CHAPTER 3

3.0 AFFECTED ENVIRONMENT

3.1 WILDERNESS RESOURCE
(Issue 1.8.1 – Chapter 1)

Fox and Crescent Reservoirs reside in the eastern edge of the High Uintas Wilderness (HUW). The HUW is part of the National Wilderness Preservation System (NWPS), which was created by the Wilderness Act of 1964 (PL88-577) and was designated wilderness by the Utah Wilderness Act of 1984 (PL 98-428). Approximately, four hundred and sixty five thousand acres were designated.

Photo 3.a – Fox and Crescent Reservoirs and surrounding mountains

The Wilderness Act of 1964 sets out the fundamental parameters of units of the NWPS. The basic purpose of the act is "…to secure for the American people of present and future generations the benefits of an enduring resource of wilderness" (1964 Wilderness Act, emphasis added). This clear statement of purpose from the act is the foundation upon which wilderness management policy is based. Wilderness is managed as a unique resource producing numerous benefits for the American people.

Wilderness is defined in the 1964 Wilderness Act as follows:

"A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfirmed type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value."

The wilderness resource, as defined by the Wilderness Act of 1964 has three equally important characteristics:

1. It is a place not controlled by humans, where natural ecosystem processes operate freely and where its primeval character and influence are retained.

2. It is a place not occupied or modified by mankind, where humans are merely visitors and the imprint of their work is hardly noticeable.

3. It is a place with outstanding opportunities for solitude or for a primitive and unconfined recreational experience.

The wilderness resource is also composed of basic natural resources such as soil, water, wildlife, vegetation, and air to be managed as inseparable parts of the whole – the wilderness resource. Wilderness has multiple purposes and provides a variety of benefits to the American people. The 1964 Wilderness Act states that wilderness "shall also be devoted to the public purposes of recreational, scenic, scientific, educational, conservational, and historical use."

The 1964 Wilderness Act also contains specific prohibitions on activities to insure meeting the intent and purposes stated in the act. The Act states: "Except as specifically provided for in this Act, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and, except as necessary to meet minimum requirement for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons with the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other forms of mechanical transport, and no structure or installation within any such area."

Note that the fundamental prohibitions against temporary roads, use of motorized vehicles, motorized equipment or motorboats, landing of aircraft and other forms of mechanical transport or structures and installations is tempered by the statement "except as necessary to meet minimum requirement for administration of the area for the purpose of this Act." This phrase in the Act is where the Forest Service can allow motorized tools or equipment or mechanical transport in the HUW if it is found through the analysis, that they meet the criteria for the minimum requirement for purpose of the Act.

In 1998, the Ashley National Forest completed an EIS and Forest Plan amendment for managing the HUW in accordance with both the 1964 Wilderness Act and the 1984 Utah Wilderness Act that established the HUW. This plan amendment set standards and indicators for monitoring wilderness condtion and also set some specific standards for vistitor use. These standards will apply to activities associated with this reservoir repair project. The following prohibitions and limits apply to the HUW and specifically to the Fox/Crescent Reservoir Area.

1. Group size exceeding 14 persons and 15 head of stock.
2. Terrain permitting, camping within 200 feet of trails, lakes, ponds, springs, and other water sources.
3. Camping within 100 feet of an occupied campsite.
4. Camping for more than 14 days at an individual site.
5. Shortcutting a trail switchback.
6. Disposing of debris, garbage or other wastes. (Human waste and food scraps must be buried; all other garbage, debris and waste must be packed out ot the wilderness).
7. Bedding, tethering, hobbling, or hitching a horse or other saddle or pack animal overnight within 200 feet of lakes or springs.

The High Uintas Wilderness contains 60 miles of the 150 mile High Uintas mountain range. It contains 26 summits and peaks that exceed 13,000 feet. The High Uintas Wilderness elevation ranges from Kings Peak at 13,528 feet, the highest peak in the state of Utah, to a low of 7,520 feet along the boundary near the North Fork of the Duchense River.

Fox and Crescent Reservoirs are located at the upper of the Uinta Canyon drainage. This drainage consists of approximately 73,710 acres. This drainage received approximately 13,000 visitor days use in 1994 (HUW EIS 1998). Most of the use was concentrated around the fishable lakes and reservoirs. Both Fox and Crescent Reservoirs are stocked with fish and they are popular destination sites for anglers and campers. Most use occurs from mid-June through early September. Due to early snows and poor trail and

pass conditions in the fall, hunting use is light, although some use occurs at Fox Reservoir.

There are two primary routes to the Fox/Crescent Reservoir areas. The first is up Uinta Canyon from the Uinta Canyon Trailhead. This route takes a person directly up the Uinta River to the Highline Trail and then travelling east, the trail will take a person directly to the reservoirs. The second route is from the vicinity of the West Fork Trailhead along the Fox-Queant trail. This route provides access from the east into the drainage from Fox/Queant Pass or with a bit of a detour from North Pole Pass. From the wilderness boundary at Fox/Queant Pass, or North Pole Pass, most camping occurs around Fox Reservoir.

The Fox and Crescent Reservoir areas of the HUW meet most of the fundamental parameters of high quality wilderness resource area. There are exceptional opportunities for primitive recreational experiences and opportunities for solitude. It is typical of the quiet backcountry expected in a wilderness setting – free of noise other than from nature's activities. Natural processes predominate in the area, and the imprint of human activity is relatively unnoticed (with the exception of the reservoirs themselves) and there are good opportunities for meeting other valuable purposes for which wilderness areas were established including scientific study, scenic beauty, educational opportunities and historical values.

The area has some wilderness detractions, primarily the human-made reservoirs themselves, and some scars upon the landscape from borrow areas used in the initial construction of the reservoirs. The reservoirs are, however, historical structures, and there are other associated historical items in the vicinity including old tools (fresno scrapers) and remains of the cabin structures occupied at the time of reservoir construction.

Overall, wilderness values are very high in the vicinity of Fox and Crescent Reservoirs.

3.2 RECREATION

(Issue 1.8.2 – Chapter 1)

The purpose of this section is to describe the existing recreational components within the area of consideration. It describes the recreational and visual resources that would be affected by implementation of the alternatives.

The majority of recreation use of Fox and Crescent Reservoirs originates from trailheads located in the Upper Uintah River and Whiterocks River Watersheds. Trail distances to the reservoirs from trailheads in the northern end of the Whiterocks River Watershed are shorter than those in the Upper Uinta River Watershed. Therefore, most recreationists access Fox and Crescent Reservoirs from the Whiterocks River Watershed.

Whiterocks Drainage

-Roads, Staging Areas, and Trails-

Roads

The Chepeta Lake Road #110 provides access to the Chepeta Lake backcountry, extending 10.5 miles beyond its intersection with Farm Creek Forest Road #117 (near Pole Creek Campground) to the Chepeta Lake area. Road surfacing is both native material and gravel. This road is open to general vehicle travel and provides a transportation route for recreationists, irrigation permit holders, and outfitter/guides. Two high clearance jeep trails interesect road #110 and access the adjacent backcounty.

Jeep Trails

The Rasmussen Lakes Jeep Trail is approximately 2.3 miles in length and terminates in the proximity of Rasmussen Lakes. The Queant Lake Jeep Trail terminates 2.25 miles from its junction with the Chepeta Lake Road #110; the terminus is approximately 2.5 miles from Queant Lake. The jeep trails have native surfaces and narrow widths, ranging from 10 to 14 feet. Large rocks and blow down trees often block clear passage along the routes, and access is limited to high clearance vehicles.

Old timber cutting units exist along both jeep trails.

Helicopter and Horsepacking Staging Areas

-Reader Creek meadows-
Dry Gulch Irrigation Company (DGIC) proposed using Reader Creek meadows as a staging area for helicopter operation and and horsepack trips. The meadow areas are located two miles south of Chepeta Lake along Forest Road #110. Another option is the nearby Chepeta Trailhead area and a meadow area located 50 feet south of the trailhead on an existing track. Helicopter flights between Reader Creek meadows, the Chepeta Trailhead area and the reservoir areas would be over North Pole Pass or Fox/Queant Pass.

The staging areas at Reader Creek meadows and Chepeta Trailhead are located on the relatively flat, dry ground morainal component of the AM3 Unit. This component is very stable, rocky, and dry (see the Chapter Three, Soils and Landform for a complete description of this unit).

-Queant Lake Jeep Trail-
In addition to Reader Creek meadows, the Ashley National Forest Interdisciplinary (ID) Team identified a site located immediately north and west of the junction of Chepeta Lake Road #110 and the Queant Lake Jeep Trail as an alternative helicopter and horsepacking staging area. Helicopter flights from this alternative site could be over North Pole Pass or Fox/Queant Pass.

This alternative staging area is located on a relatively stable elongated lateral moraine that has a broad and flat top. Slope percentage range from five to 15 percent. (See Chapter Three, Soils and Landform for a complete description of this unit).

Trails
DGIC proposed to organize horsepacking operations at the Reader Creek meadow staging area and use Reader Basin Trail #133 and the Uinta Highline Trail #025 across North Pole Pass for the horsepack trips to Fox Reservoir.

Horse packing operations from the optional Chepeta Trailhead would occur over alternative Uinta Highline Trail #025d and Uinta Highline Trail #025 across North Pole Pass.

-Reader Basin Trail #113-
This trail is located predominately on dry ground morainal landform components of AM3 (see the Chapter Three, Soils and Landform for a complete description of this unit). The majority of the trail is located adjacent to Reader Creek, and crosses the creek and a few riparian areas several times.

-Highline Trail #025 and #025d-
Trail #025 and #025d are located predominately on ground morainal components with a mix of wet and dry areas. Trail #025 is poorly drained and captures and carries water during storms. Trail #025d is on flatter terrain, has moderate drainage, and carries less water during storms. Downcutting and minor areas of disturbance exist, due to the rocky nature of the surrounding area, rapid runoff, and loss of fines along the trail tread. Moderate recreation use of the trails is resulting in braiding of the trail system, i.e., users waking outside of the trail tread to avoid rocks, water, etc.; thereby creating another trail corridor.

-Queant Lake Jeep Trail, Queant Lake Trail #048, and West Fork Whiterocks Trail #047-
The trail system from the alternative staging area would be the Queant Lake Jeep Trail, Queant Lake Trail #048 and West Fork Whiterocks River Trail #047.

Queant Lake Jeep Trail and Queant Lake Trail #048 traverses through a mix of dry drift over bedrock. At the end of the jeep trail, Queant Lake Trail descends across wet components. The last mile to Queant Lake is deeply rutted and braided (more than one trail tread) through wet areas. These same conditions exist from Queant Lake to the junction with the Highline Trail #025 east of Taylor Lake.

West Fork Whiterocks Trail #047 traverses through a wet riparian bottom area between ground moraines for a considerable distance. Trail erosion is highly evident and there are numerous stream and wet area crossings. Trail damage from use by hikers and horseback riders is evident and many segments of the trail are difficult to use.

Photo 3.b – meadow & hummock along West Fork Whiterocks Trail # 047

Aesthetic Amenities

The Chepeta Lake backcountry is a beautiful landscape with streams flowing through alpine meadows and forested areas. Other than the jeep trails, all of the backcountry is managed as a non-motorized area, except for snowmobile use in the winter. Many non-motorized trails provide access to high country lakes and link with trails providing access to the High Uintas Wilderness.

Current Recreation Use Patterns

Dispersed recreation activities in the backcountry consists of camping, fishing, hunting, ATV and four wheel drive travel on the jeep roads, backpacking, day use hiking, horsepacking and horseback riding. Some snowmobiling occurs during winter months.

-Reader Creek Meadow-

Fishing, hiking and dispersed camping are the major recreation uses of the Reader Creek meadow area and Reader Basin Trail #133. Horseback riding and horsepacking also originates at the meadow area. Most fishing in the meadow area occurs between the confluence of Reader Creek with Whiterocks River to the junction of Reader Basin Trail #133 and Highline Trail #025. Backpackers, horseback riders, and horsepackers use the Reader Basin Trail to access backcountry areas and Fox and Crescent reservoirs. The reservoirs are located approximately 12 trail miles west of the Reader Creek meadow. These recreationists park their vehicles at several roadside locations adjacent to the meadow.

Deer and elk hunting also occur during the fall months, with most hunters using horses to access the adjacent backcountry and High Uintas Wilderness.

Chepeta Trailhead and Chepeta Lake –

Fishing is the major recreation use of the lake and Whiterocks River corridor. The old parking areas and the new Chepeta Trailhead also serve as staging areas for horsepacking, horseback riding, day use hiking and backpacking. The trailhead is located approximately 2.5 miles north of Reader Creek meadows along Chepeta Lake Road #110. Trail distance to Fox and Crescent Reservoirs from this trailhead is approximately 10 miles. Horsepacking and horseback riding account for approximately 60 percent of the recreation use of Chepeta Lake Trailhead and Highline Trail #025. Day use hiking, backpacking, and fishing account for remaining recreation use.

Deer and elk hunters also use the Chepeta Lake area and trailhead as staging areas during the fall months.

-West Fork Whiterocks River-

This river and river corridor are located approximately three miles south of Reader Basin Creek. Horseback riding and horsepacking are the major recreation uses of the river corridor and West Fork Whiterocks Trail #047, followed by packpacking and fishing. The West Fork Whiteriver Trailhead is approximately 10 miles from Fox and Crescent Reservoirs.

The Queant Lake and Rasmussen Lakes Jeep Trails are located immedaitely north and south of Trail #047 and are used mainly by horsepackers.

Upper Uinta River Drainage

-Roads and Trails-

Roads
Forest Development Road #118 provides access to the High Uintas Wilderness boundary at U-Bar Ranch. Road surfacing on #118 is both native surface and gravel.

Trails
Visitors enter the wilderness via Uinta River Trail #044. Trail distance from the trailhead to the reservoir areas is approximately 19 trail miles via Uinta River Trail #044, Shale Creek Trail #045 and Highline Trail #025.

The Uinta River Trail #044 traverses along the Uinta River to the junction with Shale Creek Trail #045. In the lower end of Uinta Canyon, the trail crosses along a glacial valley bottom consisting of hummocky ground moraine and outwash, scattered wet meadows, seeps and springs. Near the junction with Shale Creek Trail, conditions change to steep to moderately steep canyon side slopes that are covered with boulder glacial moraine. Trail conditions are fair to good, with moderate erosion and loss of trail tread in the steeper terrain.

Shale Creek Trail #045 ascends along steep side slopes of boulder glacial moraine, before reaching meadows, ponds, and wet depressions near the junction with the Highline Trail #025. Trail conditions are poor to fair, due to erosion and loss of trail tread.

Aesthetic Amenities
As with other wilderness areas, the streams corridors are located in highly scenic areas of the wilderness, including forested slopes at lower elevations and alpine lakes, glaciated cirque, and basins and meadows in the upper watersheds. Fox and Crescent Reservoirs along with Atwood Basin and Krebs Basin (Chain Lakes area) are extremely popular areas with backpackers and horsepackers. Areas of concentration exist around the perimeter of these lakes and reservoirs, while the stream corridors receive light to moderate use as part of trail access to lake areas.

Current Recreation Use Patterns

The majority of users traveling from Uinta Canyon Trailhead to Fox and Crescent Reservoirs are horsepackers, with backpackers accounting for the remaining trail use.

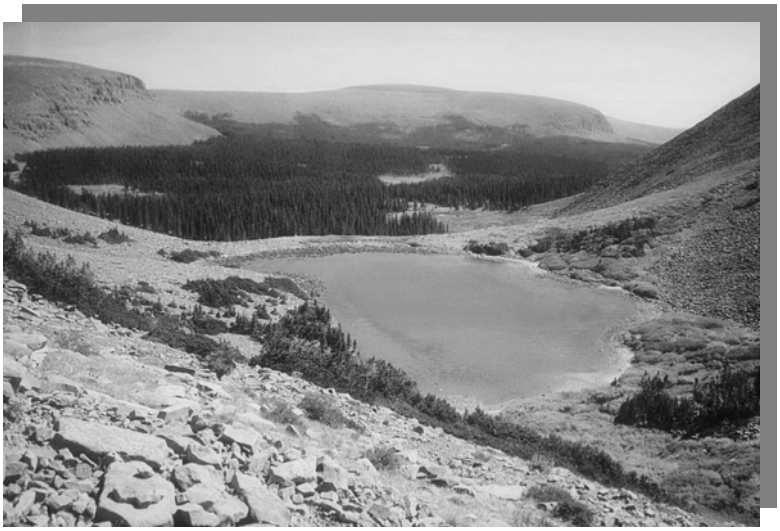
Camping and fishing are the primary recreation activities at the reservoir areas, with moderate to heavy use through summer and fall months.

The season of use is about four to five months, from mid-June through early September.

3.3 VEGETATION
(Issue 1.8.4 – Chapter 1)

The vegetation associated with this proposal is discussed by *ecological unit* as delineated in the Land Systems Inventory of the Ashley National Forest and may be viewed on the *Ecological Unit Site Map in Chapter Six - Appendices*. Only those ecological units that have bearing on this proposal will be discussed. No threatened, endangered, rare, or uncommon plants species associated with the Uinta Mountains are known to be growing at or in the ecological units associated with this proposal.

Photo 3.c – Pond at Fox/Crescent Pass, looking northwest



Alpine Moraine 3 Ecological Unit (AM3)

This ecological unit is described as hummocky ground moraines located along glacial valleys bottoms below the cirques. Lakes, ponds, wet depressions, open and forested knolls are commonly associated with this unit. The Alpine Moraine 3 Ecological Unit is separated into two vegetative sub-units. The alpine moraine meadows sub-unit (AM3M) consists of both wet and dry meadows with less than 10% tree cover within the sub-unit. Wet meadows are dominated by sedges, grasses, and low growth willows such as plane-leaf willow (*Salix planifolia*). Communities of mud sedge (*Carex limosa*), few-flowered spikerush (*Eleocharis pauciflora*), deerhair bulrush (*Scripus caespitosus*), or water sedge (*Carex aquatilis*) are common in water-saturated histosolic soils. Marsh marigold (*Caltha leptosepala)* and elephanthead (*Pedicularis groenlandica*) are common forbs in these wet areas. Plane-leaf willow is lacking, or infrequent and of low vigor in bogs and wet meadows. It is abundant and a community type dominant in many well-drained soils, such as sand levees of streams and sand deltas at the base talus slopes. Tufted hairgrass (*Deschampsisa cespitosa*) commmunities thrive in areas where the water table is between 10 to 14 inches, thus delineating an ecotone between the wet meadow and dry meadow components of AM3. Timber oatgrass (*Danthonia intermedia*) is nearly ubiquitous in dry meadows and is an indicator of the dry meadow component. Its abundance indicates the watertable is below the rooting depth of most graminoid and forb species. Tufted hair grass is also present in well-drained soils, but decreases with drier conditions. Other common species in the dry meadow component include Canada single-spike sedge (*Carex scripoideae*), alpine timothy (*Phleum alpinum*), alpine bluegrass (*Poa alpina*), sheep fescue (*Festuca ovina*), spike trisetum (*Trisetum spicatum*), slender-leafed ligusticum (*Ligusticum tenuifolium*), and dwarf huckleberry (*Vaccinium caespitosum*).

The alpine moraine timber sub-unit (AM3T) consists of areas that are predominately forested, but are interspersed with some small meadows. Intermixed communities of lodgepole pine (*Pinus contorta*), Engelmann spruce (*Picea englemannii*), and subalpine fir (*Abies lasiocarpa*) are associated with this sub-unit. Grouse whortleberry (*Vaccinium scoparium*) is often the dominant understory species. Engelmann spruce is occassionally the dominate tree in this sub-unit, but is usually a co-dominant with lodgepole pine. Meadows in this sub-unit are similar to those described in AM3M.

The forage areas west and south of Fox and Cresent Reservoirs and at Cleveland Lake correlate with the AM3M and AM3T ecological units. *(Refer to Alternative Maps One, Two and Three, Chapter One.)*

Alpine Moraine 5 Ecological Unit (AM5)

This ecological unit consists of broad glacial moraine lands above the main drainages and below cirque headwalls. The AM5 is predominately forested with Engelmann spruce trees, but mixed conifer stands are common. Grouse whortleberry is the principal understory species. A few small lakes and narrow meadows can also be observed in this ecological unit. Both wet and dry meadows are present in the AM5 and are similar to those described in the AM3M ecological sub-unit; however unlike the AM3M, stands of glaucous willow (*Salix glauca*) have formed in some of the open meadowed uplands of the AM5.

The forage areas west and south of Fox and Cresent Reservoir and at Cleveland Lake correlate with the AM5 ecological unit. *(Refer to Alternative Maps One, Two and Three, Chapter One.)*

Alpine Moraine 6 Ecological Unit (AM6)

This ecological unit consists of steep glacial valley walls with a thin veneer of bouldery glacial moraine. The slopes in the unit are benchy with bedrock outcrops located at the outside edges of some of the flatter areas. Surfaces are very cobbly and stony. The dominant soils are well drained.
Plant communities of lodgepole pine-aspen, lodgepole pine, and engelmann spruce-lodgepole pine can be expected within the AM6 ecological unit. Grouse whortleberry is the common

understory in coniferous stands. Ross sedge (*Carex rossii*) is often associated with aspen and lodepole pine communities.

Alpine Moraine 7 Ecological Unit (AM7)

This ecological unit consists of lateral moraines with several small parallel ridges that curve in at the distal ends. Large blocky, angular, and coarse fragments of the Uinta Mountain Group are common in the soil profile and often on the surface. Coniferous forests dominate the ecological unit in which lodgepole pine is seral to englemann spruce and sub-alpine fir. Grouse whortleberry is the principal understory species. Englemann spruce is more abundant at upper elevations and lodgepole pine is more abundant at lower elevations. Subalpine fir is frequently present, but has yet to show capacity to dominate in the ecological unit.

Uinta Bollie 2 Ecological Unit (UB2)

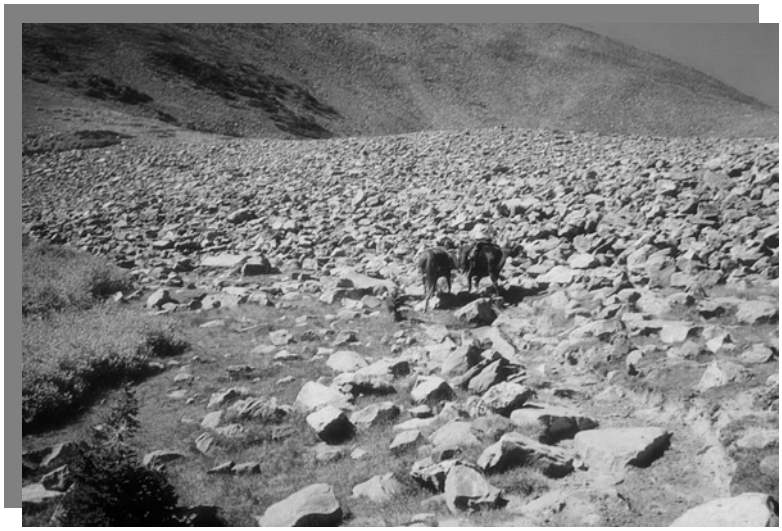


Photo 3.d – Boulder field west of Fox/Crescent Pass

Boulder fields of large quartzite boulders with little soil or fine gravel represent this ecological unit. The Uinta Bollie ecological unit supports little if any vegetation. In protected pockets at the base of rocks, mountain sorrel (*Oxyria digyna*), Colorado columbine (*Aquilegia caerulea*), *Cirsium eatonii*, and a few other alpine species become established. Cliff faces often support a more diverse flora with greater numbers of each species than do the boulder fields. In fine talus slopes of quartzite and red pine shale sticky sky-pilot (*Polemonium viscosum*), Fremont groundsel (*Senecio fremontii*), woolly groundsel (*Senecio canus*), Michaux mugwort (*Artemisia michauxiana*), alpine dusty-maiden (*Chaenactis alpina*), alpine smelowskia (*Smelowskia calycina*), fernleaf fleabane (*Erigeron compositus*), Scribner wheatgrass (*Elymus scribneri*), alpine pussytoes (*Antennaria alpina)*, and rock brake fern (*Cystopteris fragilis*). Other talus plants less common include dwarf fireweed (*Epilobium latifolium)*, dwarf hawksbeard (*Crepis nana*), tufted saxifrage (*Saxifraga caespitosa*), nodding saxifrage (*Saxifraga cernua*), Uinta parrya (*Parrya rydbergii*), alpine poppy (*Papaver radicatum*), and pygmy saxifrage (*Saxifraga debilis*). In more moist areas, Parry primrose (*Primula parryi*), mountain deathcamas (*Zigademus elegans*), and streamside bluebells (*Mertensia ciliata*) are occasional to frequent. Shrubs of this ecological unit include grayleaf willow (*Salix glauca*), wine gooseberry (*Ribes inerme*), common juniper (*Juniperus communis*), and shrubby cinquefoil (*Potentilla fruticosa*). These are often found in protected areas.

Uinta Bollie 3 Ecological Unit (UB3)

This ecological unit consists of alpine surfaces that are rounded and moderate-to-steep sloped. Stone nets, channels, and rock stripes account for much of the UB3 ecological unit.

Cushion plant (*Paronychia pulvinata)* and curly sedge (*Carex rupestris*) communities are common on the rounded summits that are windswept yearlong and generally free of snow during the winter. Common plants are curly sedge, moss campion (*Silene acaulis*), and dwarf clover (*Trifolium nanum*). Sedge and geum communities are common between stone nets and strips. Alpine avens (*Geum rossii*) and Canada single-spike sedge the most frequent plants at these sites.

Uinta Bollie 8 Ecological Unit (UB8)

This ecological unit consists of broad divides, benches, and concave slopes associated with drainages of low relief (mostly less than 8%). Soils associated with this unit tend to be deeper and more developed than in other UB ecological units, they have not been scoured with ice or water, and lack or rarely consist of rock polygons that are common on the UB1 unit. Dry to moist alpine meadows are associated with this ecological unit. Plants are low in stature and create a carpet-look across the landscape; however, vegetative communities are not uniform and large in size, but form a frequent finely-dissected mosaic pattern. Common plant species in the unit include Canada single-spike sedge, tufted hairgrass, dwarf sagebwart (*Artemisia scopulorum*), Ross avens (*Geum rossii*), Parry clover (*Trifolium parryi*), American bistort (*Polygonum bistortoides*), and wedge-leaf cinquefoil (*Potentilla diversifolia*).

Production on the great majority of AM3 and UB8 Ecological Units indicates capability to support livestock grazing, which includes horse use. Forage production from four dry meadow sites (Range Analysis of 1960s, 2210) within the Fox Lake area shows a range of production from 48-214 lbs/acre with an average of 169 lbs/acre (refer to Table 3.3.1). Forage plant composition at these dry meadow sites includes timber oatgrass, tufted hairgrass, Canada single-spike sedge, sheep fescue, alpine timothy, alpine bluegrass, and spike trisetum. Studies from moist and wet areas near Fox Lake indicate 590-1080 lbs/acre forage production. Water sedge is the dominant forage species at these sites. Since many parts in the wet meadows are too boggy for horse grazing and cannot be differentiated from the wet parts that can be grazed, production of the wet meadows was not considered in the overall carrying capacity. Even though the carrying capacity for wet meadows was not indicated in Table 3.3.1, the available forage for horses in the accessible wet meadows should greatly increase the carrying capacity for horse use at Fox Reservoir.

The forage area north of Fox and Crescent Lakes correlates with the UB8 ecological unit. *(Refer to Alternative Maps One, Two and Three, in Chapter One.)*

Table 3.a Forest Types and Available Forage

Forage type	Type	Acres	Forage (lbs)/Ac	Total Forage (lbs)
Dry sub-alpine meadow	S1 70/42	109	214	23,326
Dry alpine meadow	S1 81/61	266	205	54,530
Timbered meadows	S6 73/79	345	48	16,560
Timbered meadows	S6 68/41	52	207	10,764
Totals/ Average		772	169	105,180

Based upon proper use standards, only about ½ of the production should be considered as available forage. About 85 lbs/acre should be included as available forage for dry areas. In the wet meadows, about 290 lbs/acre might be included in proper grazing use.

3.4 WILDLIFE

(Issue 1.8.3 – Chapter 1)

Terrestrial Wildlife

This section discusses the habitat conditions and potential occurrence of terrestrial wildlife species of conservation concern in the project area, including species federally listed or proposed as threatened or endangered and species the Forest Service has identified as sensitive. It also addresses species listed in the Ashley's Forest Plan as management indicators (MIS) for the habitats present in the project area and birds of conservation concern that may be at risk from the proposed project. Additional information and references on threatened, endangered, and sensitive species can be found in the Biological Assessment and in the Biological Evaluation prepared for this project (on file at the Roosevelt Ranger District Office). For a quick reference of species occurrence in the project area refer to Appendix B, Items 1 and 4.

Federally Threatened, Endangered, and Proposed Species

Appendix B, Item 3 lists the threatened, endangered and proposed species that are known or suspected to occur on the Ashley National Forest and the habitats typically used by each species.

Canada Lynx

In the United States, lynx inhabit conifer and conifer-hardwood habitats that support their primary prey, snowshoe hares. Lynx habitat in the Southern Rockies is likely found within the subalpine and upper montane forest zones, typically between 2,450 – 3,650 meters (8,000 – 12,000 ft) in elevation (Ruediger et al. 2000).

Snowshoe hares are the primary prey of lynx, comprising 35-97% of the diet throughout the range of the lynx. Southern populations of lynx may prey on a wider diversity of species than northern populations because of lower average hare densities and differences in small mammal communities. Other prey species include red squirrel, grouse, flying squirrel, ground squirrel, porcupine, beaver, mice, voles, shrews, fish, and ungulates as carrion or occasionally as prey (Ruediger, et al. 2000).

There are 10 specimens of lynx that have been reliably traced to the Uinta Mountains, with collection dates ranging from 1916 to 1972 (Bates 1999). According to a completed biological assessment, lynx occur rarely, if at all in the Uintas (McKay 1991). Forest Service track surveys (Ashley National Forest Unpub data) in 1996-1997 (covering 237+ miles of transect) have not documented any lynx tracks in the Uintas. The Ashley National Forest began hair snare surveys in the fall of 1999 as part of the National Lynx Detection Protocol (McKelvey et al. 1999). In 1999, several hair samples were collected and results from the Rocky Mountain Research lab indicated no positive Canada lynx hair samples. Hair samples from the 2000 and 2001 field seasons also resulted in no positive Canada lynx hair samples. The last definitive occurrence of a lynx in the Uinta Mountains was in 1972 (McKay 1991). Although no positive Canada lynx hair samples were collected, there is potential lynx habitat on the Forest, and lynx habitat is considered to be within the project area.

A Lynx Analysis Unit, or LAU, is a subwatershed that approximates a female's home range. The proposed project occurs within the Chepeta/Whiterocks LAU and the Uinta LAU.

Bald Eagle

Bald eagles are known to occur on the Ashley National Forest, primarily near Flaming Gorge Reservoir and the Green River corridor during the winter months (Ashley NF unpub. data). Occasionally they are near other waters until freeze-up. Bald eagles are considered to be a winter visitant to the state of Utah and rare in the summer (Behle 1985). There are only four active bald eagle nests in the state (two near Moab, one near Orangeville, and one near the west desert) and they are all more than 100 miles away from the project area (Romin, USF&WS, 2004, pers. com.). The majority of wintering bald eagles are found near open water, where they feed on fish and waterfowl. Winter habitat must contain an abundant available food supply, with one or more night roost sites (Behle 1981). Due to the heavy snow cover, low availability of food, and lack of expansive open water, winter habitat does not exist near the project area. Therefore, the bald eagle would not be affected by the proposed project.

Forest Sensitive Species

Forest sensitive species are identified by the Forest Service Regional Forester as 'those…for which population viability is a concern, as evidenced by…significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution' (FSM 2670.5). The current list of sensitive species pertinent to the Ashley National Forest and the species habitat requirements are located in Appendix B, Item 2. Of the species listed, the northern goshawk, boreal owl, great gray owl, and three-toed woodpecker are associated with the habitats in or near the project area.

Northern Goshawk

This species inhabits coniferous, deciduous, and mixed forests in North America and prefers to forage in closed canopy forests with moderate tree densities as compared to young forests (Graham et al. 1999). A goshawk's home range may be up to 6,000 acres and has three main habitat component needs (nesting, post fledgling area, and foraging area) within this home range (Reynolds 1992). Nesting areas are typically 30 acres in size and may include more than one nest (Reynolds 1992). The post-fledgling area is 420 acres in size and surrounds the nest area (Reynolds 1992). The post-fledgling area typically includes a variety of forest types and conditions, but it should contain patches of dense trees as well as developed herbaceous areas and shrubby understory, snags, downed logs and small openings (Reynolds 1992). These attributes are needed to provide the necessary habitats for hunting, security and prey species (Reynolds 1992). The foraging area is approximately 5,400 acres and surrounds the post-fledgling area (Reynolds 1992).

In Utah, most of the 421 known nests located during project level surveys occur in mid-elevation (6,000 ft) to high-elevation (10,000 ft) sites, which are currently occupied by mature quaking aspen or coniferous forests (Graham et al 1999). Many of the documented goshawk territories on the Ashley National Forest are associated with lodgepole and aspen cover types (Ashley NF unpub. data). However, some nests in Utah have been documented in the spruce/fir type (Graham et al. 1999). Nest areas are occupied from early March until late September, when fledglings are no longer dependent upon the post fledgling area PFA (Reynolds et. al. 1993). The Goshawk Amendment to the Ashley National Forest plan also considers the nesting period to be this same period. According to Ashley National Forest monitoring data, young usually fledge from early July to early August (approx. 43 days of age) and are dependent upon the PFA until approximately 65 days of age (August – mid September), at which time the fledglings venture further away from the PFA (Dewey 1998 and 1999). The Ashley National Forest annually monitors known goshawk territories on the Forest (Ashley NF unpub. data).

The predominant forest cover type in the project area is mature spruce/fir with alpine meadows. There are no documented goshawk territories in or near the project area. However, suitable habitat is present and an established territory is possible. A juvenile goshawk was sighted near Reader Creek Lake in August of 2000 (Ashley NF unpub. data). Two other goshawks have been sighted to the south near Pole Creek Lake (Ashley NF unpub. data).

Boreal Owl

The boreal owl occurs throughout the holarctic in boreal climactic zones (Hayward 1994). Within North America, boreal owls occur in a continuous band concurrent with the boreal forests of Alaska and Canada (Hayward 1994). South of this continuous band, populations are restricted to subalpine forests with the southern most records in the mountains of northwestern New Mexico (Hayward 1994). In the southern portions of their range in North America, they are documented in subalpine forests characterized largely by subalpine fir and Engelmann spruce (Hayward 1994).

Boreal owls nest in cavities excavated by woodpeckers in mixed coniferous, aspen, Douglas-fir, and spruce-fir habitat types (Hayward 1994). Nests are usually initiated by mid April to the first of June, and young have usually fledged (28 – 36 day nestling period) by early July (Hayward 1994). Foraging habitat has been documented in mature and older spruce/fir forests (Hayward 1994). Prey consists of voles (particularly red-backed vole), lemmings, mice, shrews, pocket gophers, squirrels, chipmunks, small birds, and insects (Hayward 1994).

Habitat for boreal owls is present in the Reader Creek – Fox/Crescent Lake areas. Spring calling surveys on the Forest have detected five boreal owls. In 1996, owl surveys were conducted on the road near the proposed staging area in Alternative Two and one boreal owl responded (Ashley NF unpub. data). Two other boreal owls responded further to the south, along the road on Pole Mountain (Ashley NF unpub. data). An owl survey was also conducted in 1992 along the road near the staging areas in Alternative One, but no owls were detected (Ashley NF unpub. data).

Great Gray Owl

The great gray owl ranges from the boreal forests of Alaska, northwestern Wyoming, western Montana, Idaho, and through the Sierra Nevadas of California (Duncan and Hayward 1994). In the southern portion of their range, great gray owls nest in relatively dry coniferous or mixed deciduous/coniferous forests, especially Douglas fir, lodgepole pine and aspen (Duncan and Hayward 1994). Detections on the Ashley National Forest show they will also use mixed conifer forests (Ashley NF unpub. data). Eggs are usually laid by the first of May, and young have usually fledged in 3 –4 weeks (first of June) and ready to fly one to two weeks later (mid June) (Duncan and Hayward 1994). Foraging habitat consists of relatively open grassy areas, or timber stands with low canopy closure and grassy understorys (Duncan and Hayward 1994). Availability of prey and nest sites (typically old hawk or raven stick nests or natural depressions in broken-topped snags) is believed to be the primary factors limiting distribution of this species (Duncan and Hayward 1994).

Behle (1981) described this species as "casual or possibly a rare resident" of northeastern Utah. A statewide bird distribution study (UDWR 1983) was less optimistic, listing the great gray owl as an "accidental" species (meaning it was considered outside its normal range) in extreme northern and northeastern Utah. However, three great gray owls have been detected during calling surveys in the Uinta Mountains on several occasions (Ashley National Forest unpub. data). In 1996 owl surveys were conducted on the road near the proposed staging area in Alternative Two and two great gray owls responded (Ashley NF unpub. data). A great gray owl was also sighted to the south, near Pole Creek Lake (Ashley NF unpub. data). An owl survey was also conducted in 1992 along the road near the staging areas in Alternative One, but no owls were detected (Ashley NF unpub. data).

Three-toed Woodpecker

The three-toed woodpecker ranges from Alaska across northern Canada to Newfoundland, and south and southeast through the Rocky Mountains to Arizona and New Mexico (DeGraaf et. al. 1991). In Utah, this woodpecker nests and winters in coniferous forests, generally above 8,000 ft. in elevation (Parrish et. al. 2002). They stay on their territories year-round, though insect outbreaks, such as spruce bark beetle infestations, may cause irregular movements (Parrish et. al. 2002). Nesting for three-toed woodpeckers occur in May and June and young can be found in the nest into July (Nature Serve 2003). In Montana, they have been known to fledge later, in early August (Nature Serve 2003). Because the three-toed woodpecker requires snags for feeding, perching, nesting, and roosting, it is threatened by activities such as logging and fire suppression, which remove or eliminate snags (Parrish et. al. 2002). Feeding consists mainly of wood boring insects (Parrish et. al. 20022).

This woodpecker has been found in lodgepole, Douglas fir, spruce/fir and mixed conifer on the Ashley National Forest (Ashley NF unpub. data). Woodpecker surveys were conducted in 1994, in the blow-down, where the staging area in Alternative Two is located (Ashley NF unpub. data). Several three-toed woodpeckers were detected during this survey (Ashley NF unpub. data). Two three-toed woodpeckers were observed near the proposed Chepeta staging area in Alternative One, during point counts in 1994 (Ashley NF unpub. data). There are several other observations of three-toed woodpeckers across the drainage to the east (Ashley NF unpub. data).

Management Indicator Species

Elk and Mule Deer

Both elk and mule deer are listed as MIS because of their economic importance as hunted species. Both these species occur within the project area. Due to hunting pressure, hiding cover and road densities are important habitat variables of big game management in part of the project area. However, difficult access in the wilderness area does provide some security for elk and mule deer. Elk and deer habitat within the project is primarily summer and fall range.

The Ashley National Forest occurs within five of the states wildlife management subunits (North Slope, Daggett (elk population objective is 1300 and population estimate is 1400); South Slope, Vernal (elk population objective is 2500 and

population estimate is 2600); South Slope, Yellowstone (elk population objective is 5600 and population estimate is 5300); Nine Mile, Anthro (elk population objective is 700 and population estimate is 810); and Wasatch Mountains, Avintaquin (elk population objective is 1000 and population estimate is 1250) (UDWR 2004). Since there are portions of these subunits that are off the Forest, not all of these animals would occur on the Forest. With the exception of the Yellowstone subunit, the elk population on each of these subunits appears to be on a stable to slightly increasing trend. The Yellowstone subunit (proposed project is within this subunit) has nearly met the population objective and has been relatively stable for the past three years (Thacker, UDWR, 2003, pers. com.). Before that time, elk numbers in this subunit were on an increasing trend (Thacker, UDWR, 2003, pers. com.). Since the Forest constitutes a large portion of these subunits and population objectives have been exceeded or nearly met, it appears that the elk population across the Forest is stable. Based on the available data, it is also believed that the Forest is providing well-distributed habitat that supports a viable population of elk.

Mule deer population objectives and population estimates for the five wildlife management subunits in which the Ashley National Forest occurs are as follows: South Slope, Vernal population objective is 13,000 and the population estimate is 11,600; South Slope, Yellowstone population objective is 12,000 and the population estimate is 10,400; Wasatch Mountains, Avintaquin population objective is 3,000 and the population estimate is 1600; North Slope Unit (Daggett is a subunit within this unit) population objective is 12,000 and population estimate is 10,400; and Nine Mile Unit (Anthro is a subunit within this unit) population objective is 8,500 and the population estimate is 3,400. (UDWR 2004)

The estimated deer population is below the population objectives in all of the subunits discussed above. There was a sharp decline of mule deer populations in the state of Utah in the winter of 1992-‘93. This decline has been attributed to several years of drought followed by an unusually hard winter. The years following the decline, the deer population rebounded slowly. However, due to the current drought, the deer population has again taken a downward trend since 2000. (UDWR Statewide Management Plan for Mule Deer 2003)

Thacker states that data from recent deer classifications indicate that deer numbers in the Yellowstone subunit (proposed project is within this subunit) continue to be down (Thacker, UDWR, 2003, pers. com.). From the data above and since the Forest constitutes a large portion of the discussed subunits, it appears that the overall deer population on the Forest is currently in this same downward trend. However the data also suggest that the Forest is providing well-distributed habitat that supports a viable population of mule deer.

Northern Goshawk

The northern goshawk is the MIS for mature and old forest habitats on the Ashley National Forest. It is also a Forest Service sensitive species, and was discussed under the “Forest Service Sensitive Species” heading earlier in this section.

This species inhabits coniferous, deciduous, and mixed forests in North America and prefers to forage in closed canopy forests with moderate tree densities as compared to young forests (Graham et al 1999). A goshawk's home range may be up to 6,000 acres and has three main habitat component needs (nesting, post fledgling area, and foraging area) within this home range (Reynolds 1992). Nesting areas are typically 30 acres in size and may include more than one nest (Reynolds 1992). The post-fledgling area is 420 acres in size and surrounds the nest area (Reynolds 1992). The post-fledgling area typically includes a variety of forest types and conditions, but it should contain patches of dense trees as well as developed herbaceous areas and shrubby understory, snags, downed logs and small openings (Reynolds 1992). These attributes are needed to provide the necessary habitats for hunting, security and prey species (Reynolds 1992). The foraging area is approximately 5,400 acres and surrounds the post-fledgling area (Reynolds 1992).

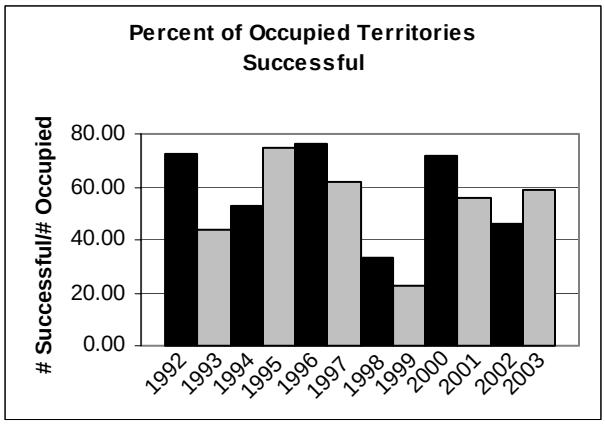
In Utah, most of the 421 known nests located during project level surveys occur in mid-elevation (6,000 ft) to high-elevation (10,000 ft)

sites, which are currently occupied by mature quaking aspen or coniferous forests (Graham et al 1999). Many of the documented goshawk territories on the Ashley National Forest are associated with lodgepole and aspen cover types (Ashley NF unpub. data). However, some nests in Utah have been documented in the spruce/fir type (Graham et al 1999).

The predominant forest cover type in the project area is mature spruce/fir with alpine meadows. There are no documented goshawk territories in or near the project area. However, suitable habitat is present and an established territory is possible. A juvenile goshawk was sighted in the project area near Reader Creek Lake in August of 2000 (Ashley NF unpub. data). Two other goshawks have been sighted to the south near Pole Creek Lake (Ashley NF unpub. data).

Statistical analysis of autumn migratory raptor counts in the Wellsville Mountains of Utah from 1977-1979 and 1987-2001, showed a decline in counts of northern goshawks. This analysis also suggests that northern goshawk productivity has dropped substantially in portions of northern Utah. (Hoffman and Smith 2002) Hoffman and Smith further suggest that the severe drought may be depressing raptor populations, range wide, in the interior west.

The Ashley National Forest annually monitors and surveys known goshawk territories on the Forest (Ashley NF unpub. data, USDA Forest Service 2003). The graph below depicts the percent of occupied northern goshawk traditional territories that were successful on the Ashley National Forest, between 1992-2003 (USDA Forest Service 2003).



The Ashley National Forest has been monitoring northern goshawks since 1991. Of the 13-year total of 236 active nests, 162 (69%) fledged young (USDA Forest Service 2003). The occupancy rate of known territories has fluctuated since data collection began, with an average of 46.9% (USDA Forest Service 2003). A paper by Patricia Kennedy in 1997 evaluated goshawk populations across the west, including the goshawk population on the Ashley National Forest (Kennedy 1997). Kennedy found no statistical evidence of a decline in the goshawk population on the Forest (Kennedy 1997). Analysis of goshawk data collection on the Forest since Kennedy's paper indicates that the population is apparently stable across the Forest (USDA Forest Service 2003, Ashley NF unpub. data). It also appears that the Forest supports a viable goshawk population and continues to provide well-distributed habitat across the Forest for this species.

Lincoln's Sparrow and Song Sparrow

Lincoln's sparrow and song sparrow are indicators of riparian shrubs. These species are generally found along streams, wet meadows, riparian thickets, and brushy forest edges (Nature Serve 2003). They forage on insects and seeds, and nest on the ground in concealing vegetation (Nature Serve 2003). Home range for both species is approximately 0.4 hectares (1 acre, or 208ft X 208ft.) (Nature Serve 2003).

Habitat for Lincoln's and song sparrows is within the project area. A point count transect in 1994 was near Reader Creek, but there were no detections of Lincoln's or song sparrows. However, two Lincoln's sparrows were sighted in the next drainage (Dry Fork), directly east of the project area in 2001. These birds were in habitats that are similar to those in the project area. It is therefore likely that Lincoln's sparrows are present in the project area. (Ashley NF unpub. data)

Nature Conservancy data shows Lincoln's sparrow populations in Utah to be "vulnerable" (Nature Serve 2003). According to data compiled from surveys (including two routes on the Forest) from 1966 to 2002, the North American Breeding Bird Survey (BBS) (Sauer et. al.) shows Lincoln's sparrow populations in the state of Utah to have a

positive trend. Data from the Grizzly Ridge route (occurs on the Vernal RD) appear to indicate that Lincoln's sparrow populations are slightly increasing (Sauer et. al.). There have been no detections of Lincoln's sparrows on the Moon Lake route (occurs on the Roosevelt/Duchesne RD) (Sauer et. al.). Four other BBS routes (Soapstone, Wasatch, Matt Warner Res, and Flaming Gorge routes) are in similar habitats that occur on the Ashley National Forest and are in close proximity to the Forest (Sauer et. al.). The Flaming Gorge and Matt Warner routes did not have any Lincoln's sparrow occurrences, but the Soapstone and Wasatch routes indicate a stable to increasing trend of occurrences of this species (Sauer et. al.). The Forest ran three transects in the riparian canyon type in 1994 and 1995 and detected no Lincoln's sparrows and seven Lincoln's sparrows respectively (Ashley NF unpub. data). Other recorded sightings of Lincoln's sparrows on the Forest appear to be distributed across the Forest (Ashley NF unpub. data).

Nature Conservancy data shows song sparrow populations in the state to be "apparently secure" (Nature Serve 2003). According to data compiled from surveys (including two routes on the Forest) from 1966 to 2002, the North American Breeding Bird Survey (Sauer et. al.) shows song sparrow populations in the state of Utah to have a positive trend. Data from the Grizzly Ridge and Moon Lake routes appear to indicate a stable to slightly decreasing trend in song sparrow populations (Sauer et. al.). The Flaming Gorge and Wasatch routes did not have any song sparrow occurrences, but the Soapstone and Matt Warner routes indicate a stable to increasing trend of occurrences of this species (Sauer et. al.). The Forest ran three transects in the riparian canyon type in 1994 and 1995 and detected 120 song sparrows and 47 song sparrows respectively (Ashley NF unpub. data). Other recorded sightings of song sparrows on the Forest appear to be well distributed across the Forest (Ashley NF unpub. data).

Based on the available data for the Ashley National Forest and for Utah (Nature Conservancy data, BBS state wide data, BBS data on the Forest and surrounding the Forest, Ashley NF bird transects and sighting records), it is believed that the Lincoln's sparrow population on the Forest is stable to increasing and the song sparrow population is stable. It is also believed that the Ashley National Forest provides ample riparian shrub habitat (20,700 acres) that is well distributed across the Forest, and sustains viable populations of Lincoln's and song sparrows (USDA Forest Service 1986).

Red-naped Sapsucker and Warbling Vireo

These species are indicators for deciduous woodlands, primarily aspen and riparian cottonwood. These species inhabit deciduous forests, primarily aspen, and deciduous/conifer mix (DeGraaf et. al. 1991). These habitats are not present in the project area, and there would be no effect to this species from the proposed project.

White-tailed Ptarmigan

White-tailed ptarmigans are indicator species for alpine meadows. They nest on the ground under shrubs or next to rocks on snow free areas in early June (DeGraaf et. al. 1991) and incubate eggs for 23 days (Nature Serve 2003). They feed on willow, forbs, leaves, flowers and some insects (DeGraaf et. al. 1991). Although habitat for this species is not present near the repair work of the dams, there is some habitat within the helicopter flight path. In the winter of 1993, one white-tailed ptarmigan was sighted near the proposed staging area in Alternative Two (Ashley NF unpub. data).

Since the release of 57 white-tailed ptarmigan into painter basin (Ashley National Forest) of the Uinta Mountains in 1976, this species has populated and dispersed across much of the alpine habitat in the Uinta Mountains (UDWR 1999, UDWR 1997). Painter basin is located east of the project area and in the same drainage (Uinta River drainage). The Utah Division of Wildlife believes white-tailed ptarmigan have increased in this basin to the point of reaching carrying capacity (UDWR 1997). The Division of Wildlife also believes, though population surveys have been difficult to complete, this species population may be stable or slightly increasing (Maxfield, UDWR, pers. com). The white-tailed ptarmigan in the Uinta Mountains became a huntable population as early as 1982, and has since remained a viable hunted population (UDWR 1999). Therefore, the

population on the Forest is viable, is believed to be stable, and is well-distributed throughout its limited range on the Forest.

Golden Eagle

The golden eagle is an indicator species for cliffs and rocks. Golden eagles require elevated nest sites, primarily cliffs (4,000 ft. – 10,000 ft. above sea level) that are close to hunting areas, but may also use trees (DeGraaf et. al. 1991). There are no known nests within the zone of influence of the project area (Ashley NF unpub. data). Ridges in the project area are above 10,000 ft. in elevation and are mainly comprised of talus slopes, with very few cliffs. Because of the lack of cliffs in the area and the ridges being above 10,000 ft. in elevation, golden eagles would not be affected by the proposed project.

Sage Grouse

This species is an indicator for sagebrush steppe. Sagebrush habitats are important for the survival of nesting and wintering sage grouse (Connelly et. al. 2000. Therefore, sage grouse populations are allied closely with sagebrush habitats (Connelly et. al. 2000). Sagebrush habitats do not exist in or near the project area, and there would be no effect to this species from the proposed project.

Birds of Conservation Concern (Migratory Birds)

The draft Memorandum of Understanding of December 9, 2002 between the USDA Forest Service, USDI Bureau of Land Management, and USDI Fish and Wildlife Service to promote the conservation of migratory birds, provides direction for managing migratory birds. This direction includes identifying species listed in the Fish and Wildlife Service Birds of Conservation Concern that are likely to be present in the area of the proposed action, and to utilize best available demographic, population, or habitat association data in the assessment of impacts to these species. Only one species, the Williamson's sapsucker, on the USF&WS List of Birds of Conservation Concern is associated with those habitat types in or near the project area. A complete list of birds from this list that are known to occur or are suspected to occur on the Ashley National Forest can be found in Appendix B, Item 4.

Williamson's Sapsucker

Williamson's sapsucker is associated with montane coniferous forest, especially fir and lodgepole pine. In migration and winter they are also found in lowland forest (Nature Serve 2003). Species selection of trees for nesting varies from conifers to aspen, however trees infected with heartrot, or trees that have cavity nests are preferred (DeGraaf et. al. 1991). Nesting occurs in mid May to mid June and young have usually fledged by the end of July (Dobbs et. al. 1997). They feed primarily on sap, cambium, and ants, but also forage on wood-boring larvae, moths, and other insects (Nature Serve 2003). The Ashley National forest is within their breeding range. They arrive in the spring and leave in the fall. Breeding Bird Surveys (BBS) (Sauer et. al.) have been done on the ANF, and have found that the Williamson's sapsucker is present on the Ashley National Forest. Habitat for this species is present within the project area.

Utah Partners in Flight Avian Conservation Strategy

The Utah Partners in Flight (PIF) working group recently completed a statewide avian conservation strategy (Parrish, Howe and Norvell 2002). The strategy identifies "priority species" for conservation due to declining abundance or distribution, or vulnerability to various local and/or range-wide risk factors. This list of priority bird species is intended to be used as a tool by federal and state agencies in prioritizing bird species that should be considered for conservation action" (Parrish, Howe and Norvell 2002). One application of the strategy and priority list is to give these birds specific consideration when analyzing effects of proposed management actions, and to implement the recommended conservation measures where appropriate. A complete list of birds from this list that are known to occur or are suspected to occur on the Ashley National Forest can be found in Appendix B, Item 4.

Three species in the Utah Partners in Flight Priority Species are associated with those habitat types in or near the project area. These species are the black rosy-finch, three-toed woodpecker, and broad-tailed hummingbird. The three-toed

woodpecker was discussed earlier as a Forest Service sensitive species, and will be discussed under the "Forest Sensitive Species" heading throughout the remainder of the document. The black rosy-finch and broad-tailed hummingbird, are discussed below and will be discussed under the "Partners in Flight Priority Species" heading throughout the remainder of the document.

Black Rosy-Finch

The black rosy-finch can be found breeding in the mountains of the western United States (Parrish et al. 2002). This species breeds beyond timberline in alpine tundra, using barren rocky or grassy areas (Parrish et al. 2002). The nest-building period occurs between mid June and early July (Parrish et al. 2002). The incubation period is 12 to 14 days, and young leave the nest at approximately 20 days old (Nature Serve 2003). They primarily feed on insects and seeds, and roost in abandoned mines, natural caves, or in culverts (Parrish et. al. 2002).

The black rosy-finch is known to occur in the Uinta Mountains and can be seen at high elevations during the breeding season (Parrish et. al. 2002). Two black rosy-finches were observed at the head of the Uinta river drainage (west of the project area and in the same drainage) in 2001, and three in 1998 (Ashley NF unpub. data). Although habitat for this species is not present near the repair work of the dams, there is some habitat within the helicopter flight path.

Broad-tailed Hummingbird

Broad-tailed hummingbird prefers streamside areas adjacent to open patches of meadow with wildflowers available (Parrish et. al. 2002). They can be found foraging on small insects and nectar in open woodlands, brushy hillsides, conifer/aspen mix, and montane scrub thickets (Nature Serve 2003). Breeding usually begins in early June and ends by mid August. Breeding broad-tailed hummingbirds in Utah usually nest between 6,000 and 8,000 ft. in elevation and has been confirmed breeding as high as 10,400 ft. (Parrish et. al. 2002). Two broad-tailed hummingbirds were observed near the proposed Chepeta staging area in Alternative One, during point counts in 1994 (Ashley NF unpub. data).

Aquatic Wildlife

Forest Service Sensitive Species

Colorado River Cutthroat Trout

On July 18, 2002, Utah Division of Wildlife Resources personnel conducted a fish population survey on Shale Creek. The survey started approximately 1.5 miles below the Fox Reservoir dam and was terminated 0.1 miles upstream from the starting point. The sampling method used was a backpack electrofishing unit. Results from this survey confirmed that brook trout *(Salvelinus fontinalis)* were thriving in Shale Creek. Colorado River cutthroat trout (*Oncorhynchus clarki plueritcus*) were not encountered during the survey. A total of 49 sub-adult to adult brook trout were caught with 8 fish missed and several juveniles not attempted to be caught. Extrapolated out, the population survey estimates there to be over 570 sub-adult to adult brook trout per mile. The average total length of the brook trout that were caught was 180 mm (7"). Weights were not taken but a ten fish mesenteric fat sample averaged out to be 3.0 on 1-4 scale which strongly suggests that food is abundant and overall the fish population is in excellent condition.

On July 19, 2002, Forest Service personnel conducted a fisheries habitat condition survey following the R1/R4 protocol. In general the findings of this survey supported the previous days population survey findings. Overall the habitat conditions were documented to be in excellent condition.

Shale Creek, which is about 4.5 miles in length, was classified into three distinct reaches. Reach 1, from the confluence of the Uinta River stretches upstream about 2.5 miles and would be classified as a Rosgen A1-A2 stream type. This part of the stream is located in a confined canyon, characterized by a high gradient with boulder and bedrock substrate. The reach that was surveyed, Reach 2, is in the transition zone between the confluence reach and the meadow reach (Reach 3) above. Reach 2 was about half mile in length and classified as a Rosgen B3 stream type. This part of the stream was made up primarily of a sequence of long riffles and some pool habitat.

Six percent of the reach was made up of pool habitat, with several other pocket pools within the abundant riffles. This reach was rated as having 100% stable banks, 30% undercut banks and a cobble dominant substrate. The riparian area vegetation consisted primarily of high elevation willow (*Salix sp.)*, grasses and sedges. There was no large woody debris in the surveyed reach. The meadow reach (reach 3), located directly above reach 2 was classified as a Rosgen E3 stream type and was about 1 mile in length. This reach consisted of long riffles and glides. This area also served as a depositional area for fines. The riparian area consisted of sedges and willows and the reach had a high bank stability rating. In this reach we could see that there was a high density of brook trout in the steam and this was later confirmed during a hook and line survey.

Shale Creek has an elevation of 10,000 feet, and on the survey date of July 19 2002, had a discharge of 4.7 cubic feet per second (cfs), and water temperatures that ranged from 57-61 degrees Fahrenheit. The physical and biological condition of this stream is very good. An assessment of the streams vegetation, hydrology, and erosion/deposition attributes is in excellent condition. Shale Creek is in proper functioning condition.

Brook trout and other non-native trout can compete with native cutthroat trout for food and habitat resources (UDWR 2000). In 1994, cutthroat trout had reportedly been stocked in Crescent Lake as fingerlings for 4 years. Cutthroat trout (spring spawn) and brook trout (fall spawn) natural recruitment was also reported. Fox Lake was reportedly stocked with brook trout for 3 years and some natural recruitment was noted. Fluctuating water levels and rapid renewals were cited as reducing the quality of fish habitat in Fox Reservoir (Schmitz 1994).

The status call of Colorado River cutthroat trout is in the Fox and Crescent Reservoir area is "present/depressed". The status of the Colorado River cutthroat trout is "present/unknown" in the upper reaches of West Fork Whiterocks River outside of the High Uintas Wilderness. Further east and downstream – in the Reader Creek/Chepeta and lower West Fork Whiterocks River areas, the status is "present/unknown". (ANF IWWI, ca.1999).

Reader Creek and West Fork Whiterocks River fish and wildlife values have been rated "high", and "moderate", respectively (W&SR 2000). Several lakes provide fish habitat, as well as the streams; brook trout (from stocking efforts) and a relic population of native Colorado River cutthroat trout are in these waters. (UDWR 2000). In West Fork Whiterocks River below Cleveland Lake, the lack of pools may be a limiting factor for trout (ANF field data 1997). The Utah Division of Wildlife Resources has identified a portion of Reader Creek for possible Colorado River cutthroat trout restoration (including removal of non-native species) by the Utah Division of Wildlife Resources.

Management Indicator Species

Macroinvertebrates

Forest-wide macroinveretebrates populations have been monitored on the Ashley National Forest since the early 1980's. The forest wide trend for macroinvertebrates has been steady for the past 20+ years with an average Biotic Condition Factor (BCI) that exceeds 75 which is the minimum value to manage for on the Ashley National Forest. The genera identified in the Forest Plan (Mayflies) ***E****peorus ssp*, *Ephemerella doddsi*, *Ephemerella inermis*,(Stonefiles) *Zapada spp*., and the True fly family Chironomidae all are widespread and common on the Forest.

Colorado River Cutthroat Trout

The Utah Division of Wildlife Resources (UDWR) manages Crescent Reservoir as a "put and take" sport fishery for both brook trout and cutthroat trout. Crescent Reservoir has received stockings of ~ 5000 Colorado River cutthroat trout in 1999 and 2001. During a 2001 gillnet survey, 19 brook trout along with 8 cutthroat trout were caught for a catch rate of 1.33 fish per net hour. While the cutthroat are surviving, brook trout appear to be dominating the fishery in Crescent Reservoir. Fox Reservoir is managed by the UDWR solely as a brook trout "put and take" sport fishery as it receives periodic brook trout

plantings. Forest Service biologists conducted a cursory hook and line survey in July 2002. The hook and line survey indicated that the brook trout are overwintering in Fox Reservoir.

Successful implementation of the Colorado River cutthroat trout (CRCT) Conservation Agreement and Strategy by the Utah Division of Wildlife Resources (UDWR,1997) and the Ashley National Forest has led to an upward trend for CRCT in several lakes on the south slope of the Uinta Mountains of the Ashley National Forest. Stream populations of CRCT still remain at risk and are on a downward trend Forest wide primarily due to non-native competition, hybridization, historical grazing, roads, habitat fragmentation, and timber practice. The subspecies appears to be distributed throughout much of the Forest, but populations in various streams and stream reaches vary in strength. It appears that some populations are thriving in isolated streams or stream reaches. Many populations have been replaced by non-native fish species. However, with continued planned conservation actions for stream populations as outlined in the Conservation Strategy, and upward trend could be achieved within 5-7 years on the Ashley National Forest. The UDWR and Ashley National Forest continue to better define fish distribution through ongoing surveys.

The upward trend for lake populations is largely attributed to the development of a CRCT broodstock program. For example, a healthy and very productive Colorado River cutthroat trout (CRCT) broodstock population exists in Sheep Creek Lake. For the past 5 years (1999-2003), thousands of fingerlings from this source have been stocked in several Unita Mountain lakes across the south slope of the Uintas. UDWR's 2001 monitoring effort indicates that 14 of the 62 stocked lakes in 1999 and 2000 exhibit a good potential for full establishment. The continued success of this current trend will be dependent upon future stocking.

In addition to the Sheep Creek Lake broodstock program, two other broodstock programs were recently initiated on the Forest. The Lake Canyon Lake broodstock program located on the south unit was started in 2002 and is scheduled to be ready for stockables in 2006. The third broodstock source which will be used to supplement CRCT populations on the north slope of the Uintas also resides in Sheep Creek Lake and is also scheduled for stockables in 2006.

The Forest Service and UDWR are also actively engaged in habitat protection through various activities such as constructing migration barriers to protect reclaimed streams. Along with the fish barriers, new construction and maintenance of riparian fencing has taken place to protect riparian vegetation and streambanks from cattle grazing. In addition, improvements to existing roads such as culvert replacement and reshaping of roads has occurred to reduce sediment loading in streams. Paramount to the CRCT stream effort is UDWR's lead role in an interagency effort for mechanical and chemical removal of non-native trout to provide non-competitive additional habitat for CRCT.

3.5 HYDROLOGY

(Issues 1.8.4 and 1.8.5 – Chapter 1)

The proposal, including satellite staging locations and alternatives, includes Fox Reservoir, Crescent Reservoir, Shale Creek, Chepeta Lake area, Reader Creek, West Fork Whiterocks Creek, and Queant Lake. Fox and Crescent Reservoir, along with Shale Creek below them, are part of the Uinta River drainage; the others lie to the east in the Whiterocks River drainage.

Issues include water quality, riparian impacts from reconstruction, camping, staging, access routes, wetland effects, and storage rights to water.

Dry Gulch Irrigation Company holds two water rights in Fox Reservoir (#'s 43-3176 and 43-3824) and one in Crescent Reservoir (# 43-3175. The Crescent Reservoir water right and water right # 43-3176 in Fox Reservoir have 1919 priority dates, and are for storage from November 1 to April 1, with use from April 1 to November 1. In Fox Reservoir, 750 acre-feet of storage is allowed with the 1919 water right priority. An additional 400 acre-feet of storage is authorized by water right # 43-3824, which has a priority date of 1964, a storage period of October 15 to July 15, and a use period of April 1 to November 1. Crescent Reservoir water right # 43-3175 allows storage of 216 acre-feet.

Uinta River Drainage

The following four Ashley National Forest land types influence the area's hydrology:

- AM3 – characterized by lakes, ponds, and wet depressions in the hummocky ground moraine, and is a complex of areas that are meadow (<10% tree cover) and trees (>10% tree cover).
- AM3M – dominated by meadow with less than 10% tree cover,
- AM3T – dominated by at least 10% tree cover.
- AM5 – similar to AM3 but with less meadow and more forest cover; a few small lakes and narrow meadows are found.

Fox Reservoir area includes AM3T and AM3M landtypes with AM5 to the south and east; Crescent Reservoir includes AM5 with a small portion of UB1 on the southeast edge; Queant Lake and West Fork Whiterocks River are mostly AM3, Reader Creek includes AM3M and AM3 landtypes; and the Chepeta area is mostly AM3. For the most part, wetlands lie away from the edges of Fox and Crescent Reservoir, but are common around the edge of Queant Lake (per color infrared photos August 1988).

Construction of dams in the High Uinta Mountains occurred from 1900 through 1957. Water stored from snowmelt was released in summer for downstream irrigation and culinary use. The drawdown creates a "bathtub ring" effect where muddy or rocky shorelines become exposed. (Pritchard 1983, Anon 1983)

The reservoir information in the following Tables (3.b and 3.c) is excerpted from 1967 report of a 1966 survey of Fox and Crescent Reservoir related (Metsker 1967).

Table 3.b
Hydrologic Reservoir Data for
Fox and Crescent Reservoirs

Feature	Fox	Crescent
Access	FDR #118 and Forest Trails #s 044 and 045 *[Note-FDR #118 descend along the Uinta River, several miles below the lakes]*	Same
Elevation	10,800 ft.	10,830 ft.
Approx. reservoir area drained	3,342 ac.	536 ac.
Estimated potential drainage water yield	4,680 ac. ft.	895 ac. ft.
Active storage	750 ac. ft.	500 ac. ft.
Max. surface size	106 ac.	31 ac.
Natural surface size	88 ac.	34 ac.
Drained surface size	59 ac.	26 ac.
Shore conditions	Scattered timber and meadow	Talus, scattered timber

Table 3.c
Dam Structure Information for
Fox and Crescent Reservoirs

Feature	Fox	Crescent
Kind	earth	masonry
Length	400 ft.	57 ft.
Condition	Undercutting downstream of spillway has been repaired. "Stilling Basin" is suggested below spillway to prevent undercutting.	Good condition. Spillway is in low place in lake rim, and water flows through meadow to Fox Reservoir. No piping exists.

Uinta River

Fox Lake and Crescent Reservoirs drain into Shale Creek, a tributary of the Uinta River. These reservoir and their associated streams lie within the High Uintas Wilderness. The Upper Uinta River, including Shale Creek, is considered eligible for "Wild and Scenic River" status under the "Wild" category. They are both free of major channel modification, free of major structures that significantly impair natural flows, and are both considered free-flowing; the dams on headwater lakes do not significantly divert or reduce stream flows. (W&SR 2000).

In wet meadows below tree line, vegetation is commonly sedges (*Carex* spp.), grasses, and low-growing willows (*Salix* spp.). Within the steep "V"-shaped canyons, streamside vegetation has an overstory of lodgepole pine and Engelmann spruce. These rugged areas have many downed trees and large boulders (W&SR 2000).

Streams flow across three main glacial landforms – wet meadows (swales) dry meadows (on hummocks), and conifer areas (larger hummocks). The water table is generally close to the surface. Low-gradient streams are interspersed with "V"-shaped canyons at mid-elevations, where steep stream gradients are found. Sediment contribution is low, except where the stream flows across shale outcrops (W&SR 2000).

In 1997, two bank profile stations were established near Fox and Crescent Reservoir, about 400 feet above the confluence of the Dime Lake outflow. The two stations both exhibited bank undercut, which is a desirable indicator of bank stability and a beneficial fish habitat attribute. One station exhibited a more complex undercut, reflecting conditions that were likely stable for several years (ANF Electronic and Field Data; Dammann and Plunkett 1997).

Photo 3.e – Outlet stream below Fox Dam

Trail reconnaissance in late September 2001 confirmed that the descent from the drainage divide at Fox/Queant Pass is mostly boulder hillslope. However, the lower section passes by a riparian area with rill erosion on the adjacent upland. At Crescent Reservoir, the trail is adjacent to a shore that includes both willows and conifers. The reservoir outlet is a straight rock channel leading to the existing dam and outlet

works. Below the outlet works, the stream has a natural appearance. The trail crosses dam levees

Photo 3.f – Fox Reservoir inlet stream

en route to Fox Reservoir, where an historic cabin lies along the north shore. In the fall of a low-water year (2001), the cabin was about 215 feet from the lake water level. The shoreline in this area is rocky, with conifers above the high water level. Further east, the higher terrain continues to have high surface rock with open habitat and low-growing vegetation. The area near the lake becomes less rocky toward the inlet. Although stable, susceptibility to erosion is suggested by downcutting of an old trail and some isolated rills, the latter being within 50 feet of the high water line.

The Fox Reservoir inlet area is a flat meadow with willow and grass. Multiple channels feed into the lake. Bankfull widths were estimated at 9 feet on one channel and 1.5 feet on another; the average bankfull depths were estimated as 14 inches on the former and 9 inches on the latter. The large stream had a temperature of 11-12 ^{o}C on September 25, 2001.

The outlet channel downstream of the gate below the dam was warmer in temperature at 14 ^{o}C on September 25, 2001. Most water is concentrated in a single channel that flows through coniferous forest. Bankfull width was estimated at 11.5 feet and bankfull depth at about 20 inches. Substrate was rocky, with cobble and some boulder.

Whiterocks River Drainage

The Whiterocks drainage is on the Vernal Ranger District, outside of the High Uintas Wilderness. Upper elevations were grazed by sheep from the 1920's until about the mid-1960's. Sheep avoided many wet areas and timbered areas were only lightly used. There has been little permitted livestock use since that time and the area was closed to permitted livestock grazing in the mid-1980s (Anon 1998).

Chepeta Reservoir is a popular recreation destination with an all-weather road access. A dam augments the lake volume.

Both Reader Creek and West Fork Whiterocks River are considered eligible for "Wild and Scenic River" status under the "Scenic" category. They are both free of major channel modification, free of major structures, which significantly impair natural flows, and are both considered free-flowing. (W&SR 2000; Anon 1998)

Reader Creek received a high preliminary rating and West Fork Whiterocks River received a moderate preliminary rating for fish and wildlife values. Reader Creek received a moderate preliminary rating for historic values and a high preliminary rating for geologic/hydrologic value. (W&SR 2000).

<u>West Fork Whiterocks River</u>

West Fork Whiterocks River cuts through glacial moraines that are generally dry *(W&SR 2000)*. Stream surveys were conducted in 1994, covering about 3 miles upstream of the Chepeta Lake Road. In 1997, the remainder of the headwaters below Cleveland and Queant Lakes was surveyed. In September 2001, a visual inspection of the trail from the West Fork trailhead to Fox/Queant Pass was conducted.

In the first 3 miles above the Chepeta Lake Road, stream channels are mostly moderate-gradient with cobble streambeds. Some streambeds have quite a bit of boulder or gravel. Stream gradients of 5-7% are not uncommon. Streambank stability ratings (Pfankuch, 1974 methodology) ranged from 50-63, which are all good, and banks were 95-100% stable. Intermittent islands or short stretches of multiple (two or more) channels are found. About 1/8 mile above the trailhead, the stream is braided but well vegetated with riparian (Drummond willow/*Salix drummondii* and water sedge/*Carex aquatilis*) and non-riparian (lodgepole pine/spruce) vegetation. Below the trailhead, bedrock cliff/outcrop and boulder materials sometimes border the stream, and some mass wasting from cliff fallout may be found in the stream. Both above and below the trailhead, pools are generally sparse – only about 5% of the stream habitat in September; riffles and runs make up most of the habitat. (ANF Field data 1994)

In these upper reaches of West Fork Whiterocks River below Cleveland Lake, streams are much flatter (from less than 1% gradient to about 3%). Willows and water sedge are common in riparian areas, hydric vegetation made up 98-100% of the greenline, and banks were 98-100% stable with Pfankuch stability ratings of 48-68 (good). These are all indicators of quality riparian zones. Banks are commonly undercut (20-75%), which is desirable for fish habitat. Pools are generally less than 10% of the stream habitat (with riffles and runs fairly equally making up the remainder), but one reach of very low gradient included 90% deep pools (3.5-5 feet deep). The stream's bankfull width is 31 to 37 feet at the lower end, but narrows to 7 to 16 feet on the upper portions below Cleveland Lake. Bankfull depths ranged from an average of 1.5-4.9 feet, with the flat (<1% gradient), high-pool (90%) area having the 4.9-foot reading and the others ranging from 1.5-2.4 feet at bankfull depth. (ANF Field data 1997)

Also in 1997, a bank profile monitoring station was established on a tributary to West Fork Whiterocks River approximately 2 miles below Queant Lake (tributary in Section 24 which leads to two small lakes to the east). In 1997, the three monitoring sites all exhibited undercut bank of similar dimensions, suggesting a stable system of high quality. No subsequent readings were taken for comparison. *(ANF Electronic and field data)*

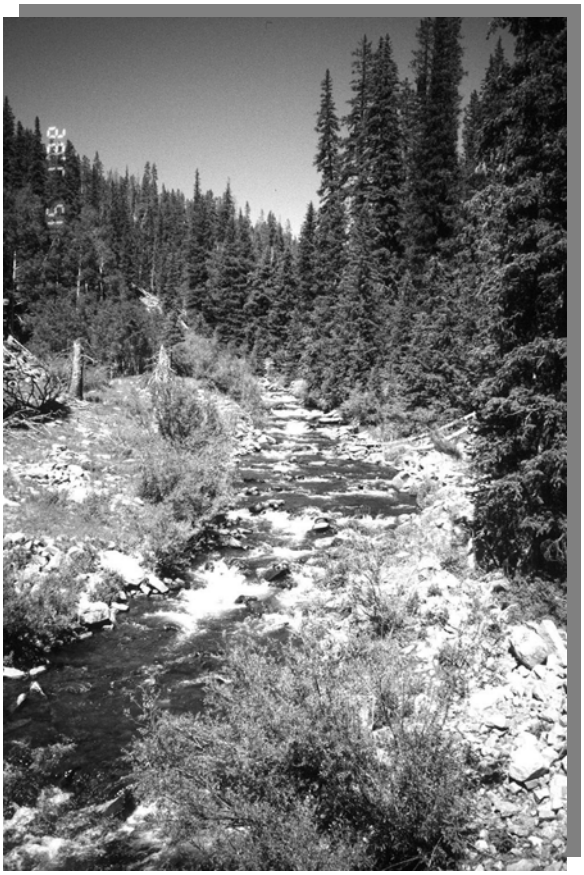


Photo 3.g – West Fork Whiterocks River

Trail reconnaissance (#047) in late September 2001 was conducted from the West Fork Whiterocks Trailhead to Fox/Queant Pass. Several riparian crossings were identified. In general, where the ground has considerable rock content, the trail seems to hold up well to use; where finer materials predominate, more mud and wear exist. Old corduroys in disrepair also create hazardous conditions when intermingled with rock. Trail users have been creating new treads where the trail is becoming deep in fine-soiled habitats such as meadows, downcutting is also occurring on an occasional glacial hummock. In some areas, there is no apparent easy re-route that would avoid a more sensitive area. There are also occasional timbered upland areas with moist trail

areas, which are likely muddy earlier in the year or in wet years. The ascent to Fox/ Queant Pass is mostly large boulder; while safety may be of concern, little impact from pack stock is anticipated.

Color infrared photography (Ashley NF 1988) suggests that the trail between Taylor Lake and Queant Lake (#048) basically follows a drainage. The meadows around Queant Lake may be moist early in the year or in wet years, but drier portions are also present. The trail that accesses Queant Lake from the southeast (#048) traverses mostly drier land than the West Fork Whiterocks River Trail (#047) until the riparian area just southeast of Queant Lake. It crosses former timber sale patch cuts between the access road and Queant Lake.

Reader Creek.

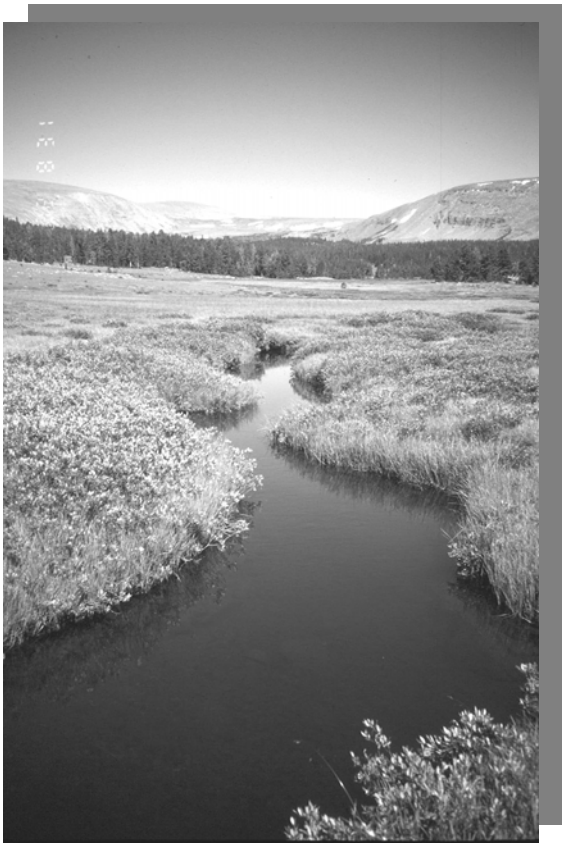
Reader Creek has been identified as a potential riparian reference area. Sheep have not been permitted for about 30 years, and the wet areas were not previously heavily used by sheep (Anon 1998). Reader Creek's broad relief cuts through glacial moraines in Uinta Mountain quartzite. Hummocky ground moraine and wet meadow types are common, with numerous seeps and springs adjacent to wet meadows. The wet meadows are former lakes filled in by sediments following glaciation. The riparian vegetation includes cinquefoil *(Potentilla*) with sedges *(Carex* spp.*)*, grasses and low growth willows. Marsh marigold (*Caltha* spp.) and elephanthead (*Pedicularis* spp.) are common forbs in wet areas. The stream has a defined channel bed with base flow. *(W&SR 2000)*

Reader Creek was surveyed in September 1994. Stream gradients were generally around 2-4% (low to moderate) with one section up to 7% (Rosgen channel types B3, C3, E3, and E5). Banks were 85-100% stable and the streambed was dominated by cobble-sized rock, with some boulder. Pools represented 5-20% of the stream habitat, with most of the remainder (50-75%) in "run" (glide) habitat and the remainder as riffles. Bank stability ratings (Pfankuch 1974) ranged from 40-62, which are all good. Beaver activity and multiple channels were *apparent in some areas*. (ANF Electronic and field data)

Bank erosion monitoring stations along Reader Creek were installed in 1997, and then re-read in 1998 and 2000. One bank was unchanged between 1997-2000, and a second was nearly unchanged between 1997 and 1998 (monitoring pins not found in 2000). The third exhibited less undercut in 2000 (bank more vertical) than in 1997, and the bank itself had moved back (eroded) about ½ to 2/3 foot at the lower bank. (ANF Electronic data)

Summer 2000 data was collected along three reaches of Reader Creek. The channel bed in two reaches was 40-50% cobble, with sand or silt secondary. The third reach was about 43% sand with 28% cobble and 18% fines (silt/clay). Pfankuch bank stability ratings were 58-72, which indicates good stability. (ANF Electronic data)

Photo 3.h – Reader Creek



Color infrared photography (Ashley NF 1988) suggests that the trails from Chepeta and Reader Creek (which go west below Reader Lakes) are similar to the West Fork Whiterocks River Trail in that the trails intermittently cross meadows, headwater drainages, or riparian areas which may be wet early in the year or later in wet years. Some of these areas are expected to be dominated by fine soils, which would be susceptible to erosion with heavy use. Stream crossing hazards may also exist. There are also drier areas along the trail, such as the open area between Reader Lakes and Taylor Lake and in timbered areas.

3.6 SOILS AND LANDFORM

(Issues 1.8.4 and 1.8.6 – Chapter 1)

General Description *(Refer to Ecological Unit Site Map in Chapter Six-Appendices for locations of the land type associations.)*
The Fox and Crescent Reservoir maintenance project is located in the Alpine Moraine (AM) Land Type Association and contains both AM3 and AM5 land types. This association consists of glacial landforms including ground moraines, wet and dry meadows, ponds and small lakes, and culturally altered lakes forming reservoirs. Most reservoirs are located in AM3, as is Fox Reservoir.

AM3 consists of hummocky ground moraine containing lakes, meadows, and streams located in the glacial valley bottoms just below the cirque headwalls. The head of the drainage in which Fox Reservoir is located had varying affects from the glacier that included minimal ice sheet movement to full scouring at the head of the basin. Fox Reservoir was constructed in one of the meadow lake components of AM3 in which scouring took place and meadows were developing from the filling in of old lakebeds. Ground moraines adjacent to the meadows and lakes are deposited over bedrock to varying depths. The ground moraines contain unconsolidated materials derived from the metaquartizitic sandstones and shale of the Uinta Mountain Group.

AM5 land types are the broad glacial moraine lands above the main drainages and below cirque headwalls, including a few small lakes and narrow meadows. The unit includes Engelmann spruce forests and mixed conifer forests with grouse whortleberry as the common under story, with small meadows as a minor component. This unit is more or less a mirror image of the AM3 land type, which contains more meadow and less forest cover than AM5. Ground moraines constitute the major component of this land type and are comprised of unconsolidated materials derived from the metaquartzitic sandstones and shale of the Uinta Mountain Group.

Slope
Gradients are typically 1-15% for both AM3 and AM5.

Soils
The soils that occur on moranic areas are high in coarse textured till and high in rock fragments. Included are poorly drained swale areas with mantle of colluvium or organic materials. Bedrock outcrops occupy 5 to 10 percent of the area and scattered boulder fields are common. The dominant soils are well drained and occur on moderate slopes. The surface layer is very dark brown stony loam about two inches thick. It underlies a discontinuous one half to one-inch thick litter layer. The subsurface layer is reddish brown, stony fine sandy loam about 11 inches thick. The subsoil is reddish brown stony sandy loam about 14 inches thick. The underlying material is weak reddish stony sandy loam. Reaction is strongly acid. Content of coarse fragments on the surface and through the profile ranges from 30 to 80 percent.

The soils that occur in the low-lying areas and wet depressions are poorly drained. In a representative soil, the upper 20 to 40 inches consist mostly of organic materials over a buried mineral soil in colluvial materials. In a representative profile, the upper 20 inches consist mostly of moderately and highly decomposed organic materials. A very dark gray sandy clay loam (A1 horizon) about two inches thick, and a gray, sandy clay loam (Cg horizon) are under these organic materials. The water table is at or near the surface during most of the growing season. Reaction is very strongly to strongly acid. Content of coarse fragments in the upper organic layer consist of a few scattered stones, and the

underlying material has 2 to 20 percent coarse fragments.

Soils of AM3 land type occur on rolling ground moraines in the glacial valley bottoms leading out from the cirque basins. Included are scattered bedrock outcrops, numerous small lakes, and wet meadows, the latter occurring along the drainageways. The dominant soils are well drained and occur on moderately to strongly sloping plain and convex slopes. The surface is a discontinuous reddish brown, cobbly fine sandy loam about one inch thick. This underlies a duff layer that is ½ to 1 inch thick. The subsurface is dark reddish gray, cobbly loam fine sand about seven inches thick. The subsoil is reddish brown, friable, cobbly loam about 25 inches thick. The underlying material is reddish brown material ranging in texture from cobbly sandy loam, cobbly loamy sand or stratified loamy sands and sandy loams. Reaction is medium to very strongly acid. Contents of coarse fragments on the surface and through the profile ranges from 10 to 55 percent.

Photo 3.i – meadow area (bog-like) east of Fox/Queant Pass

The soils, which occur in the wet meadows are poorly drained and subject to ponding or overland seepage. In a representative profile, the surface layer is very dark grayish brown silt loam about 14 inches thick. The underlying material is mottled gray stratified silty clay loam and loamy fine sand. Reaction is strongly acid. The water table ranges from 0 to 30 inches. Content of coarse fragments ranges from 0 to 15 percent.

Physical Properties

Lacustrine deposits underlying the meadow organic soils are fine-grained silt with minor clay and have a high percentage of organic matter. They are well-graded and stratified, overlying fine and medium sands with a silt fracton. An ice sheet may have have compressed and compacted the old lake beds and meadows to form their current platey structure.

The morainal soils at the edge of the meadows and reservoir were not subject to compaction. They are not stratified, and thus consist of loose, poorly-graded unconconsolidated, sand with silt, gravel, cobbles and rock. These unconsolidated soils have rapid infiltration that allow water delivery to the basin by subsurface rather than open runoff. They have a higher permeability rating than the meadow, and have a higher ermeability rating than the meadow. Due to the sandy textural materials, the soil has low productivity, low bearing strength, low compaction potential, and stability problems when disturbed.

3.7 CULTURAL RESOURCES

(Issue 1.8.7 – Chapter 1)

The Forest archaeologist and a Forest Service heritage crew first recorded the Fox Reservoir Dam and associated features on August 1, 1992. At that time the site was determined to be eligible for the National Register of Historic Places. A subsequent visit by the Ashley National Forest archaeologist was made on October 26, 2001 to obtain more photographs, complete an earlier sketch map of the embankments, and survey areas adjacent to the complex for additional cultural resources.

Fox Reservoir Dam history is typical of early efforts by Anglo-European farmers to secure late summer irrigation water for their fields. The Dry Fork Irrigation Company filed "An Application to Appropriate Water" with the State of Utah on July 31, 1919 and upon receiving additional information the application was eventually recorded on September 20, 1919. Work did not progress quickly at the site. The Ashley National Forest issued a Special Use permit on September 30, 1922, for the purpose of constructing and maintaining dams at Crescent and Fox Lakes. A letter from Forest Supervisor Charles DeMoisy, Jr. dated January 7, 1925 wanted to know why so little work had been done at the site and gave the company "reasonable time" to show why the "special use permit should not be cancelled for failure to complete the construction within the specified time…" A pencil note on the original 1922 permit stated "construction started in 1923 and completed in 1927." It would appear that the majority of work happened at the site during the summer of 1927. Forest Service files do not contain any information detailing construction methods employed by the irrigation company or highlighting any difficulties encountered constructing this remarkable feature in such a remote location with the technology and tools available.

Photo 3.j – horse drawn scraper & plow at Fox Reservoir

The Fox Reservoir complex consists of four embankments of varying height, length, and shape, at least nine borrow areas, a concrete spillway, and a log cabin with attached garage. A headgate, spillway and weir in the complex may have been modified or added to the original configuration. Iron railing, a headgate plate, a tin can scatter with well-preserved cans, horse drawn scrapers and a plow can also be found at the site. Fox Lake is considered eligible for the National Register of Historic Places under Criteria C. The guidance for eligibility from 36 CFR 294.1 is that "the quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:" must also meet one of four other criteria. The most relevant criteria for Fox Lake is Criteria C, "that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose component may lack individual distinction." In essence, a historic property must have integrity and represent a particular construction technique.

Fox Reservoir Dam has integrity and is an outstanding example of historic Uinta Mountain reservoir construction. The Fox Lake Dam complex is the longest and most complex embankment system in the Uinta Mountains. Except for the outlets, the entire system is essentially intact from the original construction. The most unique aspect of the site is its integrity. The original borrow pits where dam material was extracted are still visible. Several pieces of equipment employed in the dam construction, the horse drawn scrapers (fresnos) and a plow, are still on site. A cabin built by the construction workers, although in poor condition, is still standing. The site represents the best and most complete example of an early historic effort to obtain late summer irrigation water from the Uinta Mountains.

Almost any work done by the irrigation company to stabilize, improve or even decommission the dam would be an adverse impact to the historical integrity and hence National Register eligibility of the dam. Before any work could commence the Forest Service will enter in consultations with Utah Division of State History (SHPO) to develop an agreed course of mitigation for the activities.

Mitigation might include further documentation, archaeological excavations, removal or equipment, or interpretive materials such as brochures or videos. The National Advisory Council on Historic Preservation may also become involved in mitigation discussions to negotiate any disagreements between SHPO and the Forest Service over procedures, or they can insert themselves in the process if they feel adequate mitigation steps have not been taken. National Register status of the dam, a determination of adverse effect, and development of mitigation measures cannot prevent work from being accomplished on the dam and location. The Historic Preservation Act established this process to ensure that adequate consideration is given to possible alternatives and proper documentation has been accomplished before a historic property is altered. The location of the dam in the High Uintas Wilderness discourages consideration of certain kinds of mitigation measures such as on site interpretation through signing or long-term maintenance of the facilities. SHPO and the advisory council have allotted time frames for them to comment on the Forest Service proposals. No on site work can be commenced until the appropriate time has transpired or an agreement has been reached on mitigation.

Photo 3.k – cabin at Fox Reservoir

The Chepeta and Fox Reservoir Basins are the most inventoried and studied high altitude areas in Utah. However, this is not to say that a very complete knowledge of prehistoric and historic activities in the area is known. Since 1992 several cultural resources surveys have been conducted in the two basins and over 115 archaeological sites recorded. Most of these sites are prehistoric, although several historic camps associated with sheep herding are known. To protect the location of sensitive cultural resources only a broad summary will be provided.

Prehistoric Sites

Surface artifacts indicate prehistoric use began as early as 6000 BC and continued up until European contact. However, high country uses seems to have been most important beginning around 2000 BC, climaxing between AD 800 and 900, and leaving less evidence after AD 1200. The period from 4000 to 800 years ago comprise the Late Archaic and Fremont archaeological complexes. Hunting medium (mountain sheep and deer) and large (elk) mammals was the predominate high elevation activity. Kill sites, ambush locations, butchering stations, tool making areas and camp sites are some of the particular sites types that have been documented. The raw material for most of the stone tools is Tiger chert and Sheep Creek quartzite. These materials were obtained from north of the Uintas and originally led Madsen et al (2000) to suggest that hunter/gatherer groups from the Uintas north slope were responsible for the cultural remains that had been noted. Obsidian, relatively rare in the Uintas, found near Chepeta Lake and Fox Reservoir was brought from such disparate sources as Jimez, New Mexico, Paradise Valley, Nevada, Malad, Idaho, and central Utah.

Subsequent research has revealed our original hypothesis for high country use may have been simplistic. Pottery made by the Fremont people living in the Uinta Basin has been found near Fox Reservoir. A Fremont village site near the confluence of Ashley Creek and Dry Fork yielded considerable amounts of Tiger chert and Sheep Creek quartzite. The material had to be brought across the Uintas before it arrived at the village. The primary prehistoric occupation in the Uintas now appears to have been Fremont people from the Uinta

Basin, located to the south, who were engaged in hunting and acquiring toolstone material. Why a horticultural group would spend so much time at high elevations when they had gardens and homes to attend to at lower elevation is an unresolved issue. Sites within the project area can provide considerably more information about one of the most interesting and dynamic periods in Utah prehistory.

There is another site type that is not as common, but has garnered the interest of archaeological graduate students. Robyn Watkins (2000a, 2000b) proposed that some high elevation sites were used by Native Americans to gather plant remains. Tubers, in particular spring beauty and bistort, may have been an important food source for groups in this region. Watkins conducted limited excavations at 42Dc823, near Chepeta Lake, to determine what plants the prehistoric occupants were gathering. To her surprise economic species (food stuffs) were brought from lower elevation. It appears that plants, possibly for medicinal and ceremonial use, unique to the high country were gathered at the site. Michelle Knoll, another graduate student, followed Watkins' research with new excavations at other sites in 2002 (Knoll 2003).

Historic Sites

The first and most important historic use of the Uinta was for livestock grazing. Pardon Dodd, the first White settler along Ashley Creek, grazed his own cattle in the Uintas as early as 1873. William Anderson, the first Forest Supervisor on the Ashley National Forest established in 1908, mentioned that one of his first orders of business was to separate the cattlemen from the sheep men and divide the mountains into grazing allotments. At first cattle were the most important livestock, but sheep quickly replaced them as the dominant livestock. Grazing in the Uintas peaked around 1905 when over 100,000 sheep spent the summer on alpine pastures. These numbers remained relatively steady until the 1930's when concerns about environmental damage lead to a long steady reduction in livestock numbers. The Chepeta Lake and Fox Reservoir allotments have been converted to recreation livestock.

Sheep camps, cairns and corrals dating from the 1880's through the 1950's can still be found in the Chepeta and Fox Lake basins. These historic sites, just like the prehistoric ones, are an important link to the past. Historic remains are protected by the same preservation laws and regulations as prehistoric sites.

Affected Environment

Nearly all of the areas proposed for camping and staging areas in this project have been surveyed for cultural resources. A number of National Register eligible sites have been documented in the basins. Some of these sites may be impacted by the proposed action once a staging or camping area has been clearly identified on the ground. Just as with Fox Reservoir Dam, impacts to National Register sites will have to be mitigated. In the case of staging or camping areas mitigation will generally consist of moving the location to avoid any eligible site.

3.8 INVENTORIED ROADLESS AREA

(Issue 1.8.8 –Chapter 1)

3.8.a Background

In response to President Clinton's Roadless Area Conservation Initiative, the Forest prepared and submitted an inventory of its roadless areas in December 2000. These inventoried roadless areas were officially adopted as part of the administration's final rule approving restrictions to activities in roadless areas in January 2001. This rule is currently suspended as several states challenge its merits in court. While the roadless issue is being debated, certain administrative and analytical protocols must be followed prior to the construction of new roads in roadless areas. There is no specific management direction currently assigned to an area by virtue of its 'inventoried roadless' status.

3.8.b Inventoried Roadless Area Conditions within the Project Area

(Refer to Inventoried Roadless Area Map, page 32.)

Whiterocks Drainage – Roads, Trails, and Staging Areas

Most Forest areas located between Chepeta Lake Road #110 and the boundary of the High Uintas Wilderness are within an inventoried roadless area.

The access roads, trails, and staging areas for helicopter and horsepacking operations are located either within or adjacent to the inventoried roadless area. Locations are as follows:

Chepeta Lake Road #110 –

The road segment between West Fork of Whiterocks River and Chepeta Lake traverses through areas within and outside of the inventoried roadless area. Adjacent areas that are outside are associated with past salvage logging operations and dispersed recreation areas.

Reader Creek meadows – (Proposed helicopter and horsepacking staging area) –

The staging area is outside of the inventoried roadless area.

Highline Trail #025 and Reader Basin Trail #033 from Reader Basin meadow to Fox and Crescent Reservoirs –

The trails and trailheads locations are within the inventoried roadless area.

Rasmussen Lakes and Queant Lake Jeep Trails –

Rasmussen Jeep Trails is located outside of the inventoried roadless area. Of the 2.2-mile Queant Lake Jeep Trail, the first 0.5-mile and last 1.0 miles of the trail are outside of the inventoried roadless area. The middle 0.7 miles of this trail crosses through a portion of the inventoried roadless area.

The jeep trails are low standard, native surface off-road vehicle travelways that junction with Chepeta Lake Road in the vicinity of the West Fork of Whiterocks River. The running widths of these travelways vary from 12 to 20 feet.

Queant Lake Jeep Trail alternative staging area –

The alternative staging area is located outside of the inventoried roadless area at the end of the Queant Lake Jeep Trail. The staging area is part of a log loading area (landing area) used during past salvage logging operations.

West Fork Whiterocks River Trail #047 and Queant Lake Trail #048 –

The trailhead for Trail 047 and first 2.5 miles of trail are outside of the inventoried roadless area. The remaining length of the trail to the boundary of the High Uintas Wilderness is within the inventoried roadless area.

The trailhead for Trail #048 and the first 1.2 miles of the trail area are outside of the inventoried roadless area. The remaining length to the High Uintas Wilderness is within the inventoried roadless area.

3.8.c Characteristics of the Inventoried Roadless Area

The term "roadless character" refers to an area of at least 5,000 acres that is substantially natural, without development and maintained roads. Roadless areas have varying degrees of wilderness characteristics; wilderness is specifically defined in the Wilderness Act of 1964 (P.L. 88-577). Roadless characteristics include: natural integrity, apparent naturalness, remoteness, solitude, special features, and manageability/boundaries.

The existing ratings for roadless area attributes adjacent to the roads, trails and staging areas discussed above take into consideration existing conditions and activities within the Whiterocks Drainage, such as public travel along Chepeta Lake Road #110 and motorized and non-motorized recreation activities adjacent to the proposed and alternative staging areas, and trail access routes. Attributes are rated as follows:

- High – attribute fully maintained
- Moderately High – attribute maintained, with a few exceptions that are seldom noticeable

- Moderate – attribute is mostly maintained, and exceptions are evident and noticeable to the majority of users
- Moderately Low – at least 50 percent of the attribute characteristics are missing or affected
- Low - all by a few of the attribute characteristics are missing
- Very Low – all attribute characteristics are missing

Natural Integrity –
Natural integrity is the extent to which long-term ecological process are intact and operating. Impacts to natural integrity are measured by the presence and magnitude of human-induced change to an area. This change includes physical developments as well as activity in the area.

> Natural integrity of the adjacent inventoried roadless area is moderately high. The long-term ecological processes are in tact and operating. Some integrity has been lost due to the proximity of past salvage logging along Chepeta Lake Road and Rasmussen Lake and Queant Lake Jeep Trails, and the existence of adjacent road and trail features, i.e., road rights-of-way, bridges, roadside and trailhead parking areas, and recreation signs. *(The logged areas along Chepeta Lake Road are outside of the inventoried roadless area. Several of these areas were harvested in 1973. Salvage logging occurred during the summers of 1994 and 1996 to remove blow down trees from a windstorm that occurred in the summer of 1993. Logging also occurred along Rasmussen Lake and Queant Lake between the mid-1970's and late 1980's. Logged areas are generally patch clear cuts of 2 acres or less in size. The dispersed recreation area associated with Reader Creek meadows is also outside of the inventoried roadless area.)*

Dispersed camping occurs at trailheads and along the trail access routes, and evidence of past use (such as campfire rings) is visible at various places.

Apparent Naturalness –
Apparent naturalness is an indicator of whether an area appears natural to most people who are using the area. It is a measure of importance of visitor's perception of human impacts to the area. There may be some human impact, but it will not be obvious to the casual observer and the area will have the appearance of being affected only by the forces of nature.

> The apparent naturalness of the project area is moderately high. Evidence of man's activities is evident at nearby salvaged-logged areas, trailhead areas, and in and around Chepeta Lake. This evidence is primarily associated with recreation activities, such as fishing and dispersed camping.

Remoteness –
Remoteness is the perceived condition of being secluded, inaccessible, and "out of the way". Topography, vegetative screening, distance from human impacts, distance from the sights and sounds of humans, and difficulty of travel all contribute to remoteness.

> The feeling of remoteness is moderate within the inventoried roadless area. Although nearby Chepeta Lake Road, and trailheads and trails receive moderate to heavy recreation use from late spring to late fall, most locations in the inventoried roadless area are screened from the sights and sounds of humans by dense stands of trees and mountainous terrain. Human impacts and the sights and sounds of humans are most noticeable within and adjacent to road and trail corridors.

Solitude –
Solitude is a personal, subjective value defined as isolation from the sights, sounds, and presence of others, and the developments of man. A primitive recreation experience includes the opportunity to experience solitude, a sense of remoteness, closeness to nature, serenity, and spirit of adventure.

> Solitude in the inventoried roadless area is moderately high, except at the Chepeta Lake area and trailhead locations, and within ¼ to ½ mile of the Rasmussen Lake and Queant Jeep Trails. At these areas and locations, solitude is rated as moderately low to low. For the most part, topographic features of the

area isolate the sights, sounds, and presence of others. The sights and sounds of vehicle travel are sometimes evident within ¼ to ½ mile of the Chepeta Lake Road #110. Sounds from snowmobile activity along Chepeta Lake Road also break solitude during winter month.

Special Features –
Prominent ridges, broad basins, small and large meadows, stream courses, and pockets of dense tree cover provide outstanding diversity and uniqueness within the area. The ridges and peaks associated with North Pole Pass and Fox/Queant Pass along the east side of the adjacent High Uintas Wilderness provide outstanding foreground views.

Manageability/Boundaries –
The eastern most boundary of the inventoried roadless area lies along the Chepeta Lake Road corridor. Exact boundary locations are in question in areas associated with past salvage logging within the road corridor. These areas vary from ¼ to ½ mile on either side of the road. The western most boundary of the inventoried roadless area is in common with the boundary of the High Uintas Wilderness.

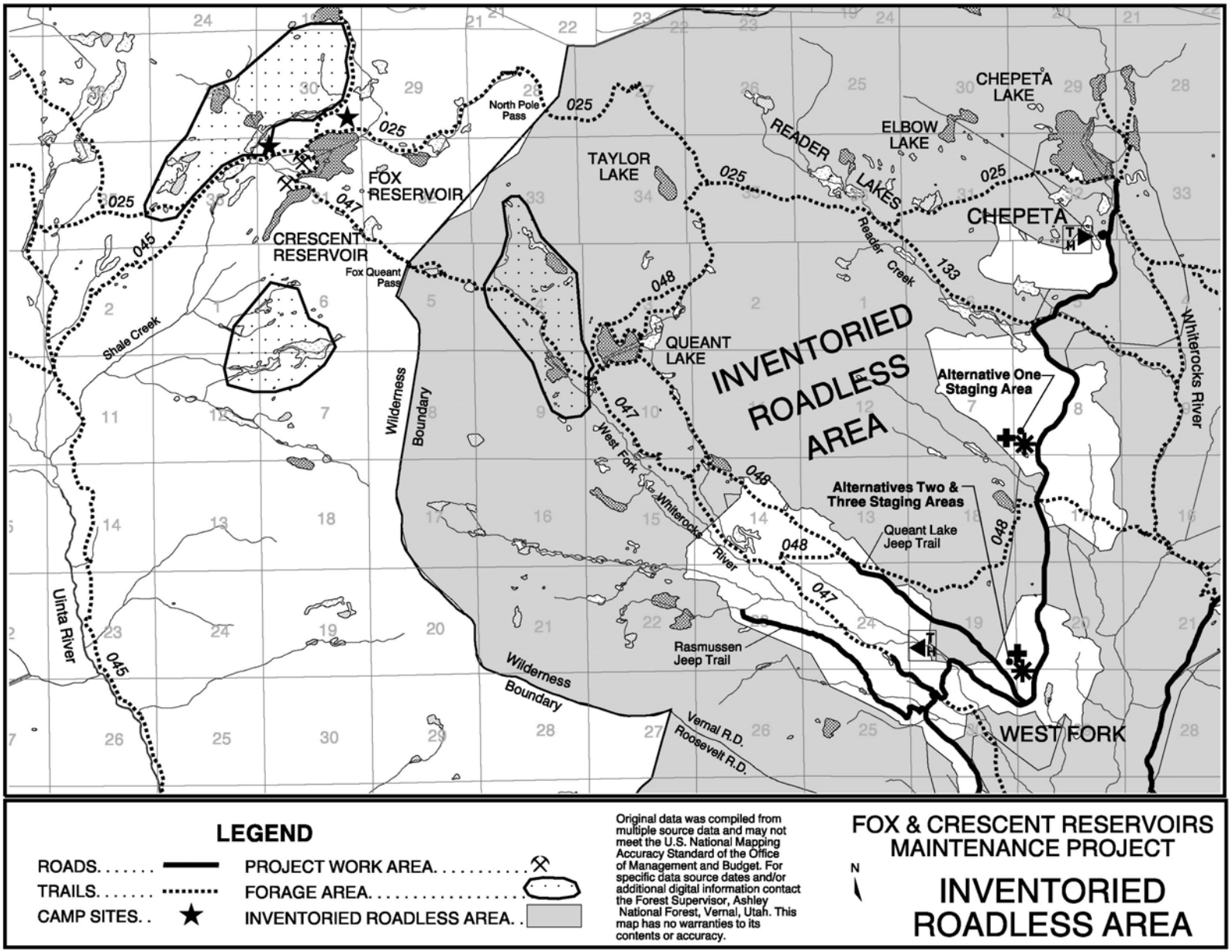
3.8.d Existing Travel Administration Policies

The Travel Opportunity Guide Plan for the Vernal Ranger District, dated 1999, shows the proposed and alternative staging areas and trail access routes as located in "Area C". The opportunities/ restrictions for this area are as follows:

Off-road travel restricted to:

a. Street legal vehicles on designated routes.
b. ATV's on routes with specific restrictions that allow such use.
c. Over snow vehicles on unplowed routes when snow is at least 12 inches deep.

Rasmussen Lake and Queant Lake Jeep Trails are shown as open to off-road vehicles and snowmobiles.


FOX RESERVOIR
CRESCENT RESERVOIR
North Pole Pass
Fox Queant Pass
TAYLOR LAKE
QUEANT LAKE
READER LAKES
ELBOW LAKE
CHEPETA LAKE
CHEPETA
Reader Creek
Shale Creek
Uinta River
Whiterocks River
West Fork Whiterocks River
Wilderness Boundary
INVENTORIED ROADLESS AREA
Alternative One Staging Area
Alternatives Two & Three Staging Areas
Queant Lake Jeep Trail
Rasmussen Jeep Trail
Vernal R.D.
Roosevelt R.D.
WEST FORK
025
045
047
048
133
LEGEND
ROADS
TRAILS
CAMP SITES
PROJECT WORK AREA
FORAGE AREA
INVENTORIED ROADLESS AREA
Original data was compiled from multiple source data and may not meet the U.S. National Mapping Accuracy Standard of the Office of Management and Budget. For specific data source dates and/or additional digital information contact the Forest Supervisor, Ashley National Forest, Vernal, Utah. This map has no warranties to its contents or accuracy.
FOX & CRESCENT RESERVOIRS MAINTENANCE PROJECT
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INVENTORIED ROADLESS AREA

3.9 SOCIOECONOMICS

This section addresses the socioeconomic information and data for operation and maintenance operations at Fox and Crescent Reservoirs, and for the uses of the irrigation water released from the reservoirs. Dry Gulch Irrigation Company (DGIC) provided the information and data at the request of the Ashley National Forest. *(DGIC, 02/25/02)*

Figures in Table 3.d., page 33 (Costs and Values Associated with the Fox and Crescent Reservoirs Maintenance Project) are average annual amounts over the last 10 years (1991 through 2000).

Sources of information:
"Utah Agricultural Statistics – 2003 Economic Report to the Governor"; Duchesne County Water Conservancy District, Socioeconomic Computations associated with Fox and Crescent Reservoirs, letter to Clark Tucker, dated March 24, 2003); Telephone discussions between Randy Crozier of Duchesne County Water Conservancy District and Garth Heaton, Forest Service Contractor - August 20, 2003; and USDA National Agricultural Statistics Service, 1997 Census of Agriculture

Table 3.d
Costs and Values Associated with the Fox and Crescent Reservoirs Maintenance Project

Maintenance Costs	
Average annual costs for normal and minor and maintenance for the reservoirs	$2,500.00 *(approximate)*
Economic Values	
Combined average annual storage yield for the reservoirs	1,324 acre feet
Number of acres irrigated with water from the reservoirs	4,155 acres – 2,205 acres in Uintah County and 1,950 acres in Duchesne County
Crops, livestock and products dependent and produced on the irrigated lands	Alfalfa – 1,000 acres Meadow hay – 1,200 acres Oats – 100 acres Irrigated pasture – 1,855 acres Beef cattle (numbers show below) Horses (numbers shown below)
Average annual yield of each crop and product produced on the irrigated acres, expressed in the corresponding measure –	Alfalfa – 4 tons/acre Meadow hay – 3 tons/acre Oat – 70 bushel/acre Irrigated pasture – 3 tons/acre
Average annual livestock numbers fully supported by the irrigation water	Beef cattle – 1,366 cow/calf units The cow/calf units were determined by four animal unit months, which equals one cow/calf unit to three acres of hay ground and irrigated pasture. Horses – 60 head
Average annual meat production in pounds for livestock numbers supported by the irrigation water (beef cattle operations are cow/calf operations)	409,800 pounds Based on slaughtering 1,366 calves at 500 pounds with a 60% hanging weight.
Value of an acre-foot of water (expressed in year 2000 dollars)	$70.00/acre foot for agriculture use Taken from Uinta Basin Final Feasibility Study for the Section 203(a) Uinta Basin Replacement Project.

Table 3.d continued
Costs and Values Associated with the Fox and Crescent Reservoirs Maintenance Project

Economic Values continued	
Value of each crop and product produced on the irrigated acres (expressed in 2000 dollars)	With few exceptions, the crops are consumed by the beef cattle and the value is included in the value of the beef.
Commodity value of meat (based on 2000 selling prices) for livestock supported by the irrigation water	$669,340.00 Based on 1,366 calves marketed at 500 pounds at $0.98 per pound live weight.
Cash receipts for Livestock for Uintah and Duchesne Counties as compared to "Commodity Value of Meat" produced from livestock on the 4,155 acres of irrigated land.	Livestock Receipts Uintah County = $22.9 MM for the year 2000 Livestock Receipts Duchesne County = $32.5 MM for the year 2000 Total Livestock Receipts = $54.4MM Average annual Commodity Value of Meat from cow/calf production on the 4,155 acres of irrigated lands = $669M. **Average annual Commodity Value of Meat from cow/calf production on the irrigated lands as compared to Livestock Receipts in Uintah and Duchesne Counties:** **$669M/$54.4MM = 0.0122 or 1.2%**
Cash receipts for Crops for Uintah and Duchesne Counties as compared to the "Average Annual Receipts for Crop Production" on the 4,155 acres of irrigated acres	Crop Receipts Uintah County = $6.2MM for the year 2000 Crop Receipts Duchesne County = $7.7MM for the year 2000 Total Livestock Receipts = $13.9MM Average annual receipts of Crop Production on the 4,155 acres of irrigated lands: Alfalfa: 4 tons/ac. x 1,000 acres x $100 per ton = $400M Meadow Hay: 3 tons/ac. x 1,200 acres x $80/ton = $288M Oats: 70 bushels/ac. x 100 acres x $2.52/bushel = $18M Total average annual receipts of Crop Production = $706M **Average annual receipts of Crop Production on the irrigated lands as compared to Crop Receipts in Uintah and Duchesne Counties:** **$706M/$13.9MM = 0.0508 or 5.1%**

Table 3.d continued
Costs and Values Associated with the Fox and Crescent Reservoirs Maintenance Project

Social Values	
Number of farms and ranches dependent on the irrigation water	113 *Note: There are 811 farms in Duchesne County and 795 farms in Uintah County*
Estimate of number of people employed on the dependent farms and ranches	24 full time farmers or ranchers 89 part-time employees
Estimate of the salary earned on the dependent farms and ranches	$10,000.00 – full time This is estimated at 25% of their operation. $ 2,000.00 – part time per operation