

Chapter 3 – The Affected Environment and Environmental Consequences

3.1 Introduction

Chapter 3 provides a summary of the affected environment including the physical, biological, and social-economic (human) resource conditions that could be affected by the proposed action and the alternatives to it. This information provides a baseline from which comparisons can be made for the effects analysis. The CEQ regulations direct agencies to succinctly describe the environment that could be affected commensurate with the importance of the impacts (40 CFR 1502.15).

This chapter also provides a summary of the direct, indirect, and cumulative effects on the physical, biological, and social-economic environment within the analysis area, and provides the scientific and analytical basis for comparison of the alternatives. The environmental effects section also includes disclosure of any unavoidable adverse effects, a discussion of effects on short-term versus long-term productivity, and any irreversible or irretrievable commitments, as applicable, for each resource area.

3.1.1 List of Past, Present, and Reasonably Foreseeable Future Actions

Table 3.1 shows the actions considered in the cumulative effects disclosure. Past, present, and ongoing activities have resulted in the resource’s existing condition. Reasonably foreseeable future actions are also considered. As applicable to each resource, these conditions, actions, and effects are described in Chapter 3.

Table 3.1 Past, present and ongoing, and reasonably foreseeable activities in or near the project area

PAST ACTIONS		
Action	Description	Date
Livestock Grazing	Historic sheep grazing	1800s-early 1900s
Timber Harvest	Timber harvest in Steep Hollow (on State land); scattered individual tree removal for firewood	1960s-1990s
Wildfire	Wildfire occurred on the hillside to the east of the Logan River near Petersen Hollow and the ground cover has recovered and no accelerated erosion is occurring.	1994
PRESENT AND ONGOING ACTIONS		
Action	Description	Date
Livestock Grazing	Cattle grazing on the adjacent Logan Canyon Allotment	On-going
Private Property	Private cabins are located near the Franklin Basin/Logan Canyon Highway junction (east and west	On-going

	of the highway) and there is a private parcel of land (4 owners, no cabins) located in Steam Mill Canyon.	
Motorized Recreation Use and Dispersed Camping Use	The Travel Plan for the Logan District was first approved in 1991. The Franklin Basin Road has a 4.4 management prescription (dispersed motorized emphasis). Roads designated as closed in the Travel Plan continue to be decommissioned through road obliteration, seeding, and signing. Unauthorized use of closed roads and trails continues to occur. Dispersed camping and hunting continue to occur.	On-going
Fire Suppression	Active fire suppression of human-caused fires. Lightening fires within wildland fire use consideration areas may be managed as wildland fire use	Ongoing
Noxious Weeds Treatment	Treatment of 50 acres annually primarily along roads of maintenance level 3 roads or above	Ongoing
REASONABLY FORESEEABLE ACTIONS		
Action	Description	Date
There are no reasonably foreseeable actions within this project area.		

In addition to the past, present and ongoing, and reasonably foreseeable activities listed in Table 3.1, other actions were considered and Table 3.2 presents the justification for elimination from further consideration in Chapter 3.

Table 3.2. Actions not considered in the cumulative effects analysis and the justification for elimination from consideration

Action	Justification
Prescribed Burns	None have been implemented in the area

For the complete cumulative effects analysis for each resource area, see the individual resource sections, as follows in Chapter 3.

3.2 Aquatic Resources

3.2.1 Introduction

The purpose of this section is to explain and clarify the existing conditions of the aquatic resources in the analysis area and to disclose the effects of the proposed action and the alternatives to it.

3.2.2 Area of Influence

The general analysis area for aquatic resources includes the drainages that are within the project boundaries. These drainages include: White Pine Creek, Steam Mill Canyon, Hells Kitchen Canyon, Steep Hollow, Crescent Lake Canyon, Hansen Hollow, Peterson Hollow, Beaver Creek, and the Logan River. White Pine Creek, Beaver Creek, and the Logan River are fish-bearing streams (Bonneville cutthroat trout, brook trout, sculpin sp. and brown trout). White Pine Lake supports an introduced population of brook trout.

3.2.3 Existing Inventories, Monitoring, and Research Literature Review

Fish monitoring surveys were conducted on project area streams in 2004 by the USDA Forest Service. Amphibian surveys were conducted on the Logan Ranger District from 2001-2004 and included sites in the project area. Utah State University has monitored fish populations annually since 2001 throughout the Logan River as part of a larger whirling disease study.

3.2.4 Key Assumptions and Methodologies

Baseline conditions were determined through review of literature and field observations. Field observations were conducted to identify and quantify fish and amphibian populations, and to characterize habitat conditions in the Franklin Basin Allotment. Assumptions that are made in this analysis are:

- Stubble height and utilization thresholds are not exceeded (through effective permit administration)
- Improvements, fences, and off-channel water developments are constructed on schedule and maintained to standard
- Livestock are encouraged to use suitable uplands through offsite watering, strategic salting, and intensive riding.
- Trespass from Logan Canyon Allotment is not allowed

3.2.5 Affected Environment

- **Aquatic habitat**

A number of water features found in the Franklin Basin Allotment are within the 3.1a management prescription, including White Pine Creek, Steam Mill, Logan River, Beaver

Creek, and Steep Hollow. The 3.1a management prescription consists of the stream and adjacent riparian areas (or 300 feet either side of the stream whichever is greater). Under the Forest Plan guideline G3.1A.2, livestock grazing is allowed with the utilization standard for Riparian Class 1, and to meet site-specifically developed desired conditions. A total of 20.78 miles of stream is classified as Management Prescription 3.1a within the Franklin Basin Allotment (see Aquatics Map, Appendix C).

- **Water features**

The analysis area is located in portions of two subwatersheds, Hells Kitchen Canyon-Logan River (Hydrologic Unit Code 160102030302) and Tony Grove Creek (Hydrologic Unit Code 160102030304). From south to north, the analysis area is within the following drainages: White Pine Creek, Beaver Creek, Hansen Hollow, Stream Mill Canyon, Hells Kitchen Canyon, Peterson Hollow, Steep Hollow, and Crescent Lake Canyon. These drainages flow into the headwaters of the Logan River (which is also included in the analysis area) which flows into the Bear River northwest of Logan, Utah. Within these drainages, stream length ranges from 2.2 miles to about 5.8 miles and streams flow generally from west to east (with the exception of Hanson and Peterson Hollow). A total of 58.31 miles of stream occur in the Franklin Basin Allotment, of which 37.92 miles are ephemeral (See Aquatics Map, Appendix C). Portions of the area have been glaciated, and morrainal features and cirques can be seen in White Pine Creek, Steam Mill, and Crescent Lake drainages. Each of these drainages has a small lake located in the cirque basin at the head of the drainage.

Of all these water features, only the Logan River, Beaver Creek, and White Pine Creek and White Pine Lake support fish. A total of 13.18 miles of stream supports fish within the Franklin Basin Allotment.

- **Threatened, Endangered, and Sensitive Aquatic Species (TES)**

No threatened or endangered aquatic species occur on the Wasatch-Cache National Forest. The Intermountain Region Sensitive Species list was last updated in December 2003 (http://fsweb.r4.fs.fed.us/unit/bpr/bpr_web/r4_tes_lst_03.rtf). The Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*), Bonneville cutthroat trout (*Oncorhynchus clarki utah*), and the Columbia spotted frog (*Rana luteiventris*) are the only sensitive species listed for the Wasatch-Cache National Forest. Neither Colorado River Cutthroat trout nor Columbia Spotted Frog are found on the Logan Ranger District.

The Logan River drainage contains the largest remaining meta-population of Bonneville cutthroat trout (BCT) in addition to supporting populations of mountain whitefish, sculpin sp, and introduced brown trout. Sterile rainbow trout are stocked at the three impoundments (lower in the drainage) throughout the summer, and brook trout are found in low densities in the upper reaches of the drainage. Sampling by USU in Franklin Basin and Red Banks from 2001 to 2006 has shown some annual variability in BCT population numbers. Overall, BCT at both sites showed a negative population trend over

this six year interval (Budy et al. 2007) which matches what the USFS found during their MIS surveys (Wasatch-Cache National Forest, 2007).

White Pine Creek is an essential tributary providing spawning and rearing habitat for BCT. White Pine Creek was last sampled on 21 July, 2004. BCT were abundant (703 ± 115 fish/mile) and numerous age classes were observed (Chase, 2004 unpublished data). White Pine Lake and the upper portion of White Pine Creek contained an introduced, self sustaining population of brook trout.

Little to no cattle grazing occurs along Beaver Creek within the Franklin Basin Allotment. Fences constructed to keep cattle away from Highway 89 also exclude cattle from this stream.

Site visits to both Franklin Basin (Logan River) and White Pine Creek in August 2007, found stream conditions in good condition with limited amounts of bank disturbance attributed to cattle grazing (See Appendix D, Figures 2 and 3). In 2004, riparian/stream damage attributed to cattle grazing was noted at Beaver Springs (Franklin Basin/Logan River) and an enclosure was constructed in 2005. Since that time conditions have improved within the enclosure (for additional information, see Wildlife, Section 3.7).

Other riparian areas impacted by cattle grazing have been noted. These areas are generally along the Logan River where small drainages direct cattle down to the Logan River, such as below Hansen Hollow, Peterson Hollow and Steep Hollow. A site visit on August 5, 2008 found poor riparian conditions along two springs located north of Hansen Hollow (See Appendix D, Figures 4 and 5). Overall, riparian conditions along fish bearing streams are good and the BCT population appears healthy, despite the presence of whirling disease and the effects of a prolonged drought.

- **Management Indicator Species**

Bonneville and Colorado River cutthroat trout were the two aquatic species identified as management indicator species (MIS) in the Wasatch-Cache National Forest Plan. Both of these subspecies have been petitioned for listing under the Endangered Species Act, however, both subspecies were found to be “not warranted” for listing. Only the Bonneville cutthroat trout is present in the proposed project area (See TES section above). Current Aquatic MIS trends for the Forest can be found in the annual report, Management Indicator Species of the Wasatch-Cache National Forest (Wasatch-Cache National Forest, 2007).

- **Amphibians**

Amphibian surveys were conducted on the Logan Ranger District during the Summers of 2001 through 2004. Boreal toad (*Bufo boreas boreas*), tiger salamander (*Ambystoma tigrinum*), and boreal chorus frog (*Pseudacris triseriata maculate*) were all found on the District. However, only tiger salamander and boreal chorus frog were found in the Proposed Project Area (Thompson and Chase 2001, Thompson and Chase 2003,

Thompson and Chase, 2005, Thompson et. al, 2003). Both of these species are common throughout suitable habitat in Utah.

- **Fish Habitat**

A fish habitat survey was conducted on the Logan River in 2001 to determine habitat conditions in relation to fish. Three reaches of stream were surveyed adjacent to or within the proposed project area. Each reach was divided into discrete habitat units. Slow water habitats (pools) were broken down into dammed and scour habitat types and were further categorized by their formative feature. Fast water habitats were broken down into turbulent and non-turbulent habitat types. Turbulent habitat types include cascades, step runs, high gradient riffles, and low gradient riffles. Non-turbulent habitat types include runs, and glides.

Within each habitat unit the following variables were measured: 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. Number of pocket pools and average depth of pocket pools were recorded for fast water habitats. In addition, maximum depth, and crest depth were measured in slow water habitats.

A total of 300 habitat units were identified and measured within the 10.5 kilometers of stream. Overall, habitat conditions were good and are summarized in Table 3.1. Habitat objectives and measures taken from the Assessment of Management Indicator Species Capability and Suitability on the Wasatch-Cache National Forest with the Management and Restoration Direction (USDA Forest Service, 2007). A limited amount of habitat features were measured in the 2004 fish survey for White Pine Creek and are summarized in Table 3.1. Additional habitat data can be found in Tables 3.2 and 3.3 and the raw data for the habitat and fish data can be found in the Project File.

Table 3.1. Franklin Basin Cutthroat Trout Habitat Factors

Habitat Component	Instream Cover	Relatively Stable Water Flow Regime	Stable Summer Temperature Regime	Relatively Silt Free Rocky Substrate in Riffle-Run Areas	Pool-Riffle Ratio	Shade and Cover Minimizing In-Channel Fines
Objective	$\geq 25\%$ of the stream providing cover	$< 50\%$ annual fluctuation from average annual daily flow	Water Temperature Averaging $13^{\circ}\text{C} \pm 4^{\circ}\text{C}$	Fines should never be the dominant or subdominant substrate in riffle-run areas	1:1 ratio	Stable vegetated banks
Measure	Width-to-depth ratio	Average Stream and Thalweg Depth (m)	Water Temperature ($^{\circ}\text{C}$)	Dominant/subdominant substrate	Percent Pools	Percent bank stability
Logan River Results	33.9	0.26	14	Cobble/small boulder	55	88%
White Pine Creek Results	18	0.15	13.5	No Data	No Data	80%

Table 3.2 Logan River - summary data, number and area of habitat types by reach (reaches 7, 8, and 9 all located within the Franklin Basin Allotment).

Count of Habitat Type by Reach				Percent of Habitat Type by Reach			
REACH	FAST	SLOW	TOTAL	REACH	FAST	SLOW	TOTAL
7	81	107	188	7	43%	57%	100%
8	16	18	34	8	47%	53%	100%
9	38	40	78	9	49%	51%	100%
Totals	135	165	300				
Count of Habitat Area (m ²) by Reach				Percent of Habitat Area (m ²) by Reach			
REACH	FAST	SLOW	TOTAL	REACH	FAST	SLOW	TOTAL
7	36,704.7	11,951.0	48,655.7	7	75%	25%	100%
8	4,745.4	1,258.2	6,003.6	8	79%	21%	100%
9	17,293.1	3,169.3	20,462.4	9	85%	15%	100%
Totals	58,743.2	16,378.5	75,121.7				

Table 3.3 Logan River - summary data, habitat lengths and average width and depth by reach.

Total Length (m)				Average Length (m)			
REACH	FAST	SLOW	TOTAL	REACH	FAST	SLOW	
7	4,014.8	1,293.3	5,308.1	7	49.6	12.1	
8	649.8	192.7	842.5	8	40.6	10.7	
9	3,412.3	959.0	4,371.3	9	89.8	24.0	
Totals	8,076.9	2,445.0	10,521.9				
Average Width (m)				Average Depth (m)			
REACH	FAST	SLOW	AVG	REACH	FAST	SLOW	AVG
7	9.1	9.2	9.2	7	0.27	0.41	0.30
8	7.3	6.5	7.1	8	0.23	0.32	0.25
9	5.1	4.5	5.0	9	0.14	0.29	0.17

- **Multiple Indicator Monitoring (MIM)**

Four Designated Monitoring Areas (DMAs) using the Multiple Indicator Monitoring (MIM) protocol were established within the Franklin Basin Allotment in 2008. These DMAs included reaches along White Pine Creek, Steep Hollow, and two reaches along the Logan River. Data was collected at all four sites in July of 2008. The monitoring

procedures for these sites can be used to help evaluate livestock grazing management and to determine whether the vegetation and stream channels are responding as anticipated (Burton et al. 2008). If one of the action alternatives is chosen (allow cattle grazing), these sites would be visited on the third and fifth years after implementation and the results would be included in the adaptive management strategy of this allotment.

- **Spawning Habitat Impairment**

On March 18, 2008, Western Watersheds Project, Inc. submitted a letter/report (Carter 2008) describing spawning habitat impairment and riparian utilization on the Logan Ranger District due to cattle grazing. Western Watersheds Project collected stream bed core samples within the Franklin Basin Allotment and surrounding areas. Three samples were taken at each site and the results for each sample were averaged for the site and used in calculating survival of egg to emergence. Forest Service personnel were not invited nor did they participate in this sampling effort.

The Forest has no set standard for sediment in streams or survival rates of egg to emergence. The Forest is required to manage habitat to “. . . maintain viable populations of native and desirable non-native vertebrate species in the planning area.” (CFR 219.19). Western Watersheds Project stated that they used a McNeil sediment core sampler to collect samples. Analysis of the core samples collected in and around the Franklin Basin Allotment suggested survival from eggs to emergence varied from 4.23% - 28.17% (Table 3.4). The core sample points were collected on the Upper Logan River (just above the Beaver Springs enclosure) and Beaver Creek (State ownership) based on maps provided within the report (Carter 2008).

The samples were collected in September of 2005 and 2006. Western Watersheds Project determined egg to emergence survival percentages by the method developed by Irving and Bjornn (1984). However, Chapman (1988) states, “One cannot, with the existing information on survival of embryos and alevins in the redds of large salmonids, predict survival quantitatively and with known accuracy on the basis of physical factors measured in field or laboratory studies.” He goes on to state Tappel and Bjornn (1983) and Irving and Bjornn (1984) suggest that the greatest applicability of their model functions for survival in relation to two classes of fines lies in predicting the relative change in embryo survival rates that may occur if changes occur in the spawning and incubation substrate.” “One cannot assume for example, that a 10% incremental increase in particles smaller than 0.85 mm will result in a predictable decline in embryo survival of a given salmonid in a field environment.” It should be noted that Chapman’s comments were addressed to large salmonids (i.e. steelhead and Chinook). They are likely applicable to smaller cutthroat trout with the recognition that these smaller fish use smaller substrate to spawn in.

Chapman suggests to get accurate measurements the core sample should be taken from the redd area. Young et al. (1989) also supported this recommendation. Chapman (1988) suggests that to do this would require that the redd pocket be located during the spawning

period. No mention is made in Western Watersheds Project report if this was done or not.

The best time to measure the impact of sediment on eggs and swim-up fry is to do a sediment measurement just as the fish are hatching out and swimming up. This generally occurs during the end of July to the first of August on the Logan Ranger District instead of the September sampling that occurred.

Within Western Watersheds Project's report, both the Bridger-Teton National Forest and the Idaho DEQ standards for sediment are presented. Neither of these standards is applicable on the Uinta-Wasatch-Cache National Forest. The report also states that some of the samples exceed or do not exceed these standards. Again, these standards are not applicable in Utah or on the Uinta-Wasatch-Cache National Forest.

Table 3.4. Sediment fines and predicted survival of salmonids to emergence in Beaver Creek and the Logan River as identified by Western Watersheds Project (2008) on the Uinta-Wasatch-Cache National Forest, Utah.

Stream	Mean % (<6.35 mm)	Mean % (<0.85 mm)	Estimated Survival % Egg to Emergence
Beaver Creek	52.10 ± 14.61	23.31 ± 4.87	5.06
Logan River Upper	53.96 ± 6.38	29.57 ± 1.97	4.23
Beaver Creek Upper	44.03 ± 9.68	13.47 ± 3.42	10.71
Beaver Creek Lower	32.38 ± 5.25	11.90 ± 1.91	28.17

In reviewing the locations sampled in and around the Franklin Basin Allotment it appears the Upper Logan River site is located directly upstream of the Beaver Springs enclosure. If this is the case, additional grazing impacts are to be expected from cattle that are directed around the enclosure. All three sample sites along Beaver Creek appear to be on lands managed by the State of Utah and are not impacted from grazing occurring on Franklin Basin.

As is discussed above, measuring sediment data to predict spawning success is at best imprecise. A more appropriate estimate can be made by actual fish counts made in the drainage and presented in this document. These counts document viable populations within all fish bearing streams occurring in the Franklin Basin Allotment.

3.2.6 Issues Addressed

Public and agency scoping, followed by Forest Service interdisciplinary team review identified the following issue to be addressed in this impact analysis:

- **Aquatic Species** – The issue is the extent to which cattle grazing may affect Bonneville cutthroat trout, aquatic habitat, and aquatic and semi-aquatic species found to exist within the project area.

Indicator used to compare alternatives:

- A qualitative description of the effects of livestock grazing on aquatic species and habitats.

3.2.7 Direct and Indirect Effects

This section presents the direct, indirect, and cumulative effects to BCT (Sensitive Species and MIS) and amphibians. While aquatic invertebrates are also found in most water features in the Project Area, effects to them would be similar to those for BCT and amphibians. Aquatic invertebrates will not be discussed further.

A complete discussion of potential direct and indirect effects of grazing on riparian areas and fish species is available in the Project File (Chase, 2001).

Cattle are attracted to riparian areas because of drinking water, shade, relatively gentle topography, and vegetation that remains green long after upland areas (Roath and Krueger 1982, Platts and Nelson 1985, Armour et al. 1994, Fleischner 1994, Belsky et al. 1999). Cattle grazing in these riparian areas can have numerous direct and indirect effects on aquatic species including: reductions in abundance, habitat, and diversity (Platts and Nelson 1985, Belsky et al. 1999, Rinne 1999). To reduce or eliminate both direct and indirect effects to aquatic species several grazing strategies have been developed and are discussed by Alternative below.

3.2.7.1 Alternative 1 - Proposed Action

Deferred grazing means use of a pasture is delayed until important forage plants develop mature seeds or gain needed growth. The problem with this grazing strategy is a considerable amount of cattle movement (or fencing) is required and if cattle aren't moved out of riparian areas in a timely manner or are overstocked, streambank shear can occur (Platts, 1991). The benefits of this strategy include; periods of nonuse provide for preferred grazing plants to improve vigor and cover, and plants are allowed to gain the necessary growth to set seed and maintain root structure. Overall, this strategy can provide for aquatic protection.

A potential impact to BCT connected to livestock grazing is the trampling of redds/eggs/fry. In the Logan Drainage, BCT spawn throughout May into June. Generally, fry emerge from the gravel in late July. Eggs/fry would be vulnerable to trampling and sediment inputs (smothering) in Grazing Timing 1 and 2 (only one or two weeks for Grazing timing 2). While some redds would likely be impacted, based on current conditions, it would appear that trampling would have a limited effect to the overall BCT population. Both the Logan River and White Pine Creek would continue to support large numbers of fish/mile.

Based on past studies (Fillingim 1981; Harniss 1986; and Williams 2007) cattle distribution problems have consistently been identified as a management challenge within the Franklin Basin Allotment. This is tied to a lack of water. Where water does occur, cattle often concentrate and riparian resources are impacted (Lower Steep Hollow and

Upper Steam Mill and isolated areas along the Logan River). Under this Alternative, cattle distribution would continue to be determined by riding and salting. If monitoring indicates key riparian areas are not improving, additional riparian fencing would need to be constructed. Currently, the same permittees have grazing permits on both the Logan Canyon and Franklin Basin Cattle allotments. Since the cattle are owned by the same permittees, they have identical brands and eartags. This makes identification of which allotment they belong on nearly impossible. With no allotment fencing occurring between Logan Canyon and Franklin Basin, cattle drift between the two allotments is expected to continue.

Overall, if the decision is made to continue grazing under this Alternative, this project would have the effect of “**may impact individuals but not likely to cause a trend to federal listing or a loss of viability**” for Bonneville cutthroat trout.

Strong populations of tiger salamanders and boreal chorus frogs were identified at Crescent Lake and other water features within the Proposed Project Area. For both of these species it appears cattle grazing has had little to no effect. In the case of tiger salamanders, water developments in the form of stockponds appear to provide additional habitat.

3.2.7.2 Alternative 2 – No Action (No Grazing)

Under this Alternative, no grazing would occur. The benefits to aquatic habitat and species include; riparian stream habitats would move towards their potential in the shortest time, little to no livestock related trampling of redds/eggs/fry would occur, and all stream riparian habitats would regain their natural potential to provide fishery resources (Platt, 1991).

If the decision is made to discontinue grazing under this Alternative, this project would have the effect of “**no impact**” for Bonneville cutthroat trout.

3.2.7.3 Alternative 3 – Current Management

Under this Alternative, season long grazing would continue to occur. Continuous season long grazing means that cattle graze a particular pasture or allotment throughout the grazing season year after year. The problems with this grazing strategy are livestock congregate and linger on streambank areas because of the convenience of forage, water, terrain, and cover (Platts, 1991). The main benefit of this strategy is operating costs are kept at a minimum. Overall, this strategy is seldom compatible with fisheries under commonly used grazing intensities and seasons of use because too much pressure is exerted on riparian plants and streambanks; it has been rated as one of the poorest grazing strategies presently being used for aquatic impacts (Platts, 1991).

Like Alternative 1, a potential impact to BCT connected to livestock grazing is the trampling of redds/eggs/fry. In the Logan Drainage, BCT spawn throughout May into June. Generally, fry emerge from the gravel in late July. Under Alternative 3, eggs/fry

would be vulnerable to trampling and sediment inputs (smothering) from the time cattle enter the allotment until BCT fry emerge in late July. While some redds would likely be impacted (more than Alternative 1), based on current conditions, it would appear that trampling would have a limited effect to the overall BCT population. Both the Logan River and White Pine Creek would continue to support large numbers of fish/mile.

Based on past studies (Fillingim 1981; Harniss 1986; and Williams 2007) cattle distribution problems have consistently been identified as a management challenge within the Franklin Basin Allotment. This is tied to a lack of water. Where water does occur, cattle often concentrate and riparian resources are impacted (Lower Steep Hollow and Upper Steam Mill and isolated areas along the Logan River). Under this Alternative, cattle distribution would continue to be determined by riding and salting. Currently, the same permittees have grazing permits on both the Logan Canyon and Franklin Basin Cattle allotments. Since the cattle are owned by the same permittees, they have identical brands and eartags. This makes identification of which allotment they belong on nearly impossible. With no allotment fencing occurring between Logan Canyon and Franklin Basin, cattle drift between the two allotments is expected to continue. Since no periods of nonuse would occur, habitat conditions would likely remain unchanged.

Overall, if the decision is made to continue grazing under this Alternative, this project would have the effect of “**may impact individuals but not likely to cause a trend to federal listing or a loss of viability**” for Bonneville cutthroat trout.

Strong populations of tiger salamanders and boreal chorus frogs were identified at Crescent Lake and other water features within the Proposed Project Area. For both of these species it appears cattle grazing has had little to no effect. In the case of tiger salamanders, water developments in the form of stockponds appear to provide additional habitat.

3.2.8 Cumulative Effects

The affected area for this analysis is the Franklin Basin Allotment. The Franklin Basin Allotment contains portions of three fish bearing streams (White Pine Creek, Logan River, and Beaver Creek).

Effects of past, present, and reasonably foreseeable future connected and cumulative actions, including the proposed action.

Certain natural processes outside the influence of the Forest Service have the potential to result in cumulative effects to aquatic resources, both negative and positive, across land ownership boundaries. It is difficult to predict effects to aquatic resources over the short- or long-term, whether direct, indirect, or cumulative, due to natural processes that operate on aquatic resources at this spatial scale (drought, wildfire, and flood).

Existing conditions are the result of past and ongoing management activities such as forest roads, fisheries management, forest and rangeland management, as well as the

natural processes discussed above. The interdisciplinary team identified past, present, and future ground disturbing activities. Given the nature of these activities, the primary cumulative impacts to aquatic habitat and aquatic/semi-aquatic populations can be summarized into the following categories:

- Historical and current livestock grazing
- Past, present and future roads and trails management
- Aquatic management (fishing, non-native fish introductions)
- Timber harvest
- Fire (prescribed, suppression of natural and human-caused fire)
- Riparian fencing

Grazing

The Franklin Basin Allotment was established in 1896 and was owned and managed by the State of Utah until 1998, when the state land was acquired by the USDA Forest Service. At the time of the land exchange, the State Term Grazing Permit was reissued for 10 years and managed under the “State of Utah” grazing permit policy. Originally, 10,000 head of sheep grazed this allotment. In 1950, the number of permitted sheep was reduced to 5,400 and 207 head of cattle were added. The current state grazing permit authorizes 607 cow/calf pair to graze on this allotment. High numbers of animals grazing within the Franklin Basin Allotment in the early 1900’s likely had effects on all streams within the allotment including reduced stream productivity from bank erosion, high sediment delivery, decreased pool frequency, decreased pool depth and size, increased width to depth ratios, and likely an increase in water temperatures. Since livestock numbers have been reduced habitat conditions have been improving.

Road and Trail Management

Erosion can be expected from roads and trails that are not adequately maintained. Roads also provide access, and the activities that accompany access, and magnify their negative effects on aquatic habitats. Activities associated with roads within the analysis area include recreation, timber harvest, livestock grazing, prescribed fire, and fire suppression.

Recreation

A number of dispersed camping sites occur along the Logan River in Franklin Basin. Use at many of these sites has removed much of the vegetative cover which can add sediment to the stream. However, most of these sites are far enough from the river to allow a vegetative buffer which traps moving soil before it reaches the stream. In 2003, the Forest Service removed several dispersed sites along the Logan River that were impacting the stream. Several other sites were moved away from the riparian area to reduce impacts.

Aquatic Management

Impacts to the Bonneville cutthroat trout within the Franklin Basin Allotment from angling are managed by the Utah Division of Wildlife resources. No angling occurs from January 1 until the second Saturday in July. Another concern is the introduction of brown trout. Brown trout were stocked in the Logan River in the early 1900’s and have

been expanding into the upper Logan River in recent years. Brown trout are known to negatively affect BCT populations indirectly through competition for food and space, and directly through predation.

Timber Harvest

Riparian habitat conservation areas (RHCA) are used to protect riparian areas within harvest units. No recent timber harvesting has occurred or is planned along the Logan River, however, timber harvest has occurred in the Steep Hollow area. It is unlikely that timber harvest has any continuing effects on the population of BCT in the upper Logan River.

Fire

The last wildfire that occurred in the Franklin Basin Allotment was near Beaver Mountain. The fire occurred high on the mountain and impact/influence any streams. No prescribed burns are planned in this area. Effects of fire are difficult to predict due to the variation inherent to wildfires (intensity, size, location). Fire effects to vegetation and watersheds influencing hydrologic and temperature regimes and erosion may persist for years. Bonneville cutthroat trout populations have evolved with fire, and have developed characteristics that provide for resilience in the face of such events. They likely depend on large, well connected, and spatially complex habitats, and these are available within the Franklin Basin Allotment.

Riparian Fencing

A riparian fencing project was completed in 2004 around Beaver Spring and a portion of the Logan River. The fence was designed to protect an area that was receiving heavy use from livestock. This fence has improved conditions at the spring and along the stream. Other riparian fencing might need to occur if a grazing Alternative is selected and monitoring indicates conditions are not improving along key areas.

Expected cumulative effects to aquatic habitats and aquatic and semi-aquatic species with implementation of Alternative 1 will result in a small improvement to current conditions outside of the enclosure, and improving conditions inside the enclosure. The amount of improvement that actually occurs would be determined by cattle control and monitoring. Implementation of Alternative 2 would result in the quickest recovery of stream habitat. With no livestock grazing occurring, there would be no cumulative effects. Under Alternative 3, no improvement to riparian areas outside the enclosure would likely occur

3.2.9 Irretrievable or Irreversible Commitment of Resources

No irretrievable or irreversible commitments affecting aquatic resources are expected as a result of implementing any of the alternatives.

3.3 Rangeland Resources

3.3.1 Introduction

The purpose of this section is to explain and clarify the existing conditions of the rangeland resources in the analysis area and to disclose the effects of the proposed action and the alternatives.

3.3.2 Area of Influence

The analysis area for rangeland resources includes the land within the Franklin Basin allotment.

3.3.3 Grazing History of the Allotment

Three years following Utah's statehood in 1896, the area comprising the Franklin Basin allotment was acquired by the State of Utah Land Board under the "Floating Land Grants" program and assigned to the Institution for the Blind. Domestic livestock have grazed this area since that point in time.

For several years this block of land was grazed by approximately 10,000 head of sheep. In 1950, the numbers were reduced to 5,000 - 6,000 head of sheep. In the mid 1980's, at the request of the permit holder, the permit was changed from sheep to cattle. This permit holder grazed 200-250 head of cattle and an association of permit holders grazed 200 head. The Utah Division of State Lands and Forestry administered the permit. It was agreed that the range would be assessed every 3-5 years and cattle numbers would be adjusted accordingly. By the mid-1990s the total permitted number had increased to about 650.

In 1998, when the Forest Service acquired this parcel of land in an exchange with the State of Utah, it was being grazed by about 600 head of cattle (390 in one permit; with 40 head allowed for private land) and 207 cattle permitted to the grazing association. In 2005, the individual permit holder sold his operation to the grazing association, making them the only permit holder.

The Cache National Forest, which completely surrounded the Franklin Basin state land, was established in 1908. On June 29, 1940 approximately 160 acres of land that surrounds the White Pine Lake area was purchased by the Forest Service from the Logan Chamber of Commerce and is in acquired status. A small allotment known as the Crescent allotment was located north of the White Pine area and adjacent to the northwest side of the state land and extended west to the main ridge running north and south dividing the watersheds.

In 1998, when the land was acquired by the Forest Service, an agreement was included that indicated the State Term Grazing Permit be reissued for another 10 year term and managed under "State of Utah" grazing permit policy. Upon completion of a NEPA

analysis, if so decided, it would be converted to a Forest Service Grazing Permit upon the 2008 expiration of the State's Permit.

Throughout the history of the state livestock use, grazing prescriptions were given within the state grazing permits. Range surveys and studies were conducted in 1981 and 1986 by A. T. Fillingim, former Range Scientist with the Soil Conservation Service, and Roy O. Harniss, former Range Scientist with the Intermountain Research Experiment Station in Logan. These studies were conducted to determine range condition and capacity.

The historic grazing system appears to have been season long with riders and herders distributing the livestock in the lower areas of the allotment in the first of the grazing season then moving to the upper areas of the allotment later in the grazing season. Few, if any, structural or non-structural range improvements have been constructed on the allotment.

Past Range Analysis Information

The following is a summary of range analysis and related data that includes studies and analysis by range scientists from the Soil Conservation Service (1981) and the Intermountain Forest Research Experiment Station (1986).

1981 Range Survey –

Excerpts from A.T. Fillingim's 1981 survey, conducted when the allotment permitted both sheep and cattle, indicated the unit was thought to be best adapted for sheep grazing. Fillingim noted, "Steep slopes, poor water distribution (for cattle) and forage (mostly forbs and browse) make it more ideal for sheep use. It would be almost financially impossible to fence the area into manageable units for cattle or sheep. The use of sheep with herders appears to be the most practical way to get desired management."

His report summarized that the control of range fires coupled with livestock and big game use of the areas adjacent to the river and streams allowed invasion of big sagebrush. He added, "Brush management could be used to restore the potential plant community and productivity." No documented evidence was identified as to use of big sagebrush by livestock or big game. Bitterbrush was being suppressed by utilization by livestock and big game.

Fillingim noted, "Alluvial fans along rivers and streams indicate basin wildrye is in a high state of vigor and health. Little use is being made of them by sheep or cattle. An increase in utilization could be allowed without damaging the plant community. Improvement in plant vigor has probably been brought about by not permitting livestock on the range until July. This permits the plant to become coarse and fibrous, thus resulting in little utilization. These areas could be advantageously used in the early winter season when cattle energy needs are greater and the plants are softer with fall moisture.

Extended use has the possible negative trade-off of over utilizing the riparian zones. Before greater cattle use is allowed, considerable thought should be given to the relative advantages and disadvantages associated with this trade-off.” Current use in 1981 was 4,810 AUM’s with 6,234 AUM’s estimated forage production (or an estimated 77% of what was available).

In his report, Fillingim suggested, “Perhaps in working closely with the herders and riders a modified system of deferment could be worked out. A possibility would be to start at the bottom of a drainage area and move the animals up the north side and down the south side and then alternate the following year. This may or may not work, but some effort should be made to achieve a deferment.”

“On-site” investigation of sample areas as recorded in 1981 indicated “no major problems in the health and vigor of the plant communities. Sixty-three percent of the rangeland rated as fair, 30 percent rated good, and 7 percent rated poor.

A. T. Fillingim’s 1981 survey and report are included in the project file.

1986 Range Survey –

Another range survey of Franklin Basin was conducted in 1986, this one by Roy O. Harniss, a Range Consultant, with the Range Science Department and USU Foundation, Utah State University. His 1986 range survey indicated that about 3,896 AUM’s for cattle grazing was the estimated carrying capacity after slope, water, access adjustments, and proper use practices were considered. He concluded that for a 3.5 month grazing season, about 1,113 head of cattle could graze if proper distribution could be obtained.

Further recommendations were to explore ways to move cattle off of the Logan River after proper grazing was obtained. Harniss suggested setting up a deferred-rotation grazing practice with riding, salting and some drift fences. He noted that his range survey should be treated as a beginning point and that trend plots and future studies of actual cattle use should be used to obtain proper range utilization.

Harniss established 15 trend plots located on identified range sites in Franklin Basin (13 of which are located within the current Franklin Basin allotment). The 1986 data indicated that of those 13, 8 of the plots had a ground cover of 75% or greater.

Roy O. Harniss’ 1986 survey and report are included in the project file.

3.3.4 Current Grazing

The current state grazing permit authorizes 607 cow/calf pairs for a grazing season of use from June 25 through October 10, with some flexibility allowed for weather conditions, range readiness, and livestock needs. If the forage is fully utilized or the Forest Service determines that further grazing reaches Forest Plan Standards for livestock use, the permittee can be required to remove livestock early.

A season-long grazing system is in place, with riders distributing cattle throughout the allotment as the season progresses. With this season-long system there are areas that are deferred from grazing by nature of the seasonal progress through the allotment. Current management includes the requirement to graze within Forest Plan grazing standards.

3.3.5 Inventories and Methodologies

The inventory of capable and suitable range acres was updated for the Franklin Basin Cattle allotment during the 2006 and 2007 field seasons. Inventory methodologies were conducted primarily using vegetation cover/ macro-plot techniques. Ground cover transects were also conducted as part of the inventory. The collection of vegetative cover data provided a plant species composition for capable range areas. This data, along with ground cover data, was used to determine if the capable range acres were in satisfactory or unsatisfactory condition. Comparison of the actual species composition to the desired conditions using area vegetation habitat classifications and resource value ratings from Forest Service Range Handbooks, were the basis for determination of conditions. Field data and reports are included in the project file.

3.3.6 Rangeland Capability and Suitability

According to the Forest Service, rangeland *capability* is represented by “the physical attributes or characteristics of the landscape that are conducive to livestock grazing” (USDA Forest Service 2003). Rangeland *suitability* is represented by those lands “that are allocated to grazing use based on decisions related to social, economic, or environmental choices and uses foregone” (USDA Forest Service 2003). Range suitability identifies areas within the capable land base where grazing is appropriate within the context of land management considerations such as economics, environmental consequences, rangeland conditions and other uses or values of the area.

Typically, suitability decisions are made at the forest plan level but can be done at the project or allotment level. Suitability issues are usually broad in scope and extend across a larger landscape than a single allotment. The determination of Forest Service lands suitable for grazing on the Logan Ranger District was made in the Revised Forest Plan (USDA Forest Service 2003). On the Franklin Basin allotment, the White Pine Lake area is not open to livestock grazing due to conflicts with recreation use. Therefore, that area is not suitable for grazing. The rest of the allotment is considered suitable for livestock grazing.

Criteria used to determine capable rangeland acres on the Franklin Basin allotment follow the Revised Forest Plan (USDA Forest Service 2003) and they include: rangelands that produce at least 200 lbs/acre of forage, are one mile or less from available water sources, and occur on slopes less than 30 percent. Field reconnaissance and the vegetation cover type map were used as the basis to determine the ability to produce 200 lbs/acre. Certain cover types (e.g., non-range (dense) conifer, timber harvest units, and low sagebrush) do not produce this amount of forage and thus were designated as non-capable. Distance to

water was determined using geospatial data sets of all water sources (perennial springs, seeps, and streams) and analyzing their distribution using GIS. A GIS analysis process was also used to determine percent slope.

The Brush Canyon and Rigby Hollow area on the east side of Highway 89 has limited capable range due to lack of water. The primary water sources (springs) in this area are located on private land and no private land grazing permit is in place. Therefore, this area is not capable, due to water limitations.

Approximately 5,500 acres of the 20,700-acre allotment (FS lands only) are capable rangelands. Capable rangelands comprise approximately 27% of the allotment. A map of the capable rangelands within the Franklin Basin allotment is shown in Appendix E.

3.3.7 Existing Rangeland Conditions

A determination of existing conditions (satisfactory or unsatisfactory) of rangeland vegetation on the Franklin Basin allotment was made based on an analysis of data collected during 2006-2008 field inventories. Satisfactory rangeland condition, as defined in the Revised Forest Plan (page GL-17) is “when the desired rangeland condition is being met, or short-term objectives are being achieved to move rangeland toward desired conditions; either meeting or moving toward desired conditions.”

A summary of the range conditions for the Franklin Basin allotment is shown in Table 3.5.

Table 3.5 Franklin Basin Range Conditions (National Forest System Lands)

Capable Acres	Capable Acres	Non-Capable Acres	Total Acres
Satisfactory	Unsatisfactory		
5,160	494	15, 081	20,736

There are isolated areas of heavy use near the lower Steep Hollow area, along portions of Steam Mill, and along portions of the main drainage. However, there are also areas within the allotment that are under used indicating distribution challenges within the allotment. These areas of heavy-use and under-use fluctuate with the years and may be attributed to activity other than permitted livestock and may indicate a distribution issue that could be solved with riders where permitted livestock are concerned.

The capable range acres that are currently rated as being unsatisfactory are spread throughout the base of capable range acres on the allotment. Generally, acres in unsatisfactory condition have the gentlest terrain and are easily accessible to livestock. The 2006-2007 inventories identified areas that are unsatisfactory, primarily due to poor plant species composition and/or low ground cover.

A majority of the unsatisfactory sites do not support a plant species composition similar to the habitat type for the area. The inventory data indicates sites that are unsatisfactory

commonly are dominated by species such as: western coneflower, western groundsel, sawtooth butterweed, western yarrow, and lupine. These plants and others like them (including small forbs such as starwort, wild strawberry, and tarweed) increase under heavy grazing pressure. In addition, heavy cattle grazing has reduced the desirable perennial grass and grass-like species such as: blue wild rye, slender wheatgrass, mountain brome, elk sedge, great basin wildrye, and Columbia needlegrass. These changes in species composition were the primary basis for determining that sites were unsatisfactory.

Some of the steeper and higher elevation areas (historic sheep grazing areas) still exhibit impacts to both the soil and vegetation resource. As described earlier, the 10,000 head of sheep that grazed the Franklin Basin allotment grazed what is now inventoried as non-capable cattle range (too steep to be capable rangeland for cattle). Heavy sheep grazing on some sites created areas of bare ground and thus reduced the production potential of the sites. Many of these sites, although they are not grazed by cattle to any extent today, are still unsatisfactory and recovery of the vegetative species will continue to be slow. To some extent, heavy sheep grazing also impacted the gentler aspen and sagebrush sites which have been recovering at variable rates over the past 50 years. However, some of these sites are still favored by cattle and remain unsatisfactory as illustrated on the range condition map. For more information, see the Rangeland Resources Technical Report in the project file.

3.3.8 Issues Addressed

Public and agency scoping, followed by Forest Service interdisciplinary team review identified the following issue to be addressed in this impact analysis:

- How would rangeland resources and management be affected by cattle grazing if authorized on the Franklin Basin Allotment?

Indicator used to compare alternatives:

- A qualitative description of the effects of livestock grazing on rangeland vegetation and range management within the Franklin Basin allotment

Cattle grazing can affect native vegetative species composition and soil conditions if not properly managed. Season long cattle grazing that allows range sites to be grazed to similar intensities and times each year during the growing season, is known to allow less desirable plant species to increase, and desirable species to decrease. Decreases in perennial grass species that are preferred by cattle, can also reduce ground cover leaving soils vulnerable to erosion.

3.3.9 Direct and Indirect Effects

3.3.9.1 Alternative 1 – Proposed Action

The proposed action would implement deferred grazing. The deferment of grazing after the fast growth period in two out of three grazing seasons, which is the basis of the proposed action, is expected to allow for a gradual improvement in species composition, and a measurable upward trend to occur between 5 and 10 years after implementation. It is important to note that even though improved management would be implemented in year 1, a measurable improvement in species composition and the eventual range condition takes time and would not be readily apparent in the first few years. An upward trend would be based on desirable native species seeding into interspaces of bare ground, and plant species that have increased under current and historic grazing pressures to begin to decline. The two out of three years of grazing deferment is expected to allow for an improvement in the plant species composition for three reasons: 1) the desirable forage plants are allowed to go through the most vulnerable part of their annual life cycle prior to being exposed to any grazing pressures two out of three years, 2) the deferment of grazing minimizes the opportunity for cattle to graze on annual re-growth of perennial grass species, and 3) deferment of grazing allows for ample forage production to occur throughout the capable range acres on the allotment, providing the best opportunity to distribute cattle across the allotment, thus minimizing impacts to areas where otherwise cattle tend to concentrate.

The riparian areas that have been identified as unsatisfactory would also be expected to improve due to the deferment in grazing use two out of three years. However, it is important to note that livestock management, including riding and salting, will continue to be a critical element to distribute cattle across the allotment and prevent congregation of cattle in the unsatisfactory riparian areas. Even under the scheduled deferment that is the basis of the proposed action, prolonged cattle concentration is often associated with the stream bank trampling and heavy browsing on woody species, primarily willows (as evidenced in the few unsatisfactory riparian areas described in this EA).

3.3.9.2 Alternative 2 – No Action (No Grazing)

The removal of permitted livestock on the Franklin Basin allotment would allow for improvement in range conditions on the 494 acres of uplands currently inventoried as unsatisfactory and on the unsatisfactory riparian areas.

The most immediate and measurable improvement in conditions would be in the riparian area in lower Steep Hollow and smaller areas of concern along the Logan River. Measurable improvements would be expected within 5 years. Improvements in stream bank stability would be expected as riparian plant species such as sedges, rushes, and willows re-establish. Areas that are currently used as water crossings and have sustained heavy trampling effects over time would not be expected to recover as fast; however notable improvements would be expected after 10 years. The Beaver Springs riparian area which currently has a “riparian enclosure” fence would continue in an upward trend; however the riparian fence would no longer be needed.

The speed of improvement in species composition on the 494 acres of unsatisfactory of upland range would vary depending on the current similarity of the existing species composition to the desired composition. Under no grazing, some measurable upward trends would be expected after 5 years. More measurable improvements in trend would be expected after 10 years. After 10 years, most of the unsatisfactory range sites would be expected to have a species composition similar (within 80% similarity) to the desired plant community.

3.3.9.3 Alternative 3 - Current Management

The annual grazing by cattle on perennial forage species on capable range acres would remain the same as described under the “Current Grazing” section of the range affected environment section in this analysis. The resulting range conditions would also remain the same as those described in the existing conditions. In summary, the number of unsatisfactory range acres, 494, would remain the same. However, there may be some instances of upward trends on upland range sites that are currently rated as unsatisfactory. This would only be expected on small inclusions of upland range sites that have poor species composition that resulted from past sheep grazing, but now receive lighter intensities of cattle use. Conversely, there may be some instances where the current level of cattle grazing, 607 cow/calf pairs, and season long grazing continue to cause a decline in the unsatisfactory riparian conditions currently identified on the allotment, if not managed to standard.

3.3.10 Cumulative Effects

- **Dispersed Recreation** – Dispersed camping occurs mainly along the Logan River from Beaver Creek to the Idaho border. The dispersed recreation sites occur in the relatively flat valley bottom next to the Logan River and have small areas bare soil associated with fire rings, tent pads, vehicle and trailer parking, and access trails from the nearest road to the site.
- **Timber Harvest** – Timber has been harvested in Steep Hollow.
- **Livestock Grazing** – Sheep and cattle grazing has been an activity that has been occurring for over 100 years. Poor land conditions occurred in the late 1800s and early 1900s and a gradual improvement in land conditions have occurred as indicated by increased ground cover and absence of active soil erosion in most areas within grazing allotment.
- **Wildfire** – Wildfire occurred on the hillside to the east of the Logan River near Petersen Hollow.
- **Off Highway Vehicles (OHV) use** – Illegal OHV use occurs mainly in the dispersed recreation areas along the Logan River and up the Steep Hollow road.

The area of cumulative effects includes the entire Franklin Basin area. The Forest permits no other livestock grazing in Franklin Basin.

Historic sheep grazing which was recorded to be around 10,000 head of sheep prior to 1950, and then dropping to 5,400 head of sheep after 1950, would be the primary cumulative effect of grazing pressures that affect perennial vegetative species. Historic sheep grazing would not only have altered the plant species composition through grazing pressure, but the trampling pressure from hoof action would have been considerable. The effects of historic sheep grazing are part of the reason for upland range sites in aspen, dry meadow, mountain brush, and sagebrush sites are unsatisfactory. A majority of the unsatisfactory range sites that account for 494 acres and are spread across the allotment are also grazed by cattle under current management. Rangeland trend on these areas will be difficult to assess until range trend studies are reread. However, improvements on the unsatisfactory range sites are not expected due to past sheep impacts and current season long management by cattle.

The cumulative effect of historic sheep grazing has also been noted on non-capable steep range sites on the west side of the allotment where sheep herds would have grazed. Cattle grazing does not occur on these steeper slopes under current management and is not expected to occur to any measurable degree under any alternative.

It is recognized that elk and deer also forage on the native plant species on the allotment. However, unsatisfactory range sites inventoried on the allotment are indicative of historic levels of sheep grazing and season long cattle grazing.

Under the no grazing alternative, it should be noted that on sites where western coneflower and groundsel are a dominant plant in the species composition, the eventual decrease of those species, which can be very persistent species, will take many years.

Under the proposed action, the cumulative effects will be the same as those described for the No Action alternative, with the noted exception that improvement in range conditions is expected to occur on the 494 acres that are currently rated as unsatisfactory.

The rate of improvement in range conditions on the areas impacted by historic sheep grazing will not be affected by cattle. Improvement on the historic sheep sites of steeper gradient will vary depending on past losses of soil.

3.3.9 Irretrievable and Irreversible Commitment of Rangeland Resources

No irretrievable or irreversible commitment of rangeland resources would occur under the proposed action or any of the alternatives because grazing would be to Forest Plan standards under the proposed action and current management, and there would be no grazing under the no action alternative. Under the no action alternative there would be a loss of acres available for permitted grazing.

3.4 Recreation

3.4.1 Introduction

The purpose of this section is to explain and clarify the existing conditions of the recreation resources within the analysis area and to disclose the effects of the proposed action and the alternatives.

3.4.2 Area of Influence

The general area of influence for recreation resources is the grazing allotment boundary and major access points into the Franklin Basin allotment, where relevant.

3.4.3 Existing Inventories, Monitoring, and Research Literature Review

Several sources of information are used to analyze the effects of the proposed project and alternatives. Site visits, comments to the proposed action, previous campsite inventories and a literature review will be used to inform the discussion.

3.4.4 Key Assumptions and Methodologies

Assumptions made in this analysis are:

- (1) Livestock will be managed to stay within the allotment boundaries
- (2) Overnight use (camping) is more impacted by grazing than day use
- (3) Some individuals are negatively affected by seeing cattle grazing or their impacts, some are not, and some enjoy seeing cattle grazing

The analysis method is to present the desired conditions for the project area (see Section 1.5); describe current conditions, present likely effects to the desired recreation experience from the proposed action and alternatives along with recommended mitigation measures where applicable.

- **Recreation Opportunity Spectrum**

ROS is a key component of management direction in the 2003 Revised Forest Plan. The Forest Service has used the Recreation Opportunity spectrum (ROS) since the 1980's as a management tool to describe and allocate outdoor recreation settings. Opportunities, activities, and settings are part of the ROS system. The ROS establishes zones of uses (settings) where allowed activities provide opportunities for visitors to enjoy their public lands and attain desired beneficial experiences. As a tool ROS helps visitors decide which areas, or settings, are the best choice for their desired experience by letting them know what physical, social and managerial settings are available. Providing the information helps visitors chose the best location for their desired activity so they have the best chance of having a quality, satisfying experience. Often when visitor expectations are not met they have a less satisfying experience.

- **Recreation Experience**

The results of a recreation outing are often discussed in terms of the experience one has and the benefits one receives from the experience. The experiences resulting from an outing can have many contributing components. Some components are personal such as if you become ill or if some element of the trip didn't meet prior expectations. Some elements are beyond management control such as the weather. Some elements are of a more personal nature and may relate to issues defined by one's individual values. The Forest Service focuses on providing opportunities for individuals to engage in desired activities in appropriate settings. Opportunities, activities, and settings are part of the management system called the Recreation Opportunity Spectrum (ROS). The ROS provides land management agencies with defined or definable categories (zones) where opportunities for certain activities are allowed. These zones then provide visitors with an understanding of what to expect when they chose to go to a certain area (setting) for a specific activity. Providing the information helps visitors chose the best location for their desired activity so they have the best chance of having a quality, satisfying experience. Often when visitor expectations are not met they have a less satisfying experience.

Little is known regarding what experiences visitors are seeking in the Franklin Basin project area. Utah State University did a study of on-site visitors and "key informants" to the Franklin Basin area (USU 2004). Their findings suggest that the heaviest time of use is in late fall and winter. Visitors come seeking a "sense of solitude and a sense of wilderness" (USU 2004, p.4). Most visitors are "long-term local residents" who have been using the basin for over a decade (USU 2004 p.4). Many come to relax in a natural setting and for some the focus is more on social interactions. All but one person interviewed was satisfied with their experience.

Visitors' experiences are often influenced by the conditions of the setting they are in. Based on the interviews with key informants, roughly one third of respondents were unhappy with the impact of grazing on the vegetation quality of the Basin (USU 2004 p.20). So, while visitors are satisfied with their visit, the level of grazing in the area does affect the experience of some.

3.4.5 Affected Environment

Much of the land in the Franklin Basin allotment was conveyed to the USDA Forest Service in land swaps in 1998 and 2000. Since that time limited recreation information has been gathered. Some planning for the area was done during the Forest Plan revision process and various land allocations were decided in the 2003 Forest Plan Revision. In particular, this planning effort delineated Summer and Winter Recreation Opportunity Spectrum zones and Management Prescription zones.

There are three different ROS allocations in the area: Roaded Natural (3,602 acres), Semi-Primitive Motorized (1,419 acres) and Semi-Primitive Non-Motorized (15,736 acres). The Roaded Natural (RN) zone is along the Logan Canyon National Scenic Byway (Hwy 89), the Franklin Basin Road (Forest Road 006, 5.8 miles) and the Franklin

Basin Private Access (FR 288, 0.5 miles). There is a Semi-Primitive Motorized (SPM) zone along Steep Hollow Road (FR 289, 2.0 miles) with the Semi-Primitive Non-Motorized zone outside of the buffers of these routes. All of these ROS classes provide opportunities for visitors to experience closeness to nature, challenging travel, and a high degree of self-reliance with some risk involved.

The settings of these areas are characterized as having a natural appearance with minor improvements to protect resources. Managers provide limited numbers of signs that are rustic looking and made of natural materials. Visitors will expect to meet a low number of other people while traveling the routes. Most information relating to these areas will be located at trailheads with minimal management in the interior of the areas. These allocations are mapped as shown in Appendix F.

There is a separate Winter ROS map, but there is no grazing or associated impacts occurring during the time this allocation is in place. Therefore impacts to winter recreation will not be further analyzed.

The majority of the area is in Management Prescription 2.6 that is designated as an Undeveloped Special Interest Area. There are Management Prescriptions of 3.1 emphasizing aquatic habitats along some streams and a Management Prescription category of 4.4 along the Franklin Basin Road emphasizing dispersed motorized recreation, mostly for vehicle access to camping within 150' of the road.

The project area provides for year round recreation use. Motorized and non-motorized visitors use the area in both summer and winter. Based on the management prescriptions and ROS for the area the recreation management focus is on providing for dispersed motorized camping along the Franklin Basin Road with a large block of non-motorized area set aside for hiking, biking and horseback riding. Camping and day use activities are both important opportunities in the area.

Recreation use is thought to be increasing yearly on the entire Logan Ranger District. Summer season recreation guards report that use in Franklin Basin is increasing as well. The 2006 closure of dispersed camping sites in the Beaver Creek area on land acquired and managed by SITLA (Utah School and Institutional Trust Lands) has displaced some visitors from Beaver Creek to Franklin Basin, also increasing use there.

Non-motorized use is popular in the project area. Hiking, horseback riding and mountain biking are all popular activities. Horse use and some mountain biking are probably the highest use from the Franklin Basin area. Hiking is probably the dominant use from the Bunchgrass and Tony Grove Trailheads with some horse use and limited mountain biking.

Access for visitors to the area is varied. The most used access point is the Franklin Basin Road entering from Highway 89. The majority of overnight and day use starts from sites along the Franklin Basin Road. Some traffic also enters the area on the Franklin Basin Road from the Caribou National Forest to the north in Idaho.

Other more remote points to access the area from are the Bunchgrass parking pull-out along Highway 89 that accesses the White Pine-Bunchgrass Trail which is popular with hikers, mountain bikers and horseback riders. The Tony Grove Lake area is another popular access point to the area. This is a highly developed recreation site about a mile south of the southern boundary. The Tony Grove Lake Day Use Parking is a very popular access point for hikers and mountain bikers. Overnight visitors and people riding horses can access the area from the Backcountry Trailhead just south of the Day Use Parking. Most of the use from this access point is day use, except for those hiking in to White Pine Lake.

White Pine Lake is the Logan Ranger District's most popular backcountry camping destination. It is used extensively by scouting and church groups for day hikes, camping, and outdoor education as well as by the general public.

There is very little development in the project area and the Forest Plan Revision emphasized a management desire to keep this area undeveloped. Recreation developments in the area include the trail system, a horse camp, and designated dispersed camp sites at White Pine Lake.

There are approximately 36 miles of non-motorized trails in the project area as listed below. Many of these trails were likely established by moving livestock to different parts of the area. Hikers, mountain bikers, and horses all share the trails with very few reports of conflicts. There are no motorized trails in the project area.

System Trails in the Franklin Basin Grazing Allotment

Name	System Number	Approximate Miles
Double Top	7137	6
Naomi Peak National Recreation Trail	7005	2
Petersen Hollow	7135	3.5
Shorty's Cut-Off	7001	4.2
Steam Mill	7139	6.2
White Pine-Bunchgrass	7051	7.1
White Pine Lake	7025	4
White Pine Canyon	7039	2.8

An additional recreation development is the horse camp area being developed jointly by the Bridgerland Backcountry Horsemen and the Forest Service. This is located to the west of the Franklin Basin road approximately one half mile north of the road junction with Highway 89. The horse camp was planned for this area due to the traditional use, non-motorized trail system, beautiful terrain, and access to good hunting. The horse camp consists of metal corral panels, an improved access route, some hardened trailer pads and barrier rock and fencing. These items are provided to aid in resource protection.

The other major recreation asset in the area is at White Pine Lake. Visitors to this area are looking to get away from the daily routine. They are able, within a short distance, to find solitude and a seemingly remote, lightly developed area. Day hikes and horseback rides in to White Pine Lake are popular. For some visitors this may be their first experience camping in the outdoors. The Logan Ranger District gets yearly complaints about cattle spending extended periods of time in the White Pine Lake Basin. Flies, noise, manure, and cattle in campsites are some of the complaints. These are all negative impacts to the recreation experience. Until recently, White Pine Lake was not within the allotment and the riders attempted to keep cattle from drifting in illegally. This has generally not been successful and cattle bed down at the White Pine Lake for extended periods of time.

Due to the popularity of White Pine Lake there is increased recreation management. As a result of resource impacts around the lake, overnight visitors are asked to camp in designated sites. Camp sites for horse groups away from the lake have also been designated. Numerous social and cattle trails have been blocked and scarified and reseeded. Many summer weekend nights over 100 people will be camped in this area. Due to the high volume of use a pit toilet was provided by local scout groups with assistance from the Bridgerland Backcountry Horsemen. Numerous Forest Service patrols are scheduled into this area to provide public contacts, assist visitors where needed, and enforce land use regulations. The lake has been considered an ideal location for making public contact and teaching Leave No Trace camping etiquette.

There are other areas of concentrated use within the project area. Most of the motorized dispersed camping is along the Franklin Basin Road and at the junction with the Steep Hollow Road. Twenty two campsites were identified and inventoried during the 2006 field season. This is not an all inclusive number as the inventory focused mainly on campsites associated with roads and did not include backcountry sites except for those identified earlier at White Pine Lake. Due to concerns regarding impacts to water quality and riparian areas, numerous campsites adjacent to and impacting the Logan River were closed within the last 10 years to motor vehicle access for resource protection. Barrier rocks were placed to stop vehicles and access routes delivering sediment into the Logan River were scarified and reseeded.

While actions have been taken along the Logan River to reduce recreation impacts, this area may be among the most desirable areas left on the Logan Ranger District to add additional dispersed recreation vehicle camping. Due to the relatively high elevation this area can provide desirable cooler temperatures. It is relatively flat in comparison to the rest of the places on the district suitable for motorized dispersed area camping with adjacent non-motorized recreation opportunities. While somewhat lacking in shade compared to areas such as camping along the Sinks Road, this high elevation location still provides relatively cool temperatures.

Motorized use in the area is largely by ATV. Overnight visitors bring ATV's and ride the Franklin Basin and Steep Hollow Roads. Most of the visitors ride north into Idaho where there is an extensive system of roads and trails open to motorized use. Some

unauthorized ATV use does occur in the area. There are occasional problems off of the Steep Hollow road where ATV riders have pioneered trails into and around Crescent Lake and beyond the end of the Steep Hollow road into the Steep Hollow basin.

In addition to the trail system there are two yurts operated under Special Use Permit. These are located in the Hell's Kitchen and Bunchgrass drainages. The structures themselves are the only developments allowed. As these are only permitted for winter use, they will not be considered further in this analysis.

3.4.6 Issues Addressed

- How would recreation experiences be affected by cattle grazing if authorized on the Franklin Basin Allotment?

Indicators used to compare alternatives:

- A qualitative analysis of areas where cattle and dispersed camping coincide
- A qualitative assessment of public perception of cattle induced resource impacts

3.4.7 Direct and Indirect Effects

This section describes the direct, indirect, and cumulative effects to the recreation experience from the proposed action and alternatives.

The effects of livestock grazing on the recreation experience has had limited research. Wallace et. al., 1996 studied visitor perceptions of livestock grazing on a Forest Service allotment in Colorado. Their findings indicated that visitor reactions to cattle grazing varied by perception of resource impacts and where the interactions took place. Of visitors who reported something affecting their recreation experience, livestock grazing impacts were mentioned most. Asked to describe resource impacts, livestock impacts were mentioned most frequently, with impacts to lakes, streams and riparian areas found most disturbing. However, of all sampled visitors they were about evenly split between visitors who identified encounters with cattle as negative or positive.

Where cattle are encountered also affects the perceptions and the recreation experience. Negative encounters were most often associated with cattle, manure, and flies in campsites or along trails.

Some measures to minimize the conflict between cattle and recreation visitors were also noted. Timing of cattle movements (drop-off, trailing) can be accomplished during lower use times such as midweek rather than weekend reducing the amount of time visitors interact with large numbers of animals. Reducing the amount of time large numbers of cattle are in high use recreation areas also can minimize conflict. This is mentioned as being most important in areas where most conflict may occur: near camps, trailheads, and

streams, lakes, and riparian areas (Wallace et. al. p.10). In addition, most visitors are less likely to have conflict with grazing if they perceive that good management is occurring or important resources are improving. Reduction of on-site impacts and direct effects to the visitors and their activities may minimize conflict.

In a study of hunter and hikers to a newly created National Monument in southern Utah, Brunson and Gilbert 2002 found that demographic characteristics had an effect on the perception of grazing impacts and an affect on recreation experience. This was also true for certain demographic characteristics differing between the two groups. Hunters using the area were more likely to be from Utah and have a rural background. They were also more likely to perceive impacts from grazing, but less likely to be negatively affected by them. Hikers were more likely to be from an urban background and outside of Utah. Hikers felt grazing had a greater impact on their recreation experience than did hunters.

In this study they concluded that as more people were drawn to the National Monument, more were likely to be hikers therefore an increase in conflict between visitors and grazing may occur over time.

A class project with students from Utah State University explored human uses and values, as described by users, in the Franklin Basin (Christensen et.al. 2002). In their analysis they were told that the heaviest use of Franklin Basin occurs in the late fall and winter. The majority of study participants were long-term local residents who on average had been using the Franklin Basin for over a decade. A majority of those visitors valued a wilderness experience while many came for preferred recreation activities. The most special places to visitors were significantly influenced by the lakes and streams. They were also informed that use by non-locals has increased in recent years, mostly by motorized users.

Regarding resource conditions, roughly one-third of the individuals were unhappy with impacts to vegetation due to grazing.

3.4.7.1 Alternative 1 – Proposed Action

This alternative incorporates an adaptive management strategy that varies the grazing season, timing, intensity, frequency and amount of cattle control based on resource conditions and minimizing cattle presence in high value recreation areas.

In general this alternative may improve the recreation experience in the area by reducing the visitor perceptions of cattle caused resource impacts such as upland and riparian areas grazed beyond standard. It may also improve the visitor experience by reducing cattle drift into high value recreation areas such as Tony Grove and White Pine Lakes and dispersed camp sites along the Franklin Basin Road.

If the grazing season is shortened in the fall, campers' experiences will be improved if cattle are moved out of identified campsites along the Franklin Basin Road and forced to concentrate away from campsites and trails. If the grazing season is variable, having

cattle gathered and out of the allotment prior to the opening of the general hunts in the Northern Region, usually early October (Oct. 4, 2008), when camping in Franklin Basin is busiest would improve the experience there. Adjustment to the early part of the season would have a more limited positive effect on the recreation experience.

Improving grazing intensity could have a positive effect on the recreation experience. If managed to standard, hunter complaints will decrease regarding impacts to water bodies and loss of vegetation resulting in poorer quality hunts.

Improved cattle control would have the greatest improvement to the recreation experience. Cattle outside of their allotments, particularly in the Tony Grove and White Pine Lakes area have very negative effect on the experience of some visitors. Cattle in campsites along Franklin Basin Road are having a negative effect on some visitors, but it may be mitigated by the fact that they are within their legal boundaries.

3.4.7.2 Alternative 2 – No Action (No Grazing)

This alternative eliminates livestock grazing on the Franklin Basin Allotment.

In general, this alternative would provide the greatest improvement to the recreation experience in the area as there would be no cattle and manure in campsites, cattle induced resource impacts would decrease over time, and there would be no cattle drift into Tony Grove or White Pine Lakes or cattle sharing campsite with visitors along the Franklin Basin Road.

3.4.7.3 Alternative 3 – Current Management

This alternative allows for the current level of grazing and current management of the allotment to continue.

This alternative would have the greatest negative impact to the recreation experience. Resource impacts from grazing would continue to affect some visitors. Cattle would be on the allotment for a longer period of time (than the proposed action), mixing with people camping there, and cattle drift into the Tony Grove and White Pine Lakes areas would continue. As more people are drawn to the Franklin Basin area for dispersed camping along the Franklin Basin Road there may be increased concerns from new visitors who are not used to sharing campsites with cattle.

3.4.7 Cumulative Effects

- **Dispersed Recreation** – Dispersed camping occurs mainly along the Logan River from Beaver Creek to the Idaho border. Favored camping opportunities have been reduced in Franklin Basin by closing some sites which were having a negative impact to water quality and riparian resources. However, camping is still allowed within 150' of the road outside of riparian areas.

- **Livestock Grazing** – Sheep and cattle grazing has been an activity that has been occurring for over 100 years. Poor land conditions occurred in the late 1800s and early 1900s and a gradual improvement in land conditions have occurred as indicated by increased ground cover and absence of active soil erosion in most areas within grazing allotment. Some evidence of historic grazing (such as small patches of bare ground) may still be visible to the recreation visitor.
- **Timber Harvest** – The evidence of past timber harvest in Steep Hollow is still visible.

The cumulative effects analysis area for recreation resources is the area contained within the Franklin Basin Grazing Allotment on the Logan Ranger District. This area was chosen because it represents the area for the majority of the recreation visitors to this project area.

Past, present and future actions that may affect the project area involve changes in opportunities for recreation including closing some dispersed camping sites, and effects on the recreation experience such as evidence of past timber harvest, and historic sheep grazing. The effects as described above are relatively minor as relates to the quality of the overall recreation experience.

Therefore, the effects of the proposed action or any of the alternatives in combination with the effects of past actions will not have a significant effect on the recreation experience in Franklin Basin.

3.4.8 Irretrievable or Irreversible Commitment of Resources

No irretrievable or irreversible commitments affecting recreation opportunities are expected as a result of implementing any of the alternatives.

3.5 Soil Resources

3.5.1 Introduction

The purpose of this section is to explain and clarify the existing conditions of the soil resources in the analysis area and to disclose the effects of the proposed action and the alternatives.

3.5.2 Area of Influence

In general, the activity area for analysis of soil quality effects from the proposed action and its alternatives is often defined to be the individual pastures which make up the allotment being analyzed. However, the Franklin Basin Allotment is just being brought under Federal management as a result of a recent land exchange. Previous management did not include any identified pasture/rotation system. Soil quality monitoring was conducted within White Pine, Steep Hollow, and Steam Mill Canyons, and around Crescent Lake. These were the only areas found to have evidence of past livestock pasturing. Detrimental soil disturbances due to grazing activities will be summarized and disclosed for these general areas of the allotment.

3.5.3 Existing Inventories, Monitoring, and Research Literature Review

Previous range condition monitoring and evaluations have shown that the majority of the pastures are well vegetated and the soils are well protected from wind or water erosion (Harniss. 1986.) However, scattered areas of low ground cover/bare soil, and pedestaled plants have been noted throughout these allotments (Fillingham 1981.). Up to this time, lack of current field data has made it impossible to quantify the extent of these scattered areas across the pastures. This analysis will rely mainly upon monitoring of existing soil quality conditions, conducted by the Forest Soil Scientist during field trips to the allotment that occurred from June 18 through 21, 2007.

Western Watersheds Project has collected information about vegetation utilization within riparian areas within this allotment, and its potential effects upon trout spawning habitat. Other than photographs of selected riparian sore spots, their March 18, 2008 letter and associated powerpoint presentation contain no data about soil or ground cover conditions in either riparian or upland range areas. Western Watersheds Project has also prepared a powerpoint presentation (no date available) that looks at capable range determinations conducted by the Caribou National Forest (CNF) This powerpoint presents conclusions about soil erosion rates based upon soil erosion modeling work, and recommendations for selecting capable range based on “low” erosion rates. Because the erosion modeling relies heavily upon ground cover values, and because CNF ground cover values are markedly less than those observed on the Franklin Basin Allotment, the powerpoint and its associated conclusions appear to have little relevance to this analysis.

Basic soil properties and information for the area was obtained from the Soil Survey of the Cache Valley Area (USDA-NRCS. 1984).

3.5.4 Key Assumptions and Methodologies

This analysis utilizes results of soil quality condition monitoring transects conducted to collect data and disclose the severity and extent of low ground cover/bare soil areas within grazing activity areas of the allotment. The analysis methodology used will compare current soil quality conditions with the Revised Forest Plan (RFP) soil quality direction and disclose whether or not current grazing management is meeting RFP soils related standards and guidelines. The analysis assumes that soil quality will be maintained if related RFP standards and guidelines are being met.

Key disclosures of this report include:

- How much barren soil occurs within representative pastures or vegetation community types
- Whether the barren sites are a result of current management activities, or are an inherent (natural) feature of range sites in the Bear River Mountains.

The soil quality condition information that was collected is expected to represent most of the conditions found in specific vegetation communities and soil types (see Results of Surveys, below) of the allotment at the present time, and is assumed to be adequately complete for assessing the environmental effects of the proposal. Soil quality condition survey procedures, methodologies, and results are described in more detail in a separate report (Flood 2008a.).

3.5.5 Affected Environment

Existing Conditions - Based upon field data collected, representative ground cover values for the major upland vegetation communities found in the Franklin Basin Allotment are presented in Table 3.6. Many communities were found to have large amounts of bare soil associated with gopher activity. Gopher activity is readily identified in the field by the presence of mounds, holes, eskers, and casts. In alpine grass and dry meadow sagebrush/grass communities in the Uinta Mountains, Goodrich found similar effects from gopher activity, and considered them to be inherent natural features of the community types (Goodrich, S. 2006-PG). Discounting gopher activity related bare soil as an inherent, natural property of the vegetation community indicates that bare soil due to other factors, including management activities, in this allotment ranges from 1% to 15%.

Table 3.6 Ground Cover Data for Franklin Basin Survey Transects, By Vegetation Community

Transect	Vegetation Community	Rock+Litter Cover (%)	Gopher Impacts (%)	Bare Soil (%)	Potential Ground Cover/ (85%)
010618	Silver Sage	85	12	5	89-96%/ (76-82%)
020618	Few Flowered Sage	89	8	3	81-96%/ (69-82%)
030619	Tall Forb	98	1	1	49 to 75 %/ (42-64%)
040619	Curleaf Mahogany	84	1	15	70-82%/ (60-70%)
050619	Low Sage	81	14	5	69%/ (59%)
060619	Snowberry	89	9	2	92%/ (78%)
070619	Silver Sage	69	29	2	81-96%/ (76-82%)
010620	Tall Forb	60	40	0	49 to 75 %/ (42-64%)
020620	Few Flowered Sage	70	20	10	89-96%/ (69-82%)
030620	Tall Forb	69	30	1	49 to 75 %/ (42-64%)
040620	Silver Sage	68	29	3	81-96%/ (76-82%)

In his 1981 range report, Fillingim conducted surveys at 29 individual locations representing 9 different range soil-range ecological sites. Of the surveyed locations, sixty three percent received an overall “fair” rating, 30 percent good, and 7 percent poor. Overall, erosion was found to be a minor problem in the allotment area. Twenty three of the survey sites were found to have none or only slight erosion; the remainder was noted to have moderate erosion. Measured bare soil values were concentrated in the 5 to 15 % range, ranging from none to 35 %. The Fillingim report made no mention of bare soil associated with gopher activity.

Based upon observed erosion, apparent soil condition trend between 1981 and now is upward. Apparent ground cover trend is either stable or slightly upward.

3.5.6 Issues Addressed

Public and agency scoping, followed by Forest Service interdisciplinary team review identified the following issue to be addressed in this impact analysis:

- **Soil Resources**– The issue is the extent to which cattle grazing may affect soil resources within the project area.
 - A qualitative description of the effects of livestock grazing on the soil resources within the Franklin Basin allotment.

3.5.7 Direct and Indirect Effects

General Effects - Livestock grazing has the potential to adversely affect riparian and stream conditions in several ways. The primary impacts that result from grazing domestic livestock are the loss of vegetative cover because of consumption, and trampling and stream bank erosion from the presence of livestock. Stream corridors are particularly attractive to livestock because they are generally highly productive, provide ample forage, water is nearby, shade is available, and slopes are gentle. Unless carefully managed, livestock can overuse these areas and cause substantial disturbance.

In upland and riparian areas, extensive loss of ground cover and soil compaction from heavy grazing can increase runoff and erosion of topsoil by exposing surface soil aggregates to damage and transport from raindrop impact (Holechek et al. 2001). With heavy grazing, soil compaction can degrade soil hydrologic function and productivity to the point where dry upland species are favored over phreatic plants, and weedy annuals out compete perennial forbs.

The direct effects of livestock grazing are the removal of vegetation, trampling of vegetation, destruction of biological soil crusts, compaction of underlying soils, and redistribution of nutrients. The indirect effects are altered runoff, infiltration rates, and soil water-holding capacity; accelerated erosion; changes in vegetation structure, productivity and composition; altered stream channels; changes in water quality; and frequency and severity of fire (National Research Council 2002).

3.5.7.1 Alternative 1 – Proposed Action

The proposed action would authorize grazing on the Franklin Basin allotment with alternating the *timing* of grazing on an annual basis, to allow for deferment of grazing (primarily on perennial grass species), with intensity of grazing use (utilization) that would be according to grazing utilization standards as described in the WCNF Revised Forest Plan, with the frequency of cattle grazing on any given range site within the allotment would be limited to one time each season, with cattle control (through such means as riding and salting) to keep cattle out of closed areas. Monitoring of cattle that drift into closed areas, or that drift into the allotment from adjacent allotments, would be the basis for adapting management to gain better control of cattle. If trespass cattle are repeatedly found in the allotment, or permit livestock in closed areas, additional riders or other strategies would be required.

It is expected that litter, as a component of ground cover, would increase slightly as a result of ungrazed or lightly grazed vegetation as grazing terms are deferred to later dates. However, pocket gopher activity will continue to contribute to the loosening and movement of topsoil, particularly in the sagebrush and tall forb vegetation communities. Where effective cattle control is implemented reductions in bare soil from live vegetation and litter increases would be more dramatic and consistent. For instance, in the short-term, it is expected that vegetation ground cover will improve on bare soils in Steep Hollow through the effective exclusion of cattle. Some trampling of stream banks and wetlands will continue to occur in small specific areas but cattle control will allow adversely affected areas to be managed.

Under this alternative, all soils related standards and guidelines in the Revised Forest Plan will be met.

3.5.7.2 Alternative 2 – No Action (No Grazing)

Under this alternative, livestock would no longer be permitted to graze on the Franklin Basin allotment. This pertains to sheep and cattle. Non-permitted recreational horse use would still occur.

It is expected that litter, as a component of ground cover, would increase slightly as a result of ungrazed vegetation. However, pocket gopher activity will continue to contribute to the loosening and movement of topsoil, particularly in the sagebrush and tall forb vegetation communities. No trampling of stream banks by permitted livestock would occur and bare ground will revegetate in Steep Hollow. Because this alternative merely removes permitted grazing from the allotment, it would have little effect on the occurrence of grazing that results from the drifting of livestock from adjacent allotments.

Under this alternative, all soils related standards and guidelines in the Revised Forest Plan will be met.

3.5.7.3 Alternative 3 - Current Management

It is expected that ground cover values would remain stable, with little or no improvement occurring. Pocket gopher activity will continue to contribute to the loosening and movement of topsoil, particularly in the sagebrush and tall forb vegetation communities.

Currently, grazing on the Franklin Basin allotment has caused some trampling of stream banks and adjacent wetlands in specific areas of the allotment. It is expected that erosion of bare soil and sedimentation of the stream along the lower reach of Steep Hollow will continue because the soils are erosive, are located on steep slopes with no buffer between the stream and the slopes, and trampling by cattle along the stream banks will continue to keep the soils bare.

Current livestock grazing has caused some soil compaction through trampling of the wetlands within the allotment. Based on field reviews, about 0.03 percent of wetlands of the allotment have impacts from trampling by livestock and from other users including horses and hikers along the main trails in the allotment. It is expected that the impacts to wetlands will continue because most of the impacts are located at trail crossings that will continue to be used by livestock, recreationists, and wildlife.

Under this alternative, all soils related standards and guidelines in the Revised Forest Plan will be met, with the exception of Guideline G-11 (“Use Best Management Practices and Soil and Water Conservation Practices during project level assessment and implementation to ensure maintenance of soil productivity, minimization of sediment discharge into streams, lakes and wetlands to protect of designated beneficial uses”.) Other than utilization guidelines and cattle distribution through herding, there are no BMP’s currently being implemented to allow for vegetation rest and recovery. Also, no control of cattle to exclude permitted livestock from sensitive areas, or areas with unsatisfactory conditions, is currently occurring.

3.5.8 Cumulative Effects

The cumulative effects area for soil resources is the allotment boundary. The main issue with cumulative effects is localized soil disturbance from other activities in addition to grazing. Pocket gopher activity is expected to continue to cause soil disturbance on sites conducive to their activity. Recreation traffic will continue to cause localized soil disturbance, especially near the established trail. In the foreseeable future these activities in addition to on-going livestock grazing will continue to be agents of loosening dry surface soil over this activity area.

In addition to livestock grazing, other actions that may have an influence on soil quality are dispersed recreation, timber harvest, wildfire, and illegal off-highway vehicle use. The list below contains a summary of other actions that have occurred in the past, are happening currently, and are expected to occur in the future.

- **Dispersed Recreation** – Dispersed camping occurs mainly along the Logan River from Beaver Creek to the Idaho border. The dispersed recreation sites occur in the relatively flat valley bottom next to the Logan River and have small areas bare soil associated with fire rings, tent pads, vehicle and trailer parking, and access trails from the nearest road to the site.
- **Timber Harvest** – Timber has been harvested in Steep Hollow and some of the roads are continuing to erode.
- **Livestock Grazing** – Sheep and cattle grazing has been an activity that has been occurring for over 100 years. Poor land conditions occurred in the late 1800s and early 1900s and a gradual improvement in land conditions have occurred as indicated by increased ground cover and absence of active soil erosion in most areas within grazing allotment.

- **Wildfire** – Wildfire occurred on the hillside to the east of the Logan River near Petersen Hollow and the ground cover has recovered and no accelerated erosion is occurring.
- **Off Highway Vehicles (OHV) use** – Illegal OHV use occurs mainly in the dispersed recreation areas along the Logan River and up the Steep Hollow road. The extent of soil disturbance from illegal OHV use on unauthorized trails has not been quantified.

The cumulative effects from the proposed action and alternatives are about the same. Very little change to soil resources is expected from the proposed action or any of the alternatives in combination with past and on-going actions. Therefore, it is expected direction within the Revised Forest Plan will continue to be met.

3.5.9 Irretrievable and Irreversible Commitment of Soil Resources – No irretrievable and irreversible commitment of soil resources is expected because soil quality is currently meeting all direction within the Revised Forest Plan. It is expected to continue with implementation of any of the alternatives.

3.6 Water Resources

3.6.1 Introduction

The purpose of this section is to explain and clarify the existing conditions of the water resources in the analysis area and to disclose the effects of the proposed action and the alternatives.

3.6.2 Area of Influence

The area of influence for water resources is the area within the allotment boundary. The allotment is located in portions of two sub-watersheds, the Hells Kitchen Canyon-Logan River sub-watershed and the Tony Grove Creek sub-watershed. From south to north on the west side of Logan River, the allotment is within portions of the following drainages: Bunchgrass Creek, Clarks Hollow, White Pine Creek, Steam Mill Canyon, and Hells Kitchen Canyon, Steep Hollow and two unnamed drainages north of Steep Hollow. On the east side of Logan River, the allotment is within portions of the following drainages: Rigby Hollow, Brush Creek, Beaver Creek, and Petersen Hollow. These drainages flow into the headwaters of the Logan River which flows into the Bear River northeast of Logan, Utah.

3.6.3 Existing Inventories, Monitoring, and Research Literature Review

Several sources of information are used in this analysis. Field trips to the allotments were conducted on June 18 through 20, 2007 and 08/30/2007. Water quality information was obtained from the State of Utah. Aerial photos, topographic and orthophoto maps, and GIS information were used to identify water features, wetlands, and floodplains. Municipal watersheds were identified from knowledge of local communities in the area.

Some general effects from livestock grazing are presented from page 3-37 of the Final Environmental Impact Statement for Wasatch-Cache National Forest Plan.

“Livestock grazing directly impacts soil infiltration by trampling, soil compaction and loss of vegetative cover on both upland and riparian sites. Fecal wastes can increase bacterial concentrations in water through livestock defecation in a stream or riparian area. Soil and water quality can be indirectly affected by the resulting increased soil runoff and erosion, and sediment delivery to adjacent riparian areas and streams (Holechek et al. 2001). Impacts are often greater in riparian zones because they are preferred because of the availability of shade, water and more succulent vegetation (Platts 1991). Over longer time periods, grazing can result in increased fine sediment loads from stream bank erosion, loss of riparian habitats by stream channel widening or degradation and lowering of water tables through channel degradation.

Changes in grazing management such as rest, implementation of rest-rotation grazing schemes, reduced livestock numbers and adherence to forage utilization standards can lead to improved range and riparian conditions (Gifford 1975). Grazing may result in

low magnitude but long-term impacts to aquatic systems, especially from changes in ground cover, species composition, and sedimentation rates and are difficult to detect because the aquatic systems themselves are dynamic and naturally variable (Platts 1991). In addition, degraded stream channels may remain in relatively poor condition for long periods after the original impact due to the way that sediment is stored and routed through natural channels making it difficult to identify the principal cause of degradation.”

In addition to these effects, loss of riparian vegetation can cause increased stream temperatures due to loss of overhanging vegetation resulting in reduced shade.

3.6.4 Key Assumptions and Methodologies

The analysis method is to present the desired conditions for soil and water resources; describe soil and water resource features and conditions within the project area; present information on amount of effects of grazing on water quality, wetlands, floodplains, and municipal watersheds; and then present recommended mitigation measures. Disclosure of this information is used to determine if soil and water resource standards and guidelines are being in the Wasatch-Cache Revised Forest Plan (2003).

For the analysis of this allotment, the general effects of grazing will be considered in light of the site-specific soil and water conditions on the allotment and conclusions about the effects of cattle grazing on this allotment will be made. The main indicators that will be used to evaluate the water conditions of allotment are stream channel shape, ground cover conditions in the uplands and riparian areas, streambank stability as indicated by vegetation and soil/rock content, and the amount of trampling of wet areas.

3.6.5 Affected Environment

Precipitation Patterns

In Utah, most precipitation occurs from winter snowfall and summer thunderstorm activities. Thunderstorms generally occur as a cloudburst that may drop heavy precipitation along a narrow path (Ashcroft et al. 1992). Precipitation is estimated from the average monthly values from the Tony Grove SNOTEL site for water years 1979 through 2006. The months of highest water accumulation are December and January, and the amounts of precipitation averages between 6.8 and 7.2 inches mostly in the form of snow. The lowest months of precipitation are between July and October, and the average amount of precipitation ranges between 1.1 and 1.5 inches mostly in the form of rain (NRCS 2007).

Drainage Patterns and Water Features

The allotment is located in portions of two subwatersheds, Hells Kitchen Canyon-Logan River (Hydrologic Unit Code 160102030302) and Tony Grove Creek (Hydrologic Unit

Code 160102030304). From south to north on the west side of Logan River, the allotment is within portions of the following drainages: Bunchgrass Creek, Clarks Hollow, White Pine Creek, Steam Mill Canyon, and Hells Kitchen Canyon, Steep Hollow and two unnamed drainages north of Steep Hollow. On the east side of Logan River, the allotment is within portions of the following drainages: Rigby Hollow, Brush Creek, Beaver Creek, and Petersen Hollow. These drainages flow into the headwaters of the Logan River which flows into the Bear River northeast of Logan, Utah. Within these drainages, stream length ranges from 0.8 to 6.8 miles. Portions of the area have been glaciated, and morrainal features and cirques can be seen in White Pine, and Steam Mill drainages. White Pine Lake and Steam Mill Lake are located in the cirque basins at the head of their drainages and Crescent Lake is located north of Steam Mill Canyon. The stream length, lakes or ponds, and the number of springs that are shown on topography maps are listed in the Table 3.7.

Within the allotment, the streams are small and are between 4 and 10 feet wide which is typical of headwater streams. The smaller streams are in Steep Hollow and Steam Mill and are about four feet wide. The larger streams are the Logan River which is between 8 and 20 feet wide and White Pine Canyon Creek which is about 8 feet wide. A stream below a spring at the bottom of White Pine Creek is about 10 feet wide.

Drainage	Stream Length (miles)	Lakes or Ponds	Number of Springs
Logan River	4.1	3	3
Bunchgrass Creek	0.8	2	2
Clarks Hollow	2.9		
White Pine Creek	6.8	White Pine Lake	1
Steam Mill Canyon	4.5	Steam Mill Lake	1
Hells Kitchen Canyon	2.2		
Steep Hollow	3.3		
Unnamed drainages north of Steep Hollow	3.7	Crescent Lake	1
Rigby Hollow	0.9		
Brush Creek	1.8		
Beaver Creek	0.8		
Petersen Hollow	3.4		

Stream Channel Conditions

During the June 18 through 20, 2007 field review of the allotment, stream and riparian conditions were observed in most of the main drainages within the allotment. Almost all of the stream banks were very stable as indicated by the dense, deep-rooted vegetation such as willows and sedges and large cobbles or boulders. The riparian areas and wet meadows also had dense, deep-rooted vegetation and small areas where sheep access water have short-term trampling of vegetation but very little bare soil. No long-term

adverse effects to stream banks were noted during the review. The areas that were seen during the 2007 field review as having trampling impacts were along trails near the canyon mouths where livestock, horses, and hikers enter the canyons that are along the west side of the main Logan River valley. Trampling of stream banks were seen for about 160 feet long and about 5 feet wide at a trail crossing of Steam Mill Canyon and infrequently in small areas two to five feet long along the stream channel. Although there are bare areas in these locations, the contribution of sediment is low because of the infrequent rainfall and small size of the bare-bank areas.

In Steep Hollow, the stream banks and uplands adjacent to them were well vegetated during the review on January 18-20, 2007. However, in August 30, 2007, Steep Hollow had bare soils up to 20 feet from the bank on each side of the perennial stream and this occurred for a distance of 2,200 feet between the Franklin Basin road and the Steep Hollow road crossing. The cause of the bare soil is from livestock trailing up the V-shaped, narrow canyon which does not allow livestock to spread out as they trail to the upper part of Steep Hollow. Sediment has been getting into the Steep Canyon channel as indicated by the gravel in the channel bed which is similar to the gravel seen in the soils of the slopes adjacent to it.

Water Quality

The State of Utah has designated the streams draining the watersheds above the National Forest boundary as Anti-degradation Segments. This indicates that the existing water quality is better than the established standards for the designated beneficial uses. Water quality is required by state regulation to be maintained at this level. The beneficial uses of streams within these watersheds, as designated by the Utah Department of Environmental Quality, Division of Water Quality, are:

- Class 2B – protected for recreation
- Class 3A – protected for cold water species of game fish and other cold water aquatic species
- Class 4 – protected for agricultural uses.

The numeric water quality standards can be found in Section R317-2, Utah Administrative Code, *Standards of Quality of Waters of the State* (Utah, State of. 2006).

Water quality samples have been collected on Logan River above Beaver Creek as part of a cooperative effort between the US Forest Service and the State of Utah for the purpose of assessing the water quality of this area. The State of Utah has used this information in their reports to U.S. Congress regarding the quality of waters of the State of Utah. Water samples have been analyzed for chemical, nutrient, and metals parameters on a quarterly annual basis up to July 2002 and on a monthly basis since July 2002. Since the start of the cooperative effort, the State of Utah has determined that the waters draining these watersheds fully meet the beneficial uses for which they are classified and are currently fully supporting its beneficial uses. During the field trips, the water in the streams was clear.

Wetlands

Most of the area is dry upland but small areas of wetland that are less than 1 acre in size occur near springs and along stream channels. Small wetlands occur immediately adjacent to stream channels with only a few larger wetlands occurring on the flatter areas near the Logan River. The width of wetlands adjacent to stream channels near the mouth of the streams are about 40 feet on Bunchgrass Creek, 10 feet on Clarks Hollow creek, and 70 feet on White Pine Creek, none on Steam Mill Creek (ephemeral channel), 10 feet on Hells Kitchen Canyon, 5 feet on Steep Hollow. In the upper parts of the streams, the wetland areas are much closer to the stream channel.

Wetlands were delineated in a geographic information system using 2004 NAIP imagery and on the ground experience for identifying wetlands. The GIS delineation included wetlands along Logan River and Beaver Creek, ponds, and slope wetlands. No tributary streams to the Logan River were delineated because of the difficulty in delineating a narrow strip along the stream channel. The amount of wetlands based on GIS delineation was 443.5 acres of willow-type wetlands, 19.1 acres of sedge-dominated wetlands, and 7.5 acres of pond-type wetland.

Since the tributary streams are not included in this estimate, an estimate of the amount of wetland along the streams may be made based on experience with these areas during field reviews. Using this experience, an assumption can be made that the main channels having perennial water with wetlands along them are mainly in White Pine and Steam Mill Canyon creeks and these are mainly willow-dominated wetlands that occur about 5 feet on each side of the channel. It is assumed that the perennial portions of White Pine and Steam Mill Canyon creeks are 6.8 and 4.5 miles long, respectively.

Based on these assumptions, the amount of willow-type wetlands along the tributary channels is 13.7 acres. If this amount is included with the amount of wetlands delineated in GIS, then an estimate of the total amount of wetlands in the allotment is 483.6 acres based on the amounts shown in Table 3.8.

Wetland Type	Area (acres)
Willow	457.0
Sedge	19.1
Pond	7.5

A conclusion from the review of the allotments in June 18 through 20, 2007 is that current livestock grazing has very little effect on the wetlands of the allotment. In order to determine an estimate of the amount and location of wetland impacts from grazing the length and width of trampled and bare areas noted during the field reviews are compared with the total estimate of wetlands within the allotment. From this information, trampling of stream banks in the riparian area of Steam mill Canyon at the trail crossing occurred about 160 feet long and about 5 feet wide (800 square feet) and the riparian area that has

livestock trampling located at the mouth of Hells Kitchen Canyon is about 10 feet wide and about 500 feet long (5,000 square feet) results in a total disturbance of wetland of 0.13 acres. This represents 0.03 percent of wetlands of the allotment that have impacts from trampling by livestock and from other users including horses and hikers along the main trails in the allotment.

Floodplains

Floodplains are defined by Executive order 11988 as “lowland and relatively flat areas adjoining inland and coastal waters”. Floodplains have also been defined in various ways but for this analysis, these areas are defined as flat areas adjacent to streams that are composed of unconsolidated depositional material derived from sediments transported by the related stream, based on definitions contained in (Fairbridge 1968). Most of the streams in the area have no floodplains or very small areas adjacent to the stream where sediment may become deposited during high flows. This is because the stream gradients of most of these streams are moderate to steep and the stream channel is moderate to highly-confined so that there is not much area for the streams to flow outside of their banks.

Floodplains occur in the allotment along the Logan River in an area located east of Hells Kitchen Canyon where beaver dams are present. This area is currently enclosed in a fence to protect the area from livestock.

Floodplains in the allotment are functioning properly and are affected very little by livestock grazing. This is indicated by the dense vegetation lining the main channels, the stable stream banks, and the few structures such as culverts that cross stream channels do not restrict the flooding of the floodplain.

Municipal Watersheds

Water originating in the Logan River drainage is used for municipal purposes by Logan City which takes the water from springs located near Spring Hollow about 12 miles below the project area. The project area is in the headwaters of the Logan River drainage above the point at which water is withdrawn for municipal purposes. Thus there would be an insignificant effect on the municipal watershed.

3.6.6 Issues Addressed

Public and agency scoping, followed by Forest Service interdisciplinary team review identified the following issue to be addressed in this impact analysis:

- **Water Resources**– The issue is the extent to which cattle grazing may affect water resources within the project area.

Indicator used to compare alternatives:

- The main indicators used to evaluate the water conditions of allotment are stream channel shape, ground cover conditions in the uplands and riparian areas, streambank stability as indicated by vegetation and soil/rock content, and the amount of trampling of wet areas.

3.6.7 Direct and Indirect Effects

3.6.7.1 Alternative 1 – Proposed Action

The proposed action would authorize grazing on the Franklin Basin allotment with alternating the *timing* of grazing on an annual basis, to allow for deferment of grazing (primarily on perennial grass species), with intensity of grazing use (utilization) that would be according to grazing utilization standards as described in the WCNF Revised Forest Plan, with the frequency of cattle grazing on any given range site within the allotment would be limited to one time each season, with cattle control (through such means as riding and salting) to keep cattle out of closed areas. Monitoring of cattle that drift into closed areas would be the basis for adapting management to gain better control of cattle. If cattle are repeatedly found in closed areas, additional riders or other strategies would be required.

It is expected that improvements will occur to specific areas of the allotment that have concerns to water resources from cattle trampling by taking action on cattle control. For instance, in the short-term, it is expected that vegetation ground cover will improve on bare soils in Steep Hollow through the exclusion of cattle. Some trampling of stream banks and wetlands will continue to occur in small specific areas but cattle control will allow adversely affected areas to be managed. Water in Logan River is expected to continue to meet State water quality standards since vegetation is expected to improve and provide better ground cover. It is expected that this alternative will not change characteristics of floodplains and municipal watersheds and the effects of grazing will be similar to current management.

The following mitigation is recommended to minimize impacts to soil and water resources and maintain the health and integrity of the watershed.

- Based on the proposed action, specific areas of the allotment that have adverse effects to water features within the allotment can be managed for improvement. It is recommended that the stream in the steep, V-shaped, narrow canyon of Steep Hollow between the Franklin Basin road and the Steep Hollow road crossing be closed to livestock trailing by herding cattle around this area when moving cattle to the upper part of Steep Hollow. Also, monitoring of ground cover should be conducted at the end of the season for the next three years in this area of Steep Hollow. This will allow vegetation near the stream channel to reestablish and cover the ground surface so that erosion will be reduced.

3.6.7.2 Alternative 2 – No Action (No Grazing)

Under this alternative, livestock would no longer be permitted to graze on the Franklin Basin allotment. This pertains to sheep and cattle. Non-permitted recreational horse use would still occur.

It is expected that some changes to water features would occur through non-grazing by livestock (sheep and cattle). No trampling of stream banks by livestock would occur and bare ground will revegetate in Steep Hollow. Wetlands would not be impacted by livestock and based on field trips in 2007, about 0.03% of the wetlands in the allotment have been impacted by trampling by livestock and from other users. It is expected that improvement to some of these wetlands would occur from removal of livestock. It is expected that very little change would occur to water quality and water in the Logan River should continue to meet State water quality standards. It is expected that characteristics of floodplains and municipal watersheds will not change due to the removal of livestock.

3.6.7.3 Alternative 3 - Current Management

Currently, grazing on the Franklin Basin allotment has caused some trampling of stream banks and adjacent wetlands in specific areas of the allotment. It is expected that erosion of bare soil and sedimentation of the stream along the lower reach of Steep Hollow will continue because the soils are erosive, are located on steep slopes with no buffer between the stream and the slopes, and trampling by cattle along the stream banks will continue to keep the soils bare. Although the Logan River currently has stable banks, it is expected that some bank trampling will continue.

Current livestock grazing has caused some trampling of the wetlands within the allotment. Based on field reviews, about 0.03 percent of wetlands of the allotment have impacts from trampling by livestock and from other users including horses and hikers along the main trails in the allotment. It is expected that the impacts to wetlands will continue because most of the impacts are located at trail crossings that will continue to be used by livestock, recreationists, and wildlife.

Floodplains in the allotment are located mainly along the Logan River and grazing has not affected the ability of stream channels to flood. Since the source of municipal water is from springs that are 12 miles downstream from the grazing allotment, it is expected that no effect to municipal water will occur. It is expected that the Logan River will continue to meet State water quality standards. In lower Steep Hollow, sediment will continue to enter the stream channel due to livestock trampling causing bare soils if livestock continue to be trailed up this drainage.

3.6.8 Cumulative Effects

The main issue with cumulative effects is the sedimentation of the Logan River from other activities in addition to grazing. The cumulative effects area for water resources is the area draining into the Logan River above Beaver Creek plus White Pine Creek drainage. This area is chosen because a water quality site is located at the confluence of Logan River and Beaver Creek, which can be used to represent the effects of all the uses in the drainage above it. In addition to livestock grazing, other actions that may have an influence on water quality are dispersed recreation, private property use, timber harvest, livestock grazing, wildfire, riparian fencing, motorized roads and trails, off-highway vehicle use. The list below contains a summary of other actions that have occurred in the past, are happening currently, and are expected to occur in the future.

- **Dispersed Recreation** – Dispersed camping occurs mainly along the Logan River from Beaver Creek to the Idaho border. The dispersed recreation sites occur in the relatively flat valley bottom next to the Logan River and have small areas of stream bank trampling that are caused by people accessing the stream and from horses that get water from the stream.
- **Private Property Use** – Private property is located along the Logan River on a strip of land north of White Pine Canyon and along the Logan River and near Steep Hollow near the Idaho border. Soil disturbance is mainly associated with a small amount of land used for road access to a few homes in these areas.
- **Timber Harvest** – Timber has been harvested in Steep Hollow and some of the roads are continuing to erode and cause sediment to be delivered into Steep Hollow stream channel.
- **Livestock Grazing** – Sheep and cattle grazing has been an activity that has been occurring for over 100 years. Poor land conditions occurred in the late 1800s and early 1900s and a gradual improvement in land conditions have occurred as indicated by increased ground cover and absence of active soil erosion in most areas within grazing allotment.
- **Wildfire** – Wildfire occurred on the hillside to the east of the Logan River near Petersen Hollow and the ground cover has recovered and no accelerated erosion is occurring.
- **Riparian Fencing** - Within the last five years, exclosure fences were installed around wetland areas along Logan River near the mouth of Hells Kitchen Canyon. These fences have been effective in protecting wet areas around springs and behind beaver dams from livestock trampling and off-road vehicles.
- **Motorized Roads and Trails** – The main source of sediment to streams from motorized roads and trails occur at the road that crosses Steep Hollow stream about 0.5 miles west of the main Logan Canyon road. This crossing is a ford and vehicles stir up the sediment in the stream and some sediment from the road goes into the stream at this crossing during storm events. The road up Steep Hollow requires 4-wheel drive which results in low vehicle use and the amount of road above the crossing that contributes sediment to the stream during storm events is about 100 feet long.
- **Off Highway Vehicles (OHV) use** – OHV use occurs mainly in the dispersed recreation areas along the Logan River and up the Steep Hollow road.

The cumulative effects from the proposed action and alternatives are about the same. Very little change to water quality is expected from any of the alternatives because currently very little sediment is found in the Logan River. The main reason water quality is not expected to change very much is that the main source for water in the Logan River in this area is from spring sources

due to the karst hydrologic system in the limestone strata found in Logan Canyon. A karst hydrologic system is one in which water goes into the ground and flows through the ground in solution cavities formed in limestone. At lower elevations, this ground water comes to the surface at springs and seeps. One of the main sources for water in the Logan River particularly after the spring runoff, is at a spring area on the Logan River about 300 feet north of Steep Hollow stream. Above this point the stream is intermittent with a very little flow.

3.6.9 Irretrievable and Irreversible Commitment of Water Resources – No irretrievable and irreversible commitment of water resources is expected because water is meeting State water quality standards and the effects of grazing practices can be changed to adjust for impacts to water resources.

3.7 Wildlife

3.7.1 Introduction

The purpose of this section is to explain and clarify the existing conditions of wildlife and wildlife habitats in the analysis area and to disclose the environmental effects of the proposed action and the alternatives on wildlife.

3.7.2 Area of Influence

The area of influence for direct and indirect effects to wildlife is the area within the Franklin Basin allotment. For hunted game species such as deer and elk, the area of influence is the Cache Harvest Unit in northern Utah. See the project file for a map of the Cache Harvest Unit relative to the allotment.

The allotment is located within a portion of a wildlife corridor which has regional importance in providing linkage to other larger habitat areas. This is especially true for forest carnivores such as the Canada lynx. Most forest carnivores have some preference for forested conifer patches and maintaining connectivity between patches throughout the larger corridor is important. Maintaining vegetation diversity within the corridor is also important to provide for the needs of a variety of species. See the project file for a map of the allotment relative to the regional wildlife corridor.

The project area falls under several management prescriptions as described in the WCNF Revised Forest Plan: *3.2U Terrestrial Habitat Emphasis*: “manage upland habitats to provide for sustaining and/or recovering desired plant and animal species and/or communities. Maintain or restore lands to meet desired conditions of habitat for TES species. Considerations for these areas include winter ranges and corridors for seasonal migrations as well as movement of genetic materials, individuals, and populations; vegetation composition, structure, and pattern needed for life cycle stages; needs for control or eradication of undesirable non-native species; and protection of special or unique habitats”; *3.1A Aquatic Habitat Emphasis*: “maintaining and improving quality aquatic conditions”; *2.6 Undeveloped Areas Emphasis*: “Manage to protect undeveloped landscapes in a manner other than formal recommended wilderness. Although other uses and activities may occur, the primary emphasis is protection to assure the values and unique qualities associated with undeveloped areas are recognized and preserved.”; and *4.4 Emphasis on Recreation Motorized Setting*.

The Desired Future Condition for the Cache Box Elder Management Area associated with wildlife habitat is: “Restoration and maintenance of a healthy and sustainable, broad scale, north- south wildlife corridor within this management area will be a priority in all management decision.”

A list of vertebrate wildlife species for the Wasatch-Cache National Forest (USDA Forest Service, 2003) is located in the project file. For game species, Utah Division of Wildlife Resources GIS habitat maps have been used for this analysis.

USFS GIS vegetation information (See WC Vegetation Map, Appendix G) was utilized to group and summarize the existing condition of specific vegetation/habitat types (See Franklin Vegetation Map, Appendix H). These habitat types should be referenced as related to the discussion below for individual wildlife species (Table 3.9).

Table 3.9 Acres of each major vegetation type within the allotment (only USFS lands; does not include state and private lands)

Habitat Type *	Total Habitat Acres
Conifer Forest	8,581
Grass/Shrubland	4,170
Aspen Forest	6,506
Mahogany	725
Willow/B. Hardwood	292
Other	462
Total Acres	20,736

* Conifer Forest consists of mixed conifer, limber pine, spruce/fir, Douglas-fir, and conifer/aspen vegetation types; Grass/Shrubland consists of sagebrush/grass, alpine, tall forb, and tall shrub vegetation types; and Aspen Forest consists of aspen/conifer and aspen vegetation types. Other includes juniper, water, and barren rock.

3.7.3 Affected Environment

3.7.3.1 Big Game Species

Big game species that reside within the boundaries of the Franklin Basin allotment include mule deer (*Odocoileus hemionus hemionus*), elk (*Cervus elaphus nelsoni*), and moose (*Alces americanus shirasi*). Table 3.10 displays the estimated numbers of animals and population objectives in the Cache Harvest Unit.

Table 3.10 Estimated numbers of animals and population objectives in the Cache Harvest Unit for deer, elk and moose.

Species	Population Objective	2006 Population Estimates
Deer	25000	14000
Elk	2300	2300
Moose	200	250

Information provided by Darren DeBloois UDWR Wildlife Biologist

Crucial value habitat is defined by UDWR as “habitat on which the local population of wildlife species depends for survival because there are no alternative ranges or habitats available. Crucial value habitat is essential to the life history requirements of a wildlife species. Degradation or unavailability of crucial value habitat will lead to significant declines in carrying capacity and/or numbers of the wildlife species in question.”

Substantial value habitat is defined by UDWR as “habitat that is used by a wildlife species but is not crucial for population survival. Degradation or unavailability of substantial value habitat will not lead to significant declines in carrying capacity and/or numbers of the wildlife species in question.”

Mule deer habitat within the project area consists of 20,736 acres (USFS ownership) of crucial summer habitat; no deer winter range habitat occurs within the project area.

Elk habitat within the project area consists of 19,085 acres of crucial value summer habitat and 1,651 acres of crucial winter range in the southeastern portion of the project area. In 2003, UDWR re-evaluated the accuracy of the elk range delineations in the Franklin Basin area (UDWR letter December 22, 2003) and indicated that most of the area north and west of Highway 89 as good summer and fall habitat and marginal to poor winter range because of deep snow in most winters. The Elk Habitat Map (Appendix I) displays elk habitat within the project area (derived from UDWR elk habitat maps). As snow depths recede in the spring the area associated with the summer range/winter range boundaries becomes important transitional habitat for elk. The Elk Patch Map (Appendix J) displays patch size and the effects of motorized disturbance after buffering open roads and motorized trails within elk habitat for the existing travel management plan

Moose habitat within the project area consists of 5,606 acres of crucial value winter range and 15,130 acres of crucial value summer habitat. In 2003, UDWR re-evaluated the accuracy of the moose range delineations in the Franklin Basin area (UDWR letter December 22, 2003) and indicated that a portion of the area is accurately mapped as moose habitat. The Moose Habitat Map (Appendix K) displays moose habitat within the project area (derived from UDWR moose habitat maps). Moose are yearlong residents moving little between summer and winter ranges. Their large body mass and long legs allow the need for only minor adjustments between summer and winter ranges. Habitat primarily used by moose includes riparian areas with plentiful willow browse and areas such as ridgelines with abundant mahogany shrubs. Within the project area, willows are primarily associated along the Logan River, while mahogany stands occur primarily on the south and east aspects such as near Beaver Mountain (see the Vegetation Map in Appendix H).

3.7.3.2 Management Indicator Species (Wildlife)

The WCNF Revised Forest Plan identified the goshawk (*Accipiter gentilis*), the snowshoe hare (*Lepus americanus*), and beaver (*Castor canadensis*) as “wildlife” management indicator species (Forest Service 2003b:J4-J5). The most current direction for MIS is contained in 36 CFR 219.14(f) of the 2005 Planning Rule (Federal Register, Vol.70,

No.3, pps.1022-1061). National Forests, such as the Wasatch-Cache, that revised under earlier regulations and whose plan requires population monitoring or population surveys are required to comply with the Forest Plan. Site-specific monitoring or surveying of a proposed project is not required.

The following information is found in the Management Indicator Species of the Wasatch-Cache National Forest (USDA Forest Service 2007). For additional information on Forest MIS refer to that report.

- **Northern goshawk – aspen, conifer, and mixed conifer**

The range of the northern goshawk is circumpolar. In the West it is found from Alaska through the Rocky Mountains to New Mexico. While all forested landscapes are used to some extent, certain forest cover types appear to be occupied by goshawks more than others (Graham et al. 1999). Cover types most often occupied by goshawks, based on sightings and nest locations, are Engelmann spruce, subalpine fir, lodgepole pine and quaking aspen, in either single or mixed species forests. The population under consideration for MIS is forest-wide.

Three components of a goshawk's home range have been identified including the nest area (approximately 30 acres), post fledging-family area (approximately 420 acres), and foraging area (approximately 5,400 acres). Goshawks nest in a wide variety of forest types including aspen, coniferous, and mixed conifer forests. It typically nests in mature and old forests.

The goshawk preys on large-to-medium-sized birds and mammals, which it captures on the ground, in trees, or in the air. Observations of foraging goshawks show that, in fact, they hunt in many forest conditions. This opportunism suggests that the choice of foraging habitat by goshawks may be as closely tied to prey availability as to habitat structure and composition.

Specific habitat attributes used by these species include snags, downed logs and woody debris, large trees, herbaceous and shrubby under-stories, and a mixture of various forest vegetation structural stages.

It was concluded in the Conservation Strategy and Agreement for the Management of Northern Goshawk Habitat in Utah that goshawk populations in Utah were viable. This conclusion was based on the findings of Graham et al. (1999) that good quality habitat is well distributed and connected throughout the state, the absence of evidence of a population decline on National Forest System lands since 1991, and conclusions of the U.S Fish and Wildlife Service in their decision to not list the northern goshawk under the Endangered Species Act (Federal Register, 1998).

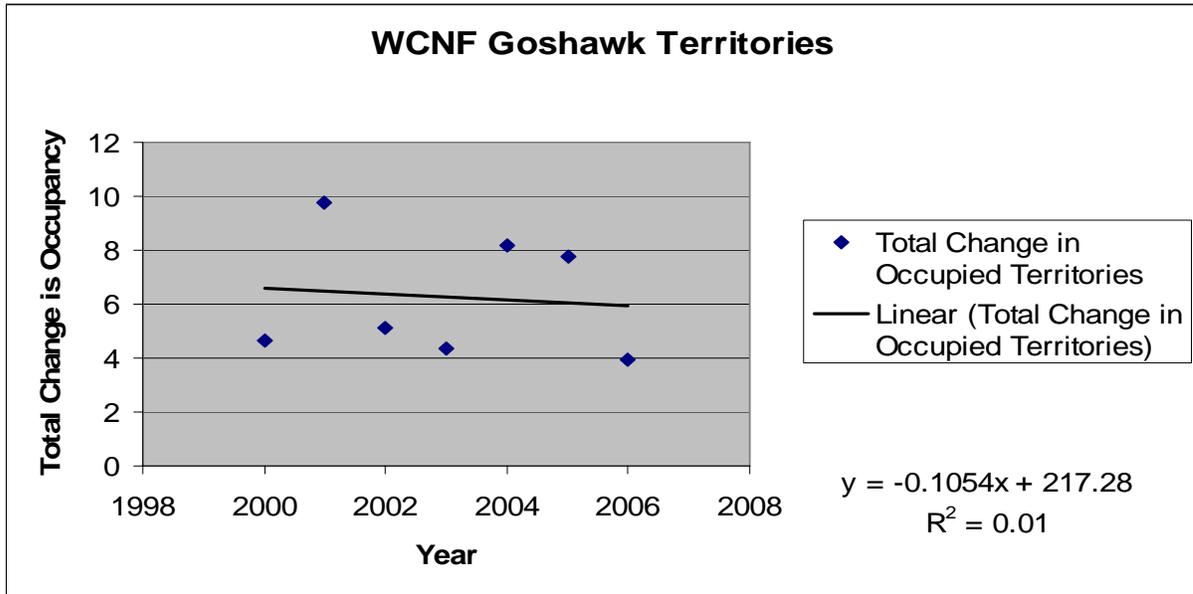
Territory occupancy has been monitored consistently on the Forest since 1999. Table 3.11 shows the results of that monitoring (USDA Forest Service 2007).

Table 3.11 Goshawk territories – Forest-wide

Year	1999	2000	2001	2002	2003	2004	2005	2006
Number of Known Territories	29	31	34	35	45	51	50	54
Territories Monitored	20	31	23	33	41	36	48	46
Occupied Territories	7	7	11	14	16	22	20	21
Percent of Monitored Territories Occupied	35	23	48	42	35	61	49	46

When monitoring started in 1999, there were a total of 29 known territories on the Forest. In 1999, 20 of the known territories were surveyed of which 7 were observed as occupied. Every year a percentage of territories have been monitored and new territories found. The number of territories monitored in 1999 was divided by the number of territories monitored in the current year. This gave us the percent of territories monitored for occupancy each year compared to the baseline data. The change in occupancy was obtained by dividing the number of territories occupied by the number of territories monitored for the current year then multiplying the percent monitored for the year and the number of territories monitored in 1999. These calculations were completed for each district and a sum was taken to show the total change in occupancy for the Forest. Figure 3.1 shows the total change in territory occupancy from 1999 to 2006. The results are similar to the 2007-1 monitoring report and show a static trend in occupancy.

Figure 3.1 Total change in occupied goshawk territories on the Wasatch-Cache NF (USDA Forest Service 2007).



Year	1999	2000	2001	2002	2003	2004	2005	2006
Total Change in Occupied Territories¹	7	4.66	9.76	5.09	4.33	8.18	7.775	3.97

¹Sum of each Districts change in territory occupancy.

Project information (Franklin Basin Allotment) – Goshawk surveys have been conducted within the project area, but no territories have been located. It is likely that undiscovered goshawk territories exist within the conifer vegetation type.

- **Snowshoe Hare - pole/sapling aspen, conifer and mixed conifer**

Snowshoe hares were selected as management indicators for pole/sapling aspen, conifer and mixed conifer. The snowshoe hare is a valuable prey species to the lynx, goshawk, and to other predators. In the Rocky Mountains and westward, hares mainly use coniferous forests in the higher mountainous areas. They are predominately associated with forests that have a well-developed under-story that provides protection from predation and supplies them with food.

For snowshoe hares, the Wasatch-Cache National Forest has been divided into two separate populations (the Wasatch/Bear River Range and the Uinta Mountain “North Slope Range”). These two populations were identified because of the large habitat gap between mountain ranges essentially blocking interactions between the two populations. The Wasatch/Bear River Range population consists of the Salt Lake, Ogden, and Logan Ranger Districts. The Uinta Mountain Range consists of the Mountain View, Evanston, and Kamas Ranger Districts

In Northern Utah, a study was done in the Bear River Range on the Wasatch-Cache National Forest where snowshoe hare use was determined in different vegetation types (Wolfe 1982). Table 3.12 displays the associated hare density using information from Wolfe (1982) which was converted to hares/hectare by Hodges (2000).

Table 3.12 Snowshoe hare density by vegetation cover type (Wolfe 1982 and Hodges 2000)

Vegetation Type	Hares/Hectare
Subalpine Fir	0.99
Douglas Fir	0.57
Aspen dense understory	0.22
Aspen-conifer edge	0.17
Engelman spruce	0.1
Aspen-sparse understory	0.01

As part of the forest plan monitoring effort for Management Indicator Species, snowshoe hare plots were established across the forest. In 2003, two, six, and seven grids were established on the Salt Lake RD, Ogden RD, and the Logan RD, respectively. Each grid consists of 50 square meter sample points. The two grids established on the Salt Lake

Ranger District contain the following vegetation types: aspen/conifer and mixed conifer. The six grids established on the Ogden Ranger District contain the following vegetation types: Spruce-fir, aspen/conifer, aspen, Douglas-fir, mixed conifer and mature lodgepole pine. The seven grids established on the Logan Ranger District contain the following vegetation types: Spruce-fir, aspen/conifer, aspen, Douglas-fir, mixed conifer, mature lodgepole pine, and young/mid-age lodgepole pine (The Logan aspen/conifer grid is located within the project area).

At each of the 50 sample points, the number of snowshoe hare pellets is tallied on an annual basis. On some surveys, individual sample points cannot be relocated (e.g. they are lost or stolen) and the sample size is less than 50. Those instances where the sample size is less than 50 are indicated in the table below as n=XX, where n is the number of sample points. Pellet counts have been used in many studies to infer snowshoe hare densities. Table 3.13 displays the results of pellet counts for 2004, 2005, and 2006 within each district.

Table 3.13 Snowshoe hare pellet counts for the Wasatch-Bear River population on the Wasatch-Cache National Forest (USDA Forest Service 2007).

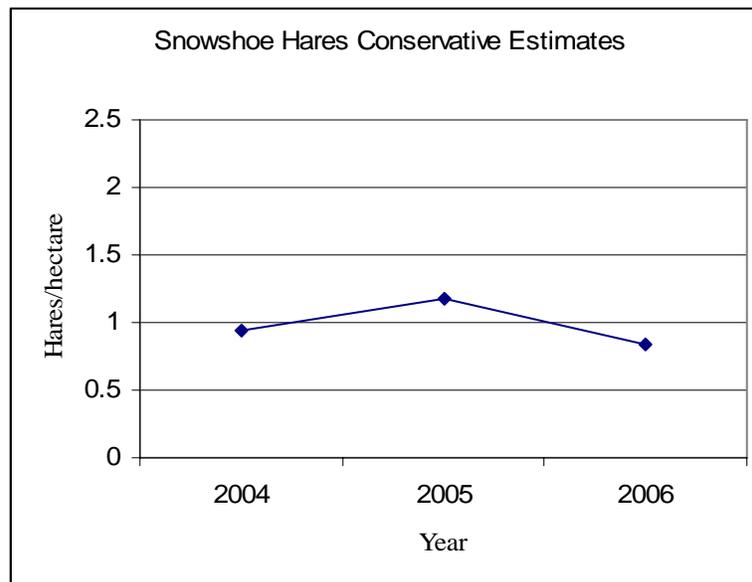
District	Vegetation Type	Total Pellet Counts 2004	Total Pellet Counts 2005	Total Pellet Counts 2006
Ogden	Douglas-fir	409	459	527
Ogden	Mixed Conifer	354	361	286
Ogden	Aspen/Conifer or Conifer/Aspen	313	229 (n=49)	402 (n=49)
Ogden	Lodgepole Pine - Mature	216	184 (n=48)	158 (n=47)
Ogden	Spruce/Fir	41	17	50
Ogden	Aspen	1 (n=49)	0	0
Salt Lake	Mixed Conifer	252 (n=44)	650	337
Salt Lake	Aspen/Conifer or Conifer/Asp	106	155	92 (n=47)
Logan	Lodgepole Pine/Aspen – young/mid aged	583	863	406 (n=48)
Logan	Douglas-fir	147	85 (n=47)	18 (n=48)
Logan	Spruce/Fir	135	84	20
Logan	Aspen/Conifer or Conifer/Aspen	96	41 (n=49)	8 (n=28)
Logan	Mixed Conifer	53	111	168
Logan	Lodgepole Pine - Mature	52	183	47
Logan	Aspen	7 (n=48)	27 (n=49)	8

Table 3.14 and Figure 3.2 display the conservative and liberal estimates for hares per hectare based on the number of pellets per plot. The pellet count data between 2004 and 2005 from the Wasatch/Bear River Range suggests an increase of 25 % (3.73 versus 4.65 pellets per plot) in snowshoe hare numbers.

Table 3.14 Conservative and liberal estimates of hares per hectare based on the average pellets per plot between 2004 and 2006 for the Wasatch/Bear River Range.

	2004	2005	2006
Average Pellets per Plot	3.73	4.65	3.52
Conservative and Liberal Estimates (Hares/ha)	0.94-1.79	1.18-2.24	0.89-1.69

Figure 3.2 Conservative estimates of hares per hectare based on the average pellets per plot between 2004 and 2006 for the Wasatch/Bear River Range.



North Amazon Basin: Since 1998, Dennis Austin (UDWR-retired) and the USFS have been conducting snowshoe hare pellet surveys (sampling methods are not similar to those described above) in Amazon Basin on the Logan Ranger District. The pellet count data from North Amazon Basin suggests that the snowshoe hare population was stable or displayed very little change from the summer of 1998 thru the summer of 2001. From the summer/fall of 2001 the data suggests an increase in snowshoe hare numbers with the highest numbers so far occurring during August 2006 to July 2007, the most recent survey (see Table 3.15 and Figure 3.3). This pellet count data represents an increase of 34% between 2004 and 2005, which is similar to the 25% increase suggested by the USFS data (USDA Forest Service 2006). Over the last year between 2006 and 2007, the Amazon Basin pellet count data represents an increase of 64 %.

Table 3.15 Snowshoe Hare Pellet Counts in Amazon Basin 1999-2007.

YEAR	Mean Pellet Counts (100 m²)	Converted Mean Pellet Counts (1m²)
1999	94.0	0.94
2000	29.5	0.30
2001	98.8	0.99
2002	562.9	5.63
2003	785.3	7.85
2004	657.9	6.58
2005	882.6	8.83
2006	910.4	9.1
2007	1490.9	14.91

NOTE: The table year represents the year in which the pellets were counted. The number of pellets counted reflects the presence of snowshoe hares over the past year. Plots 1-10 are averaged for this site.

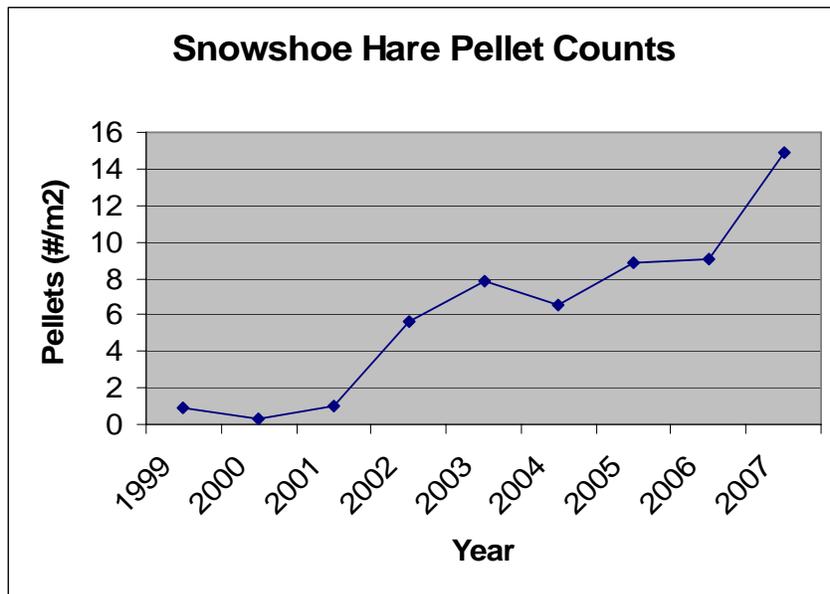


Figure 3.3 Snowshoe Hare Pellet Count Trend for North Amazon Basin.

Project information (Franklin Basin Allotment) - For snowshoe hare plots, the North Amazon Basin plots are located approximately 3 miles east of the project area. The Logan aspen/conifer grid is located within the project area near Crescent Lake.

- **Beaver - Riparian**

Beaver occur in permanent slow moving streams, ponds, small lakes, and reservoirs. They play an important role in maintaining and enhancing riparian and aquatic ecosystems (Olsen and Hubert 1994) and are important for the creation of habitat for several species of fish, big game, waterfowl, and neo-tropical birds. A beaver colony is typically about 5 to 6 beavers and consists of an adult pair, the present year young, and young of the previous year.

For beaver, the Wasatch-Cache National Forest has been divided into two separate populations (the Wasatch/Bear River Range and the Uinta Mountain “North Slope Range”). The Wasatch/Bear River Range population consists of the Salt Lake, Ogden, and Logan Ranger Districts. The Uinta Mountain Range consists of the Mountain View, Evanston, and Kamas Ranger Districts.

As part of the forest plan monitoring effort for Management Indicator Species, square mile sections were surveyed across the forest. To achieve an unbiased, well-distributed sample, sample units were systematically selected sections (1 section = 1 m² = 640 acres). With a 10% sampling intensity, every 10th section was sampled (the first section sampled was selected randomly, and then every 10th section were systematically selected). Only complete sections of National Forest System lands are sampled. By surveying sections and recording the location of active dams, the number of colonies can be determined and converted into the number of beaver by using an average of 5 beaver per colony.

Information regarding the monitoring of the beaver sections for the entire Wasatch/Bear River Range for 2004 and 2005 are contained within the planning record. In the beaver section of the 2006 Report for Management Indicator Species of the Wasatch-Cache National Forest, additional information is provided regarding both populations (Wasatch/Bear River Range and the Uinta Mountain Range).

Tables 3.16 and 3.17 display the monitoring results and the estimated number of beaver per square mile within the Wasatch/Bear River Range (USDA Forest Service 2006). At the present time the Forest has only established baseline information for beaver populations.

Table 3.16 Wasatch/Bear River Range Beaver Monitoring Results (baseline data: 2004-2005)

District	Number of Sections	Completed sections monitored	Sections monitored w/active dams	Sections-w/old activity, no new activity	Sections w/no activity or H ₂ O present
Wasatch/Bear River Range					
Salt Lake	14	14	1 (1 dam)	3	10
Ogden	17	17	3 (9 dams)	2	5
Logan	32	32	3 (20 dams)	5	15
Total	63	63	7 (30 dams)	10	30

Table 3.17 Beaver Population Estimates for the Wasatch/Bear River Range (baseline data: 2004-2005)

Population	Active dams	Number of colonies	Individuals	Estimated # of beavers/mi ²
Wasatch/Bear River Range Population	30	7	35	.55

Currently there are not enough years of Forest Service monitoring population data on beaver to indicate a trend. However, there are other source documents provided by the Utah Division of Wildlife Resources (UDWR) that currently indicate a trend. Several UDWR reports provide information regarding the historical beaver trends for the Forest: The 1979-80 and 1998-1999 Furbearer Harvest Reports ((State of Utah, 1980, 1999 respectively) and the 1971-1982 Beaver Distribution, Habitat and Population Survey (published in 1993 Blackwell) provide relevant information on beaver.

The 1993 Blackwell report restates the trend from the 79-80' Report but calculates carrying capacity for each of the 52 beaver units in the state. Blackwell used beaver habitat data collected from 1971-81 to determine the carrying capacity.

There are 11 trapping units that include some National Forest System lands administered by the Wasatch-Cache National Forest, as shown in Table 3.18. UDWR beaver units include all land ownerships.

Table 3.18 UDWR Units occurring, at least partially, on NFS Lands

Unit	Unit Location	Status of beaver population 81'
Wasatch/Bear River Population		
2	North ½ Cache County	Static
3	Rich County	Static
5	South ½ Cache County	Static
6	West Weber County	Static
7	East Weber County	Static
8	Davis County	Static
9	Morgan County	Static
10	Northern ¾ Summit County	Static
11	Southern ¼ Summit County	Increasing
14	Southwest Salt Lake County	Static
15	Southeast Salt Lake County	Increasing

Source: UDWR 1971-1982 Beaver Distribution, Habitat and Population Survey (Published 1993)

With the exception of a few specific locations, Forest Service management of suitable beaver habitat within National Forest boundaries has not changed significantly from 1980 to the present. Therefore, until Forest Service monitoring yields data for population trends, it is assumed that the determinations made in the State of Utah Survey Report remain valid for both populations on the Forest.

Additional information regarding Forest Plan monitoring and trend is contained within the project record (USDA Forest Service 2006 Management Indicator Species of the Wasatch-Cache National Forest).

Project information (Franklin Basin Allotment) - All potential beaver habitat was surveyed within the project area in 2007. Within the project area, beaver are present at White Pine Lake, White Pine Creek, Beaver Creek, and the Logan River. In recent years, beaver have been present within a small area near the lake within Steam Mill Canyon. No past or present activity was recorded within Steep Hollow. Within the project area, approximately 3-4 colonies occur within the White Pine drainage, while 3-4 colonies occurred within the Logan River.

In addition, as part of the Revised Forest Plan MIS monitoring effort, square mile sections were surveyed for beaver. Within the Logan Ranger District, 32 survey sections occur, with four sections located within the project area. The Beaver Creek section (24) was surveyed with the occurrence of active beaver activity (1 colony); the Crescent Lake section (4) had no past or present activity but has moderate potential to be occupied with a small portion of the section; the Bunchgrass section (32) had no past or present activity and has low potential to be occupied; and Steam Mill section (16) did not have any water present (sections surveyed within the Logan Ranger District in 2004/2005 and the results of these surveys are contained within the district files).

3.7.3.2 Threatened, Endangered, Proposed, and Candidate Species (Wildlife)

The U.S. Fish and Wildlife Services lists one Threatened and one Candidate species as occurring, or potentially occurring, in Cache County. These are the Canada lynx (T) and the yellow-billed cuckoo (C). The Bald eagle has been removed from the endangered/threatened species list and is now addressed as a USFS sensitive species.

- **Canada lynx**

Habitat for Canada lynx occurs within the Logan Ranger District, primarily in the conifer cover types dominated by various combinations of lodgepole pine, Douglas-fir, subalpine fir, and Engelmann spruce interspersed with the aspen cover type. The Logan Ranger District lies within a “travel corridor” between two larger habitats areas (in Idaho and within the Uinta Mountains of Utah) and is not considered permanent resident habitat. In a letter from the USFWS dated November 6, 2002, lynx habitat within the Logan Ranger District was reclassified from Lynx Analysis Unit (LAU) to linkage area due to a low percentage of primary habitat.

Reports of lynx in Utah indicate sightings between 1961 and 1982 on the Ashley and Wasatch-Cache National Forests, but no sightings between 1983 and 1993 (USDA Forest Service 1994). In August/September 2004, a transplanted lynx released in southwestern Colorado traveled on to the Wasatch-Cache National Forest and has moved northward through both the Ogden and Logan Ranger Districts into Idaho.

The Canada lynx occurs across the boreal forests of Canada and Alaska in association with snowshoe hare habitat or habitat of other suitable prey species. They have also been found in isolated spruce, fir, and lodgepole pine forests of Washington, Idaho, Montana, Wyoming, and Colorado. Early successional stands with high densities of shrubs and seedlings are optimal for hares, and subsequently important for lynx. Mature forest stands are used for denning, cover for kittens, as well as travel corridors. Home ranges of lynx are generally 6-8 square miles, but range from 5-94 square miles. Males have larger ranges than females. Overlapping ranges do occur, mainly among animals of different sex and age classes. Adult lynx of the same sex tend to keep exclusive home ranges. Density of lynx in an area is highly dependent on prey (snowshoe hare) abundance. Most densities range from one lynx per 6-10 square miles.

In 1999-2001, lynx hair snares were established throughout Utah and other western states. No lynx hair samples occurred in northern Utah during this effort.

On July 3, 2003, the U.S. Fish and Wildlife Service issued a Notice of Remanded Determination of Status for the contiguous United States distinct population segment of the Canada Lynx (USDI 2003). The notice states that there is no evidence of lynx reproduction in Utah and that lynx, which occur in Utah, are dispersers rather than residents.

On 9 November 2005, the USFWS proposed critical habitat for the Canada Lynx within the United States; no critical habitat is proposed within the project area or within Utah (50 CFR Part 17, Volume 70, No. 216). Within the USFWS Recovery Outline for the Canada Lynx (USFWS, September 14, 2005), core areas, provisional core areas, secondary areas, and peripheral areas were identified; none of these areas have been identified to occur within the project area. Currently the lynx critical habitat designation for the contiguous United States is being re-evaluated by the USFWS and a draft proposal is being prepared (e-mail from Lee Jacobson, USFS Intermountain Region TES Program Manager, January 29, 2008).

In Utah, Engelmann spruce, white fir, subalpine fir, and lodgepole pine forests at the higher elevations, 7,300 to 10,500 feet (2,250 – 3,250 m) are the primary vegetation cover types that may contribute to lynx habitat. Quaking aspen dominates much of the landscape, but snowshoe hares may use aspen stands much less than conifer stands in this area (Wolfe et al. 1982), probably because they lack dense overstory cover (Hodges 2000). Where they are intermixed with spruce-fir and lodgepole pine stands, aspen stands would constitute secondary vegetation that may contribute to lynx habitat (Ruediger et al. 2000).

Maintaining connectivity with Canada and between mountain ranges is an important consideration for the Northern Rocky Mountains Geographic Area (Ruediger et al. 2002). It is likely that the Northern Rocky Mountains Geographic Area and the Southern Rocky Mountains Geographic Area of Colorado and southern Wyoming are poorly connected. Shrub-steppe communities in central and southern Idaho, Wyoming, southeast Montana, and eastern Oregon may provide connectivity between adjacent mountain ranges. Along the Continental Divide, they may also provide an important north-south link between large patches of lynx habitat. Figure 8 displays lynx primary and secondary habitat within the Logan Ranger District. Based on the location of primary and secondary habitat and the connectivity of habitat, the most direct connection passes through the eastern portion of the Ogden and Logan Ranger Districts; thus connecting into Idaho to the north and the Uinta Mountains to the southeast. Table 3.19 displays the percentage and number of acres of primary and secondary habitat that occurs on the Logan Ranger District and within the project area (only USFS managed lands).

Table 3.19 Acres and percent of lynx habitat on the Logan Ranger District and within the project area (only USFS managed lands)

Location	Total Acres	Primary Habitat	Percentage	Secondary Habitat	Percentage
Logan Ranger District	274,810	24,182	9	110,133	40
Project Area	20,736	3,751	18	11,628	56

- **Yellow-billed cuckoos**

The current distribution of yellow-billed cuckoos (*Coccyzus americanus*) in Utah is poorly understood, though they appear to be an extremely rare breeder in lowland riparian habitats statewide. Historically, cuckoos were probably common to uncommon summer residents in Utah and across the Great Basin (Parrish et al. 2002). Nesting habitat is classified as dense lowland riparian characterized by a dense sub-canopy or shrub layer (regenerating canopy trees, willows, or other riparian shrubs) within 100 m (333 ft) of water. Overstory in these habitats may be large, gallery-forming trees, 33 to 90 feet in height or developing trees 10 to 27 feet in height, usually cottonwoods. Nesting habitats are found at elevations below 6,000 ft. Cuckoos may require large tracts of contiguous riparian nesting habitat between 100 and 200 acres. Yellow-billed cuckoo habitat does not occur within the project area.

3.7.3.4 Forest Service Intermountain Region Sensitive Species

Of those species listed as sensitive for the Wasatch-Cache NF, the following occur or are likely to occur within the project area: northern goshawk, flammulated owl, three-toed woodpecker, boreal owl, and the Townsend's big-eared bat. The wolverine and great gray owl may possibly occur within the project area. The sharp-tailed grouse, sage grouse, bald eagle, and peregrine falcon are not known to occur within the project area. Currently, the pygmy rabbit and spotted bat are not known to occur on the district. Detailed habitat requirements and general distribution information for all sensitive species on the Wasatch-Cache National Forest are discussed in the Revised Forest Plan (USDA Forest Service 2003).

- **Gray Wolf**

The U.S. Fish and Wildlife Service delisted the wolf within portions of the western United States. In northern portion of Utah, the wolf became a USFS sensitive species upon delisting (Wolves are not included in the list of TE species for Cache County-USFWS November 2007). The U.S. Federal District Court in Missoula, Montana, issued a preliminary injunction on Friday, July 18, 2008, that immediately reinstated the Endangered Species Act protections for gray wolves in the northern Rocky Mountains.

Up 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 Yellowstone National Park was captured near the town of Morgan in northern Utah, southeast of Ogden. The animal was returned to Grand Teton National Park where it later rejoined its pack. In Utah, the gray wolf is not part of the US Fish and Wildlife Service experimental recovery effort being conducted in Wyoming, Idaho, and Montana. There has not been a breeding pair or a pack identified in Utah to date, only a dispersing animal. Wolves are not included in the list of threatened or endangered species for Cache County.

If wolves from the federal recovery areas (Wyoming, Idaho, and Montana) were to enter Utah, they would receive protection under the Endangered Species Act. They are not on the threatened or endangered list for Cache County.

- **Bald eagles**

Bald eagles are winter visitors for the most part to Utah and tend to congregate wherever food is available, often near open water where fish and waterfowl can be caught. Bald eagles do not occur within the project area in the summer/fall.

- **Northern goshawk**

The goshawk is also Management Indicator Species for the Forest and is described in detail in that section. Surveys have been conducted within the project area, but no territories have been located. It is likely that undiscovered goshawk territories exist within the conifer vegetation type.

- **Flammulated owls**

The flammulated owls breed from southern British Columbia south to Veracruz, Mexico and from the Rocky Mountains to the Pacific. Their winter range is thought to extend from central Mexico to Guatemala and El Salvador. Flammulated owls are a migratory species that occur in mixed conifer forest with spruce and fir at higher elevations and have also been found in aspen communities. They prefer ponderosa pine-Douglas-fir forests with open canopies. Large diameter (>20 inch dbh) dead trees with cavities at least as large as northern flicker cavities are important site characteristics. Territory size varies from 20 to 59 acres and is determined by age and patchiness of overstory trees.

Flammulated owls are present on the Wasatch-Cache National Forest and appear to be fairly well distributed. On the Ogden and Logan Ranger District, flammulated owl habitat primarily consists of mature stands of aspen, aspen/conifer, and conifer/aspen. Flammulated owl studies have occurred on the Ogden Ranger District in which they have focused on the effects of disturbance and feeding habits (Mika 2003). A total of 6,506 acres of aspen and aspen/conifer occur within the project area (31 percent of the project area).

- **Three-toed woodpeckers**

Three-toed woodpeckers are circumboreally distribution coincides with the range of spruce habitat, however they can be found in sub-alpine fir, Douglas-fir, grand fir, ponderosa pine, aspen, and lodgepole pine forests. The three-toed woodpecker is dependant on recent burns and bark beetle infestations for food resources. Coniferous forests generally above 8000ft (2400m) in elevation are typical of wintering and nesting habitat. In Utah, three-toed woodpeckers also use aspen for nesting where intermixed or adjacent to coniferous forests (Hill et al. 2001). Territory occupancy is year-round

however outbreaks or beetle infestations may cause irregular movements. The loss of snags associated with vegetation treatment can have affects on cavity nesting species.

- **Townsend's big-eared bats**

Townsend's big-eared bats are widely distributed throughout the Intermountain Region. The species occurs in large numbers at Bat Cave on the Ogden District and in Logan Cave on the Logan District. The presence of big-eared bats have been document at other cave locations within Logan Canyon, but the number of individuals have been small (Lengas 1994). They may exist in other areas of the Forest where there is suitable cave or cliff roosting habitat. Western big-eared bats use juniper/pine forests, shrub/steppe grasslands, deciduous forests, and mixed coniferous forests from sea level to 10,000 feet. During winter they roost singly or in small clusters in caves, or rocky outcroppings, occasionally in old buildings, or mine shafts.

- **Boreal owls**

Boreal owls have a range that is circumboreal. In North America, it breeds from Alaska east across Canada, and south into the mountains of Washington, Idaho, Montana, Wyoming, and Colorado. Boreal owls are closely associated with high elevation spruce-fir forests because of their dependence on this forest type for foraging year round. Nesting habitat structure consists of forests with a relatively high density of large trees (12 inch dbh), open understory, and multi-layered canopy. Owls nest in cavities excavated by large woodpeckers in mixed conifer, aspen, Douglas-fir, and spruce-fir stands. In winter, they may move down in elevation and roost in protected forested areas. Boreal owls avoid open areas, such as clearcuts and open meadows, except for occasional use of the edges of openings for foraging.

Boreal owls have responded to taped calls in northern Utah in 2-3 locations on the Ashley, Uinta, and Wasatch-Cache National Forests. Within the project area , a boreal owl was observed in the spring of 1999, at the head of Hells Kitchen Canyon. Nest locations have not been found on the Wasatch-Cache NF. In 2001, on the Uinta National Forest, a nesting boreal owl was located; this being the first documented nesting of a boreal owl in Utah (Mika 2000 pers. comm.). In early spring 2006, a survey of a portion of the project area only documented great horned owl vocalizations, no other species of owl were heard.

- **Wolverines**

Recent data searches (USDA Forest Service 1994) indicate that no wolverines were sighted in Utah between 1961 and 1983, but there were sightings between 1983 and 1993, on the Ashley and Wasatch-Cache National Forests. Aubry et al (2007) found no verifiable records of wolverine occurrence in Utah from 1961 thru 2005. They feel that populations in Utah were extirpated by a combination of unnaturally high mortality and very low or nonexistent immigration. A 1995 survey conducted in Franklin Basin did not produce any tracks or photographic evidence of wolverines (Bissonette et al. 1995). On

March 29, 2002 a helicopter survey for wolverine conducted by the Caribou National Forest identified probable wolverine tracks just south of the Idaho/Utah state line (USDA Forest Service 2002). On March 17, 2004 a vehicle hit and killed a wolverine on U.S. Highway 30 near Fossil Butte National Monument west of Kemmerer, Wyoming. There have been unconfirmed sightings elsewhere on the Wasatch-Cache National Forest. In addition, Aubry et al (2007) specifies that human caused mortality factors no longer pose a significant threat, thus reintroduction may be appropriate.

- **Great gray owls**

Great gray owls use mixed coniferous and hardwood forests usually bordering small openings or meadows. They forage along edges of clearings. Semi-open areas, where small rodents are abundant, near dense coniferous forests, for roosting and nesting, are optimum habitat for great gray owls. During winter some birds stay on or near their breeding territories and others make irregular movements in search of prey and favorable snow conditions. In the Intermountain Region, great gray owls occur primarily in lodgepole pine/Douglas-fir/aspen zone and in ponderosa pine. Great gray owl surveys have been conducted on the Logan Ranger District. Data collected from these surveys yielded no evidence of great gray owls. In general, it is felt that these winter vagrants only occasionally visit Utah. In early spring 2006, a survey of a portion of the project area only documented great horned owl vocalizations, no other species of owl were heard.

3.7.3.5 Neo-tropical Migratory/Song Birds

Two US Forest Service neo-tropical migratory bird survey point counts routes have been established within the vicinity of the project area (south of the project area); these are the Blind Hollow and Tony Grove routes. The results of these surveys are included in the project record.

Priority migratory bird species that occur within the Wasatch-Cache National Forest identified in the Utah Bird Conservation Plan (Utah Partners in Flight 2002) and/or those identified by USFWS as birds of conservation concern have been identified as species at risk in the Revised Forest Plan (see Forest Plan FEIS, Appendix B-2). The Species at Risk List was revised on February 23, 2004 (see planning record). Of those species, the Brewer's sparrow, broad-tailed hummingbird, red-naped sapsucker, and Williamson's sapsucker are known to occur within the project area.

Brewer's Sparrow (*Spizella breweri*) - Occurs in shrub steppe habitats in the western U.S., particularly in the Great Basin area (UDWR 2000). Brewer's sparrows breed primarily in shrub steppe habitats in Utah and are considered to be shrub steppe obligates. In Utah, Brewer's sparrows are common to very common summer residents. The species winters in the southwest U.S. and into Mexico. It nests in the mid-upper canopy of dense sagebrush and are usually located in patches of sagebrush that are taller and denser, with more bare ground and less herbaceous cover, than the surrounding habitat. Clutch size is

usually 3-4 eggs. Brewer's sparrows will renest in a few days if the initial clutch is lost. Brewer's sparrows are primarily insectivorous during the breeding season. Loss of sagebrush steppe habitat is considered the main threat to the species.

Broad-tailed Hummingbird (*Selasphorus platycercus*)- The broadtail is a common breeder in the eastern and central parts of the Great Basin. It winters primarily in Mexico. It nests primarily in riparian habitat though also occurring within aspen, ponderosa pine, Engelmann spruce, subalpine fir, and Douglas fir dominant habitats. The broad-tailed hummingbird typically requires streamside areas adjacent to open patches of meadows or grasses with good quantities of wild flowers available throughout the breeding season. This hummingbird feeds on nectar of wildflowers.

Nests are from as low as 3 ft to as high as 30 ft above the ground and are often found overhanging a stream. Threats to this species would include loss of riparian habitat and lack of wildflowers.

Red-Naped Sapsucker (*Sphyrapicus nuchalis*) - The red-naped sapsucker is a woodpecker that breeds in coniferous forests and montane riparian woodlands of the western United States and southwestern Canada (UDWR 2001). It winters in Baja California and western Mexico. In the summer, it is commonly found along riparian woodlands at mid-elevations throughout the State of Utah. It occurs in the inland West, inhabiting montane coniferous forests mixed with deciduous tree patches, particularly aspen, cottonwood, and willow. Sapsucker nests are strongly associated with the presence of shelf fungus (*Fomes ignarius* var. *populinus*), which advances heart rot in aspen. The red-naped sapsucker is considered a “double keystone” species due to their nest cavity and sap well producing capabilities. Their cavities are used by several cavity-nesting bird species in addition to their sap wells being utilized by some 40+ species of birds, mammals, and insects.

Williamson’s Sapsucker (*Sphyrapicus thyroideus*) - This is an uncommon summer resident in Utah, but occurs throughout most mountainous areas (UDWR 2001). They are known to the Rocky Mountain States, and the interior coastal ranges of the western U.S. It is found in Utah mainly in the mountainous areas of the eastern two-thirds of the state, where it is an uncommon breeder. The breeding habitats used by this species are middle - to high - elevation coniferous forests and mixed deciduous-coniferous forests containing aspens. They drill holes in trees to extract sap along with the insects it attracts. This woodpecker excavates a cavity in a tree for nesting, typically an aspen or a conifer. Threats are from the loss of snags for cavities.

3.7.3.6 Species at Risk

Species at risk have been identified in the Revised Forest Plan as “federally listed endangered, threatened, candidate, and proposed and other species for which loss of viability, including reduction in distribution or abundance, is a concern within the plan area. Other species-at-risk may include sensitive species and state listed species.”

As the Plan explains, legal mandates and regulations (i.e. Endangered Species Act) and policy (i.e. sensitive species management) will continue as separate processes for threatened, endangered, and sensitive (TES) species listed under species at risk. These require analysis for any project implemented under the Revised Forest Plan to ensure that negative effects are avoided and viability is provided for these species. MIS species are also considered in project specific analyses. Species with federal status (i.e. endangered, threatened, candidate, proposed, and USFS sensitive species) are addressed elsewhere in this document under their respective categories. Species not specifically addressed through implementation and monitoring for TES or MIS will be managed opportunistically. By managing within the range of historic variation and properly functioning conditions it is expected that these species will be sustained in the long term. For additional information see the Wasatch-Cache National Forest Final Environmental Impact Statement (USDA Forest Service 2003) Appendix B-2: Terrestrial Wildlife Diversity and Viability. The Species at Risk List was revised on February 23, 2004. The following species are species at risk which have not been discussed anywhere else within this document (e.g. TES species and neotropical migratory/song birds).

Fringed Myotis (*Myotis thysanodes*)

The fringed myotis is a small bat that occurs in most of the western United States, as well as in much of Mexico and part of southwestern Canada (UDWR 2001). It is uncertain whether this species occurs within the Logan Ranger District, since only specimens from southern and east-central Utah have been reported in the literature (Hasenyager 1980). The fringed myotis inhabits caves, mines, and buildings, most often in desert and woodland areas. The species commonly occurs in colonies of several hundred individuals. The fringed myotis has been found in Utah in a moderately wide range of habitats: lowland riparian, desert shrub, juniper–sagebrush, sagebrush–rabbitbrush, pinyon–juniper–sagebrush, pinyon–juniper, mountain meadow, ponderosa pine forest, and montane forest and woodland (Douglas-fir–aspen) (Oliver 2000). Females generally give birth to a single offspring during the summer. Beetles which are plucked from vegetation or the ground are the major prey item.

Pine Marten (*Martes Americana*)

The marten is a furbearing mammal that is about two feet in length from head to tail and yellowish-brown in color. It occurs in much of Alaska and Canada, and its range extends into several areas of the contiguous United States (UDWR 2001). In Utah, the species has been found in many of the high remote mountainous areas of the state. Pine martens prefer forest habitat, where their dens can be found in logs, hollow trees, stumps, and rock crevices. The species mates during the summer, and females give birth to a litter of one to five young during the following spring; litters are often smaller when food is scarce. Martens are typically solitary animals that may cover great distances each day looking for food. The diet of the species consists primarily of small mammals, although birds, insects, and fruits are occasionally consumed.

3.7.4 Issues Addressed

Public and agency scoping, followed by Forest Service interdisciplinary team review, identified the following issue to be addressed in this analysis:

- How will the proposed action, current grazing, and the no grazing alternative affect wildlife species and their habitats? This includes USFWS listed Threatened, Endangered, Proposed, and Candidate species, USDA Forest Service Sensitive species, Management Indicator Species (MIS), and general species of local concern.

Indicator used to compare alternatives:

- To what degree would wildlife species and habitats be affected by livestock grazing (as prescribed in the proposed action and the alternatives)?

3.7.5 Effects Analysis Methods and Assumptions

Baseline conditions were determined through review of literature and field survey/observations. Field surveys were conducted to identify and quantify wildlife species and populations, and to characterize habitat conditions in the Franklin Basin Allotment. To compare the environmental effects by alternative it was necessary to make a few key assumptions. These were:

- Under the “no grazing alternative” for this analysis it is assumed that light grazing by native ungulates and other native herbivore species would maintain plant vigor and therefore, vegetation production would not be reduced.
- Utilization standards included in the Revised Forest Plan (and implemented with this project) are to maintain critical minimum residuals to protect soil, forage plant vigor, livestock diet quality, and wildlife habitat. The utilization standards would represent the percentage of use for key species at moderate grazing levels. Stubble height and utilization standards are measured on a timely basis and actions to remove livestock are implemented before standards are exceeded.
- Monitoring is conducted as identified in the allotment management plan and changes are made when conditions are not favorable or are moving away from desired future condition.
- Livestock are directed toward the use of suitable uplands through strategic salting and intensive riding, thus reducing pressure on riparian habitat, springs, and wet meadows.

- Barbed wire allotment boundary let-down fences could result in minor losses of big game by entanglement, but this would not cause noticeable changes to population numbers.

3.7.6 Direct and Indirect Effects

This section describes the effects of the alternatives on wildlife species that could result from grazing within the Franklin Basin allotment. The *Proposed Action*: Alternative 1 would consist of Deferred Timing/Adaptive Management (see Chapter 2 for additional details regarding alternatives). Alternative 1 consists of deferred timing and should not be confused with deferred rotation which would have entirely different effects on wildlife species and habitat. The *No Action*: Alternative 2 would consist of no grazing. The *Current Management Action*: Alternative 3 is the existing condition which is a season-long grazing system with 607 cow calf pairs from June 25 to October 10.

General Effects

Livestock grazing can affect vegetation used by wildlife in several ways. In most instances livestock grazing does not change the forest type, but influences factors such as understory vegetation cover, forage, and species composition.

Livestock and big game can influence aspen regeneration and also influence the occurrence of fire and its frequency in forested stands. Livestock use over time has changed the understory species composition within some of aspen stands in the allotment, leaving unpalatable species, such as coneflower. Livestock grazing also reduces hiding and nesting cover for species that depend on cover for security. In general, livestock grazing has decreased vegetative structural diversity in portions of the allotment, particularly those in riparian and aspen areas. A decrease in vegetation structure and species composition results in a decrease in wildlife diversity and/or abundance. These topics will be the primary focus of this analysis.

The USFS portion of the allotment area consists of 20,736 acres of which about 5,500 acres have been determined to be capable for cattle grazing (approximately 26% of the area which mostly consists of the aspen, grass/shrubland, and aspen/conifer vegetation types).

The proposed action alternative (Alternative 1) would generally provide some additional forage and cover during early summer for wildlife species in the years in which the deferred timing is implemented. The deferred timing may lead to improvements in species composition, thus benefiting wildlife species. This alternative would be comparable to current management (Alternative 3) except that there would be slight improvements in understory vegetation structure (cover) and the amount of available forage for wildlife. Alternative 1 would not rest any portion of the allotment or alter permitted numbers of livestock; thus improvement in vegetation diversity and in species composition would likely be very slow, especially in grazing-altered uplands. The no grazing alternative (Alternative 2) would have the most benefit for most wildlife species

because it would increase vegetation understory structure (for cover) and forage for wildlife across the entire area. Examples of vegetation recovery are evident within the existing Beaver Springs enclosure.

3.7.6.1 General Wildlife

- **Mule Deer**

No deer winter range occurs within the Franklin Basin Allotment. The Logan Ranger District consists of 221,657 acres of crucial summer range for mule deer within the Cache Harvest Unit (44.7% of the total acres of summer range). The Cache Harvest Unit is far below the population objective for deer. Factors which have been identified as key factors in the decline of mule deer on the Cache Harvest Unit are as follows: decreased carrying capacity on winter ranges, increased human population impacts, changes in livestock grazing practices on winter range, increased effects of predators, competition from elk on winter range, and changes in public values regarding management tools (UDWR 1999). Summer range within the Cache Harvest Unit is not a limiting factor for deer populations.

Proposed Action Alternative

There would be slight improvements over the existing condition in the quality and the amount of available forage for deer during early summer in the years in which the deferred timing is implemented. Greater fawn weights and animal condition going into fall improve animal survival in the winter. However, actual deer numbers may not be influenced since the population is most directly affected by the availability of suitable winter range within the Cache Harvest Unit. Within the allotment 15,208 acres of deer summer range are not capable for livestock grazing (73.3 percent of the allotment area).

No Grazing Alternative

This alternative would improve forage conditions (amount and quality of available forage) for deer. Greater fawn weights and animal condition going into fall improve animal survival in the winter. However, actual deer numbers may not be influenced since the population is most directly affected by the availability of suitable winter range within the Cache Harvest Unit.

Current Management Alternative

Livestock grazing would continue to reduce summer range forage and the quality of available forage to deer across the allotment. However, this may not influence deer or deer populations since they are mainly affected by the availability of suitable winter range within the Cache Harvest Unit. The reduced availability of quality forage within the summer may influence fawn condition/weights going into winter and may affect fawn winter survival. In addition, grazing under current management, has and would continue to have negative effects by altering the structure and species composition (grasses, forbs, and shrubs) within the capable portion of the allotment. Within the allotment 15,208 acres of deer summer range are not capable for livestock grazing (73.3 percent of the allotment area).

- **Elk**

Within the Franklin Basin allotment very little winter range occurs, thus effects are primarily on summer range habitat. Summer range within the Cache Harvest unit is not a limiting factor for elk populations. The Logan Ranger District consists of 152,255 acres of crucial summer range for elk within the Cache Harvest Unit (48.7 % of the total acres of summer range). The Logan Ranger District consists of 109,907 acres of crucial winter range for elk within the Cache Harvest Unit (58 % of the total acres of winter range). Elk populations are likely limited by the availability of suitable winter range and are managed at or near population management objectives by hunter harvest.

Proposed Action Alternative

There would be slight improvements over the existing condition in the quality and the amount of available forage for elk during early summer in the years in which the deferred timing is implemented. However, this may not influence actual elk numbers since they are most limited by the availability of suitable winter range and are managed at or near population management objectives by hunter harvest. Greater calf weights and animal condition going into fall, improve animal survival in the winter. Riparian areas, which are used by elk for forage, watering, and as wallows, would continue to be affected by livestock grazing.

No Grazing Alternative

This alternative would improve forage conditions (amount and quality of available forage) for elk. However, this may not influence actual elk numbers since they are most limited by the availability of suitable winter range and are managed at or near population management objectives by hunter harvest. Since understory vegetation diversity within mature aspen stands would increase, palatable forb species used by elk would become more abundant. Riparian areas used by elk for forage, watering, and as wallows would not be affected by livestock grazing. In addition, greater calf elk weights and animal condition in the fall would likely improve animal survival in the winter.

Current Management Alternative

Livestock grazing would continue to reduce summer range forage and the quality of available forage to elk within the capable portion of the allotment, though this may not influence elk populations, since they are at population management objective within the Cache Harvest Unit. Riparian areas, which are used by elk for forage, watering, and as wallows, would continue to be affected by livestock grazing.

- **Moose**

Proposed Action Alternative

There would be slight improvements over the existing condition in the quality and the amount of available forage for moose during early summer in the years in which the deferred timing is implemented. Livestock grazing would continue to reduce summer and winter range forage (primarily willows) and the quality of available forage to moose across the allotment, particularly during late summer when cattle are more likely to use

browse species. Riparian areas used by moose for forage and watering would continue to be affected by livestock grazing.

No Grazing Alternative

This alternative would improve forage conditions (amount and quality of available forage) for moose. However, this would not influence actual moose numbers since they are largely managed at or near population management objectives by hunter harvest.

Current Management Alternative

Livestock grazing would continue to reduce summer and winter range forage (primarily willows) and the quality of available forage to moose across the allotment, particularly during late summer when cattle are more likely to use browse species. Riparian areas used by moose for forage and watering would continue to be affected by livestock grazing.

- **Small Mammals**

The effects of livestock grazing on small mammals vary considerably among species because of their differing habitat requirements. Ground squirrels are highly adaptable and use a variety of environments, mostly open, non-forested areas. The exception is that of the golden mantled squirrel which uses open forests. Ground squirrels primarily eat plant material. Chipmunks and tree squirrels primarily use seeds as food and are most common in forested environments. Shrews are primarily insectivores and usually are tied closely to moist habitats with high amounts of vegetation cover such as riparian areas and meadows. Most mice use a variety of foods resources such as insects, seeds, and plant material and utilize a variety of habitat types. Voles primarily use plant material for food and usually are found in moist habitats such as riparian areas and meadows. Gophers use both forested and non-forest habitats and eat plant material such as roots and tubers for food.

The results of small mammal studies vary when comparing areas grazed by livestock and those with no livestock (Johnson 1982, Medin and Clary 1990, Douglass and Frisina 1993, Heinowski 1982, Wagner et al 1980, Cherry 1981, and McCluskey 1978). Studies tend to display a shift in species composition with species that show preferences for more open understories, such as the deer mouse, increase in abundance with livestock grazing, while those species that require greater cover, such as the vole, decrease. Small mammal abundance varies by study (sometimes even by year within the same study) with some displaying equal abundance between grazed and ungrazed areas and other studies indicating declines in overall small mammal abundance with livestock grazing. Small mammal population dynamics are variable. The causes of this variability are not well understood (Krebs and Myers 1974).

In general, Douglass and Frisina's (1993) study indicates a reduction in overall vegetation species diversity and cover with grazing, making some prey more vulnerable to predation. Actual biomass available to prey is likely to be greater with reduced

grazing. An increase in vegetation cover usually reflects an increase in small mammal populations and an increase in survival rate.

Proposed Action Alternative

Livestock grazing under this alternative would continue to affect those species that require high levels of litter and residual vegetation within the allotment. This alternative would slightly improve forage and cover conditions for small mammals during early summer in the years in which the deferred timing is implemented. Small mammal species diversity and overall species abundance across the allotment would improve slightly in comparison to the existing condition.

No Grazing Alternative

This alternative would improve vegetation conditions for forage and cover. Small mammal species diversity and overall species abundance across the allotment would be greatest among alternatives.

Current Management Alternative

Livestock grazing under this alternative would continue to affect those species that require high levels of litter and residual vegetation, particularly in riparian areas and aspen stands. Therefore, species diversity and overall species abundance across the allotment would likely be lowest among alternatives.

3.7.6.2 Management Indicator Species

- **Northern goshawk**

The northern goshawk is also an Intermountain Region Sensitive Species (Section 4.8.4.5), but potential effects to it are described here, since it is a WCNF Management Indicator Species.

Grazing can affect goshawks by removing cover and food for prey species and when it interferes with aspen regeneration (Graham et al 1999). Grazing also affects habitat by altering the structure and species composition (grasses, forbs, and shrubs) of aspen stands, which changes goshawk foraging habitat (Graham et al 1999 and Reynolds et al 1992). Grazing can reduce or eliminate foraging habitat potential within riparian areas, which are sometimes selected for goshawk nesting sites (Hargis et al 1994, Patla 1994, and Reynolds et al 1992).

Reynolds et al (1992) recommended that livestock forage utilization should average 20 percent by weight and not exceed 40 percent in any area to maintain grass and forbs (40 percent average for shrubs) to provide foods, such as berries, seeds, and leafy material, and cover for goshawk prey. He identified 14 important prey species and their special habitat attributes for maintaining sustainable goshawk prey populations. Of these, 12 occur within the Franklin Basin Allotment, including American robin, blue grouse, chipmunks, rabbits, golden mantled ground squirrel, and morning dove (with a need for a

well developed herbaceous and shrub understory), northern flicker, red-naped sapsucker, red squirrel, and Williamson's sapsucker (which require a moderate understory), and Steller's jay and hairy woodpecker (whose requirements are low to none to maintain their populations).

Graham et al (1999) also analyzed habitat importance for additional goshawk prey species within Utah. These are the snowshoe hare, ruffed grouse, and mountain blue bird with a need for a well-developed herbaceous and shrub understory, the downy woodpecker that requires a moderate understory, and the three-toed woodpecker that requires no understory to maintain its populations.

Within the report "*Assessment of Management Indicator Species Capability and Suitability on the Wasatch-Cache National Forest with the Management and Restoration Direction*" (July 2007), Table 16 displays the number of acres of overlap between capable cattle grazing land acres and forested goshawk habitat within the Franklin Basin allotment: this consists of 4,321.5 acres. Portions of the area that would be used by goshawks are conifer stands, which are not capable acres for livestock grazing.

The effects to the goshawk are related to the effects on their prey habitat and populations. See small mammals and snowshoe hare sections for additional details.

Proposed Action Alternative

Small mammal species diversity and overall species abundance across the allotment may slightly improve over the existing condition. This alternative would slightly improve forage and cover conditions for small mammals during early summer in the years in which the deferred timing is implemented. Portions of the area that would be used by goshawks are conifer stands, which are not capable acres for livestock grazing. Livestock grazing may influence nest success and nestling survival.

No Grazing Alternative

This alternative increases available forage and cover across the allotment, small mammal species diversity and overall species abundance across the allotment would be greatest among alternatives. An increase in cover would likely increase grouse nest success and increase survivorship which could lead to higher population numbers of grouse across the allotment. Prey would most likely be in greater abundant under this alternative. Increased prey abundance may increase nest success and nestling survivorship and may reflect in an increase in goshawk abundance.

Current Management Alternative

Small mammal species diversity and overall species abundance across the allotment would likely be lowest among grazing systems. Portions of the area that would be used by goshawks are conifer stands, which are not capable acres for livestock grazing. Livestock grazing may influence nest success and nestling survival.

- **Snowshoe Hare**

Although there have apparently been no studies of dietary overlap between livestock and snowshoe hares, or response of snowshoe hares to cattle grazing, several such studies have been done for other rabbits and hares. Johnson (1979) found the dietary overlap of black-tailed jackrabbits to be 51% with cows and stated that competition could occur, depending on stocking rates. In southeastern Idaho, MacCracken and Hansen (1984) found that rabbits and hares compete directly with livestock for forage.

Grazing by livestock and wild ungulates may increase competition with snowshoe hare for forage resources, particularly in riparian areas. Browsing or grazing can have an effect on snowshoe hare habitat by reducing the amount of available winter browse and altering the structure or composition of native plant communities.

Snowshoe hare densities and overwinter survival appear to be positively correlated with understory density (Adams 1959, Wolff 1980, Litvaitis et al. 1985). By changing native plant communities, such as aspen and high elevation riparian willow, grazing can degrade snowshoe hare habitat (Ruediger et al 2000).

Snowshoe hare population numbers (as shown by pellet counts) can vary greatly within the local area. A number of factors are likely responsible for this although the primary cause is not known.

Proposed Action Alternative

This alternative would continue to reduce cover and forage vegetation for the snowshoe hare within the “forested” capable portion of the allotment. There would be slight improvements over the existing condition in the quality and the amount of available forage during early summer in the years in which the deferred timing is implemented. The USFS portion of the allotment area consists of 20,736 acres of which 5,528 acres have been determined to be capable for cattle grazing (approximately 26.7% of the area which mostly consists of the aspen, grass/shrubland, and aspen conifer vegetation types). The conifer forest type would largely be unaffected since these areas are not considered capable for livestock grazing.

No Grazing Alternative

Increases in forage and in cover would likely increase survivorship which could lead to slightly higher population numbers of snowshoe hares across the allotment. Snowshoe hare population numbers (as shown by pellet counts) can vary greatly within the local area. A number of factors are likely responsible for this although the primary cause is not known.

Current Management Alternative

The current management alternative would continue to reduce cover and forage vegetation for the snowshoe hare within the “forested” capable portion of the allotment. The USFS portion of the allotment area consists of 20,736 acres of which 5,528 acres have been determined to be capable for cattle grazing, (approximately 26.7% of the area

which mostly consists of the aspen, grass/shrubland, and aspen conifer vegetation types). The conifer forest type would largely be unaffected since these areas are not considered capable for livestock grazing.

- **Beaver**

The distribution of beaver on the Franklin Basin Allotment relates to the presence of perennial water. Numerous colonies of beaver occur within the allotment area with much of the available habitat being occupied and active. The beaver population is influenced by trapping, especially in close proximity to open roads. In some areas of the west, the combination of high populations of beaver and heavy livestock grazing has prevented the reestablishment of aspen and willows necessary for future beaver occupancy.

Proposed Action Alternative

Livestock grazing would continue to reduce the amount of willows available as forage and for use as building materials where currently available on the allotment. Cattle use woody material particularly during late summer when other quality forage is less available. Within the report *“Assessment of Management Indicator Species Capability and Suitability on the Wasatch-Cache National Forest with the Management and Restoration Direction”* (July 2007), Table 11 displays the number of acres of overlap between capable cattle grazing land acres and beaver habitat within the Franklin Basin allotment: this consists of 723 acres. Beaver numbers will not likely change from the current condition as long as riparian grazing standards and guidelines are being met.

No Grazing Alternative

This alternative would improve all riparian conditions within the allotment and would likely benefit the beaver the greatest among alternatives. However, large changes in the beaver population are not likely, since many of the areas are currently active and occupied by beaver within the allotment area. In addition, trapping likely plays a role in regulating numbers within the area.

Current Management Alternative

Livestock grazing would continue to reduce the amount of willows available as forage and for use as building materials where currently available on the allotment. Cattle use woody material particularly during late summer when other quality forage is less available. Within the report *“Assessment of Management Indicator Species Capability and Suitability on the Wasatch-Cache National Forest with the Management and Restoration Direction”* (July 2007), Table 11 displays the number of acres of overlap between capable cattle grazing land acres and beaver habitat within the Franklin Basin allotment: this consists of 723 acres. Beaver numbers will not likely change from the current condition as long as riparian grazing standards and guidelines are being met.

3.7.6.3 Federally Listed Threatened, Endangered, Proposed, and Candidate Species

Habitat for the yellow-billed cuckoo does not occur within in the Franklin Basin Allotment and there have been no recorded occurrences. Therefore, the yellow-billed cuckoo will not be affected the alternatives.

The area that contains the Franklin Basin Allotment is considered linkage habitat for the Canada lynx. The potential effects to its linkage habitat and potential prey species are discussed below.

- **Canada lynx**

As discussed in Section 3.7.3.2, reports of lynx in Utah indicate sightings between 1961 and 1982 on the Ashley and Wasatch-Cache National Forests, but no sightings between 1983 and 1993 (USDA Forest Service 1994). In 1999-2001, lynx hair snares were established throughout Utah and other western states. Results indicated no lynx hair samples were snared in northern Utah during this effort. One of the Utah hair snare grids is located within the Franklin Basin Allotment.

The Franklin Basin allotment lies within a travel corridor for the Canada lynx rather than a permanent resident habitat. As stated earlier, the Logan Ranger District was reclassified in 2002 from a Lynx Analysis Unit (LAU) to Linkage Area, due to a low percentage of primary lynx habitat found here.

The Lynx Conservation Strategy (Ruediger et al 2000) specifies the following programmatic planning guideline in linkage areas: *“Where feasible, maintain or enhance native plant communities and patterns and habitat for potential lynx prey, within identified key linkage areas”*

Although the lynx is not a permanent resident here, the potential effects to the lynx are related to the effects on their potential prey, primarily snowshoe hare and a variety of small mammals. As stated in the small mammal section above, small mammal population dynamics are variable and the causes of this variability are not well understood (Krebs and Myers 1974). However, in general, a reduction in overall vegetation species diversity and cover associated with grazing makes some prey more vulnerable to predation. As discussed above, snowshoe hare population numbers can vary greatly within the local area. A number of factors are likely responsible for this although the primary cause is not known. However, browsing or grazing can have an effect on snowshoe hare habitat by reducing the amount of available winter browse and altering the structure or composition of native plant communities.

Proposed Action Alternative

Effects to prey species would be similar to those described in the current management alternative, though in years in which deferred timing would be utilized, slight improvements in available forage and cover would occur during early summer.

No Grazing

For this alternative small mammal species diversity and overall species abundance across the allotment would likely be greatest among alternatives.

Douglass and Frisina's (1993) study displayed that an increase in vegetation cover usually reflects an increase in small mammal populations and an increase in survival rate. Actual biomass available to prey is likely to be greater with reduced grazing. An increase in cover and forage would likely increase survivorship of snowshoe hares which could lead to slightly higher population numbers of snowshoe hares across the allotment, though a number of factors likely influence snowshoe populations.

Prey would most likely be in greatest abundance under this alternative.

Current Management Alternative

Small mammal species diversity and overall species abundance across the allotment would likely be least among alternatives.

The current management alternative would continue to affect those small mammal species that require high levels of litter and residual vegetation within the allotment. Small mammal species diversity and overall species abundance across the allotment would likely be lowest among alternatives.

As discussed, snowshoe hare population numbers (as shown by pellet counts) can vary greatly within the local area. The hare population seems to be cyclic within the local area and these swings in numbers will likely continue. A number of factors (e.g., predation, vegetation condition) are likely responsible for this, although the primary cause is not known. The current management alternative would continue to reduce cover and forage vegetation for the snowshoe hare within the capable portion of the allotment. The conifer forest type would largely be unaffected since these areas are not considered capable for livestock grazing.

Prey would most likely be in lesser abundance under this alternative.

3.7.6.4 Forest Service Intermountain Region Sensitive Species

Of those species listed as sensitive for the Wasatch-Cache NF, the following occur or are likely to occur within the project area: northern goshawk, flammulated owl, three-toed woodpecker, boreal owl, and the Townsend's big-eared bat. The wolverine, wolf, and great gray owl may possibly occur within the project area. The sharp-tailed grouse, sage grouse, and peregrine falcon are not known to occur within the project area. Currently, the pygmy rabbit and spotted bat are not known to occur on the district. None of the alternatives will effect sharp-tailed grouse, sage grouse, peregrine falcon, pygmy rabbit, or the spotted bat.

- **Gray Wolf**

The U.S. Fish and Wildlife Service delisted the wolf within portions of the western United States. In northern portion of Utah, the wolf became a USFS sensitive species upon delisting (Wolves are not included in the list of TE species for Cache County-USFWS November 2007). The U.S. Federal District Court in Missoula, Montana, issued a preliminary injunction on Friday, July 18, 2008, that immediately reinstated the Endangered Species Act protections for gray wolves in the northern Rocky Mountains. Because there has not been a breeding pair or a pack identified in Utah to date, only a dispersing animal, there are no direct or indirect effects to the gray wolf from the proposed action or any of the alternatives. If wolves from the federal recovery areas (Wyoming, Idaho, and Montana) were to enter Utah, they would receive protection under the Endangered Species Act. They are not on the threatened or endangered list for Cache County. The effects to the wolf of the alternatives are related to the effects on their prey species such as deer, elk, moose (see those respective sections).

- **Northern goshawk**

Northern goshawks are also Management Indicator Species for the Forest and the effects are described in detail in MIS Section.

- **Wolverine**

A possible wolverine occurrence has been recorded on the Franklin Basin Allotment, and unconfirmed sightings on other areas of the WCNF. The effects to the wolverine are related to the effects on their prey, including small to medium sized mammals such as rabbits and hares, beavers, squirrels and a variety of ground nesting birds. In winter, dead animals, primarily deer, elk, and moose, are an important food source for the wolverine. See the respective sections for additional details.

- **Townsend's Big-eared Bat**

Proposed Action Alternative

Livestock grazing would continue to affect foraging habitat for bat species, mainly in riparian areas, wetlands, and springs. Vegetation has been reduced in many riparian areas from a combination of livestock grazing and trampling, though in years in which deferred timing would be utilized, slight improvements in available forage and cover would occur during early summer. There would likely be a slight improvement over the existing condition in the abundance of nocturnal insect species that bats forage upon, though this may not influence actual bat numbers. Bat populations may be more influenced by the availability of suitable roost sites or other such limiting factors. Like all alternatives, this alternative would not affect bat roosting sites, maternity colonies, or hibernacula.

No Grazing Alternative

This alternative would improve habitat for insects associated with riparian areas, wetlands, and springs. This may not influence actual bat numbers since bat populations may be more influenced by the availability of suitable roost sites or other such limiting factors. Like all alternatives, this alternative would not affect bat roosting sites, maternity colonies, or hibernacula.

Current Management Alternative

Livestock grazing would continue to affect foraging habitat for bat species, mainly in riparian areas, wetlands, and springs. Vegetation has been reduced in many riparian areas from a combination of livestock grazing and trampling. This would likely reduce the abundance of nocturnal insect species that bats forage upon, though this may not influence actual bat numbers. Bat populations may be more influenced by the availability of suitable roost sites or other such limiting factors. Like all alternatives, this alternative would not affect bat roosting sites, maternity colonies, or hibernacula.

- **Boreal Owl**

The effects to the boreal owl are related to the effects on their prey, primarily voles. A majority of the area that is used by the boreal owl are large stands of conifer. Most of these areas are not capable acres and thus are not used by livestock. The effects of any of the alternatives would likely be negligible on boreal owl habitat or populations. Also, see small mammal effects.

- **Flammulated Owl**

The flammulated owl feeds almost exclusively on insects, primarily moths. Habitats vary in the capability to support prey and it is unknown whether this influences owl distribution (Hayward and Verner 1994). To address effects, an assumption has been made that greater foliage volume supports more insects.

Proposed Action Alternative

Livestock grazing would continue to affect foraging habitat for flammulated owls, mainly in aspen areas. Vegetation is reduced from a combination of livestock grazing and trampling, though in years in which deferred timing would be utilized, slight improvements in available forage and cover would occur during early summer. There would likely be a slight improvement over the existing condition in the abundance of nocturnal insect species that are foraged upon. Aspen forest consists of 6,506 acres within the allotment of which most is capable for cattle grazing. This alternative would not affect nest trees. Nest success and nestling survival are likely to slightly improve under this alternative.

No Grazing Alternative

This alternative would improve habitat for nocturnal insects across the allotment, likely increasing nest success and nestling survivorship. This may reflect an increase in flammulated owl abundance.

Current Management Alternative

Livestock grazing would continue to affect foraging habitat for flammulated owls, mainly in aspen areas. Vegetation is reduced from a combination of livestock grazing and trampling. This would likely reduce the abundance of nocturnal insect species that are foraged upon. Aspen forest consists of 6,506 acres within the allotment of which most is capable for cattle grazing. This alternative would not affect nest trees. Nest success and nestling survival are likely to be lower under this alternative.

- **Great gray owls**

Great gray owls use mixed coniferous and hardwood forests usually bordering small openings or meadows. They forage along edges of clearings. Semi-open areas, where small rodents are abundant, near dense coniferous forests, are optimum habitat for great gray owls. In the Intermountain Region, great gray owls occur primarily in lodgepole pine, Douglas-fir, and aspen and in ponderosa pine. There have been sightings of great gray owls on the Wasatch-Cache National Forest and on the Ashley National Forest, although in general, it is felt that these winter vagrants only occasionally visit Utah. The effects of any of the alternatives would be negligible on great gray owl habitat or populations.

- **Three-toed woodpecker**

The alternatives would have no effect on the three-toed woodpecker. This species nests, roosts, and forages in conifer and conifer/aspen forests and is not dependent on understory vegetation conditions.

3.7.6.5 Neo-tropical Migratory/Song Birds

Executive Order (EO) 13186, signed January 10, 2001, lists several responsibilities of federal agencies to protect migratory birds, including “Support the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions.”

Additional direction comes from the Memorandum of Understanding (MOU) between USDA Forest Service and USDI Fish and Wildlife Service, signed January 17, 2001. The purpose of this MOU is to strengthen migratory bird conservation through enhanced collaboration between the Forest Service and Fish and Wildlife Service, in coordination with state, tribal and local governments. The MOU identifies specific activities for bird conservation, pursuant to EO 13186, including “Strive to protect, restore, enhance, and

manage habitat of migratory birds, and prevent the further loss or degradation of remaining habitats on National Forest System lands.” This includes, identifying management practices that impact populations of high priority migratory bird species, including nesting, migration, or over-wintering habitats, on National Forest System lands, and developing management objectives or recommendations that avoid or minimize these impacts.

As displayed in the project record, numerous neo-tropical migratory birds occur within the allotment area. In general, species that benefit from a greater abundance of understory vegetation for cover will increase with a reduction or elimination of livestock grazing. Those species that prefer more open conditions and less understory vegetation will decline with a reduction or elimination of livestock grazing. For the red-napped sapsucker and Williamson’s sapsucker see the effects described for the three-toed woodpecker.

- **Brewer’s Sparrow**

Proposed Action Alternative

Livestock grazing would maintain old and dense mountain big sagebrush areas and maintain lower herbaceous understory cover that is preferred and utilized by Brewer’s sparrows for breeding. In years in which deferred timing would be utilized, there would be a reduction of the trampling of eggs and nestlings, thus increased survivorship of young.

No Grazing Alternative

Removal of grazing would increase grasses and forbs within the mountain big sagebrush vegetation type, thus reducing preferred Brewer sparrow nesting habitat. In addition, susceptibility to catastrophic wildfires in the dense mountain big sagebrush areas would increase since fine fuels, such as grasses, will be more abundant. Wildfire could greatly reduce the amount of habitat available for breeding Brewer’s sparrows and reduce Brewer’s sparrow numbers.

Current Management Alternative

Livestock grazing would maintain old and dense mountain big sagebrush areas and maintain lower herbaceous understory cover that is preferred and utilized by Brewer’s sparrows for breeding.

- **Broad-tailed Hummingbird**

Proposed Action Alternative

Livestock grazing would continue to affect foraging habitat for the broad-tailed hummingbird, mainly in riparian areas and adjacent uplands. These uplands are primarily tall forb and aspen communities containing species that the hummingbird uses such as tall larkspur and Indian paintbrush. These species have been reduced in many areas from a combination of livestock grazing and trampling. This alternative would not likely affect

nests (3-30 feet in height), but could affect vegetation conditions associated with lower canopy nest sites.

No Grazing Alternative

Understory vegetation diversity, especially within aspen stands, would increase, thus native forb species utilized by the broad-tailed hummingbird will be more abundant. This may result in an increase in broad-tailed hummingbird abundance. This alternative would not affect nests (3-30 feet in height) or nesting habitat.

Current Management Alternative

Livestock grazing would continue to affect foraging habitat for the broad-tailed hummingbird, mainly in riparian areas and adjacent uplands. These uplands are primarily tall forb and aspen communities containing species that the hummingbird uses such as tall larkspur and Indian paintbrush. These species have been reduced in many areas from a combination of livestock grazing and trampling. This alternative would not likely affect nests (3-30 feet in height), but could affect vegetation conditions associated with lower canopy nest sites.

3.7.6.6 Species at Risk

Effects related to the fringed myotis would likely be similar to those for the big-eared bat. Effects to the marten would be associated with their prey, small mammals which are discussed within the small mammal section.

3.7.7 Cumulative Effects

This section discusses the effects of past, present, and reasonably foreseeable future connected and cumulative actions, including the proposed action.

The area of influence for the cumulative effects analysis for wildlife is the project area for a majority of the species. For species with large home ranges/territories or make large movements (e.g. lynx and wolverine), the area of influence is larger than the Logan Ranger District and includes adjacent lands (primarily to the north and south). Big game species such as moose and elk are managed by UDWR within harvest units which includes a portion of USFS managed lands and lands of other ownership (primarily private land ownership). The Logan Ranger District is located within a portion of a wildlife corridor that has regional importance in providing linkage to other larger habitat areas. This is especially true for forest carnivores such as the Canada lynx. For the Canada Lynx, great detailed cumulative effects discussion is contained within the Biological Assessment.

The major influences on wildlife and their habitats within the Franklin Basin Allotment have been livestock grazing (which has had some affect on cover, forage, and vegetation composition and species diversity), fire suppression (which has reduced the presence of early successional vegetation classes) and roads, trails, and winter recreation use (which

has affected wildlife through disturbances). Timber harvest has occurred within portions of the allotment and has altered the forest age classes within the area which has likely been beneficial to many species of wildlife. Fire has had minor affects to wildlife in the allotment area and within the Logan Ranger District. No reasonably foreseeable future actions are proposed within the allotment area.

Many of the activities described below make changes in vegetation successional stages which in many instances are beneficial to many wildlife species especially considering that a majority of the habitat types within the Wasatch-Cache NF are in the mature and old classes.

Timber Harvest Projects

Overall, timber harvest has had a minor affect to wildlife with the Logan Ranger District. The majority of the forest type is old or mature. Past conifer timber harvest most likely benefited species (those which prefer early successional stands) by the creation of openings and young conifer and aspen stands. This is especially true for species such as the snowshoe hare, which prefers young lodgepole pine stands.

Wildland Fire, Prescribed Burn Projects, and Suppression Activities

Fire has had minor affect on wildlife in the area. Fire suppression has likely had the greatest affect by reducing the abundance of species that prefer early successional vegetation classes. Fire suppression has reduced habitat for wildlife species that utilize aspen. Prescribed fire and natural fire (including fire use) would benefit some wildlife species within the area by creating early successional stages and maintaining diversity in stand age and structure.

Overall, prescribed fire has had a minor affect to wildlife in the area. The majority of the forest type is old or mature. Past burns have benefited those species which prefer early successional stands. Prescribed fire and natural fire benefits some wildlife species by creating early successional stages and maintaining diversity in stand age and structure, beginning to restore a balance of successional stages, moving the district closer to properly functioning condition (PFC).

Recreation

Non-motorized trails usually have minor effects to wildlife species; though this is dependent on the amount and location of use. The amount of vegetation/habitat directly affected by a trail is very limited. Wisdom et al (2004) found that recreational activities have little difference in the measurable response during atv, mountain biking, horse-riding, and hiking activities for mule deer. Wisdom et al (2004) found that recreational activities have a substantial effect on elk behavior and that the reactions of elk were more pronounced during atv and mountain biking activities, than those of horse-riding and hiking.

Past and proposed land exchanges typically have beneficial affects to wildlife species by consolidating lands into larger blocks: simplifying management and potential effects. In some of the past exchanges, the USFS has obtained more acres than exchanged which

usually benefits a greater number of species, though it is dependent upon on the specific habitat types being exchanged.

Urbanization and development along the Wasatch Front and within Cache Valley have affected wildlife species, especially big game species dependent on winter range habitat. The amount and quality of winter range for deer and elk is primarily the limiting factor for their populations. For some species, studies have shown a strong negative relationship between higher road density and species presence. The effects of urbanization and increased road densities within watersheds adjacent to USFS managed lands especially along the Wasatch Front have affected wildlife species and the movements of some species. Within some watersheds, road densities on private lands would likely exclude use by some forest carnivore species. Continued development of adjacent lands will likely influence big game populations and habitat within the Cache Harvest Unit.

Disturbance from motorized vehicles has affected wildlife species within the allotment area and is likely to increase with human population increases and the increased popularity of ATVs and snowmobiles. Big game and other wildlife usually will avoid or reduce the use of areas within approximately ¼ mile of travel ways.

Treatment of Noxious Weeds

Existing and proposed noxious weed treatment projects will improve vegetation/habitat conditions for wildlife species. Loss of valuable wildlife habitat (e.g. big game range, riparian habitat) to noxious weeds can affect a range of species. These projects will improve vegetation conditions and wildlife habitat, thus benefiting many wildlife species (e.g. neo-tropical birds).

Riparian Exclosures

The Beaver Spring riparian exclosure located within the allotment area was constructed to reduce livestock effects within the spring, wet meadows, and riparian habitat. This project benefits a variety of species such as elk, deer, moose, beaver, and a variety of neo-tropical birds.

Conclusion

The direct and indirect effects of the implementation of the alternatives and the cumulative effects discussed above may affect species and their habitat. The direct and indirect effects of grazing are associated with effects primarily to vegetation. Effects from recreation activities involving disturbance (e.g. noise) would not change by alternative. The effects of implementing the alternatives varies by species and by the specific alternative. In all instances, implementing any of the alternatives in combination with the above actions would maintain species viability as require by NFMA.

3.7.8 Irretrievable or Irreversible Commitment of Resources

No irretrievable or irreversible commitments affecting wildlife habitat or species viability are expected as a result of implementing any of the alternatives.