

Chapter 3 Affected Environment and Environmental Consequences

3.0 General for all Resources

Logan Canyon is well developed with 14 Forest Service campgrounds and picnic areas within the drainage. U.S. Highway 89, a National Scenic Byway, passes through the canyon. There are 12 recreation residence tracts that have a total of 84 cabins. Eleven of these tracts are next to the Logan River. One, Beirdneau, is across the highway from the river and on a drier upland site, although it does have a small stream out of a spring just above the tract that passes through it.

Vegetation on south facing slopes consists mainly of mountain brush and juniper. North facing slopes are mainly coniferous. Along the Logan River one finds willows, birch, other riparian hardwoods, and a scattering of scrub maple, and juniper. Most recreation residence tracts have been altered to some extent with planted, watered, and mowed lawns.

For the purposes of this analysis, the project area for recreation residence tracts is defined as the sum total of the 84 residence lots, 5 in-lieu lots, 15 previously-identified lots within the tract (but no longer useable due to shifts in the river channel) and the tract roads. This total is approximately 51 acres. The acreage figure does not include interior spaces which were never considered (and will not be considered in the future) as part of the recreation residence tract. The existing occupied recreation residence lots total about 37 acres. The road system for all tracts encompasses 3.3 total miles of road (equivalent to about 5 acres).

The techniques and methodologies used in this analysis consider the best available science. The analysis includes a summary of the credible scientific evidence that is relevant to evaluating reasonably foreseeable impacts. The analysis also identifies methods used and references scientific sources relied on. When appropriate, the conclusions are based on the scientific analysis that shows a thorough review of relevant scientific information, a consideration of responsible opposing views, and the acknowledgment of incomplete or unavailable information.

Chapter 1 includes a list of issues developed by an interdisciplinary team (ID Team) of Forest Service resource specialists that were derived from comments received during public scoping. Potential impacts to natural resources identified by team members were also discussed and added to the issues list. The ID Team examined the list to determine if the issues identified were significant issues that would be analyzed in Chapter 3. The following sections address each of the resource headings that were determined to have significant issues. In each resource section, a description of the affected environment follows that provides background information describing and interpreting impacts. Then an environmental consequences section is included which addresses each significant issue by resource area. The environmental consequences section discusses the direct, indirect

and cumulative impacts for each alternative. Mitigation measures specific to each resource area are also included in this section.

The Proposed Action Alternative would allow continued recreation residence use for the 84 summer homes in Logan Canyon for a 20-year term, beginning in 2009. In cases where a permit holder is not in compliance with their existing authorization, the holder could ultimately be required to remove their cabin and other improvements from the National Forest and rehabilitate the site. However, for the purpose of analysis, it is assumed each homeowner will take the necessary steps to comply and that all permits would be reissued. After these new permits are in place, the 84 Logan Canyon summer homes would continue to be managed consistent with Forest Service regulations, policies, handbooks, (including the Forest Recreation Residence Management Wasatch-Cache National Forest Administrative Guidelines, May 2008) and State and local government requirements. In addition to allowing continued summer home use, the Proposed Action would include authorizing a number of long-existing tract improvements and the designation of three of the five in-lieu lots as described Chapters 1 and 2.

The No Action Alternative would involve allowing all current special use permits for summer homes in Logan Canyon to expire on their term at the end of 2008. By policy, the Forest Service would then issue 10-year permits to all permit holders, during which time homeowners would be required to remove their cabins, access roads, and other improvements from public lands and rehabilitate the sites within this period.

The following information shows the actions considered in the cumulative effects analysis for all resources. As applicable to each resource, these conditions, actions, and effects are described in each section of Chapter 3. Table 3.1 shows the actions considered in the cumulative effects disclosure for the Logan Canyon recreation residence tracts. In most cases, past and present, and ongoing activities have resulted in the resource's existing condition description in Chapter 3.

Table 3-1. Past, present, on-going, and reasonably foreseeable activities within or near the project area

PAST ACTIONS		
Action	Description	Date
Logan Canyon Highway Construction	Widening lanes, straightening curves, reducing elevation, creating pullouts, installing guard rails, and other safety enhancement measures.	1997 to 2006
Riparian Area Restoration and Improvements	Restoration of stream bank vegetation: Four to five rock weirs placed on the outside meanders of Logan River at Guinavah-Malibu Picnic Area (a) and at Birch Glen Recreation Residence area (b). Stream bank scour on stream banks has been reduced.	a. late 1990's b. January 2007
Logan Highway Bridge Construction	Right Hand Fork, Stokes Nature Center, First Dam. Reconstruction of bridges and underpasses to enhance safety.	Completed 2006
Wildfires	Recent history of fire occurring on both sides of lower Logan Canyon, but not in the areas of recreation residences (which are typically riparian vegetation).	2000-2003
PRESENT and ONGOING ACTIONS		
Action	Description	Date
Fish Stocking In Logan River	Fish stocking of rainbow trout, brown trout, and brook trout. The Utah Division of Wildlife Resources has stopped stocking viable rainbow trout in waters that support BCT.	Ongoing
Maintenance of Power and Telephone transmission line ROW	Clearing of vegetation to avoid lines.	Ongoing
Road maintenance	Cleaning culverts, re-surfacing existing roads and parking lots, grading.	Ongoing
Recreation Use on roads and trails (winter and summer) as related to wildlife, fish, watershed, and vegetation	Hiking, biking, skiing, dog-walking, angling, photographing,	Ongoing
Weed Control	FS working in cooperation with Cache County Weed board to eradicate noxious	Ongoing

	weed spread in Logan Canyon corridor. Recreation residents to refrain from non-native plantings.	
Fire Suppression	Active fire suppression in human-caused fires.	Ongoing
Operation and maintenance of First, Second, and Third Dams	Maintenance activities or water withdrawals conducted by Logan City at dam locations.	Ongoing
Grazing	Grazing by cattle on Logan Canyon allotment that is upland from one tract (Beirdneau)	Ongoing
Non-native aquatic species	Introduction of non-natives or exotic species	Ongoing
REASONABLY FORESEEABLE ACTIONS		
Action	Description	Date
Replacement of Logan City Waterline	North side of Highway from DeWitt Springs to 1 st dam	Project beginning summer 2008
Logan City Spring Development	Guinavah Area	Could begin in 2009.

Table 3.1-A. Actions not considered in the cumulative effects analysis and the justification for elimination from consideration

Action	Justification
Private Land Developments, Right Hand Fork	No formal proposed action in place
Operation and maintenance of Logan City Waterline. DeWitt Springs to 1 st dam accessed via service vehicles to maintain line.	Negligible effect on water, wildlife & fish, TES plants, RHCAs, and spread of noxious weeds.
Operation and maintenance of existing diversions at Red Bridge.	Negligible effect on water, wildlife & fish, TES plants, RHCAs, and spread of noxious weeds.
Zanavoo Expansion, Proposal to build 3-story lodging facility.	No formal proposed action in place.
Hiking Trail Construction, First Dam to Stokes Nature Center.	No formal proposed action in place.

3.1 Wildlife

3.1.1 Affected Environment

General Wildlife

Big game. Logan Canyon is part of the Cache Unit and consists of mule deer, elk, and moose. The Utah Division of Wildlife Resources (UDWR), in general, considers all elevations below 7,000 feet in elevation to be big game winter range. In Logan Canyon south and south westerly facing slopes are usually clear of snow or have less snow when compared to the northerly facing slopes and the canyon bottom. It is on these south and south westerly facing slopes where big game will spend most of the winter if they are higher in the canyon. All recreational residence tracts are below the 7,000 foot elevation; however, those located right along the river are adjacent to north facing slopes and hold enough snow, so they receive minimal big game use. Beirdneau is on the north side of the highway on the south facing slope. It is low on the slope with the potential to hold more snow than it would if higher on the slope, but still will provide habitat for big game longer into the winter and earlier in the spring.

The UDWR's deer herd objective for the Cache Unit is 25,000 with the 2004 post-season estimate of 13,700 (UDWR, 1998). The low population numbers have been attributed to many factors including loss of low elevation winter range, road kill, and predators. The elk herd objective is 2,300, with a 2004 post-season population estimate of 2,030 (UDWR, 1998b). There is no population objective or estimate for moose, but moose have a much larger winter range because they tolerate much deeper snow than deer or elk.

Fifty two per cent (258,454 acres) of deer summer range and 18% (52,258 acres) of deer winter range in the Cache Unit are on National Forest System lands. For elk, 54% (232,746 acres) of summer range and 28% (97,108 acres) of winter range are on the Wasatch-Cache National Forest.

Small game. Small game in Logan Canyon consists of blue grouse, ruffed grouse, and snowshoe hare. Where waterfowl does not actually fall into the small game category they are recognized here for convenience. Waterfowl use areas along the Logan River where the currents are slow and in the reservoirs formed by second and third dams. The other small game species use uplands where appropriate habitat is present.

Small mammals. There are many species of small mammals in Logan Canyon including squirrels, chipmunks, skunk, porcupine, raccoon, marmots, and mink (a mink was observed on the bridge entering the Card recreation residence tract on October 17, 2005). These small mammals have the capacity to hide and for the most part go undetected. Out buildings and woodpiles around summer homes create habitat for many of them.

Neo-tropical migrants.

There are many species of migratory birds that spend the summer breeding period in habitats provided in Logan Canyon. Partners in Flight (PIF) species of concern and the U.S. Fish and Wildlife Service (FWS) birds of conservation concern lists contain the following species in Table 1-Wildlife for the Utah Overthrust Mountain Section that includes Logan Canyon:

Table 1-Wildlife. Bird species of Concern That May be Present in the Utah Overthrust Mountain Section (from PIF and FWS lists).

Species ^A	Primary Breeding Habitat	Secondary Breeding Habitat	Winter Habitat ^B	Nests
Black-throated gray warbler *	Pinyon-Juniper	Mountain Shrub	Migrant	Trees
Brewer's sparrow *	Shrubsteppe	High Desert Shrub	Migrant	Sage
Broad-tailed hummingbird	Lowland Riparian	Mountain Riparian	Migrant	Trees
Gray Viero *	Pinyon-Juniper	Northern Oak	Migrant	Shrubs
Virginia's warbler *	Northern Oak	Pinyon-Juniper	Migrant	Ground
Williamson's sapsucker	Sub-Alpine Conifer	Aspen	Migrant	Trees
Yellow-billed cuckoo *	Lowland Riparian	Agriculture	Migrant	Trees/ Willows
Lewis' Woodpecker *	Ponderosa Pine	Lowland Riparian	Northern Oak	Trees
Loggerhead shrike	High Desert Scrub	Pinyon-Juniper	High Desert Scrub	Trees
Pinyon Jay	Pinyon-Juniper	Ponderosa Pine	Pinyon Juniper	Trees
Red-naped sapsucker	Aspen	Mixed Conifer	Mountain Riparian	Trees
Sage sparrow *	Shrubsteppe	High Desert Scrub	Low Desert Scrub	Sage/ Ground
Three-toed woodpecker	Sub-Alpine Conifer	Lodgepole Pine	Sub-Alpine Conifer	Trees

^A Bold type = PIF list.
 Regular type = BCC list.
 * = both lists.

^B Some species are not migratory but are listed because they are on the PIF and/or BCC lists.

In general, tree-nesting birds have not been affected by the presence of recreational residence tracts. Some larger trees have been removed but most are desired by permittees for shade and aesthetics. Species that depend on sagebrush, willows, other shrubs, and the ground for foraging or nesting may have been affected with the removal of these types of vegetation when grass was planted.

Management Indicator Species (terrestrial)

Terrestrial management indicator species (MIS) identified in the WCNF Revised Forest Plan FEIS, Appendix J, are beaver, goshawk, and snowshoe hare. Monitoring is conducted according to the 2003 Revised Forest Plan monitoring plan (RFP, 2003, page 4-10 and 4-11). Forest management actions are evaluated for their effect on population trends. As data is collected on the species, an annual report is completed for the Wasatch-Cache National Forest which details monitoring protocols and summarizes the

results of the previous year's monitoring. The following summarizes the monitoring for the three terrestrial MIS for the Forest (WCNF 2007).

Beaver. While baseline information is being collected, there is Utah Division of Wildlife Resource (UDWR) information to aid in the assessment of historical beaver trends for the Forest. The 1979-80 and 1998-1999 Furbearer Harvest Reports ((Proven, 1980, and Wolfe, 1999 respectively) and the 1971-1982 Beaver Distribution, Habitat and Population Survey (Blackwell, 1993) provide relevant information on beaver. The 1979-80 Harvest and 1971-82 Survey Reports display beaver estimations by "units" while the 1998-1999 Harvest Report considers regions (Great Basin, Rocky Mtn., Uintah Basin, and Colorado Plateau). The Survey restates the trend from the 79-80' Report.

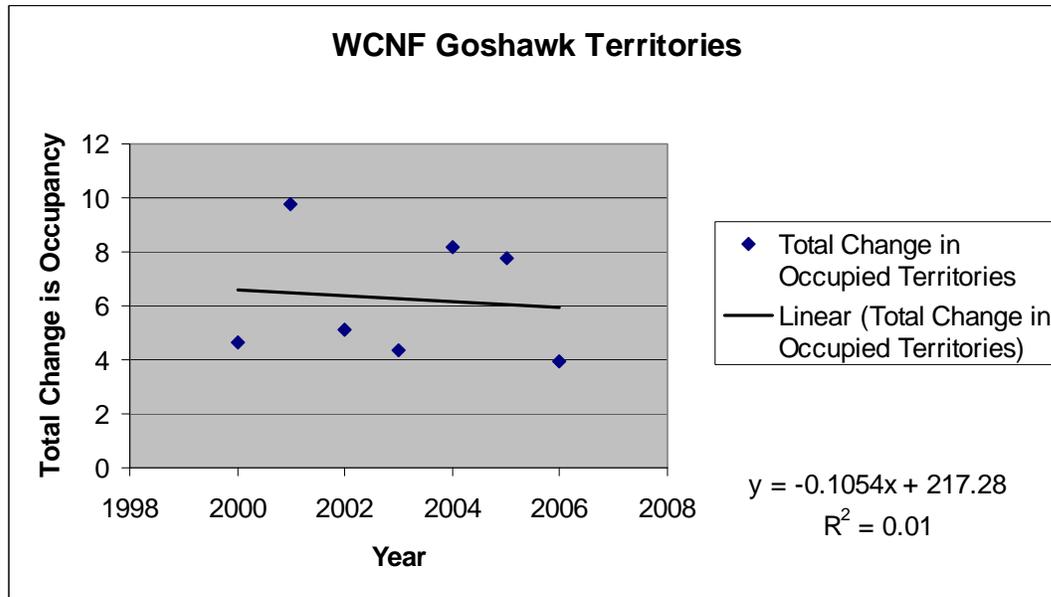
There are 13 trapping units that include some National Forest System lands administered by the Wasatch-Cache National Forest. UDWR beaver units include all land ownerships. In the UDWR's 1993 document three units were determined to be increasing and 9 units were determined to be static.

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 trend, it is assumed that the determinations made in the State of Utah Survey Report remain valid.

Beaver monitoring is accomplished on the Forest by monitoring random sections (1 square mile) across the Forest. None of these sections fall in areas along the Logan River where recreation residence tracts are present. In areas where the tracts are, the river size and proximity to U.S Highway 89 greatly decrease beaver habitat.

Goshawk. Figure 1-Wildlife shows the territory occupancy across the Forest from 1999 to 2006 (adjusted to 1999 occupied territories, based on the difference in numbers of territories monitored). The baseline used was the 1999 territory occupancy of 7 known occupied territories. Adjusting to the 1999 occupied territories there has been a high in 2001 of 9.76 occupied territories and a low of 4.33 in 2003. These differences in years are not statistically significant, showing a static trend in the goshawk population Forest-wide.

Figure 3.1-Wildlife. Total change in occupied territories on the WCNF, 1999-2006.



Territory occupancy numbers from Figure 3.1 in table form.

	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.

The monitoring plan calls for the monitoring of 50% of the goshawk territories on the Forest annually. At the present time this totals 25 territories. There have been no goshawk territories identified in the portion of Logan Canyon where recreational residence tracts are located, although many tracts are adjacent to suitable habitat and some contain suitable habitat.

Snowshoe Hare. Snowshoe hare monitoring for the Forest Plan is divided into two populations (Uinta Mountains and Bear River/Wasatch Range) because of natural barriers that keep the populations from intermixing. Monitoring grids (5 transects with 10 points in each transect) were established in vegetation types that support snowshoe hare across the Bear River/Wasatch Range in 2003. From 2003 – 2005 hare numbers increased while there was a decrease in 2006. It is too early to tell if this decrease is part of a normal snowshoe hare cycle or not. Annual surveys will continue and evaluation of the data will take place at an appropriate time.

Recreational residence tracts do have snowshoe hare habitat, although none of the monitoring grids are located in the tracts. Snowshoes will use woodpiles, under porches and such as hiding cover, but there is no indication of decreases or increases within the tracts. With the length of time the tracts have been in place it is assumed that equilibrium has been reached.

Endangered, Threatened, and Sensitive Species (terrestrial species)

The U.S. Fish and Wildlife Service (FWS) Utah Field Office releases their list, “Federally Listed and Proposed (P) Endangered (E), Threatened (T), and Candidate (C) Species and Habitat in Utah by County” (FWS, 2006) on a periodic basis. Species listed as occurring or having habitat in Cache County are the bald eagle (*Haliaeetus leucocephalus*), western yellow-billed cuckoo (*Coccyzus americanus*) and the Canada lynx (*Lynx Canadensis*). These are shown on Table 2-Wildlife with the indication of whether they have habitat in or adjacent to the recreational residence tracts. Statements about each species follow the table.

Table 2-Wildlife. Federally listed and candidate species from Cache County, Utah.

Species/ (Status)	Scientific Name	Habitat in Logan Canyon
Bald Eagle (T)	<i>Haliaeetus leucocephalus</i>	Yes
Canada lynx (T)	<i>Lynx Canadensis</i>	Yes
Yellow-billed cuckoo (C)	<i>Coccyzus americanus</i>	Yes

Forest Service sensitive species are those species identified by the Regional Forester as “[species] for which population viability is a concern as evidenced by ... significant current or predicted downward trends in population numbers or density... or significant or predicted downward trends in habitat capability that would reduce a species existing distribution” (FSM 2670.5). Forest Service sensitive terrestrial species for the Wasatch-Cache National Forest are on Table 3-Wildlife. Species that have habitat in or very near recreational residence tracts are discussed below the table. They include the Townsend’s big-eared bat (*Corynorhinus townsendii*), great gray owl (*Strix nebulosa*), Northern goshawk (*Accipiter gentilis*), and Northern three-toed woodpecker (*Picoides tridactylus*).

Table 3-Wildlife. Habitat Presence for Endangered, Threatened, and Sensitive Species in Recreational Residence Tracts in Logan Canyon

Track/District	Bald Eagle	Y-b Cuckoo	Lynx		Spotted Bat	Wolverine	Big-eared Bat	Boreal Owl	Flam. Owl	Great Gray	Goshawk	Peregrine	3-toed	Sharp-tail	Sage Grouse	Pygmy Rabbit
Status	T	C	T		S	S	S	S	S	S	S	S	S	S	S	S
Beirdneau, D-7	N	N	N		N	N	N	N	N	N	N	N	N	N	N	N
Birch Glen, D-7	Y	Y	N		N	N	N	N	N	Y	Y	N	Y	N	N	N
Brachipod, D-7	Y	Y	N		N	N	Y	N	N	Y	Y	N	Y	N	N	N
Brown’s Rolloff, D-7	Y	Y	N		N	N	N	N	N	Y	Y	N	Y	N	N	N
Chokecherry, D-7	Y	Y	N		N	N	N	N	N	Y	Y	N	Y	N	N	N

Gus Lind, D-7	Y	Y	N		N	N	N	N	N	Y	Y	N	Y	N	N	N
Hailstone, D-7	Y	Y	N		N	N	N	N	N	Y	Y	N	Y	N	N	N
Juniper, D-7	Y	Y	N		N	N	N	N	N	Y	Y	N	Y	N	N	N
Lower Card, D-7	Y	Y	N		N	N	N	N	N	Y	Y	N	Y	N	N	N
Pine Bluffs, D-7	Y	Y	N		N	N	N	N	N	Y	Y	N	Y	N	N	N
Upper Card, D-7	Y	Y	N		N	N	N	N	N	Y	Y	N	Y	N	N	N
Valhalla, D-7	Y	Y	N		N	N	N	N	N	Y	Y	N	Y	N	N	N

Status:

- E – Endangered
- T – Threatened
- C – Candidate
- S – Sensitive

Bald eagle. Except for 8 nesting pairs of bald eagles, none of which are on the Wasatch-Cache National Forest, bald eagles are considered winter visitants in Utah (FWS, 2006). Although roost trees and open water for foraging is present in the Logan Canyon, the area receives only incidental use with the most activity along the Little Bear River west of the Forest in Cache Valley. Continuation of the recreational residence tracts would have no effect on bald eagles.

Yellow-billed cuckoo. Utah is on the outer edge of the range for yellow-billed cuckoos. The Bear River Range along with the Wasatch Range and the Uinta Mountains are an island of habitat occasionally used by the species. All reports in Cache County are from areas below the Forest boundary although all recreational residence tracts are within their elevational range. Willows and other shrubby vegetation that has been removed and replaced with blue grass within these tracts have reduced the amount of habitat for the cuckoo to a small degree. Continuation of these tracts would have no effect on the yellow-billed cuckoo.

Canada lynx. Logan Canyon cuts across the north / south Bear River Range that creates the important wildlife corridor connecting the Wasatch and Uinta Mountain Ranges with other ranges in Idaho and Wyoming. In recent years one known lynx that left Colorado where it had been transplanted used this corridor to make its trip back towards Canada where it was captured. The most suitable lynx habitat with the best connectivity is higher in the canyon above the recreation residence tracts. In the area where the tracts are located, lynx habitat is generally located on the north facing slopes where mature conifer stands are located. The south facing slopes are drier and consist mostly of pinyon-juniper stands and grasses. Where it is possible for a lynx to traverse this section of canyon the route does not contain the most suitable habitat. The Federal Register of Thursday, July 3, 2003, in the FWS “Remanded Determination of Status for the Contiguous United States Population Segment of the Canada Lynx; Clarification of Findings; Final Rule,” it states, “...There is no evidence of lynx reproduction in Utah. We conclude that lynx that

occur in Utah are dispersers rather than residents...” The proposal to continue recreation residence tracts in Logan Canyon would have no effect on lynx.

Townsend’s big-eared bat. There is a known population of big-eared bats in Logan Cave just above the highest of the recreation residence tracts. These bats forage along the Logan River. The continued existence of the tracts would have no impact on the big-eared bats that have existed with the tracts for decades.

Great horned owls. Great horned owl habitat is present in the coniferous stands south and east of the recreation resident tracts. The continued existence of the tracts would have no impact on the owls that may have existed with the tracts for decades.

Northern goshawk. Goshawk habitat is present in the coniferous stands south and east of the recreation resident tracts and extends into portions of some of the tracts. The continued existence of the tracts would have no impact on the goshawks that may have existed with the tracts for decades (see MIS, above).

Northern three-toed woodpeckers. Three-toed woodpecker habitat is present in the coniferous stands south and east of the recreation resident tracts with some use possible in some of the tracts. The continued existence of the tracts would have no impact on the woodpeckers that may have existed with the tracts for decades.

3.1.2 Environmental Consequences

Based on public scoping and Interdisciplinary Team discussions, the following issue was identified as relevant to this analysis for Wildlife Resources:

Issue: How will continued recreation residence use affect wildlife, including threatened, endangered, and Forest Service sensitive species? What will be the impact to migratory bird species and Forest Service management indicator species?

Under both alternatives, because of the small amount of acreage involved, there would be no change in big game, small game, small mammals, and neo-tropical migrants. Distribution and movements might be affected to a degree, but overall there will be no noticeable change. Trends on management indicator species across the forest would not be affected, nor would they be affected at the project level. There would be no effect on endangered, threatened, or candidate species and no impact on Forest Service sensitive species.

No Action Alternative

Under the “no action” alternative recreation residences, out buildings, roads, bridges and other improvements would be removed. Disturbed areas would be revegetated with native species or return to native species through natural succession. The tract areas would provide more security for wildlife species and would tend to be used by a more diverse array of species. This would be especially true if the areas were managed for

properly functioning condition with a pattern of vegetation and age classes that would fall into historic landscape patterns. Use patterns would simulate what is presently found further away from the tracts and other developments in Logan Canyon.

Proposed Action Alternative

Under the “action” alternative of reissuing permits to residences, out buildings, roads, bridges and many other improvements would remain. In discussing terrestrial wildlife and the impacts of recreation residence tracts it must be remembered that these tracts have been in place for several decades. As such, impacts on wildlife occurred long ago when cabins and roads were first built. Wildlife species have long since grown accustomed to the development or left the area. Salt blocks, feeders, and other activities will tend to attract some wildlife species that might avoid the area more without such attractants, but in general, what is present now would remain. Following the recreation residence guide would restore and keep natural vegetation in place to benefit the most diverse array of species possible. This vegetation would continue to favor species that prefer and use older age classes of vegetation.

In-lieu lots

Three of the five in-lieu lots are located upland, away from riparian areas. With the possible future relocation of cabins to these three in-lieu lots, there would be minor, short-term impacts to wildlife habitat, since previously undisturbed habitat would be affected. However, over the long term, wildlife would benefit from the use of these three in-lieu lots because they are in less sensitive riparian areas. Two of the in-lieu lots are located within riparian areas. Relocation to these two in-lieu lots would have the potential to negatively affect wildlife habitat for species that might use these wetter areas.

3.1.3 Cumulative Effects

Cumulative effects on wildlife are centered on wildfires and human activities such as developed recreation sites, roads and road use, maintenance of power and telephone lines and right-of-ways, maintenance and replacement of water lines.

In general, wildfires are beneficial to wildlife. In setting back natural succession the area would move towards properly functioning condition with diverse age classes of vegetation that would provide habitat for the greatest number of species.

Road use may likely increase as the population in northern Utah increases. This will increase the possibilities of more automobile wildlife collisions. It will also reduce habitat effectiveness for some species that tend to naturally avoid roads.

Replacement and maintenance of waterlines and power lines are short-term disturbances that may displace wildlife.

If recreational residences were continued in Logan Canyon, wildlife use patterns would continue as they have for the past several decades. Decreases in wildlife populations would be due to increased use in the canyon due to population increases and not in the static recreational residence tracts or cabins. If the residences were to be discontinued wildlife use patterns would change and the areas occupied by the tracts might be used more. However, an increase in wildlife numbers would most likely not be detectable.

3.2 Aquatic Resources

3.2.1 Affected Environment

3.2.1.1 Project Area Description

The project area includes 12 recreation resident tracts that have a total of 84 cabins. All of the tracts are located between the City of Logan and Temple Fork road along the Logan River. The tracts range from the Gus Lind tract, located 3.5 miles up canyon from the Forest boundary near Logan to the Brachiopod tract, located 13.6 miles up canyon from the Forest boundary. Management prescriptions, from the Revised Forest Plan (Wasatch-Cache National Forest 2003) include 2.5 (Scenic Byway), 2.7 (Special Interest Area) and 3.1A (Aquatic Habitat Emphasis).

The broader analysis area with respect to aquatic effects lies within two Hydrologic Units, the Lower Logan River Hydrologic Unit (HU) and the Cottonwood Hydrologic Unit (HU). The Logan River HU is 16,600 acres in size and extends from First Dam on the Logan River upstream to the Right Hand Fork of the Logan River. It includes the perennial flows of Spring Creek, an unnamed tributary out of Beirdneau Hollow, and intermittent flows from Card Canyon.

The Cottonwood HU is 15,800 acres in size and extends from Right Hand Fork upstream to Temple Fork. Only the Brachiopod recreation residence tract is within this reach. The perennial flows of Chicken Creek and an unnamed tributary of Wood Camp Hollow and the intermittent flow from Cottonwood Creek enter the Logan River through this reach. Farther up river, the stream from Logan Cave also enters the main Logan River in this hydrologic unit. Approximately 3,900 acres of the Lower Logan Canyon HU and 3,900 acres of the Cottonwood HU are located within 300 feet of live water. Of these, approximately 128 acres (3%) in the Lower Logan Canyon HU and 6 acres (0.2%) in the Cottonwood HU are located within the recreation residence tracts. See Table 1-Aquatics.

Please note: this total of 134 acres differs from the total of 50 acres in recreation residence tracts as discussed in Chapter 1. The total in Chapter 1 includes only the area occupied by residence lots, in-lieu lots, lots no longer used due to changes in the river channel, and tract roads. It does not include interior areas (open spaces) within the tracts not currently or ever planned for occupancy or use. The 134 acres includes *all* areas within the 12 tracts within 300 feet of live water.

Table 1-Aquatics. Acres within the hydrologic unit (HU), acres within 300 feet of live water in the HU, and acres (and percent) within 300 feet of live water in recreation residence tracts

Hydrologic Unit (HU)	Acres (FS only) in HU	Acres in HU within 300 ft of live water	Acres in rec res tracts within 300 ft of live water	Rec res acres as a percent of the HU within 300 ft of live water
Lower Logan Canyon	16,600	3,900	128	2.6%
Cottonwood	15,800	3,900	6	0.2%

Other developments in Logan Canyon may also have an impact on riparian areas. These include such things as roads and trails, campgrounds and picnic areas. Recreational use of these areas can potentially compact soils and contribute sediment to the river. The area of impact within the hydrologic units under consideration is shown in Table 2-Aquatics.

Table 2-Aquatics. The area within 300 feet of the stream and the percent of recreational residence tracts, roads, and trails and developed uses (campgrounds) within the Lower Logan Canyon HU and Cottonwood HU

Hydrologic Unit (Hu)	Acres in HU within 300 ft of live water	Rec Res acres as a percent of the HU within 300 ft of live water	% of area within 300 ft of live water in roads and trails	% of area within 300 ft of live water in developed use	Total % of area within 300 ft of live water
Lower Logan Canyon	3,900	2.6%	0.7%	1.8%	5.1%
Cottonwood	3,900	0.2%	0.4%	0.1%	0.7%

3.2.1.2 Management Direction

The Forest Plan provides the primary direction for managing activities and uses of National Forest System lands. The majority of the 12 tracts in this analysis are located in close proximity to the Logan River. In the Forest Plan, the Logan River is classified as a Class I riparian area (Forest Plan, Appendix VII, p.6) making it a high priority for maintaining or enhancing its values. With respect to Aquatic Resources, a number of terms are especially pertinent to the analysis in this EA. The definitions provided below are taken from the Forest Plan (Glossary, page GL-19).

Riparian Area - Land areas that are directly influenced by water. They usually have visible vegetative or physical characteristics showing this water influence. Steamsides, lake borders, or marshes are typical of riparian areas; The ecosystems around or next to water areas that support unique vegetation and animal communities as a result of the influence of water.

Riparian Habitat Conservation Area (RHCA) – An area that includes traditional riparian corridors, wetlands, intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems by (1) influencing the delivery of coarse sediment, organic matter, and woody debris to streams, (2) providing root strength for channel stability, (3) shading the stream, and (4) protecting water

quality. This designation still allows for a full range of activities but it emphasizes the achievement of riparian management objectives that are identified on a site-by-site basis. These objectives should include riparian vegetation and in stream habitat condition.

RHCAs are divided into four categories. They extend on both sides, from 100 to 300 feet from the water's edge, depending on characteristics of the water bodies and the fisheries they support. Thus, each RHCA for the Logan River and its tributary streams is from 200 to 600 feet in total width. For example, the RHCA for the Logan River extends 300 feet upslope each side of the river, because it is a Category I (fish-bearing stream).

The Forest Service uses Riparian Management Objectives (RMOs) to provide specific, activity or project level guidance to help conserve riparian and aquatic values within RHCAs. In this case, RMOs have been developed for the recreation residence program on the Wasatch-Cache National Forest. These RMOs address not only the recreation residence itself, but also other improvements such as sheds, access roads, bridges, decks, patios, etc. A primary objective of RMOs is to retain and improve vegetation in the RHCA in a way that helps to minimize sedimentation, maintain woody debris, prevent pollution, and shade the creek to keep water temperatures low, while at the same time allowing recreation residence use, access, and wildfire protection.

Fifteen recreation residence lots in Logan Canyon are entirely outside of RHCAs. The remaining 69 lots are located partially, or completely, within an RHCA and would be subject to a number of riparian habitat protection measures. The list of the allowable actions for riparian area protection is included in Appendix D (Riparian Management Objectives for Recreation Residences for the Wasatch-Cache National Forest).

3.2.1.2 Existing Conditions

Fish species which inhabit the Logan River include the native Bonneville cutthroat trout and non-native brown and rainbow trout. Non-native fish have been stocked in the drainage and brown trout have developed a self-sustaining population.

The recreation residence tracts being analyzed in this document are located within the riparian area and flood plain of the Logan River. Many of the cabins were constructed during the 1920s through the 1950s. Many campground and picnic facilities in Logan Canyon were also constructed during this period. Likely not recognizing the importance of environmental protection at the time, many of these facilities, including virtually all of the recreation residences, were built in riparian areas. More specific to the recreation residences, over the years, natural vegetation around the residences was altered as recreational resident owners constructed cabins, outbuildings, and roads. In some cases, larger trees have been removed for power lines and to reduce the hazard of falling trees. Often, dead and down trees were removed, rather than allowed to remain in the stream channel and provide aquatic benefits. In some instances, this was done for flood control purposes, while in others it was likely done for wildfire protection, aesthetic, or safety reasons. An aquatics technical report has been prepared in support of this EA which

provides additional detail of existing conditions in these riparian areas (available in the project record). The following is a summary of the existing conditions with respect to aquatic habitats.

In some areas, the conversion of vegetation from natural vegetation to grass immediately adjacent to the Logan River and its tributaries has reduced the amount of unaltered terrestrial and aquatic habitat. Where overhanging vegetation has been replaced with low grasses, little or no shade or cover for aquatic and semi-aquatic species is provided. This reduces hiding cover for fish, hatching structure for aquatic insects and nesting cover for birds.

In some instances, sand bags, installed to provide bank protection during high run-off in the spring, were left along the stream bank. Some of the bags have rotted away, allowing sand to go directly into the stream channel. In some locations, sediment runoff is occurring from access roads, particularly those that run parallel to the Logan River. In some locations, use of the land around the recreational residence has led to an increase in soil compaction in these areas. This in turn has decreased water filtration, resulting in overland flow and a potential for adding silt to the river. An increase of sand and silt in the river can smother spawned eggs and reduce habitat for young fish and aquatic insects. Residential use in locations near streams increases the risk of introducing contaminants into the water and damaging aquatic life. The type of impacts can range from elevated nutrient levels, to toxic contamination from chemicals so high as to kill fish and macro-invertebrates, or reduce the diversity of species. Inspections of the recreation residence tracts have provided no evidence of contamination from any sanitation facilities.

Over the years, summer home construction and use has impacted channel conditions in ways that affect fish and other aquatic life. Removal of trees, shrubs, and other vegetation along streams has weakened banks and increased the potential for sloughing in some areas. In areas immediately near homes, larger trees that have fallen have been removed from the site or sawed into small sections, rather than allowed to become a part of the natural stream environment and provide habitat. In other instances, dirt berms have been constructed to shift water flows away from homes. People's natural attraction to water has resulted in pockets of compacted soils and loss of vegetation on some stream banks and streamside areas. Finally, in a few instances small weirs have been placed in the stream to create pools. While these can create habitat for small fish, these features also tend to restrict fish movement and raise water temperatures.

Some cabin owners have desired to have lawns and watered vegetation at their recreation residences. To provide water for these amenities, pumps have occasionally been used to pull water from the stream channel to run sprinkling systems.

3.2.2 Environmental Consequences

This section presents the effects of recreation residence management on the following issue:

***Issue:** What will be the effect of continued recreation residence use on aquatic life, including threatened, endangered, and Forest Service sensitive species, such as the Bonneville Cutthroat trout? As a component of the aquatic ecosystem, how will continued summer home use affect Riparian Habitat Conservation Areas?*

No Action Alternative

Under the no action alternative, 12 recreation residence tracts would be removed and the RHCA would be restored to natural vegetation. The 84 recreation residences would be removed over a 10-year period. Approximately 3 miles of tract roads would be closed and restored to vegetation.

Under this scenario, because recreation residences, improvements, and roads would be removed and the vegetation eventually restored, the impact area would decrease from 5.1% to 2.5% of the Lower Logan River HU. In the Cottonwood HU, the removal of the recreational residences would decrease the impact area by about 0.2% from .7% to .5% (see Table 3-Aquatics).

Table 3-Aquatics. Area within 300 feet of the stream and the percent impacted by recreational residence tracts, roads and trails, and developed uses (campgrounds) within the Lower Logan Canyon and Cottonwood HUC. Table reflects the elimination of the recreational residences and their associated facilities.

Hydrologic Unit (Hu)	Acres in HU within 300 ft of live water	Rec Res acres as a percent of the HU within 300 ft of live water	% of area within 300 ft of live water in roads and trails	% of area within 300 ft of live water in developed use	Total % of area within 300 ft of live water
Lower Logan Canyon	3,900	0	0.7%	1.8%	2.5%
Cottonwood	3,900	0	0.4%	0.1%	0.5%

Proposed Action Alternative

Under the proposed action, 84 recreation residence permits would be authorized for continued use and recreation residences would be managed according to the Administrative Guide. Improvements, as discussed in Chapter 1 would be authorized under association permits.

Under this alternative, as the permits are reissued, an impact area of 2.6% of the area within 300 feet of the Logan River would continue in the Lower Logan Canyon HU. In the Cottonwood HU, an impact area of 0.2% of the HU would continue.

As best management practices are implemented and active restoration of natural vegetation occurs under the Administrative Guide, the conversion of grass to more natural vegetation would occur. Cabin debris that has been identified on the lot would be removed per compliance inspections.

As per the Administrative Guide and best management practices, sandbags would only be allowed from November 1 to July 15. Sandbags would have to be removed by cabin owners by July 15 of each year. Fire rings, picnic tables, and outbuildings would be moved within 25 feet to the main cabin as they are replaced. As existing outhouses are replaced, they would be replaced with holding tanks that have been pre-approved by the County Health Department. Impacts would be expected to continue immediately around cabins, but would likely be reduced overall as most areas within 25 feet of the Logan River and its tributaries revert back to natural vegetation (see Appendix D for a list of allowable actions in RHCA's).

Watering of lots would not be allowed. All outside pumps would be required to be removed from the tracts. Drainage alterations would be corrected in the future in order to meet riparian management objectives. However, because they are covered in native vegetation, and are not causing unacceptable impacts, existing small dirt berms protecting cabins from high water would not be required to be removed or altered by cabin owners. Removal of these berms could cause exposure of bare soil, more conducive to erosion. Only after a site-specific analysis by resource specialists would changes be allowed to existing drainage structures.

As the Administrative Guide is implemented, the removal of trees and other large wood would decrease. Bank stability and riparian habitat conditions would improve as best management practices are implemented to meet the riparian management objectives and as riparian vegetation is restored in areas that have unstable banks.

In-lieu lots

Five in-lieu lots were reviewed and analyzed for potential use. Two of the lots are in the Birch Glen tract, within the RHCA, and are prone to flooding. The use of these lots for future recreation residences would be inconsistent with the Riparian Management Objectives.

The remaining three lots are greater than 300 feet from the Logan River and are located outside the RHCA. If these in-lieu lots were exchanged with existing lots that are currently in the RHCA, there would be a minor short-term impact to aquatic/riparian resources as the original cabins are dismantled and the old site revegetated. The exchange of three lots within the RHCA for the three in-lieu lots would be a benefit to riparian vegetation, water quality, and channel conditions for aquatic/riparian species.

Threatened, Endangered, and Sensitive Aquatic Species

A Biological Assessment/Evaluation has been prepared for this project to assess the impacts to Threatened, Endangered, and Forest Service Sensitive Species. The determination was made that there would be "no impact" to any federally listed aquatic species. For Forest Service sensitive aquatic species, it was determined that the proposal "may impact" individual Bonneville cutthroat trout or their habitat, but it is not likely to

contribute to a trend towards federal listing or cause a loss of viability to the population or species.

3.2.3 Cumulative Effects

Cumulative effects to aquatic resources are those past, present, and reasonably foreseeable activities which would add to the direct and indirect impacts noted above.

Other activities in Logan Canyon, such as existing roads and trails, developed sites (campgrounds), dispersed camping and two dams would continue to affect the RHCA and aquatic habitat and species in the Lower Logan Canyon and Cottonwood hydrologic units (see Table 3–Aquatics).

Roads and trails impact approximately 0.7% and 0.4% of the RHCA in the Logan Canyon and Cottonwood hydrologic units, respectively. The impacts from the roads and trails include loss of stream shading as vegetation is cleared, increased runoff from compacted soils, and loss of in-channel habitat as large hazard trees are removed.

Developed uses (campgrounds and picnic areas) are estimated to impact an additional 1.8% and 0.1% of the RHCA in the Lower Logan Canyon and Cottonwood hydrologic units respectively. These impacts include loss of stream shading as vegetation is cleared, increased runoff from compacted soils, and loss of in-channel habitat as large hazard trees are removed and used for fuel wood.

In all, 2.41% and 0.5% of the RHCA would be impacted by land management activities in the Lower Logan Canyon and Cottonwood hydrologic units respectively. A more detailed discussion of the impacts associated with recreation management activities can be found in Meehan (1991).

Another land management activity that has potential to impact aquatic systems is cattle grazing. Impacts from grazing can vary greatly between allotments, type of livestock grazed, water availability, fencing, herding, etc. Based on numbers of livestock per mile of accessible water, it is anticipated that Cottonwood HUC would have more impacts to it than Lower Logan Canyon. Most of these impacts are occurring higher in the drainages than where summer homes are located. Although cattle grazing is not strongly evident in most of the recreation residence tracts, there is a small overlap between the Logan Canyon cattle allotment and the Brachiopod recreation residence tract. On occasion, a few cattle will wander into the tract.

In the Lower Logan River, the Bonneville cutthroat trout population is divided into three sections by Second and Third Dams. Fish below the Second Dam are impacted as available habitat is reduced by the water withdrawals at that dam. Water is diverted into an irrigation canal and the stream flow is reduced. Upstream migration, which prevents genetic exchange within the species, is eliminated by the presence of these two dams.

Other factors that impact the Bonneville cutthroat trout include non-native fish (brown and rainbow trout), and *Myxosoma cerebralis*, an exotic parasite that causes whirling

disease. Impacts from these exotic species can cause direct mortality or merely reduce the physical condition of the species.

Dispersed use, such as hiking and camping, may increase in the areas currently occupied by the recreational residences. The impacts from dispersed use may or may not be greater than those currently occurring.

Despite these actions that contribute to the threats to Bonneville cutthroat trout populations and sport fisheries in Logan River and its tributaries, with the implementation of the Administrative Guide, the additive effects from continued recreation residence use is minor and will not result in significant effects to the aquatic systems. The overall habitat would improve from current conditions as the 2003 Forest Plan and the Administrative Guide for Recreational Residences are implemented.

3.3 Vegetation

3.3.1 Affected Environment

The project area includes the 12 recreation residence tracts on the Logan District. All are located along the Logan River on the Wasatch-Cache National Forest, with the exception of Beirdneau, which is located along a tributary to the Logan River.

The typical habitat in the recreation residence tracts consists primarily of deciduous trees, mixed mountain shrub (snowberry, currant, mountain lover) and some sagebrush. Willow occurs along the riverbanks. Some tracts contain scattered juniper trees, higher up on the slope. There are patches of tall forbs scattered throughout the tracts. Conifers are rare in these lower elevation tracts.

3.3.1.1 Threatened, Endangered, and Sensitive plant Species

A preliminary review of aerial photographs and topographic maps of lower Logan Canyon indicated occurrences or potential habitat for seven TES plant species. Table 1-Vegetation lists the species that occur or have potential habitat in lower Logan Canyon.

Table 1-Vegetation. TES species with known occurrences or potential habitat in lower Logan Canyon

Sensitive	Recommended Sensitive
<i>Draba maguirei</i>	<i>Angelica wheeleri</i>
<i>Erigeron cronquistii</i>	<i>Arabis glabra</i> var. <i>furcatipilis</i>
<i>Eriogonum brevicaulum</i> var. <i>loganum</i>	
<i>Penstemon compactus</i>	
Threatened	
<i>Primula maguirei</i>	

In June 2006, recreation residence tracts were surveyed for the occurrence and potential habitat for TES plant species. No TES plant individuals or populations were found and very little potential habitat exists within any of the recreation residence tracts.

3.3.1.2 Noxious Weeds, Non-Native and Invasive Species, and Horticultural Plantings

Using aerial photos, topographic maps, and local knowledge, the area within and surrounding the recreation residence tracts was surveyed for the presence of noxious weeds and non-native invasive species. Although varying in size and degree of infestation, the following noxious weeds were found in almost every tract: burdock, houndstongue, Canada thistle, silverleaf nightshade, oxeye daisy, and Russian olive. These weeds are typically found in high human-use areas. Of these weeds, Canada thistle and silverleaf nightshade have to be chemically treated to be controlled. They cannot be effectively controlled by pulling.

Common to all of the recreation residence tracts was the use of horticultural and non-native plantings. In varying degrees throughout the tracts, these plantings include poppies, lilacs, iris, daisies, Vinca (which spreads readily), lily of the valley, Arborvitae, bishops weed, sedum (a non-native species), and yew. These are all horticultural species, typical of urban landscaping, and were identified in several residences in almost every tract.

Noxious weeds that have been mapped in other parts of Logan Canyon, but not found in the recreation residence tracts include dyers woad, bull thistle, field bindweed, white top, and poison hemlock. These are weeds that were mapped in areas of high human use, such as campgrounds and trailheads. These mapped locations are considered a seed source and have the potential of being transported to any of the recreation residence tracts. These weeds will be treated through the Forest and District noxious weed program.

3.3.2 Environmental Consequences

3.3.2.1 Threatened, Endangered, and Sensitive Plant Species

Issue: How will continued recreation residence use affect vegetation, including threatened, endangered, and Forest Service sensitive plant species?

No Action Alternative

Under the No Action alternative, 84 recreation residences would be removed and all roads closed and restored over a 10-year period.

Surveys conducted for TES species within the recreation residence tracts found no plants and very little potential habitat for rare plants. The vegetation within the recreation residence tracts has been disturbed during the construction of the cabins, outbuildings and roads, and altered by the human use associated with the permitted recreation residences.

Even if under the no action alternative all structures and roads were removed, there would be no effect on TES plant species since none were found in the project area no suitable habitat exists within the tracts.

Proposed Action Alternative

The effects on TES plant species would be the same as under the No Action Alternative, because no TES plants have been found and there is no potential habitat within the recreation residence tracts.

3.3.2.2 Noxious Weeds and Non-native Plant Species

Issue: To what extent will recreation residence use affect the spread of noxious and non-native invasive plant species?

No Action Alternative

Since under the No Action alternative all recreation residence structures and roads would be removed and revegetated over a 10-year period, in all tracts except Upper Card, the vector for introducing new weed infestations would be eliminated. Upper Card would still have potential vectors due to the Forest Service road running through the tract. There would still be the need for an aggressive weed management plan to deal with existing infestations in all tracts until they are deemed weed free.

Proposed Action Alternative

Under the proposed action, permit renewals would be authorized for the recreation residences and improvements included in association permits. With permit renewals, an aggressive weed management plan would be implemented to deal with existing noxious weed infestations and potential non-native invasive species within the tracts.

Non-native vegetation generally is not compatible with the goals for natural forest settings and requires additional analysis (per the 2008 Administrative Guidelines).

The full range of treatment options, including herbicides, would be allowed under the 2006 Record of Decision for Noxious Weed Treatment Program for the Wasatch-Cache National Forest. An aggressive program to control noxious weeds would be implemented. Herbicides will only be applied by State certified applicators or under their direct supervision, using products approved for use by local governments.

In-lieu lots

Five in-lieu lots were reviewed and analyzed for potential use if needed. Two of the lots in the Birch Glen tract are within the RHCA and are prone to flooding. They would not be acceptable as replacement lots, regardless of their effect on TES plant and noxious weeds.

The remaining three lots are located outside the RHCA. The exchange of three lots within the RHCA for three in-lieu lots outside the RHCA would be a benefit to riparian vegetation. Since no TES plant species and no potential habitat for TES plant species was found within the recreation residence tracts, there would be no effect from the use of these three in-lieu lots. Aggressive noxious weed control, if needed, would be done in both the old lots as they were revegetated and in the new lots, if a noxious weed infestation did occur.

3.3.3 Cumulative Effects

TES Species

Because there are no direct or indirect effects on any threatened, endangered, or sensitive plant species, there are no cumulative effects.

Non Native, Invasive Species and Horticultural Plantings

Noxious weed establishment is dependent on two main factors, weed seed dispersal and potential habitat. The literature lists numerous vectors for weed seed dispersal. Humans, animals both wild and domestic, wind, and water have all been identified as having the ability to transport weed seeds. Potential habitat is dependent on the type of weed and its life history. The weeds that are documented on the Logan Ranger District are considered “rangeland weeds” that can establish and thrive in several vegetation types. The rate of spread and magnitude of the impacts is also variable and depends on several site specific conditions. The characteristics of the establishing weed, health of the ecosystem, and micro-climate all combine to affect the outcome. Several actions have the potential to have an effect by either introducing or enlarging weed infestations, and other actions do not.

Of the actions listed in Table 3-1 (Cumulative Effects), the following have no effect on weed infestations: fish stocking in the Logan River, Logan Canyon Highway and bridge construction, past wildfires, and riparian area restoration and improvements.

Fish management serves to improve riparian areas and protects the integrity of streamside vegetation thus preventing noxious weed establishment. Logan Canyon Highway and bridge construction and riparian area restoration and improvements follow BMPs outlined by the Forest Service which includes noxious weed abatement. No past wildfires are known in the area of the recreation residences.

An action that may have a potential effect is the operation and maintenance of developed recreation facilities. Noxious weed infestations have been identified in several developed recreation sites, as follows:

- Bridger Campground - dyers woad
- Gus Lind Flat – dyers woad
- Guinavah Malibu Campground – dyers woad, burdock, houndstongue
- Card Guard Station – burdock
- Chokecherry – burdock, dyers woad, houndstongue
- Preston Valley Guard station - burdock, dyers woad, houndstongue
- China Row Picnic Area – burdock, dyers woad, houndstongue
- Wood Camp Campground- burdock, dyers woad, houndstongue

Potential spread of noxious weeds is possible if recreation residence owners use the developed recreation facilities and inadvertently carry seed back to the recreation residence tracts via their vehicle tires. Dispersed use by non-cabin owners may also potentially spread noxious weeds.

3.4 Soil and Water

3.4.1 Affected Environment

Logan Canyon is a 214 square mile watershed containing 7 subwatersheds located east of Logan, Utah. The Logan River flows out of Logan Canyon into the Bear River near Cutler Reservoir. The average annual discharge of the Logan River near the mouth of Logan Canyon is about 215 cubic feet per second (cfs) and the minimum and maximum instantaneous extremes in discharge are 50 cfs and 2000 cfs, respectively (Utah State of 2004). Most of the recreation residences are located next to the Logan River with the exception of Beirdneau which is located along a tributary to Logan River in Beirdneau Hollow. The streambanks of the recreation residences areas along the Logan River are mostly stable and have a mix of well-vegetated, deep-rooted vegetation, and shallow-rooted vegetation with man-made stream stabilization structures such as earth berms, sandbags, logs, and broken cement slabs.

Gus Lind, Birch Glen, Juniper, and Browns Rolloff areas have a few eroding streambanks on the Logan River that lack deep-rooted vegetation. On Highway 89, rip-rap has been placed along the outside meanders of the Logan River to prevent stream erosion and these structures restrict the lateral movement of the Logan River and keep the river flowing in the same place through the canyon. Bridges that access the tracts cross the Logan River at all of the tracts except Beirdneau tract.

Floodplains and Wetlands – A floodplain is located along the Logan River in the valley bottom of Logan Canyon and is where most of the recreation residences are located.

Table 1- Water. Occurrence of Floodplains by Tract and Lot Number.		
Recreation Residence Tract	Lot Number and Total Area in Floodplain	Remarks
Gus Lind (5 permits)	All lots (1-5); 2.2 acres	All homes are on floodplain except home in the fourth lot up from down-canyon.
Beirdneau	None; 0.0 acres	Ephemeral stream flows through the area and spring development at upper-end.
Valhalla (3 permits)	All lots (8, 10, 11); 1.3 acres	Overflow channel along south edge of area. All homes are on floodplain.
Birch Glen (22 permits)	Lots 1-10, 12, 13, 16, 17, 20, 21, 23; 7.0 acres	All lots listed in floodplain have their homes on the floodplain. Spring occurs in Lot 23. Several homes in standing water during flood flows.
Brown's Rolloff (12 permits)	Lot 12 and parking lot; 0.2 acres	Home in Lot 12 is on floodplain. Ephemeral channel in Lot 11.
Lower Card (5 permits)	All lots (1-6); 1.8 acres	All homes are on floodplain.
Upper Card (6 permits)	Lots 1-3, 7; 1.2 acres	Home is Lot 1 and 2 are on floodplain.
Pine Bluffs (3 permits)	Lot 4, 5; 0.1 acres	
Chokecherry (12 permits)	Lots 1-5, 10; 1.0 acres	Homes in lots 1-5 are on floodplain.
Juniper (3 permits)	None; 0.0 acres	
Hailstone (1 permit)	Lot 2; 0.2 acres	Home is not on floodplain.
Brachiopod (2 permits)	Lots 1, 2; 0.5 acres	Homes are on floodplain.

Floodplains occur in most of the recreation residence areas in Logan Canyon and information on lots in floodplains are listed by tract number in Table 1-Water and Table 2-Water. A total of 14.0 acres of lots are within the floodplain area in 10 Logan Canyon recreation residence tracts. Beirdneau, and Juniper recreation residence tracts have no floodplains or wetlands within their lots. From field review of summer home areas during high flows in May 2006, floodplain areas were delineated on recreation residence areas within Logan Canyon by observing where flood flows were located.

Wetlands appear to correspond to the floodplain area as indicated by wetland vegetation and relatively flat topography next to the Logan River. Areas of some summer home lots were also identified as wetland areas, although the lots had non-wetland vegetation planted in the lawn areas. Flood prevention structures such as berms, logs, and sandbags have been placed along the Logan on some lots in Gus Lind, Valhalla, Birch Glen, Browns Rolloff, and Upper Card. Some small wetlands occur outside of the floodplain and are associated with springs and stream channels that are tributary to the Logan River. Wetlands in the recreation residence areas have been affected mainly by planting of non-wetland vegetation and the restriction of Logan River flooding in small areas where flood prevention structures have been constructed.

Tract	Area (acres) of Floodplain within Tract	Total Area (acres) of Tract	Percent of Tract in Floodplain	Number of Lots in Floodplain	Number of Lots in Tract	Percent of Lots in Floodplain
Gus Lind	2.2	3.1	71	5	5	100
Beirdneau	0.0	6.1	0	0	10	0
Valhalla	1.3	1.3	100	3	3	100
Birch Glen	5.5	8.0	69	18	23	78
Brown's Rolloff	0.2	4.5	4	1	12	8
Lower Card	1.8	1.9	95	5	5	100
Upper Card	1.2	2.8	43	4	6	67
Pine Bluffs	0.1	1.1	9	1	3	33
Chokecherry	1.0	6.7	15	6	14	43
Juniper	0.0	0.7	0	0	3	0
Hailstone	0.2	0.3	67	1	1	100
Brachiopod	0.5	0.5	100	2	2	100
TOTALS	14.0	37.0	38	46	87	53

Tract	Number of Homes in Floodplain	Building Area ¹ Occupying Floodplain	
		(ft ²)	(acres)
Gus Lind	4	8,400	0.19
Beirdneau	0	0	0.00
Valhalla	3	6,300	0.14
Birch Glen	16	33,600	0.77
Brown's Rolloff	1	2,100	0.05
Lower Card	5	10,500	0.24
Upper Card	0	0	0
Pine Bluffs	0	0	0
Chokecherry	5	10,500	0.24
Juniper	0	0	0
Hailstone	0	0	0
Brachiopod	2	4,200	0.10
TOTALS	36	75,600	1.74

¹ Estimate is based on the building footprint restrictions in WCNF Recreation Residence Administrative Guide – Home -1,500 ft², deck or patio – 500 ft², out-building – 500ft² for a total of 2,100 ft² per lot.

Municipal Watershed – The Logan River is a municipal watershed and the City of Logan obtains water from Logan Canyon through a spring source below Guinavah-Malibu campground. The source area for this spring is from water originating in the upper drainages on the north side of Logan Canyon such as Blind Creek where water flows through a karst system in the limestone.

Water Quality - The State of Utah has designated the streams draining the Bear River watersheds above the National Forest boundary as Antidegradation 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 3D – protected for waterfowl shore birds and other water-oriented wildlife.
- 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. 2006a). Review of the water quality information by the State Division of Water Resources shows that the water in Logan Canyon meets all of its water quality beneficial uses (Utah, State of. 2006b).

Sewage and Wastewater - The current sanitation systems at the Logan recreational residences tracts are septic systems. If renewals of the septic system are needed then the Logan Ranger District works with the Bear River health department to determine the best system for protecting human health and resources. Recent proposals for new sewer systems have been for vault toilets that contain waste and are pumped at regular intervals.

Water Use – Water is supplied to the recreation residences through several water systems. The location and the estimated amount of use by each summer home tract is listed in Table 4-Water. The estimated amount of use is 300 gallons per day (gpd) per home multiplied by the number of recreation residences in each tract. The use per day is based on 75 gallons of water per day per person for four people as described in Forest Service Handbook (USDA Forest Service 1981).

Tract	Drinking Water System	Amount of Water Use	
		(gallons per day)	(gallons per min)
Gus Lind	Bridger Camp system (Logan City)	1,500	1.0
Beirdneau	Guinavah-Malibu system (Logan City)	3,000	2.1
Valhalla	Guinavah-Malibu system (Logan City)	900	0.6
Birch Glen	Guinavah-Malibu system (Logan City)	6,600	4.6
Brown's Rolloff	Browns Rolloff Spring system	3,600	2.5
Lower Card	Card Canyon Spring system	1,500	1.0
Upper Card	Card Canyon Spring system	1,800	1.3
Pine Bluffs	Card Canyon Spring system	900	0.6
Chokecherry	Card Canyon Spring system	3,600	2.5
Juniper	Card Canyon Spring system	900	0.6
Hailstone	Spring-fed	300	0.2
Brachiopod	Spring-fed	600	0.4
TOTALS		25,000	17.5

Soil Quality –

Soil types found within each recreation residence tract, and selected characteristics, are shown in Table 1-Soil and Table 2-Soil.

Reference can be made to Table 2-Water to reflect the area, number, and percentage of Logan Canyon Recreation Residence lots that occupy floodplains.

Table 1- Soil. Distribution and Area, in acres, of Soil Types in Logan Canyon Recreation Residence Tracts						
Tract	Soil Type R10	Soil Type R55	Soil Type R58	Soil Type R60	Soil Type R65	Soil Type R66
Gus Lind					2	3
Beirdneau					5	
Valhalla						2
Birch Glen		1	2			4
Brown's Rolloff		3				1
Lower Card						2
Upper Card				2		1
Pine Bluffs				1		1
Chokecherry				5		1
Juniper				1		
Hailstone				1		1
Brachiopod	2			1		1
TOTALS	2	4	2	11	7	17

Table 2- Soil. Soil Types and Selected Properties at USFS recreation residence tracts in Logan Canyon(USDA Forest Service. 1995.)						
Soil Type	R10	R55	R58	R60	R65	R66
Soil Property						
Erosion Hazard/1	slight	moderate	slight	slight	slight	high
Erosion Hazard/2	moderate	high	moderate	moderate	moderate	very high
Runoff	medium	medium	medium	medium	medium	slow-medium
Permeability	moderate	moderate	mod rapid	mod rapid	mod rapid	moderate
Watertable Depth	> 60 in	20-40 inches				
Flood Hazard	none	none	none	none	none	seasonal
Drainage	well	well	well	well	well	mod well
/1:Under natural vegetation, /2: bare soil conditions						

Within most of the tracts, the R66 soil type is associated with the lots immediately adjacent to the Logan River. Suitability of this soil type for many recreation residence related uses (septic systems, shallow excavations, dwellings without basements) is limited due to seasonally shallow water tables and the potential for seasonal flooding. All other lots within the tracts are found on upland soil types (R10, R55, R58, R60, and R65). Suitability of this soil type for many recreation residence related uses (septic systems, shallow excavations, dwellings without basements) is limited due to either steep slopes or slower percolation rates.

Most of the lands within the recreation residence tracts are forested with native vegetation and the existing soil quality is unaffected by summer home uses in these areas. Soil physical, chemical, and biologic properties have been harmfully disturbed only where lot and tract improvements such as roads, driveways, parking areas, homes and outbuildings have been constructed. These improvements make up a very small portion of the tracts as a whole. An estimated 15 to 20% percent of the total land area within the residential tracts currently consists of impermeable surfaces such as roofs, concrete, or other forms of bare and compacted ground.

Field monitoring of the recreation residence tracts in Logan canyon was conducted to determine if tract and lot development were having an indirect effect on soil quality of the adjacent undisturbed forest lands. Soil stability in the all of the tracts is quite good, there were no areas of soil erosion or slumping noted in these areas (Flood, Paul K. 2005a.)

3.4.2 Environmental Consequences

3.4.2.1 Water Resources

Issue: How will recreation residence use affect water quality and quantity? What will be the effects on stream, floodplains, and wetland function?

No Action Alternative

Effects to Floodplains and Wetlands: In the short and long-term, the direct effects to floodplains and wetlands from this would be that flood-waters would more easily flood across the floodplain and wetlands would revert to natural conditions on lots that are located on the floodplain. This is because sandbags would not be placed along the Logan River to keep water from flooding the recreation residence lots, bridges, and abutments would be removed that currently keep Logan River flood-waters flowing in the channel under the bridges. The remainder of the summer home tracts is flooding naturally and has very little restriction of flow due to the presence of recreation residences. Recreation residences would revert back to natural wetland vegetative conditions where lawns are currently growing. The amount of wetland that would revert to natural vegetation would be something less than 14.0 acres since only part of the lots on most tracts are currently in lawn.

Effects to Water Quality: Although the direct effect of ground disturbance would occur, very little sedimentation from soil erosion would be expected because of the dense vegetation and low gradient slopes that occur on lots at most of the summer home tracts near the Logan River. Where the risk of short-term erosion is higher such as on steeper slopes, erosion control measures would be implemented to minimize erosion and sedimentation during the removal of facilities and reshaping the landscape. The long-term indirect effects would be the same as the Proposed Action because water quality beneficial use are met on the Logan River currently and the change in water quality

would not likely be measurably different from existing conditions, since there is very little erosion currently.

Proposed Action Alternative

Effects to Floodplains and Wetlands: In the short and long-term, the direct effects of reissuing the permits to the recreation residence tracts in Logan Canyon on floodplains and wetlands change very little in flood characteristics of the Logan River with a small increase in wetland species where the size of lawns at a few recreation residences is reduced as a result of following the guidelines of the WCNF recreation residences administrative guide.

Effects to Water Quality: In the short and long-term, the indirect effects of reissuing the permits to the recreation residence tracts in Logan Canyon would be no change to water quality of the Logan River since very little soil erosion occurs at the recreation residences tracts. Currently, water quality beneficial use is met on the Logan River and it is expected that these beneficial uses will continue to be met.

In-lieu lots

Five in-lieu lots were reviewed and analyzed for potential use during this review process. Two of these lots are in the Birch Glen tract and are prone to flooding and saturation. These lots would not be acceptable as in-lieu lots because of their flooding potential.

If existing occupied lots near the Logan River are exchanged for the more upland located in-lieu lots, there would be small short-term disturbance to the riparian area from removal of the recreation residence that is exchanged for the in-lieu lot. In the long-term, effects to water resources is expected to be a small improvement in water quality and riparian vegetation because human activities near the Logan River will be lessened and disturbance in the riparian area will be reduced.

Recommended Mitigation – No additional mitigation is recommended because the WCNF recreation residence administrative guide has provisions for the protection of water resources.

3.4.2.2 Soil

Issue: To what extent will continued recreation residence use affect soils, including the effects of bare soil conditions created by vehicle and pedestrian traffic within each tract?

No Action Alternative

Effects to Soil Quality and Stability: Upon expiration of the existing Special Use Permits (SUPs) in 2008, interim ten-year permits will be issued. Sometime prior to expiration of the ten-year permits all of the existing above ground improvements will be removed from National Forest System land. The ten-year permits will contain the same

standard terms as the existing permits and the same BMPs identified for the Proposed Action will be utilized during the time the improvements remain in place. Forest or District personnel shall inspect facilities authorized under the 10-year permits to ensure compliance with permit terms and the soil and water protection requirements. As a result, the direct and indirect effects associated with the No Action Alternative, up until such time that the above ground improvements are removed will be the same as described above in the Proposed Action alternative.

The 10-year permits would involve BMPs to mitigate any impact to soil and water quality resulting from the use of the recreation residences and from removal of the structures. Short-term impact to soil and potential for impact to water resources may occur as a result of disturbance associated with cabin removal. Practices relating to structure removal include an erosion control plan to minimize/prevent sediment from entering the lake and a spill prevention, and a control and countermeasure (SPCC) plan to minimize potential contamination of soil from accidental spills while facilities are being removed from the recreation residence tract. These plans will be prepared prior to the removal of any improvements. The plans must receive review and approval by the appropriate state and federal agencies before work begins. The BMPs will be monitored to ensure that they are implemented as designed and that they are effective. Ineffective BMPs will be modified.

Once the permit holders have removed their improvements, the Forest Service will rehabilitate the disturbed areas by treating soil compaction, restoring natural drainage patterns, and planting of native vegetation where needed. Appropriate site specific BMPs to minimize or eliminate potential sedimentation to the lake resulting from these activities will be developed, implemented, and monitored for effectiveness by the Forest Service.

In general, existing improvements to tracts and lots such as roads, driveways, parking areas, homes and outbuildings make up a small portion of the tracts as a whole. Removal of these improvements would therefore result in a small improvement in soil quality as the areas were stabilized and restored to native vegetation. In the short-term, the direct effects of removal of these improvements could be short-term increases in erosion.

Proposed Action Alternative

Effects to Soil Quality and Stability: There will be few, if any, additional effects on soil quality, beyond those described in the “Soil/Water Resource Features and Conditions” above, associated with the reissuance of the Special Use Permits. In general, improvements to tracts and lots such as roads, driveways, parking areas, homes and outbuildings already make up only a small portion of the tracts as a whole. No additional access roads, driveways, or parking areas are being proposed under this action.

The proposed administrative guide limits the footprint of cabins to no more than 1500 square feet, attached decks and or adjacent patios/courts to 500 square feet. Some structures within the tracts are already at these limits, for these lots the proposed action would not result in any further impairments to soil productivity. For those lots with

current cabin/deck sizes that are smaller than the proposed administrative guide limits, the proposed action could result in further harmful disturbance to soil physical, chemical, and biologic properties as a consequence of enlargement of either cabins or decks.

The proposed administrative guide also limits the number of associated outbuildings to one. Under the proposed action, effects on soil quality are expected to decrease slightly as individual lots are brought into compliance by the removal of unauthorized structures and improvements. Soil quality will be improved when these disturbed areas are restored and stabilized with vegetation. A site specific description of unauthorized improvements that will be removed under the proposed action is contained in Appendices C and D.

In-lieu lots

Five in-lieu lots were reviewed and analyzed for potential use during this review process. Two of these lots are in the Birch Glen tract and are prone to flooding and saturation. These lots would not be acceptable as in-lieu lots because of their flooding potential.

With the designation of the remaining three in-lieu lots in the Logan tracts and the possible future relocation of cabins to these lots, there would be a short term impact to soils and water quality when the original cabins are dismantled, the site revegetated, and a new building site developed. However, over the long term utilization of the two in-lieu lots that are more removed from streamside areas should help to minimize impacts, especially those related to sedimentation.

Best Management Practices (BMPs) will be implemented to mitigate potential impacts to soil quality resulting from land disturbing activities within the residence tracts. The objective of the BMPs is to protect the soil quality of undisturbed lands adjacent to the summer home lots from runoff and erosion that might result from activities that are under special use permits.

3.4.3 Cumulative Effects

The cumulative effects to soil and water resources are described below.

3.4.3.2 Water Resources Cumulative Effects

The cumulative effects analysis area for water resources is the Logan Canyon canyon-bottom from Second Dam to Twin Bridges. This area is chosen because it encompasses the recreation residences and represents the area that would have influence to the water resources from other actions. The time frame for the cumulative effects analysis is from five years ago to about five years into the future since vegetative recovery usually occurs within five years and projects further in the future than five years are not known.

Other actions in the cumulative effects analysis area that may affect water resources are Logan Canyon Highway bridge construction at Right Hand Fork, campground and picnic areas, private land development at Right Hand Fork, and four to five rock weirs that were placed on the outside meanders of the Logan River at Birch Glen Recreation Residence

area and at Guinavah-Malibu Picnic Area, resulting in reduced stream bank scour on stream banks in these locations. Logan Canyon Highway bridge construction at Right Hand Fork has had erosion control structures in place during construction to minimize sedimentation of the Logan River. The other remaining actions do not have active erosion occurring and is not expected to occur in the future.

The cumulative effects of these actions in addition to the proposed action is expected to have very little effect on water quality, wetlands, or water use because the proposed action of itself has very little effect on flood plains or wetland functions, water quality, and no change to water use. The other actions in the analysis area also have very little effect on these resources. As an additional point for water quality, the water quality of Logan River has been assessed by the State of Utah and meets State water quality standards. This indicates that cumulatively the water quality in Logan Canyon is good and other actions in the future are not expected to alter the water quality of the Logan River.

The incremental effect of the proposed action or the no action alternative, in addition to other past and on-going actions, is expected to result in very little cumulative effect on water quality, wetlands, or water use. This is because the recreation residences contribute very little additive impact on the Logan River floodplain, wetlands function or water quality.

3.4.3.2 Soil Cumulative Effects

Under the no action alternative, non-reissuance of the recreation residence SUPs, removal of all above ground improvements from National Forest System lands within 10 years following expiration of the permits in 2008, and rehabilitation of the residential lots would contribute to restoring overall ecological health on approximately 37 acres (area occupied by the lots within the recreation residence tracts) within the Logan Canyon watershed. Additional restoration would result from decommissioning access routes (native surface trails and driveways) to and between the individual tract lots.

Other activities that may cause a cumulative effect to the soil resource are clearing of vegetation in conjunction with the power transmission and telephone lines that service the tracts, and the maintenance of system hiking trails in the tracts. Maintenance of the power line ROW would be accomplished with mechanical type equipment such as chippers and boom trucks, using existing roads and driveways within the tracts. Maintenance of the hiking trail would entail brushing and removal of fallen trees by hand crews. As such, no additional soil disturbance would occur from these activities.

Under the proposed action, the renewal of term Special Use Permits, which permit the continuation of existing recreation residence uses in Logan Canyon, would result in very few additional (cumulative) adverse impacts on soil quality. Very little construction related damage to soils is anticipated under the proposed action. No additional access roads, driveways, or parking areas are being proposed under this action, and few of the existing residences can be expanded beyond their present footprints. Incorporating

standard terms of use into the permits which benefit soil quality will help limit further detrimental soil disturbance and maintain the overall physical, chemical, and biological health of the soil resource. Existing degraded soils would be restored where unauthorized improvements and structures are removed as a result of implementing this alternative. The long-term cumulative effects of implementing the Proposed Action would be beneficial to the terrestrial, riparian, and aquatic environment of the Logan Canyon watershed.

Irretrievable or Irreversible Commitment of Resources

Existing residences, driveways, and access roads within the tracts have all resulted in an irreversible loss of soil productivity. While no action would discontinue these uses in the near future, the loss in soil productivity would only be renewed over a much longer period of time. A small incremental improvement of soil productivity within the Logan Canyon watershed would occur where tract related improvements were removed and restoration work was accomplished.

Because the proposed action continues these uses, the loss in soil productivity would not be renewed over time. No additional roads, driveways, or parking areas are anticipated under the proposed action. A small incremental loss of soil productivity would occur where either residences or outbuildings are expanded to the limits specified in the proposed administrative guide.

3.5 Recreation

3.5.1 Affected Environment

The analysis area includes all tracts, from Gus Lind (located about 3.5 miles from the Forest Boundary near Logan), to Brachiopod (located about 13.6 miles from the Forest Boundary near Logan). The five in-lieu lots described in Chapters 1 and 2 are included in the analysis area, as are the acres occupied by roads.

The Logan Canyon area consists primarily of the Logan River and its tributaries, rock canyon cliffs, riparian habitat with deciduous trees, oak/maple/grass on south facing slopes, mixed with conifer on north facing slopes. Much of Logan Canyon is primarily managed as a developed recreation area with several campgrounds and picnic areas, fishing access, interpretive sites and several trails and trailheads. Developed recreation areas are dispersed throughout the canyon corridor. The main drainages are the Logan River, Right Hand Fork, Temple Fork and several smaller creeks that flow into the Logan River.

None of the recreation residence tracts are adjacent to wilderness. Recreation residence users contribute to wilderness use, but such use is a very limited amount of the total wilderness use and is insignificant for any impacts.

3.5.2 Environmental Consequences

This section presents the direct and indirect effects of recreation residence management on the main issues raised for recreation resources. Based on the result of public scoping and Interdisciplinary Team review, the following issue was identified for detailed analysis in this EA.

3.5.2.1 Recreation access and the recreation experience and safety of other visitors

Issue: How will recreation residence use affect access and the recreation experience and safety for other visitors to Logan Canyon?

No Action Alternative

Removal of the recreation residences would cause a decrease in recreation use of permit holders in Logan Canyon. Use of developed recreation areas and dispersed recreation in Logan Canyon would provide continued public recreation opportunities. Therefore, cabin removal would cause only a slight change in the recreation type and use in Logan Canyon. The area previously used for recreation residences would likely become areas for dispersed recreation for those public visitors who want a less developed experience or are unable to access existing developed sites due to overcrowding. The former recreation residence tracts would be managed for resource needs including riparian habitat and dispersed recreation use.

During the period when facilities are being removed, there would be increased noise and general disturbance caused by demolition and heavy hauling. This would temporarily detract from the quality of the recreation experience in the area. However, there would be no long-term effects to recreation caused by the activities of facility removal.

It is possible that some tract roads may be converted to trails or parking access, as public dispersed use is expected to increase in these areas if recreation residences were removed. Roads that access the archery range in the Card tract would continue to exist, as would the access road into Preston Valley Campground abutting the Juniper tract. Other roads accessing the tracts may be closed and natural conditions restored.

Since the recreation residences' taxes comprise only a small percent of the County's total real property tax revenue, no County programs are likely to be impacted. A steady decline in maintenance and construction costs would be expected over the 10-year period because permit holders would be reluctant to invest in a structure that is planned to be removed. At the end of that time, a small economic boost could occur for some local contractors, because they may be needed for removing the structures from the tract. Current permit holders would lose an undetermined amount of personal capital by the time the 10-year permit expires. Lost capital would be in the form of lost real property and expenses incurred to remove the improvements.

Proposed Action Alternative

Implementing the proposed action would involve continued use of the existing recreation residences under provisions of the Recreation Residence Administrative Guide. There would be little direct or indirect effect to recreation or social activities in the tracts under the Proposed Action; activities associated with the recreation residence tracts would continue as described in the “Existing Condition” above.

Regarding public recreation in Logan Canyon, there are very few public safety issues in the recreation residence tracts, as the general public seldom uses these areas for recreation. Some feel that recreation residences compromise the accessibility for general public use and recreation on Forest lands occupied by recreation residence tracts. It should be noted that all recreation residences at Logan Canyon are private structures, but that they are located on National Forest lands open to the public (36 CFR 251.55b). The public is allowed to legally access the land, but cannot use the structures and facilities. Most of the public use in these tracts is limited to an occasional fisherman or other recreationist. Generally, the public avoids using the tract areas because of their developed and private-like appearance. This would not change under the Proposed Action.

Typically, use at a recreation residence is by the immediate family and friends. The recreation residence permit holder must be an individual, a married couple or designated representative of a formally established living or family trust. The permit holder is required to use the residence at least 15 days a year, but permanent residence is not allowed. Commercial use of recreation residences is prohibited and rentals require written approval. Most use of recreation residences occurs during the summer, especially on weekends. Group size is primarily limited by the size of the existing facilities and limited area of approved parking.

Taxes and annual fees would continue to be paid to Cache County and the U.S. Treasury, increasing with inflation adjustments. As the area population increases, demand for the cabins will likely increase, driving up the selling prices of available existing cabins. Because no new cabins would be added, the supply availability would not increase, thus contributing to an increased purchase price. As cabin values increase, the population with buying power to afford them will likely decrease.

In-lieu lots

Under the no action alternative, the permitted use of National Forest by recreation residences would expire in December 2008, with the subsequent result being the removal of all above-ground improvements, as well as the backfilling of existing pit toilets. In this case, in lieu lots would not be identified or surveyed, as there would be no need for them to be occupied by any resident who may have been displaced due to conditions such as flooding.

Under the proposed action, three of the five in-lieu lots would be considered for potential relocations. Two of the five in-lieu lots identified on the tract maps are adjacent to the

Logan River and are prone to flooding and/or saturation in high water years. The other three in-lieu lots identified may be acceptable for recreation residence use should a relocation be needed for a current recreation residence permit holder. No additional tracts or lots will be allowed in Logan Canyon.

Under this alternative, the in-lieu lots would be surveyed and offered up to those recreation residents who may be displaced due to riparian/floodplain area issues.

Environmental consequences of this would include the following:

- a. New impacts on approximately 1 ½ acres at the location of the three preferred in-lieu sites.
- b. Improved riparian/wetland conditions over the long term on those sites previously occupied by the relocated cabins.
- c. Improved fish and wildlife habitat on the three in-lieu lots located upland away from the Logan River and its tributaries. The value of providing additional riparian habitat outweighs the value of wildlife habitat area lost at an in-lieu upland site.
- d. Reestablishment of native vegetation along the banks of the river on those sites that have had cabin relocation to in-lieu sites.

3.5.3 Cumulative Effects

A number of past, present, and reasonably foreseeable future activities in Logan Canyon would interact cumulatively with the effects of continued recreation use. The Scenic Byway extending up Logan Canyon has a high level of development in terms of recreation facilities such as picnic areas, trails, and roads. Recreation residence traffic is a small component of the overall level of traffic, but the two are additive in terms of the effect on the recreation experience and safety considerations.

Public recreation use is predicted to continue to increase in Logan Canyon because of the increased population in Cache Valley. However, total use of the canyon is somewhat limited by the availability of sites, whether those are trailhead parking areas, developed campgrounds, fishing piers, or other facilities provided along the Byway. Recreation sites in the area often reach their visitor capacities during the operational season, especially on weekends and often during summer weekday evenings.

Under the no action alternative, dispersed recreation use by the public in the tracts would likely increase after the recreation residences were removed. Activities would include picnicking, hiking, fishing, wildlife watching and snow play. Logan Canyon is already a crowded recreation area and removal of recreation residences would probably disperse some of that use to these areas and could increase use, as more land base along the river (which tends to attract the public) would be available. It is possible that such public use could actually increase some effects on other resources in parts of these tract areas (i.e., effects to wildlife, soil erosion, soil compaction) unless additional mitigation measures were taken to prevent such effects.

The renewal of the term special use permits which permit the continuation of existing recreation residences in Logan Canyon would result in very few additional (cumulative)

adverse impacts on recreation resources. Public recreation use is predicted to continue to increase in Logan Canyon (reasonably foreseeable action), because of its nearness to Logan City and Cache Valley and because of its designation as a Scenic Byway. However, total use is somewhat limited by available parking and facilities. Developed recreation sites in the area often reach their visitor capacities during the operational season, especially on weekends and often during summer weekday evenings.

Recreation use in Logan Canyon could increase slightly if recreation residences get more use from their cabins after meeting compliance guidelines (itemized in 2008 Administrative Guidelines). Since cabins are generally simple and primitive in structure and features and major changes or additions would not be allowed under the Administrative Guidelines any future increases in their capacity would be limited. Recreation residence use increase will not appreciably impact recreation as a whole in Logan Canyon.

Irretrievable or Irreversible Commitment of Resources

No major irretrievable or irreversible commitments of recreation resources were identified by the No Action alternative (not re-issuing the recreation residence permits in Logan Canyon). The main change is that there would no longer be the opportunity or type of recreation supplied by recreation residence facilities in Logan Canyon. That, combined with the fact that no new cabins or tracts would be authorized, would mean that there would be no cabin recreation in Logan Canyon unless on private land. The demand for such use would have to be satisfied outside of the Forest.

Existing residences and lots have resulted in less public use on those areas that cabins currently occupy (although many of the cabins have been here since the 1930s). Because the proposed action allows for continuation of recreation residence use, general public recreation use would not increase on this land. Other lots once listed as available have been determined to not be feasible due to riparian, slope or other resource concerns. No new lots or tracts would be added, thus limiting the capacity to the current 84 recreation residences.

3.6 Visuals

3.6.1 Affected Environment

The visual analysis area is defined by the boundaries of the viewshed. The area is bounded on the north and south by the ridgelines of Logan Canyon's deep sheer limestone cliffs. The meandering Logan River at Logan Canyon's mouth forms the western Forest boundary. The intersection at Temple Fork forms the eastern end. The analysis time-span encompasses the period from the establishment of "Logan Canyon Group-Summer Home Sites" in 1920 to present day. (For more information on the history and establishment of summer homes, see the landscape architect technical report in the project record.)

There are two landscape character themes (LCT) that compose the project area: Developed Natural Appearing (occurs within ¼ miles on each side of the Highway 89) and Natural Appearing (occurs outside the ¼ mile buffer of the Developed Natural Appearing LCT). Both LCTs are being managed for a “High” scenic integrity object (SIO) (see Appendix C for further details).

Natural Appearing

The existing landscape character has been influenced by both direct and indirect human activities, but appears natural to the majority of viewers. Natural elements such as native trees, shrubs, grasses, forbs, rock outcrops and streams or lakes dominate the views. While there is evidence of human influence from historic use, campgrounds, small organization camps, rustic structures and management activity, it is part of the valued built environment in the landscape to the majority of viewers.

Developed Natural Appearing

This landscape character theme is characteristic of National, National Forest and State scenic byways with developed recreation facilities, concentrated use areas and undeveloped recreation impacts within the foreground of the viewshed (1/2 mile). In these areas, the roadway, recreation amenities (such as picnic areas and campgrounds), and development are anticipated features in the landscape. For users, these amenities are part of the valued natural appearing landscape. Users of these amenities are attracted to the natural appearing landscape, but desire a moderate to easy interaction with the landscape through the use of these amenities. This landscape character is adjacent to Natural Evolving and Natural Appearing landscape character themes and should draw from, complement and harmonize with these themes.

3.6.2 Environmental Consequences

The following information provides an explanation of the effects of recreation residence permitted use on the visual landscape in lower Logan Canyon.

3.6.2.1 Effect on the Visual Landscape

Issue: How will visual resources in Logan Canyon (Scenic Byway Corridor) be affected by continued recreation residence use?

No Action Alternative

Removal of the recreation residence structures could change the visual character of Logan Canyon by changing the cultural landscape to which visitors have become accustomed. During the ten-year period while structures and roads are being removed, there may be a short-term effect of undesirable views of structures being torn down. But once vegetation is re-established (within 2 to 5 years of the structure removal) there would no longer be any effect on the natural appearing landscape.

Proposed Action Alternative

Under the proposed action of re-issuance of the existing recreation residence permits, there would be no change from the current visual landscape. The existing recreation residences are considered to be part of the cultural image of the canyon. Reissuance of the special use permits and continuation of the recreation residences would not change the cultural image as long as the Administrative Guidelines are complied with.

In-lieu lots

Of the five lots designated as potential in-lieu sites, two are located in areas prone to flooding and are also located within the RHCA. Three in-lieu sites are suitable for relocation by permittees that may be required to move their residences out or riparian areas due to high water or flooding. Relocation to any of the three in-lieu lots would change the impact slightly for those recreationists using the Birch Glen or Chokecherry tracts (location of in-lieu lots), as the new cabins would be visible to recreationists within the tracts. However, these relocated cabins would not be visible from the Logan Canyon Scenic Byway and would have no effect on visual landscape.

3.6.3 Cumulative Effects

Past, present, and reasonably foreseeable future actions that would interact cumulatively with continued recreation residence use with respect to visuals would include the developments already in lower Logan Canyon (for example campgrounds, picnic areas, one private home, dams, and a restaurant). The effects of the no action alternative on the viewshed would be negligible; therefore cumulatively there would be no impact on the visual resources.

There would be no cumulative effects to the scenic resource as a result of the proposed action. This is because the existing environment of recreation facilities, trails, roads, and recreation residences within the natural appearing landscape are a part of the landscape character for this portion of the Forest.

3.7 Cultural Resources

3.7.1 Affected Environment

The analysis area includes those recreation residence structures and various associated improvements that are located in the Logan Canyon recreation residence tracts that may be eligible for review under the National Historic Preservation Act. Those identified historic structures and improvements must have enough physical integrity (in terms of location, design, setting, materials, workmanship, feeling, and association) to convey that significance. They must be over 50 years of age.

3.7.2 Environmental Consequences

Issue: What will be the effect on homes and other improvements that are eligible for National Register of Historic Places, including those that are located in riparian areas?

Compliance with the National Historic Preservation Act (NHPA) is set in motion when a proposed undertaking involves ground-disturbing activities, removal or alteration of historic buildings or structures, or may cause potential effects to historic properties including the historic setting and integrity of a property.

No Action Alternative

Since under the no action alternative cabins and structures would be removed, NHPA compliance would be required for structures that are over 50 years old. Sites would be analyzed and documented for their National Register eligibility. This may include such things as documenting and recording the historic property with a photo report of the structures. This information would be used by the Forest Service to make its determinations about how to address the structures and to consult with the State Historic Preservation Officer. Once SHPO consultation was complete, the mitigation measures that were agreed upon through consultation would be enacted.

Proposed Action Alternative

Reissuance of the existing recreation residence permits does not constitute an undertaking as defined by 36 CFR 800.16. Therefore, the Section 106 process of The National Historic Preservation Act (NHPA) is not engaged for this alternative.

Compliance with NHPA would continue to be addressed in the course of regular permit administration as remodel alterations, new improvements, or activities are proposed that could have the potential to affect historic properties. The Forest Archaeologist would review all proposals that could affect historic structures, consult with SHPO, review the Forest Plan for consistency, and provide any mitigation measures that may be needed for the Authorized Officer to make a decision on a proposal.

In-lieu lots

The process outlined above would be triggered if utilization of an in-lieu lot involves dismantling any structure that is eligible for the National Register of Historic Places. These would be handled on a case-by-case basis.

Recommended Mitigation - Compliance with NHPA will continue to be addressed in the course of regular permit administration as alterations, new improvements or activities are proposed that could have the potential to affect historic properties.

3.7.3 Cumulative Effects

There are no other known past, present or reasonably foreseeable future actions that would contribute cumulatively to effects on the cultural and historic values of the recreation residences and associated improvements in Logan Canyon.