3.2.3 Species of Concern

3.2.3.1 Federally Listed (TECP)

The Utah and Wyoming Field Offices of the U.S. Fish and Wildlife Service (FWS) list the same species for Summit County (USDI 2005b; USDI 2005a) and the Wasatch-Cache National Forest (Wyoming portion, FWS letter of March 31, 2005). These are displayed in Table 3-17.

Table 3-17. Federally listed species Wasatch-Cache National Forest.

Species	Rank	Habitat in Project Area	Present in Project Area	Comments
Bald eagle *Haliaeetus leucocephalus*	T	No	No	No nesting occurs at higher elevations in the state and the elevation is not conducive to winter foraging by bald eagles. No further discussion.
Yellow-billed cuckoo *Coccyzus americanus occidentalis*	C	No	No	Lowest elevations on allotment are about 9,000 feet. Lowland riparian hardwoods not present on allotment. No further discussion
Black-footed ferret *Mustela nigripes*	E	No	No	Listed as historical in Utah. Prairie dog habitat is not present in the project area. No further discussion.
Canada lynx *Lynx canadenis*	T	Yes	Unknown	LAU # 34

Canada lynx. Historically lynx (*Lynx canadensis*) have occurred on the Wasatch-Cache throughout the spruce-fir habitats, however there have been no confirmed sightings in recent years. They occur in relatively remote, undisturbed areas suggesting that they may be sensitive to human disturbance. Lynx prefer large continuous stands of conifer that provide denning and foraging habitat. Home ranges of lynx are generally 6-8 square miles, but range up to 94 square miles. Lynx are tied closely with snowshoe hare, their primary food source throughout the year. In years of low hare populations, lynx will turn to alternate prey sources (squirrel and grouse).

On July 3, 2003 the U.S. Fish and Wildlife Service published a Notice of Remanded Determination of Status for the Contiguous United States Distinct Population Segment of the Canada Lynx; Clarification of Findings; Final Rule (USDI 2003). As for the status of lynx in Utah the Rule reads:

"Utah – There are only 10 verified records of lynx in Utah since 1916 (McKay 1991; McKelvey et al. 2000b). Nearly all of the reliable lynx reports are from the Uinta Mountain Range along the Wyoming border (McKay 1991). Four of the records correlate to the cyclic highs of the 1960s and 1970s. Recent DNA results documented the presence of a lynx in Utah (McKelvey in litt. 2003). There is no evidence of lynx reproduction in Utah. We conclude that lynx that occur in Utah are dispersers rather than residents, because most of the few existing records correspond

to cyclic population highs, there is no evidence of reproduction, and boreal forest habitat in Utah is remote and far from source lynx populations."

Although there is no evidence of reproducing lynx in Utah, from time to time when lynx dispersed into Utah, there may have been some reproduction and the animals could have been considered resident until they left the state or died out.

The DNA result referred to by McKelvey in 2003 was a hair sample collected on the Manti-LaSal National Forest. Further surveys were unable to find the animal again and it is suspected that it came from transplanted lynx in Colorado. There is also one report of a lynx trapped in Cache County in 1991 (Ruggiero et al. 1999). Inquiries to the Utah Division of Wildlife Resources (notes in planning record) produced no written record of this trapped lynx. Those who were in the area recalled that it was a fur farm escape that was trapped about 3 miles from the fur farm although the owner would never admit having an animal escape. The Division's conclusion is that without a written record it is not a credible report.

The Uinta Mountains (both north and south slope) are the only place in Utah that have designated Lynx Analysis Units (LAU). LAUs are established to represent the approximate home ranges of a lynx. They were established by a working group comprised of biologists from the Ashley, Uinta, and Wasatch-Cache National Forests, US Fish and Wildlife Service, BLM, and Utah Division of Wildlife Resources. Lynx habitat was then classified as primary, secondary and non-habitat. The West Fork Black's Fork allotment falls within LAU #34 (it comprises about 23% of the LAU). Lynx habitat within LAU #34 and the West Fork Black's Fork Allotment is identified in Table 3-18.

Table 3-18. Lynx habitat (acres) makeup in LAU #34 and the West Fork Black's Fork Allotment portion of the LAU.

LAU 34				
	Primary Habitat	**Secondary Habitat**	**Non-Habitat**	**Total**
National Forest System Land	31,217	5,423	14,261	50,901
Private Land	8,055	1,819	2,420	12,294
Total	39,272	7,242	16,681	63,195
Lynx Habitat within the West Fork Black's Fork Allotment				
National Forest System Land (No Private Land Present)	7,625	27	6,994	14,646
% of (total) LAU	19%	0.3%	42%	23%
Vegetation Types Defining Habitat				
	Conifer/Aspen	Aspen/Conifer	Water	
	Conifer	Aspen	Agriculture	
		Bottomland Hardwood	Alpine	
	Spruce-Fir	Douglas-fir	Barren	
	Willow	Limber Pine	Island	
	Wet Meadow	Lodgepole Pine	Mahogany	
	Mixed Conifer		Bigtooth Maple	
			Pinyon-Juniper	
			Ponderosa Pine	
			Gamble Oak	
			Sagebrush-Grass	
			Tall Forb	
			Tall Shrub/Mt Brush	
			Urban	

In 1999, 2000, and 2001 a national hair snare survey was conducted to determine a presence/absence of lynx. Samples collected from the Evanston District were sent in for analysis; results were negative for lynx hair.

Gray Wolf (*Canis lupus*). The gray wolf (a Threatened species) is not on either the Wyoming FWS list for the Wasatch-Cache National Forest or the Utah FWS list for any county in Utah. They are, however, a very high interest species and so the following comments are added.

Until 2002 the last verified gray wolf taken within the State of Utah was in 1930. During the past several years, sightings of wolf-like animals have occurred in Utah. Many of these have been identified as wolf-dog hybrids (Utah Division of Wildlife Resources 2003). In 2002, a wolf from a Yellowstone National Park pack was captured near the town of Morgan in northern Utah, southeast of Ogden. The animal was returned to Grand Teton National Park and later rejoined its pack. There has not been a breeding pair or a pack identified in Utah to date, only a dispersing animal(s).

With the possible delisting of the wolf there are two scenarios to consider.

1) Wolf as a listed species. As a federally listed species in Wyoming the wolf is designated an experimental population and are managed as such under the recovery plan. In Utah where the wolf is not designated as an experimental population it falls under the stricter designation as a threatened species with the full requirements of the Endangered Species Act. If wolves come onto the Wasatch-Cache National Forest they will be managed appropriately for the state they are in by the FWS.
2) Wolf as a delisted species. With other recovery plans requirements met, the FWS has indicated that the wolf could be delisted when Montana, Idaho, and Wyoming have wolf management plans that have been approved by the FWS. When the wolf is delisted management will be transferred to the states. Wyoming will have a management plan approved by the FWS. Utah's Wildlife Board approved a wolf management plan for the state on 9 June 2005. In all likelihood Utah will ask for approval of this plan by the FWS at some point. Either way, when the wolf is delisted it will fall under this plan.

Forest Plan direction supports the idea of wolves recolonizing in Utah and states the Forests role when this occurs. In the Desired Future Condition for Wildlife (Forest Plan, page 4-6) it states, "The amount, distribution, and characteristics of vegetation (live and dead) are present at levels necessary to maintain habitat for viable populations of native and desired non-native wildlife species. Species abundance and distribution change by management activities and naturally occurring events that alter structure, composition, processes, and patterns of vegetation. Management actions move habitat conditions toward Historic Range of Variability (HRV), contribute to recovery of listed species, and maintain or improve conditions for sensitive species."

Other references from the Revised Forest Plan that support the above statement include:

-Vegetation desired future condition (pg. 4-7).

-Forest-wide Goal #3 – Biodiversity and Viability (pg. 4-18/19).

-Forest-wide Guideline G14 (pg. 4-39).
-Forest-wide Guideline G16 (pg. 4-42).

3.2.3.2 Forest Service Sensitive Species

Table 3-19. Sensitive species that may occur on the Wasatch-Cache National Forest.

Species	Habitat in Project Area	Present in Project Area	Comments
Spotted bat *Enderma maculatum*	No	No	No further discussion
Townsend's big-eared bat *Plecotus townsendii*	No	No	No further discussion
Wolverine *Gulo gulo*	Yes	Unknown	
Pygmy rabbit *Brachylagus idahoensis*	No	No	No further discussion
Boreal owl *Aegolius funereus*	Yes	Possible	
Flammulated owl *Otus flammeolus*	Yes	Possible	
Great gray owl *Strix nevulosa*	Yes	Unlikely	Winter transient in Utah
Northern goshawk *Accipiter gentiles*	Yes	Yes	
Peregrine falcon *Falco peregrinus*	No	No	No further discussion
Northern three-toed woodpecker *Picoides triactytus*	Yes	Yes	
Columbian sharp-tailed grouse *Tympauchus phasianellus columbianus*	No	No	No further discussion
Sage grouse *Centrocercus urophasianus*	No	No	No further discussion

Wolverine. The wolverine is the largest terrestrial mustelid and is found in the tundra, taiga, and forest zones of North America. Wolverines are typically associated with remote wilderness areas where minimal contact with humans or developments occurs. As a scavenger it depends largely on mammal carrion provided from kills by wolves and other predators. Wolverine will forage on snowshoe hare. However, because of their size, carrion of ungulate species is also necessary. Delayed implantation allows wolverines to give birth during the winter when ungulate carrion is more plentiful. Information on natal den sites in North America is limited to data collected in the tundra region where dens are easily located. This species was probably never common in Utah, but it previously occurred (and still may occur) in the high mountainous areas of the state.

The final report "*Forest Carnivores Occurrence, Distribution & Limiting Factors: Canada Lynx and Wolverine Surveys in Utah*" (Flinders et al. 2004) reports the possibility of wolverine and/or fisher tracks in the High Uintas Wilderness. Historic records of fisher occurrences on the Wasatch-Cache would indicate the tracks most probably belong to a wolverine. The UDWR Heritage database (2002) records for fisher states "Identification of this species was based on tracks believed to be a fisher seen on two occasions (1938). A photograph of the tracks was examined by Durrant (1952) who agreed with the identification. This record is considered

questionable without further documentation." The tracks found in the Flinders et al. study were southeast of the project area. No surveys have been conducted for this species within the project area due to the species large home range (39 mi^2 – 233 mi^2) and lack of a recognized protocol.

Boreal owl. The species breeds in North America from Canada to northeastern Minnesota, local breeding populations can be found in Washington, Idaho, Wyoming, and Colorado. Forests ranging from pure deciduous to mixed and pure coniferous composition characterize boreal owl habitat in North America. Suitable habitat on the Evanston District would be old-growth Spruce-fir and high elevation mixed-conifer stands. Boreal owls are cavity dependant and typically use old woodpecker nests. Prey species typically consist of microtine rodents (red-backed vole), which are caught nocturnally. Red-backed voles and other small mammals are important food sources for foraging boreal owls. Habitat requirements for prey species vary from a well-developed understory to clear-cuts or natural openings. Recently there was a confirmed nesting pair on the Uinta Forest National Forest that is the first nesting pair found in Utah. There has been one confirmed Boreal owl on the Evanston District that responded to broadcast surveys and it was within a roadless portion of the West Bear Analysis Area, in the vicinity of Whitney Reservoir.

Flammulated owl. Flammulated owls are a migratory species arriving at their breeding territories in early May. While they occur in higher elevation mixed conifer forests with spruce and fir, and have also been found in aspen communities, they prefer ponderosa pine-Douglas-fir forests with open canopies (McCallum 1994; Probasco 2004). Large diameter (20 inch dbh) dead trees with cavities at least as large as northern flicker cavities are important site characteristics. They avoid foraging in young dense stands where hunting is difficult. Territory size varies from 20-59 acres and is determined by the age and patchiness of overstory trees. Studies in Colorado showed that clutches were laid roughly between mid-June and the first week in July (McCallum 1994). With an incubation period of 22 days, fledging at about 25 days, and continued use of the nest for about 14 days after fledging, the young would cease to use the nest between mid-August and the first week in September. Habitat for flammulated owls occurs in the West Fork Black's Fork allotment.

Great gray owl. In North America, the great gray owl breeds from the boreal forests of Alaska, east to Ontario, and south to northeastern Minnesota, northwestern Wyoming, western Montana, Idaho, and through the Sierra Nevadas of California and Nevada. All of its range in Utah is considered range of wintering vagrants. Great gray owls use mixed coniferous and hardwood forest usually bordering small openings or meadows. They forage along edges of clearings, semi-open areas where small rodents are abundant. The long-term persistence of great gray owls south of Canada and in Alaska seems likely provided that forests of all successional stages are maintained and well dispersed on a local and regional scale. Persistence on a local geographic scale is less certain. Maintaining persistence will require special attention to the long-term persistence of mature and older forest stands on sites where natural fire is less likely to destroy the old forest and where suitable nesting platforms are abundant. These stands will be necessary to consistently produce nesting structures. Furthermore, mature and older forest likely provide important alternate foraging habitat during periods when crusted snow prevents great gray owls from accessing their preferred rodent prey. Maintaining quality great gray owl foraging habitat should be compatible with forest management for commodity resources if management takes a

long-term view. Natural meadow systems must be maintained and restored through fire management. Similarly, temporal continuity of foraging habitat must be maintained through long-term harvest planning (Hayward 2004). There has been one unconfirmed reported sighting of a great gray owl on the Wasatch-Cache (1994). The great gray owl is still considered a winter vagrant to the Forest.

Northern goshawk. The Northern goshawk is a forest habitat generalist that uses a wide variety of forest ages, structural conditions, and successional stages. There are three main components of a goshawk's home range (6,000 acres): nesting area, post fledging-family area (PFA), and foraging area. Nest areas contain one or more stands of large, old trees with a dense canopy cover. Most goshawks have 2 to 4 alternate nest areas within their home range; alternate nest areas are used in different years, but some nest may be used for decades. The goshawk PFA surrounds the nest areas within a home range, totaling 420 acres and because of its size, includes a variety of forest types and conditions. The foraging areas are approximately 5,400 acres in size. Foraging goshawks are more often than not found within a mosaic of forest types and hunt in many forest conditions. Goshawks in the analysis area use mature lodgepole dominated stands and aspen/conifer stands. There is one known territory in the vicinity of the West Fork Black's Fork Allotment. It is located just to the west of the Allotment at the lowest elevations of the Allotment. One small portion of the foraging area is within the Allotment. The nest site is just over one mile from the Allotment boundary. Although the East Fork Fire did not burn the nesting area in 2002, a portion of the foraging area was. The nest has not been used since 2002.

Northern three-toed woodpecker. Three-toed woodpeckers range across North America, including Idaho, Utah, New Mexico, and Arizona. Suitable habitat is northern coniferous and mixed forest types up to 9,000 feet. Forests containing spruce, grand fir, ponderosa pine, tamarack, and lodgepole pine are used. Three-toed woodpeckers prefer to forage in mature and over mature habitat types. Three toed woodpeckers are foraging opportunists and abundance in populations may be in response to foraging resources. Goggans et al. (1988) observed that in central Oregon three-toed woodpeckers foraged in mixed-conifer 55% and mixed conifer dominated by lodgepole 20% of the time. These habitat types can be found surrounding the project area. Fire killed trees are a major source of food, and may lead to local increases in woodpecker numbers 3-5 years after the fire, which has been experienced in the East Fork fire. Three toed woodpeckers like others in its family respond positively to landscape disturbances that result in insect epidemics. These beetle-hit areas can be found throughout the Forest. Individuals have responded to broadcast surveys within the project area.

It has been determined that with the proposed action for this project that there will be no impact on Forest Service sensitive species. This determination is based on the fact that all of these species are dependent on forested habitat for denning or nesting. Although all but the three-toed woodpecker will use forest openings for foraging they are not totally dependent on openings for foraging and prey species will still be available in openings and along edges.

3.2.4 Environmental Effects

The following discussion assumes (based on information provided from monitoring and summarized in the section on vegetation and soils) that Standards and Guidelines pertaining to domestic livestock grazing will continue to be met.

Direct and Indirect Effects

3.2.4.1 Big game. There are 574,949 acres of deer summer range on the North Slope Deer Unit. The entire West Fork Black's Fork Allotment is on summer range since it is all above 9,000 feet in elevation. (UDWR 1998a) The population objective on this Unit is 5,300 deer, post hunting season. If the herd is at objective, which it is not, and the entire herd goes to summer range, which it does not, each deer would have approximately 108 acres to spend the summer on. With the allotment at 17,923 acres, it would provide habitat for approximately 166 deer from mid June to the end of October (4.5 months).

Elk are in a similar situation. There are 537,921 acres of elk summer range on the North Slope Elk Unit, a portion of which is on the east side of Flaming Gorge Reservoir. Again, this includes all of the allotment. The population objective for elk on the Unit is 1,600. (UDWR 1998b) If 530,000 acres of summer range are on the west side of Flaming Gorge Reservoir, and the entire elk herd spent the summer on summer range, then there would be approximately 331 acres for each elk across the Unit. With the allotment containing 17,923 acres, if the elk were spread evenly across their summer range the allotment would provide habitat for approximately 54 elk during a 4.5 month summer season.

3.2.4.1.1 Alternative A - No Grazing

With sheep grazing removed from the Allotment, there would be more available forage in summer range for big game although summer range is not a limiting factor.

3.2.4.1.2 Alternatives B - Discontinue Grazing Units 4a and 4b; and C - Proposed Action

The impacts of sheep grazing on this optimal number (objectives above) of deer and elk would be negligible under both action alternatives because summer range is not a limiting factor and the WFBF Allotment is all within summer range.

With Alternative B, more available summer forage would result from discontinuing sheep grazing of the upper Units 4a and 4b.

3.2.4.2 Small Game and Small Mammals.

3.2.4.2.1 Alternative A - No Grazing

With sheep grazing removed from the allotment there would be more available vegetation for hiding cover making small mammals less susceptible to predation.

3.2.4.2.2 Alternatives B - Discontinue Grazing Units 4a and 4b; and C - Proposed Action

Sheep grazing under these alternatives would make small mammals somewhat more susceptible to predators in grazed areas (Units 1-3) because of reduced cover but not to the point where these species would be threatened with extirpation from the allotment. What has been there for decades with grazing would continue to be there.

With Alternative B, there would be more vegetation available in Units 4a and 4b for hiding cover making small mammals less susceptible to predation in those units.

3.2.4.3 Under All Alternatives – Migratory Birds

There would be no consequences for migratory birds that nest in aspen or conifer because sheep grazing does not affect aspen or conifer's ability to support nesting birds. The black-rosy finch would continue to nest in talus and rock piles. Brewer's sparrow would continue to use low shrubs, mainly low willows in this high elevation habitat for nesting. Food availability for seed eaters would continue to be available as it has for decades of grazing by domestic livestock.

3.2.4.4 Predator Control

Direct and Indirect Effects

Since grazing would be discontinued in Alternative A, there would be no species removed for predator control due to predator/livestock interaction on this allotment. Under Alternative B - Discontinue Grazing Units 4a and 4b, the number of species removed for predator control would be reduced. Under Alternative C, the Proposed Action, the number of species removed for predator control on this allotment would be negligible. Since coyotes are the target species and there does not appear to be any likelihood of removal of other species by Wildlife Services (WS), the effects of predator control on sustaining this ecosystem appear insignificant. Although individual coyotes are removed, the population remains viable.

Wildlife Services also deal with depredating bear and mountain lion. When dealing with these game species, WS works though agreements and protocols with the UDWR. Although there have been a few reported and confirmed losses to bear on the North Slope of the Uintas, no bear have been taken by WS (personal communication with Dale Booth, 15 March 2006) on the Uintas for many years. Impacts have been negligible.

Cumulative Effects

Analysis Area: The cumulative effects analysis area for predator control is the entire Wasatch-Cache National Forest

Data from Wildlife Services regarding the harvest of coyotes on the entire Wasatch-Cache National Forest demonstrates the annual harvest of coyotes would not have any noticeable impact on overall coyote numbers that would raise concerns over populations or viability of the

species. (Population Monitoring, Wasatch-Cache National Forest, FY 2003; Wildlife Services Management Work Plan, Wasatch-Cache National Forest, 2004)

3.2.4.4 Management Indicator Species

3.2.4.4.1 Alternative A - No Grazing

Goshawk would continue to have nesting and foraging habitat across the allotment. Prey species in grazed areas, mostly along forest edge, would have more cover making foraging for the goshawk somewhat more difficult.

Snowshoe hare habitat would benefit minimally in areas where brushy understory in forested areas, mainly along edges, would not be grazed.

Beaver would be benefited in areas that might be grazed, under other alternatives, with an increase in willow and aspen but the increase would not negate the marginal nature of the habitat as discussed above.

3.2.4.4.2 Alternatives B - Discontinue Grazing Units 4a and 4b; and C - Proposed Action

Goshawk would continue to have nesting and foraging habitat across the allotment. Prey species in grazed areas, mostly along forest edge, would be more vulnerable to predation because of less cover.

Snowshoe hare habitat would be minimally affected in areas where brushy understory in forested areas, mainly along edges, might be grazed.

Beaver would be minimally affected in areas that are grazed with a decrease in willow and aspen but the increase would not negate the marginal nature of the habitat as discussed above.

Under all alternatives the proposed action will not affect the trend of any of the MIS across the planning unit or on the Uinta Mountain populations of beaver and snowshoe hare.

3.2.4.5 TES

The only Federally listed or candidate species of concern in the project area is the Canada lynx. In 2000 when the lynx was listed as a threatened species the Forest completed the ongoing project consultation process to see what effect ongoing projects would have on the lynx. For grazing allotments the determination was, “may affect, not likely to adversely affect.” (See BA/BE 2006)

This determination remains the same for West Fork Blacks Fork Allotment for the following reasons:

1. There are no vegetation treatments planned with this proposal.
2. Sheep only make minimal use of forested areas used by lynx for foraging or denning.
3. Adherence to Forest Plan standards and guidelines for grazing will maintain adequate vegetation in edge areas at a level that will not affect habitat for secondary prey species that may use those edges.
4. Lynx have not been documented on the North Slope of the Uintas for many years. Extensive searches with the nationally accepted hare snare protocol in 2000, 2001, and 2002 found no evidence of lynx, making the probability of their presence very low.

The determination was made that the project will have "no impact" on Forest Service sensitive species that depend on forested habitats because sheep grazing has such a small affect on forested habitats. It was also determined that even though the wolverine will forage in non forested areas that the species home range is so large that the project will have "no impact" on the wolverine.

3.2.4.5.1 Alternative A - No Grazing

For the lynx and wolverine there would be some added vegetation in non-forested areas that would provide added cover for some prey species.

For sensitive raptors the added vegetation resulting from no grazing would result in prey species having more cover and added protection from predation.

The three-toed woodpecker would not be affected under this alternative.

3.2.4.5.2 Alternatives B - Discontinue Grazing Units 4a and 4b; and C - Proposed Action

For the lynx and wolverine prey species would be more vulnerable in grazed areas.
For sensitive raptors prey species would be more vulnerable in grazed areas.
The tree-toed woodpecker would not be affected by grazing.

Under Alternative B, the effects on Units 4a and 4b would be the same as Alternative A.

Cumulative Effects

Analysis Area: The analysis area is the West Fork Blacks Fork Allotment.

Available Forage for Big Game
Forage availability for big game decreased as the grazing industry grew and peaked in the late 19th and early 20th centuries. As numbers of domestic grazing animals began to decrease forage would have increased but probably remained stable as deer numbers hit all time highs in the 1960s. With increases in elk numbers in the late 1960s and 1970s deer numbers decrease but forage most likely remained somewhat stable. With further decreases in domestic grazing animals in the last half of the 20th century and fairly stable numbers of AUMs used by big game,

forage has increased over the allotment and drainage. There will be no cumulative impacts to forage for big game in the future since domestic stock numbers are stable or declining and big game are managed within the objectives set by the Utah Division of Wildlife Resources.

Trailing of sheep across the Allotment to the Ashley National Forest can cause the displacement of some species.

Tie hacking in the early 1900s and past timber harvest could have created openings that improved wildlife forage.

Past road and trail construction reduced forage production in areas where they were built. The amount of use on existing roads will affect habitat effectiveness especially for big game. The road closures (listed in Table 3.0) will increase forage production and improve habitat effectiveness especially for big game.

Recreational use, including hiking, camping, and hunting, motorized and non-motorized uses may impacts wildlife by the displacement of some species when use is high.

Forest Service land acquisitions improve the ability to protect and improve wildlife habitat and forage production.

The East Fork Fire in 2002 modified habitat favoring early successional species and opening ground for increased forage production.

Private land development outside the allotment modifies habitat and decreases forage production.

Habitat available for MIS and Threatened Species

Habitat available to MIS will not change as a result of the activities or events listed in Table 3.0. The mix of forested areas and rangeland areas will remain the same. Snowshoe hare and goshawk that mainly use forested areas will not be affected by grazing. Beaver habitat, not present in the West Fork Black's Fork Allotment due to the lack of aspen and the very low growing willow species in the allotment, is not expected to decrease from the present condition. Continued implementation of grazing and riparian standards and guidelines in the Forest Plan will maintain or improve potential beaver habitat.

Habitat for species of concern will not decrease and species that rely on rangeland may benefit with continued implementation of grazing standards and guidelines in the Forest plan.

Adherence to Conservation Strategies

Conservation strategies listed in Appendix I of the Forest Plan include Bonneville and Colorado cutthroat trout, June sucker, spotted frog, lynx and northern goshawk (RFP 2003). Recommendations for these species have been incorporated into the Forest Plan standards and guidelines. With continued implementation of the Forest Plan there would be no cumulative negative impacts to these species due to grazing.

3.2.5 Threatened, Endangered, and Sensitive Aquatic and Semi Aquatic Species

No threatened or endangered aquatic or semi aquatic species occur within the vicinity of the West Fork Blacks Fork Allotment. The only aquatic sensitive specie found within the Allotment is the Colorado River cutthroat trout.

Colorado River Cutthroat Trout. Colorado River cutthroat trout (CRCT) are currently listed as a USFS Intermountain Region sensitive species and as a Management Indicator Species (MIS) for the Wasatch-Cache National Forest. They are the only native trout found in the upper Colorado Basin including the Green River and San Juan River (Behnke 1992). As such, they constitute a "special feature" wilderness attribute. Pure populations of CRCT are gone from most of the expansive range they inhabited 100 years ago (Benke 1992). Declines in Colorado River cutthroat trout populations elsewhere have been attributed to hybridization with introduced trout (rainbow and other sub-species of cutthroat trout), competition with and predation by introduced fish, loss and fragmentation of habitat from man-made causes such as water diversions, overgrazing of riparian areas, poor timber harvest practices, poor road and trail building practices, and water pollution (Behnke 1992; Sigler and Sigler 1996; NatureServe 2000). Another historical problem has been overfishing (NatureServe 2000).

The Forest Service has entered into a conservation agreement with other agencies to provide for a unified effort in the long-term sustainability of this species (Lentsch and Converse 1997, CRCT Conservation Team 2006). The cutthroat trout in the West Fork Blacks Fork was not identified as a conservation population in the 2001 tri state agreement. The Forest Service however continues to provide emphasis for this population in that the West Fork is in Wilderness designation or in 3.1A management prescription emphasizing aquatic species. The West Fork Blacks Fork is also a Class I riparian area which provides the highest standards for grazing. The Forest continues to monitor these populations and work the Utah Division of Wildlife Management in management of this species and their habitat.

3.2.5.1 Background

Starting in the early 1950s Yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri*) were stocked into several lakes in the WFBF drainage including Dead Horse Lake and Ejod Lake. Brook trout (*Salvelinus fontinalis*) were stocked in several lakes lower in the drainage.

Two lakes located at the headwaters of WFBF have been stocked with Yellowstone cutthroat trout for years. These fish have likely moved into the WFBF and interbred with the native CRCT. Deadhorse Lake was stocked with Yellowstone cutthroat trout from the 1960s to 1990. Netting surveys in 1989 found cutthroat trout present in the lake. Ejod Lake was stocked with Yellowstone cutthroat trout in 1984 and 1989. Gill netting in 1989 found cutthroat trout present in the lake at moderate densities (Wiechman and Pettengill 1989).

Brook trout were found in 1982 in two lakes (labeled by UDWR as G-80 and G-82) in the drainage. The origin of these fish is unknown. Starting in 1984 brook trout were stocked in these lakes by the UDWR. Brook trout are likely present in these lakes today.

In 1982 cutthroat trout were identified in G-81. The origin of these fish was unknown, but they exhibited characteristics of rainbow-cutthroat trout hybrids. In 1983 and 1988 Yellowstone cutthroat trout were stocked into this lake. Two other lakes (G-78 and G-79) were stocked with brook trout in 1983 and 1990. Netting surveys in 1992 found there were no fish surviving in these lakes. Winterkills are likely due to shallow depths and poor water exchange (Wiechman and Pettengill 1989).

The stocking described above was continued until the early 1990s when Yellowstone cutthroat trout stocking was stopped due to concerns about this subspecies interbreeding with native Colorado cutthroat trout. Brook trout stocking has continued with a shift to the use of sterile fish. Brook trout competition with native fish continues to be a concern. The stocking of fish in wilderness areas is of particular concern because wilderness is to be protected and managed so as to preserve its natural conditions. Fish stocking is at the discretion of the State Utah Division of Wildlife Resources (UDWR) as directed by the "Wilderness Act" where it states, "Nothing in the Act shall be construed as affecting the jurisdiction or responsibilities of the several States with respect to wildlife and fish in the national forests."(September 3, 1964 (78 Stat. 890; 16 U.S.C 1131-1136)). The Division is currently directed to follow the Fish Stocking and Transfer Procedures (UDWR 1997). These procedures preclude the Division from stocking non-native fish in areas where they could impact native species.

3.2.5.2 Current Situation

3.2.5.2.1 Fish Surveys

The Utah Division of Wildlife Resources surveyed WFBF for fish in 1994 (Wiechman 1995) and 1998 (Thompson 1999). The 1994 survey was conducted at four sites in the upper WFBF drainage (Map 3-3). During this survey cutthroat trout were found throughout the drainage, with higher densities found in the upper reaches (Table 3-20). Brook trout were found lower in the drainage at sample sites 4 (Map 3-3). Mountain whitefish (*Prosopium williamsoni*) and mountain sucker (*Castostomus platyrhychus*) were also found at these two lower sites. Paiute sculpin (*Cottus beldingi*) were found at sites 2 and 4. Mitochondrial DNA and meristic analysis performed on the Colorado cutthroat trout indicate that some hybridization with Yellowstone cutthroat trout has occurred (Thompson, personal communication).

In 1998 tissue samples were collected for DNA analysis. Since angling was used to capture fish no population estimates were possible. These tissue samples are to be analyzed to determine if hybridization has occurred with Yellowstone cutthroat trout in the fall of 2004. If hybridization has occurred, this test will determine how much.

A migration barrier was believed to exist about a half mile below Sample Site 2, towards the top of the drainage. It was believed that this is likely why brook trout were not found at survey sites one and two. In 2005 brook trout were found in the site. It is not known if this non-native fish came down from the higher elevation lakes or this cascade was not a migratory block. Yellowstone cutthroat trout were stocked above this point and have interbred with the native

CRCT that exist upstream of the barrier thus reducing genetic integrity of the native cutthroat trout.

At the upper site, Sample Site 2, 25 cutthroat trout and 18 brook trout were collected August 16, 2005 (Table 2). The water temperature was 10°C and the stream width was 5.4m and 0.54m deep. The cutthroat trout population, fish 100mm or larger, was estimated at 278 fish/km ±48. The brook trout population, fish 100mm or larger, was estimated at 169 fish/km ±34. This is the first time that brook trout have been found at this site.

Table 3-20. Fish collected from West Fork Blacks Fork on the Wasatch-Cache National Forest, Utah, in 1994 and 1998. (Fish species, the number per kilometer, weight per hectare, mean total length with range, mean total weight with range and mean condition factor (K) collected for fish collected in the lower West Fork Blacks Fork (Sample Site 4), Summit County, Utah, 2005. Mean total length (TL) and mean weight (WT) is for all fish captured not just those over 99mm in length. The information for 2005 is from a single pass electrofishing sample (Cowley 2005). Data for 1994 is from a 2 pass sample.)

Year	Species	number/km (number/mile)	kg/ha (lb/acre)	Average Total Length (mm)	Average Weight (g)	Average Condition Factor
1994 Sample Site 1	CRC ≥ 100 mm	163 (263)	24 (21)	199	86	0.97
1994 Sample Site 2	CRC ≥ 100 mm PSC Present	360 (579)	26 (24)	173	69	0.92
2005 Sample Site 2	CRC ≥ 100 mm BKT ≥ 100mm sculpin present	278 (447) 169 (272)	41 (36) 34 (31)	201 (140-286) 194 (80-277)	88 (25-215) 103 (6-251)	1.02 1.16
1994 Sample Site 4	CRC ≥ 100 mm BKT[1] ≥ 100mm MWF ≥ 100 mm	40 (64) 10 (16)	20 (18) 14 (12)	161 125 242	42 15 125	0.83 0.77 0.88
2005 Sample Site 4	CRC ≥ 100 mm BKT ≥ 100mm MWF ≥ 100 mm sculpin present	10 (16) 260 (418)	0 (0) 20 (18)	151 168 (47-282)	27 69 (1-234)	0.78 1.02

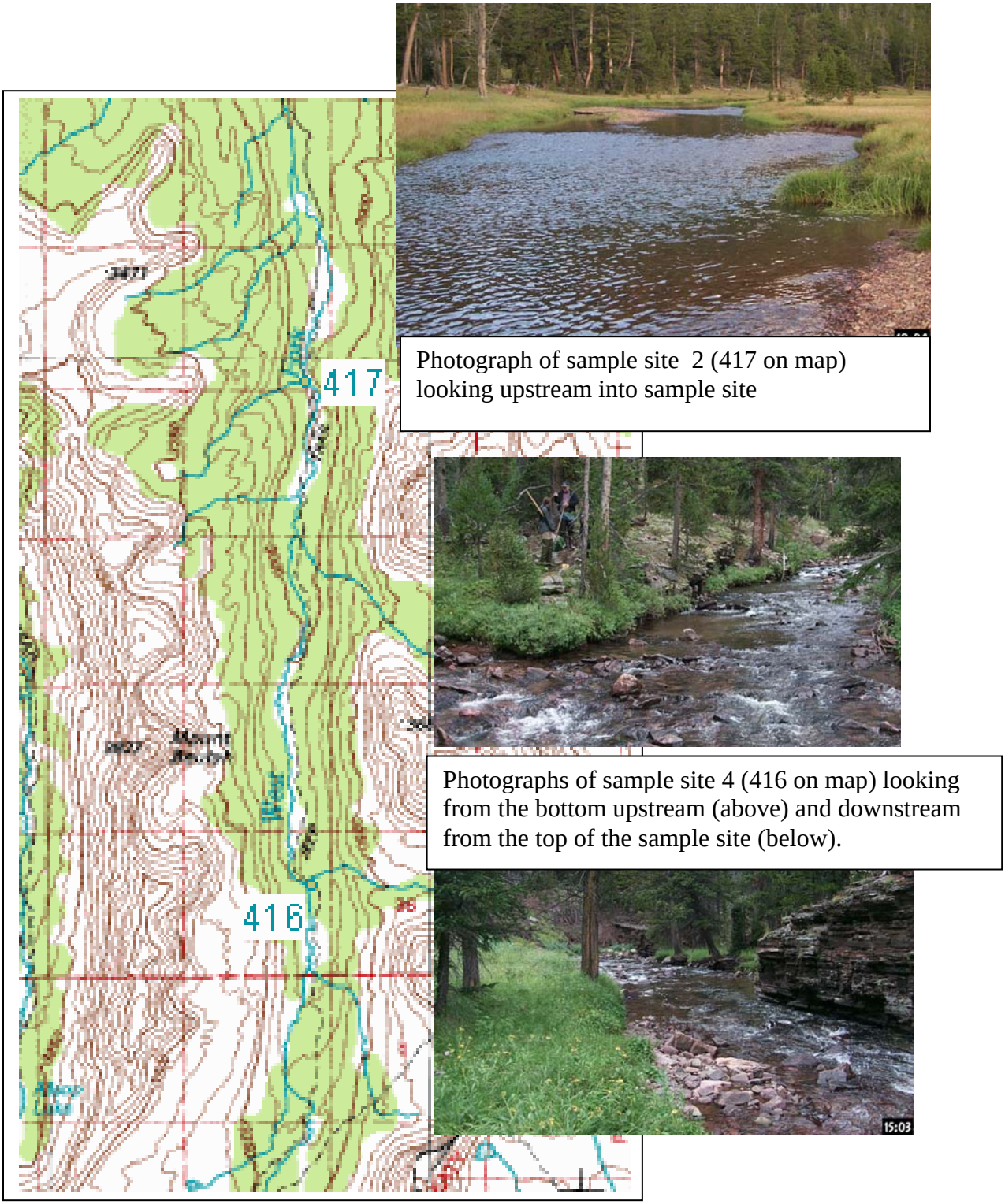
CRC= Colorado River Cutthroat Trout (hybridized with Yellowstone cutthroat trout)
BKT=Brook Trout
MTS=Mountain Sucker
PSC=Piute Sculpin
MWF=Mountain Whitefish
[1] One BKT captured on second pass

Fish collected in the West Fork Blacks Fork in 1994 had a condition factor below 1.00. If the condition factor is less than 1.00 as in this case, the fish is considered thin. Over 1.00 the fish is considered fat. It is difficult to say if the population is impacted by habitat conditions, non-native fish or if this is just the general condition for the fish in the West Fork without previous samples. A fish is generally considered healthy if it has a condition factor of 1.00. Condition factors generally were about the same throughout the stream based on the 1994 data. The fish in the West Fork of the Blacks Fork are therefore viewed as thin just based on the condition factors.

Fish information from the West Fork Black Fork (Site 2 collected in 1994), being at about the same elevation, could be compared to Bonneville cutthroat trout information collected from East Fork of the Bear River (Left Hand Fork), one drainage to the west collected in 2003. It should be noted that Site 2 had the highest number of fish and biomass production of the samples taken in 1994 in the West Fork Blacks Fork. The Left Hand Fork East Fork of the Bear River had 297 fish per mile, or 34% more fish. Biomass production in the Left Hand Fork was 21% higher and condition factors were 14% higher. Habitat may have been different as well as primary production but no data exists to validate this. It is thought that subspecies differences would have been minimal.

Mountain Sucker found in the lower West Fork Blacks Fork and the lower section of the Middle Fork Blacks Fork in 1994 were absent when surveyed in 2005.

The trend for brook trout appears to be up in the Blacks Fork. The overall trend for cutthroat trout appears to be flat. Mountain sucker populations appear to be decreasing in the Blacks Fork.



Map 3-3. Fish sampling and fish barrier locations.

3.2.5.2.2 Habitat Surveys

The West Fork Blacks Fork Allotment is completely contained within the WFBF drainage. The 42,150 acre subwatershed drains into the 260,000 acre Blacks Fork watershed. The WFBF subwatershed makes up 16% of the Blacks Fork watershed. Within the WFBF allotment there are over eleven miles of fish bearing stream in addition to several lakes that support or have supported trout.

Aquatic habitat and associated riparian habitat are critical for many species. Fish, aquatic insects, beaver, and amphibians live in lakes and streams within this analysis area. Many other wildlife species depend on this habitat for breeding, foraging, and as a water source. The habitat for fish and aquatic insects depends on many terrestrial effects such as water and sediment delivery and debris recruitment from streambank or lake shore vegetation.

Stream channel changes are a normal and ongoing process (an element of the ecological processes that comprise the wilderness attribute natural integrity). They occur more rapidly during periods of unusually high or prolonged runoff as high flows cut through oxbows, are diverted by logs in the channel, or in the case of WFBF, an avalanche.

The Forest Service R1/R4 stream habitat inventory (Overton et al. 1997) was conducted on six reaches of WFBF within the WFBF allotment from August 4th to the 11th of 1998 (Photo 3-2). Survey crews departed from the above methodology in that they only surveyed selected reaches within the stream and not the entire stream. The reaches surveyed were located throughout the drainage. Each reach was divided into discrete habitat units. These units include pools, riffles runs, glides, etc. This allows a biologist to better understand fish habitat characteristics within the survey reach. Unit length, average wetted width, average wetted depth, total length of undercut bank if undercut ≥5 centimeter (cm), the length of stable banks (right and left), and the riparian community types are determined for each Unit. Number of pocket pools and average depth of pocket pools were also recorded for fast water habitats. In addition, maximum depth, and crest depth were measured in slow water habitats. Substrate composition was measured using an ocular estimate. Large woody debris within the bankfull width was counted.

A pool provides much different habitat than does a riffle. By understanding the habitat that currently exists in a survey reach we better understand the ability of a stream course to support fish and the potential impacts that have occurred from some of the past activities.

In the User's Guide to Fish Habitat: Descriptions that Represent Natural Conditions in the Salmon River Basin, Idaho (Overton et al. 1995), natural condition descriptors of stream channel characteristics are listed. These figures can be compared to the data collected up the West Fork Blacks Fork along with statistics taken from the Inland Native Fish Strategy Environmental Assessment (INFISH, USDA Forest Service 1995). This comparison provides information relevant to the wilderness attribute natural integrity from a fish habitat perspective. INFISH lists quantitative summary features used to describe good habitat for western anadromous and non-anadromous streams. It is important to note a few main differences between Natural Condition Descriptors and INFISH. The Natural Condition Descriptors explain what is representative in the field currently, but not necessarily the most optimal conditions. INFISH, however, describes

desired future conditions for riparian zones to be achieved over time. Another main difference between these two stream descriptors is that INFISH does not account for channel type and topography in its estimates.

West Fork Blacks Fork pools per mile were comparable to the objectives for Inland Native Fish. All reaches were below objectives (Table 3-22). The objective for percent pools was low for reaches 20, 60, 80 and 90. Reaches 50 and 70 had 43 and 42% pools, respectively. When the number and percent of pools is below the objective then fish have fewer resting and holding areas. The fish condition factor is typically lower meaning that you have thinner fish with more of their food intake being used to maintain their position in the water column. With the debris slide occurring just upstream of reach 60 it could have been expected to see more pool habitat in the reach.

Large Woody Debris (LWD) is another stream channel characteristic analyzed by the User's Guide to Fish Habitat (Overton et al. 1995) and INFISH (USDA Forest Service 1995). Reaches 20, 50, 60 and 90 were forested and were the only reaches for which this objective applies. Reaches 50 and 90 were below the objective while reaches 20 and 60 met the objective (Table 3-22). Large wood within the stream channel can play an important role in providing security cover for fish and creating resting habitat.

A stream bed's width per depth ratio references its ability to be a stable ecosystem by maintaining optimal temperatures in the summer and winter, providing deep pools and therefore better fish habitat. A low width per depth ratio is ideal in productive riparian areas. West Fork Blacks Fork's width to depth ratios ranged from 21 in reach 80 to 47 in reach 70. All of these reaches were over the objective for that stream channel type. Rosgen (1996) puts the average B3 channel as having a width to depth ratio of 18.8. The WFBF ranged from 23 in reach 90 to 34 in reach 20. For B2 channels the average width to depth ratio is 20.4. Reach 70, which is a B2, has a width to depth ratio of 47. This is above the slide and appears to be caused by beaver dams in the area. Reach 60, which is a C4 channel, has a width to depth ration of 35. Rosgen (1996) suggest an average width to depth ratio for C4 as 29. With the slide area just below reach 70, aggradation or filling and widening of the channel should have occurred downstream in reach 60 and downstream. This may explain why reach 60 had the width to depth ration of 29. This would be 29 feet wide for every foot deep. Reach 80 is identified as an A3 channel (Wasniewski 2000) with a width to depth ratio of 21. Rosgen (1996) suggest an average width to depth ratio for an A3 channel of 9. Habitat features in this area consist primarily of high gradient riffles with a channel showing low entrenchment with sidechannels.

Table 3-22. Fish habitat parameters, their objectives and the source of the objective along with the West Fork Blacks Fork habitat conditions for the six reaches surveyed in the late 1990s.

Habitat Feature	Objective	Source	Reach					
			20	**50**	**60**	**70**	**80**	**90**
Reach Width (ft)		Field Data	36.7	30.5	24.0	46.3	11.5	8.9
Rosgen Reach Type (Rosgen 1996)		Field observation (Wasniewski 2000)	B3	B3 & C4	C4	B2	A3	B3
Pool Frequency Actual (objective)	Varies by channel width (see Table 3-23)	USDA Forest Service 1995	4* (47)	26* (50)	21* (53)	26* (30)	33* (90)	32* (100)
Large Woody Debris (forest system) (actual)	>20 pieces per mile; >12 inched diameter; >35 foot length	USDA Forest Service 1995	69 forested	8* meadow	29* mixed	non-forested	non-forested	3* forested
Bank Stability (non-forested systems) (actual %)	>80% stable	USDA Forest Service 1995	92	88	88	100	91	99
Width/Depth Ratio (actual)	<10, mean wetted width divided by mean depth	USDA Forest Service 1995	34*	32*	35*	47*	21*	23*
Temperature (actual ^{o}F) (actual)	<61 degrees Fahrenheit	Hickman and Raleigh 1982	57	57	57	59	57	55
Percent Pool (actual %)	40-60%	Hickman and Raleigh 1982	1*	43	22*	42	9*	6*
Natural Condition parameters								
Width/Depth Ratio objective and (range)	Varies by channel type	Rosgen 1996	19 (12-38)	19-29 (12-75)	29 (14-75)	20* (12-39)	9* (6-12)	19 (12-38)
Surface Fines (actual)	<20%	Overton et al. 1995	17	14	22*	37*	24*	19

* Suggest stream reach factors that are not meeting the objective.

Table 3-23. The objective number of pools per mile given the wetted width of a stream for inland native fish waters (USDA Forest Service 1995).

Wetted width (feet)	10	20	35	50	75	100	125	150	200
Pools per mile objective	96	56	47	26	23	18	14	12	9

Other influences to the width per depth ratio are the percent surface fines in the streambed substrate composition and the percent stream bank stability. Surfaces fines ranged from 17% to 37%, with the highest being found in reaches 70 with the high number of beaver dams. The natural condition descriptor (Overton et al. 1995) of 10-20% surface fines occurred most frequently. The Habitat Suitability Index Models (Hickman and Raleigh 1982) states the optimal spawning gravel for trout species is ≤5% fines, while ≥30% fines will cause low survival of embryos and emerging yolk-sac fry. No reaches are above the optimal percent fines, but are well below the amount to cause mortality. It is important to note, however, the distinction between percent surface fines and percent fines. Surface fines are estimated by fines at the top of the substrate, while fines are estimated within a column of material. These estimates are based on surface fines, which may be an underestimate when comparing to fines.

There appear to be a number of habitat units with unstable bank but overall the channel is stable. The stability rating was derived by averaging the percent stable bank left and the percent stable bank right. The natural condition descriptor (Overton et al. 1995) was 93-100% bank stability, which suggests that the banks are somewhat degraded just below the slide area. This is what would be expected with a major debris flow from the avalanche slide. INFISH (USDA Forest Service 1995) recommends >80% bank stability, which all reaches meet.

All stream reaches meet stream temperature guidelines. The most frequently observed natural condition descriptor temperature was 8ºC (46ºF) (Overton et al. 1995), while INFISH (USDA Forest Service 1995) lists a maximum temperature of <68ºF (20ºC) in compliance with state water quality standards. According to The Habitat Suitability Index Models (Hickman and Raleigh et al. 1982, 1984, 1986) the optimal temperature range for trout species is as follows: 12-15ºC (54-59ºF) for cutthroat. The survey data indicates that the water temperatures were within the range for the natural condition descriptor and INFISH.

Reach 20 started at the fence line upstream from Cataract Creek and ended 440 meters upstream (Photo 3-1). This reach was below the wilderness boundary. The reach contained 17 habitat units and had flows of 0.87 cubic meters/second (cm/s). The reach had an average width of 11.2 m, an average depth of 0.34 m. The width to depth ratio was determined to be 34.4. Channel type for this section is B3 (Wasniewski 2000). Surface fines were estimated at 17.2%. Stream banks within this reach were stable, with 92% of the bank classified as stable. Available fish habitat through this reach was very low, with pools making up less than 1% of the habitat.

Reach 20 overall is in good condition. The reach does however lack pool habitat and has a width to depth ratio of 19. This is larger than the natural condition that should exist with a B3 channel type. This reach does appear to be aggrading with the lack of pools and islands being found within it. It is hard to say what has caused the aggradation without having a full survey of the stream.

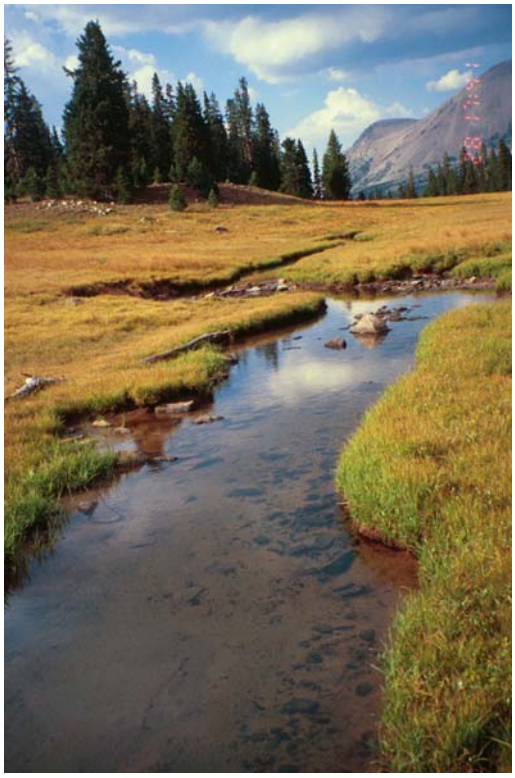
Reach 50 was located in Buck Pasture just above the wilderness boundary (Photo 3-1). The reach was 1,871 m long with 53 habitat units and a discharge of 1.73 cm/s. The reach had an average width of 9.10 m, an average depth of 0.32 m, and water temperature was 14° C. Surface fines were estimated at 14%. Stream banks within this reach were stable, with 88% of the bank classified as stable. More fish habitat through this meadow was available than in Reach 20, with pools making up 43% of the reach. However, few large, deep pools were observed. The meandering of the river formed most of these pools. There is a lack of large wood in the reach. This is probably a result of the riparian vegetation through the reach.

Reach 60 was located in a meadow above Mount Beula and just below a large avalanche area (Photo 3-1). The reach was 1,807 m long with 45 habitat units and a discharge of 1.09 cm/s. The reach had an average width of 7.3 m, an average depth of 0.22 m, and water temperature was 14° C. Surface fines were estimated at 22%. Stream banks within this reach were similar to Reach 50, with 88% of the bank classified as stable. Fish habitat was limited, with only 22% pool habitat. The pieces of large wood are also limited with only 29 pieces per mile being counted (Photo 3-1). The width to depth ratio is high in regards to optimal fish habitat but is within the range of natural condition parameters for a C4 channel type. The lack of pool habitat probably limits restricts fish numbers in the area.

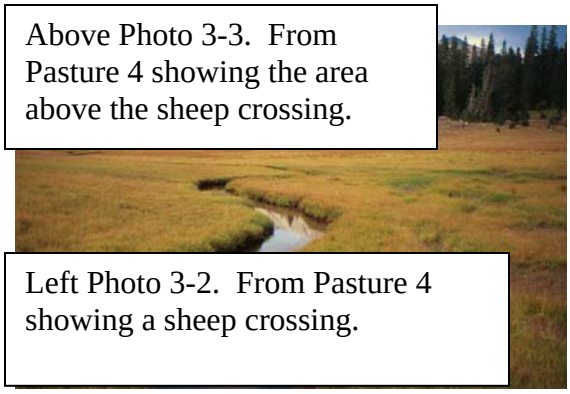
Photo 3-1. Photo of reach 60 and some of the woody debris found in the channel.

It is difficult to determine just how much of the current habitat conditions are directly related to grazing practices and how much is related to the avalanche slide. Most deviations in habitat conditions away from objectives and natural condition parameters can be explained as highlighted above reach by reach. Where conditions are a result of natural ecological processes, natural integrity is intact. There are however site-specific impacts evident related to grazing. The most obvious sign is at points where the sheep are herded across the river like where the trail crosses Buck Pasture.

From files in the Supervisor's Office of the Wasatch-Cache National Forest the following information is also provided. In 1998 macroinvertebrates were collected from eight sites on the WFBF. During this survey the biotic condition index varied from 93-122. This indicates that the stream was in excellent condition. Slight to moderate organic enrichment was noted at all sites.



Above Photo 3-3. From Pasture 4 showing the area above the sheep crossing.



Left Photo 3-2. From Pasture 4 showing a sheep crossing.

Photo 3-4. Forage use above and below the crossing was minor as seen from this photo on 11 Sept. 2002 near the end of the grazing season (Study 17-5F1). Low forage use also seen above the stream.