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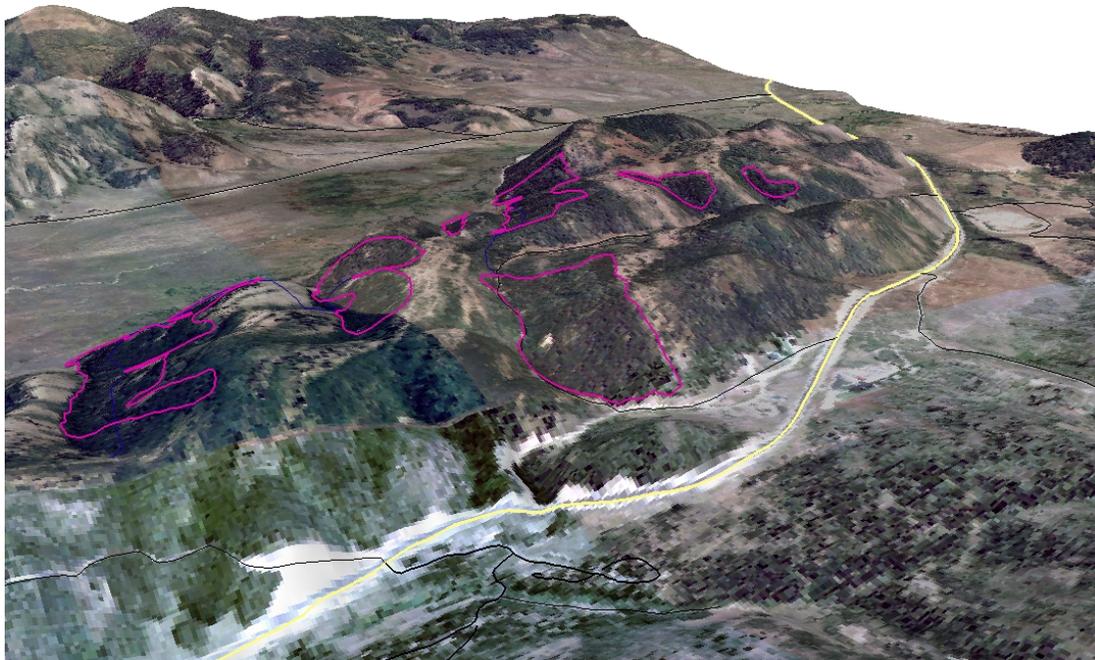
May 2007

Telephone Hollow Timber Sale and Fuels Treatment



Heber Ranger District
Uinta National Forest
Wasatch County, Utah

Township 6S Range 6E, SLM, Sections 10 and 15; Township 2S
Range 12W, USM, Sections 9, 16, 21



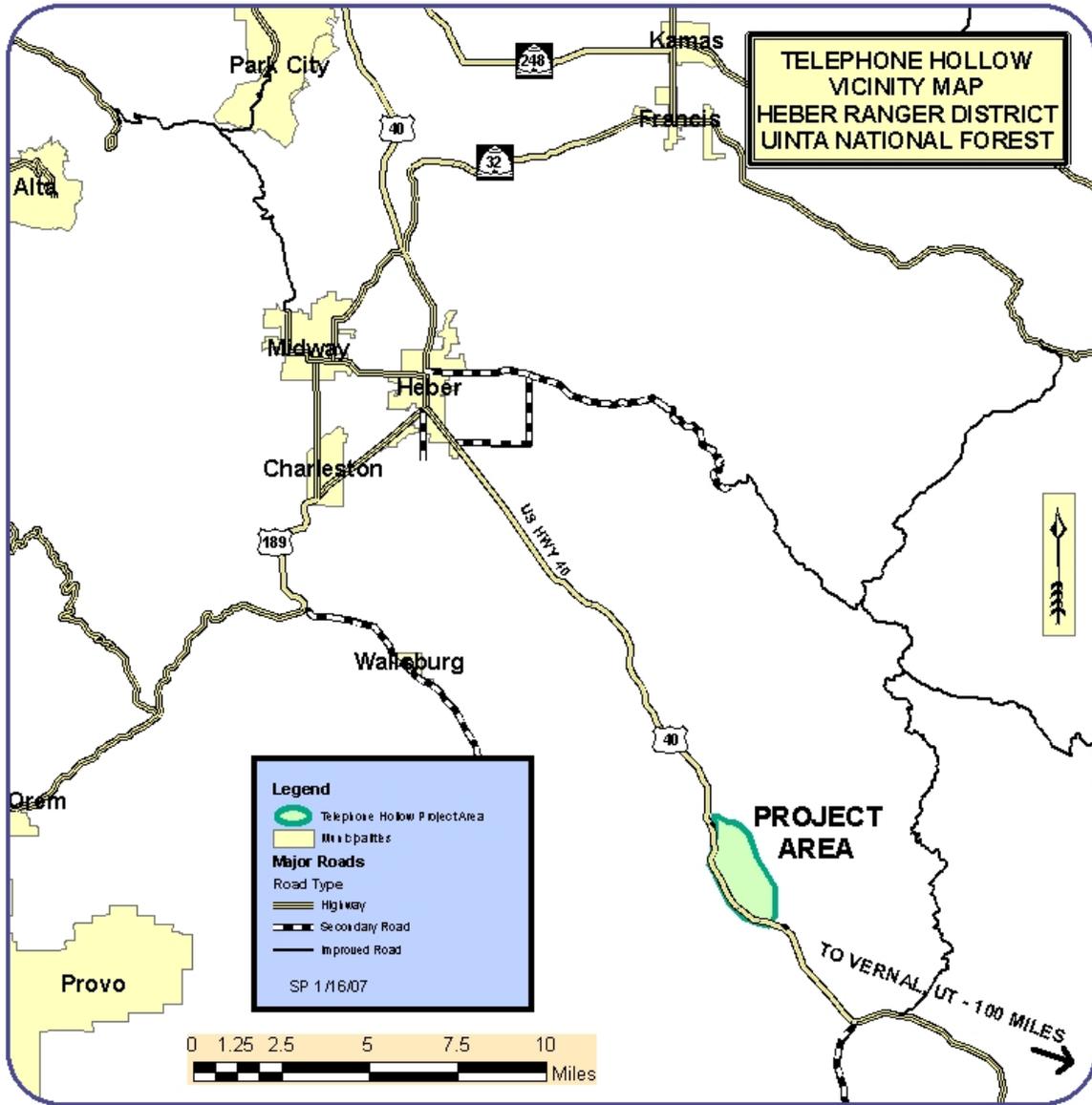
For Information Contact:

Stephen Penny, Forester
Heber Ranger District
Uinta National Forest
2460 South Highway 40
Heber City, Utah 84032
435-654-0470

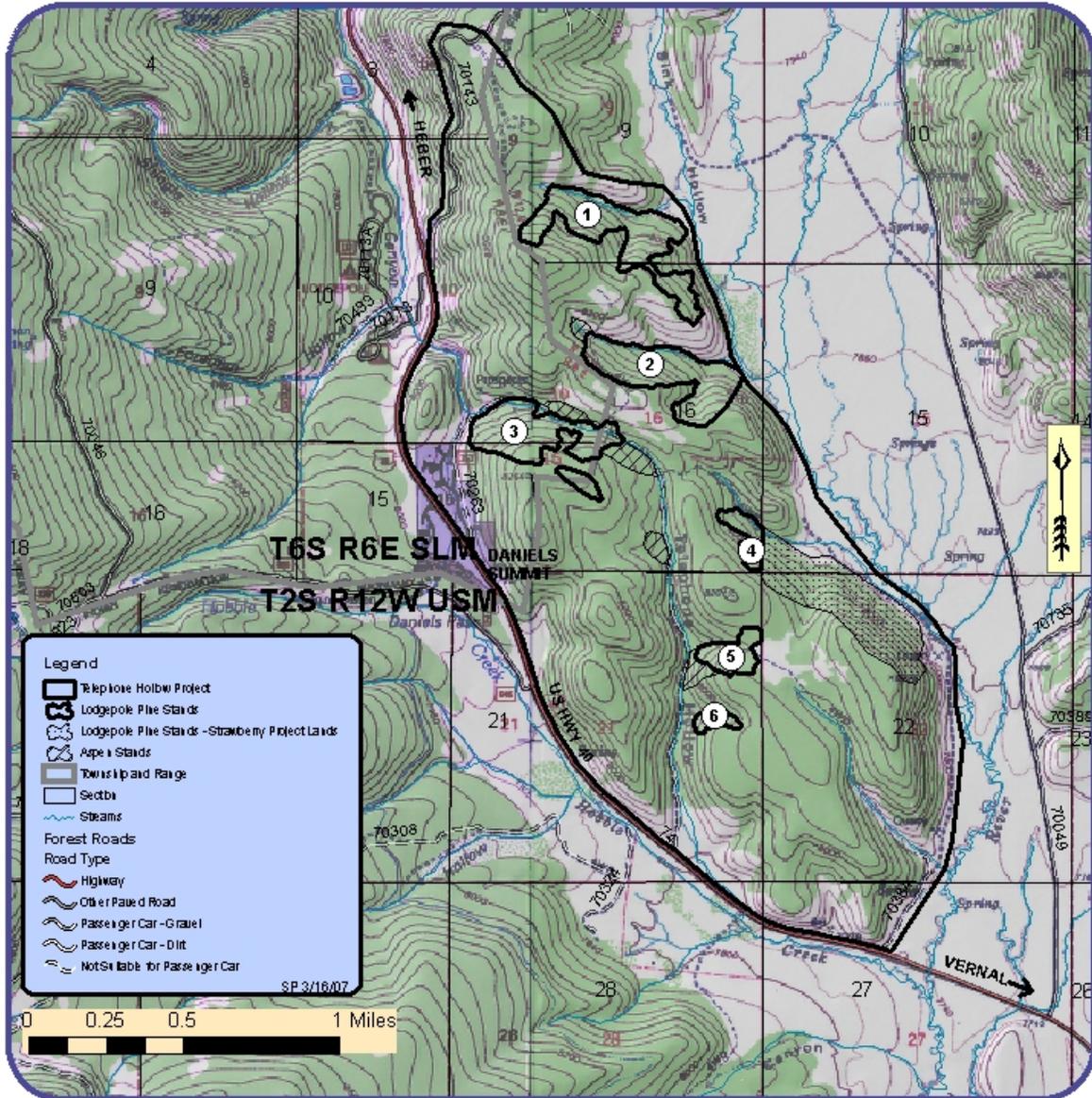
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Telephone Hollow Project Area Vicinity Map



PROJECT AREA MAP



The Forest Service is preparing this Environmental Assessment (EA) in compliance with the National Environmental Policy Act (NEPA). This document discloses the results of scoping, formulation of issues and alternatives, and details the proposed action and its analyzed alternative.

Additional documentation, including more detailed analyses of project-area resources, can be found in the project planning record located at the Heber Ranger District Office in Heber City, Utah. Contact Stephen Penny, Forester, at (435) 654-0470 for further information.

CHAPTER 1 - SUMMARY

Background

The Telephone Hollow project area is located near the northwest corner of Strawberry Reservoir in the Strawberry and Daniels drainages. The project area is approximately 18 miles southeast of Heber City, Utah and is adjacent to Daniels Summit, identified as an “urban wildland interface community within the vicinity of Federal lands” (Federal Register, Vol. 66, No. 160, p. 43423, 8/17/01).

The Telephone Hollow area represents the most western and southern extent of the native range of lodgepole pine in the state of Utah. Endemic levels of tree mortality caused by the mountain pine beetle has been occurring in lodgepole pine stands in the project area for the past 4 years, and is at epidemic levels on the Wasatch-Cache National Forest, approximately 25 miles north of the area.

Evidence gathered from stand examinations and reconnaissance suggests a stand replacing disturbance event, most likely a wildland fire occurred approximately 110 years ago in the area, which established the current predominant lodgepole pine and aspen stands. The stands to be treated are actively being replaced by less fire resistant, shade tolerant conifer species which are out-competing lodgepole pine and aspen.

Existing Condition

The project area for this study is in the Upper Strawberry River and Daniels Creek – Provo River watersheds and is approximately 1,790 acres. Table 1 shows the acreage within the area in each of the major vegetation types, and Figure 1 shows their distribution across the project area.

Table 1
Acres by Vegetation Type

Vegetation Type	Acres
Aspen (<10% canopy cover of conifer)	969
Aspen (35% - ~70% conifer canopy cover)	39
Douglas-Fir (crown density 15-59%)	14
Lodgepole Pine (crown density 60-100%)	241
Oak	2
Spruce-Fir (crown density 15-59%)	16
Spruce-Fir (crown density 60-100%)	31
Silver Sage (<i>Artemisia cana</i>)	51
Mountain Big Sage Brush (<i>Artemisia tridentata</i> var. <i>tridentata</i> ssp)	422
Willow/Birch Riparian	5
Total	1790

Figure 1
Project Area Vegetation Types

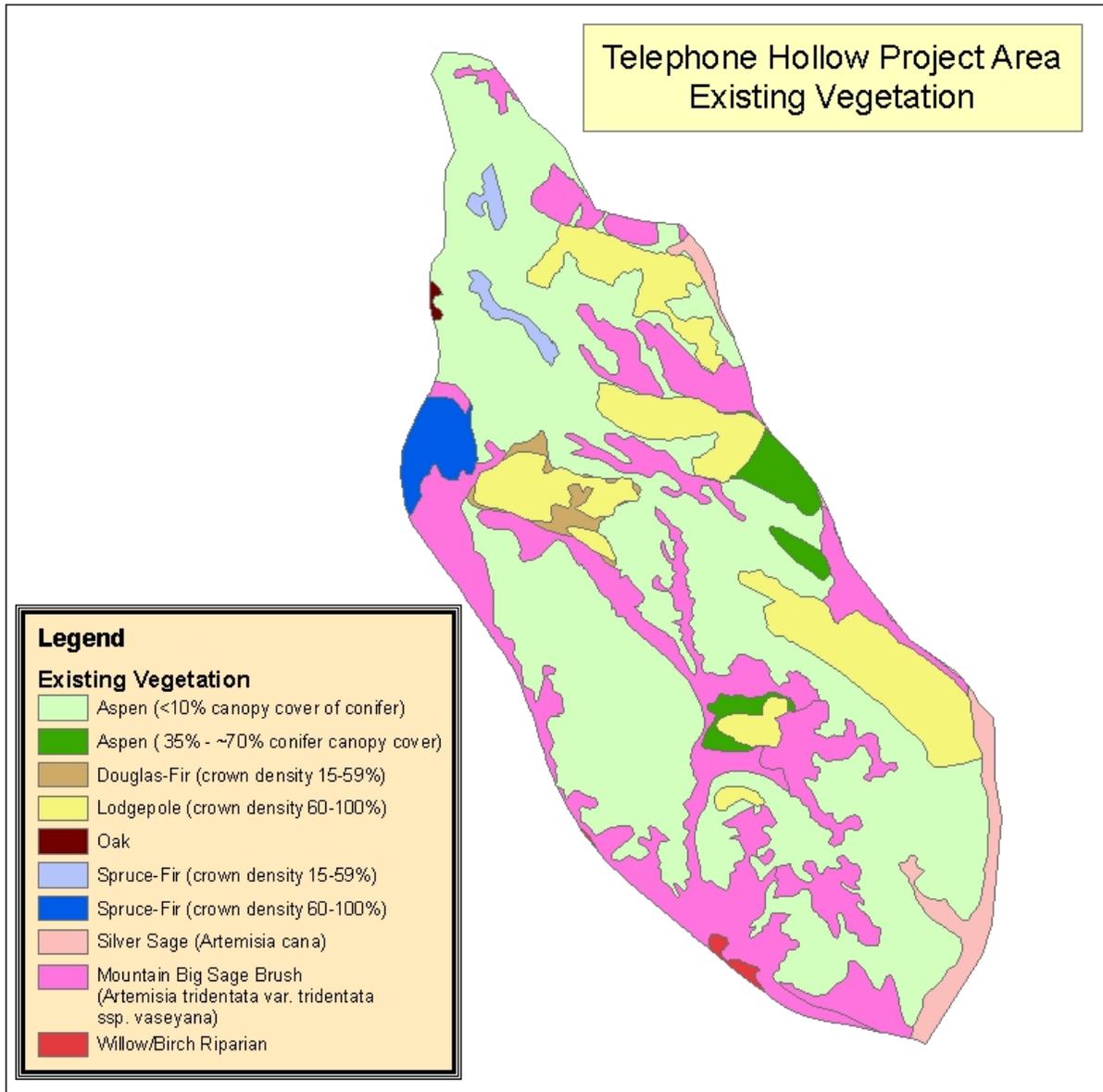


Table 2 shows the stand conditions as summarized from data collected in the fall of 2003 and processed using the Field Sample Vegetation (FSVeg) program. The stand unit numbers are shown in Figure 2 – map of the Proposed Action on page 11.

Table 2
Stand Characteristics ^{1/}

Stand Table Summary Data (live trees) ^{1/}

Stand ID	Unit #	Basal Area 5''+ DBH	QMD 5''+ DBH	Avg. Height >5'' DBH	Avg. Age >5'' DBH	TPA 5''+ DBH	TPA seed/saps <5'' DBH	% PICO (BA/AC)	Stand Density Index (SDI)	% of SDI _{max}
186-01	3	136	11.6	71	82	186	1860	93	384	55
187-01	1	168	10.2	59	78	294	980	71	408	58
187-02	2	160	9.3	59	67	340	3225	61	491	70
195-02	4	128	8.7	57	49	294	2101	53	392	56
195-03	5	193	10.1	62	95	346	2100	42	522	75
195-04	6	200	11.5	79	91	280	0	100	348	50
Avg. ^{2/}		149	9.9	61	70	284	1922	68	415	59

^{1/} **DBH** = Diameter at Breast Height, **QMD** = Quadratic Mean Diameter, **BA** = Basal Area (ft²/acre), **TPA** = Trees per Acre, **PICO** = Lodgepole pine, **SDI** = Stand Density Index (SDI_{max} = 700 from R4 Silviculture Handbook)

^{2/} Data taken from FSVeg Multi-Stand Summary Report.

White fir and subalpine fir, the most shade tolerant species represented, account for 61% of the total trees per acres but only 15% of the total basal area. Conversely, lodgepole pine accounts for only 1% of total trees per acre, but represents two-thirds of the standing volume, demonstrating that stand conditions have been favorable for the establishment of shade tolerant species. The 1922 seedlings and saplings per acre average (Table 2) is made up of 75% white fir and subalpine fir, while early seral species such as lodgepole pine, aspen and Douglas-fir account for only 25%. However, lodgepole pine is well represented among larger trees in each stand, accounting for an average of 68% of total basal area per acre, making it the dominant tree species (Table 2). This illustrates the active succession of these stands from lodgepole pine to fir.

The mountain pine beetle (MPB) plays an important ecological role in lodgepole pine forests. Endemic populations of bark beetles act as a thinning agent, attacking large older trees, creating openings for regeneration, and contributing fuel for eventual stand replacing fires (Anhold & Long 1996). The mountain pine beetle is currently present in the stands at low population levels (endemic) and is causing some individual tree mortality annually. Walk through examinations since data collection in 2003 have shown that MPB populations have remained relatively stable (Hebertson 2006), with only small pockets (1-5 trees) being attacked.

A stand hazard rating developed by Steele et al. (1996) for primary change agents was used to assess hazard ratings for Douglas-fir beetle and mountain pine beetle. Maximum individual rating values are based on maximum potential effect (mortality or growth reduction), given the

occurrence of the agent in pure stands of vulnerable hosts within the next 10 years. Each rating is adjusted for the percentage of host species in the stand to more accurately assess mixed species stands. The hazard rating is based upon four variables. These include 1) stand basal area of all live trees (≥ 5.0 inches dbh for lodgepole pine and ≥ 9.0 inches dbh for Douglas-fir), 2) the proportion of the basal area comprised of live lodgepole pine/Douglas-fir trees, 3) average age of lodgepole pine/Douglas-fir in the stand based on at least two site trees per plot (≥ 5.0 inches dbh), and 4) the average diameter of all lodgepole pine ≥ 5 inches dbh and Douglas-fir ≥ 9 inches dbh. In addition to the variables listed above, the mountain pine beetle rating also uses stand elevation as a rating variable. Values for each attribute are assigned a class (in parenthesis), and a rating value of Low, Moderate or High is determined by summing the classes (Table 4).

Table 3
Current Douglas-fir Beetle Ratings for Telephone Hollow Project Area

Stand (Unit)	LBA [†]	% DF BA	DF QMD	Avg. DF Age	Hazard Rating
187-01 (1)	168	10	12.5	80	Low
187-02 (2)	164	na	na	na	Low
186-01 (3)	NA	NA	NA	NA	NA
195-02 (4)	137	20	14.5	73	Low
195-03 (5)	195	20	14.6	146*	Low
195-04 (6)	NA	NA	NA	NA	NA

[†] LBA = Live stand basal area; % DF BA = percentage of live Douglas-fir basal area ($\geq 9''$); DF QMD = the quadratic mean diameter at breast height of Douglas-fir ≥ 9 inches; Avg. DF Age = the average age of Douglas-fir in the stand; Hazard Rating = Average stand hazard rating using Steele et al. 1996; na = No DF $>9''$ dbh recorded in stand; NA = No Douglas-fir were tallied in the Unit. *Only one DF aged in the stand, avg. DF age is assumed to be 80 years.

Based on the hazard rating performed for Douglas-fir Beetle, all of the stands that contain Douglas-fir have a low susceptibility to attack. The proposed treatment(s) will reduce overall stand basal areas, but may actually increase or have no effect on other attributes used in the rating system. Despite this, it is expected that the hazard rating for Douglas-fir beetle will remain the same for each stand.

Table 4
Current Mountain Pine Beetle Ratings for Telephone Hollow Project Area

Stand (unit)	Avg. Age [†]	QMD 5+	LBA	% LPP BA	Elev.	Rating
187-01 (1)	69 (2.2)	10.3 (3.3)	168 (3.3)	.71	8,100 (1)	6.2 – Mod-Hi
187-02 (2)	55 (1.1)	9.3 (3.3)	164 (3.3)	.61	8,100 (1)	4.7 – Mod
186-01 (3)	83 (3.3)	11.4 (3.3)	139 (3.3)	.93	8,100 (1)	9.2 – High
195-02 (4)	59 (1.1)	8.9 (3.3)	137 (3.3)	.53	8,100 (1)	4.1 – Mod
195-03 (5)	90 (3.3)	10.0 (3.3)	195 (3.3)	.42	8,100 (1)	4.2 – Mod
195-04 (6)	91 (3.3)	11.5 (3.3)	200 (3.3)	.99	8,100 (1)	9.8 - High

[†] Ave. Age = the average age of Douglas-fir in the stand; QMD 5+ = the quadratic mean diameter at breast height of lodgepole pine ≥ 5 inches; LBA = Live stand basal area; % LPP BA = percentage of live lodgepole pine basal area; Rating = Average stand hazard rating using Steele et al. 1996.

Hazard ratings for MPB are moderate for 4 stands and high for 2 stands (Table 4). The proposed treatment(s) would generally reduce two of the four variables used for the susceptibility rating

system; live basal area of each stand and the percentage of lodgepole pine basal area. All stands would have a reduced post treatment hazard rating with the exception of 195-03. The increase is attributed to the fact that this stand had the lowest percentage of lodgepole pine and the largest amount of merchantable subalpine fir. The harvest will remove more of the shade tolerant species and actually increase the overall percentage of lodgepole pine in that stand. Collectively, the average stand rating on a per acre basis will be reduced from 6.5 (medium high) to 5.5 (medium). In addition, the higher temperatures created within thinned stands will serve to reduce beetle survival and alter attack behavior of the insect (Schowalter et al. 1992).

Desired Condition

The proposed treatment stands are all or partially in Forest Plan Prescription 5.2 - Forested Ecosystems – Vegetation Management, Uinta National Forest Land and Resource Management Plan (UNF 2003). Eastern portions of stands 195-01, 195-02, and 195-03 fall within Forest Plan Prescription 3.2 – Watershed Emphasis. Stands 186-01, 187-01, 187-02 and 195-04 are entirely within Prescription 5.2.

Under Management Prescription (MP) 3.2 on page 3 – 43 of the LRMP, MP-3.2-3 Guideline states '*Vegetation management activities may be allowed if they maintain or enhance biophysical resources.*' However, on page 4-4 the LRMP states '*Grazing and timber harvest are not allowed*'. If there is a conflict between any direction for a management activity and direction for a Recreation Opportunity Spectrum (ROS) class or management prescription, the most restrictive direction will be applied (LRMP, p. 3-1). Because of this, the portion of those stands which fall in MP 3.2 (Strawberry Project Lands) will not be commercially harvested to preserve high quality soil productivity and watershed conditions.

The Uinta Forest Plan states that the desired future condition for forested vegetation within the Strawberry Reservoir Management Area and within MP 5.2 '*are managed to maintain or restore vegetation to achieve multiple resource values while providing for multiple uses and attaining goals and objectives for timber commodity production.*' (LRMP p. 5-124 & 125). The desired future condition for forested vegetation within the Deer Creek Reservoir Management Area states, '*Commercial timber sales are employed as the preferred management tool where economically viable and environmentally sound; however, achievement of high yields is not the primary purpose. Timber removed from these areas contributes to the Forest's Allowable Sale Quantity (ASQ).*' (LRMP, p. 5-40).

In terms of the overall Desired Future Condition (DFC) for Vegetation on the Uinta National Forest, the LRMP states: '*Vegetation management focuses on improving the diversity of forested and non-forested communities, with an emphasis on aspen stand regeneration and insect and disease control in conifer species. Forested vegetation that is classified as capable and available is managed to provide a portion of the Forest's ASQ. Timber harvest activities conducted to achieve management objectives provide opportunities for the local dependent timber industry.*' (LRMP, p. 5-2). The desired future condition for Water and Watershed states '*Upland vegetation in all management areas is managed to maintain sufficient ground and soil cover to limit erosion and sediment transport to streams; and Forest management activities are implemented in a manner that prevents unacceptable watershed impacts.*' (LRMP, p. 5-1)

Purpose and Need for Action

The purpose of the proposed action is to: maintain healthy, vigorous lodgepole pine stands in the affected landscape, reduce stand susceptibility to mountain pine beetle, reverse the successional trend away from subalpine fir dominated stands, and reduce the risk of a stand replacing crown fire in the treated stands. The need to treat hazardous fuel conditions is exacerbated by the proximity of residential and summer homes to treatment units.

The Daniels Summit community is located approximately eighteen miles southeast of Heber City, Utah. This community is identified as an “urban wildland interface community within the vicinity of Federal lands” (Federal Register, Vol. 66, No. 160, p. 43423, 8/17/01).

Proposed Action

The proposed action is to implement stand treatments designed to reduce stand densities and competition on approximately 270 acres of lodgepole pine and aspen forest types. Even-aged stands would be commercially thinned to increase growth and vigor, primarily retaining the larger healthier trees on the site. In conjunction with the thinning, small openings (up to 2 acres in size) would be created to promote structural diversity and lodgepole pine regeneration. Multi-aged stands would be thinned across all age/size classes, with a focus on reducing invading shade-tolerant species which contribute to ladder fuels and conversion of the site from lodgepole pine to subalpine fir dominance. Approximately 20 acres of aspen would be manually treated to reduce subalpine fir invasion. Activity fuels (logging slash) would be treated by various means to reduce post-harvest fire potential in selected areas of the project. This may include removal, chipping, crushing, and/or piling and burning. Areas within the Strawberry Project Lands (lands within the project area on the east side which are under a watershed emphasis – 3.2 in the Forest Plan) would not be part of a commercial timber sale and would be treated by piling and burning bark beetle infested trees.

Where post-treatment monitoring indicates stocking is inadequate, revenues from the sale of the timber would be used to supplement reforestation in the affected stands with planting of lodgepole pine seedlings. The proposed action is more fully described later in Chapter 2.

Decision Framework

Given the purpose and need, the deciding official reviews the proposed action and the other alternatives in order to make the following decisions:

- Should timber harvest occur within the project area?
- If so, what type of treatment should be implemented to address the purpose and need?
- Should the aspen stands be treated?

Public Involvement

The proposal was listed quarterly in the Schedule of Proposed Actions from Winter 2003 through Fall 2004 editions. The Project was reinitiated and republished in the SOPA beginning in the Summer 2006 edition through present. The Schedule of Proposed Actions is posted on the Uinta web site and is mailed to over 400 individuals. In addition:

- The Heber Ranger District sent a scoping document to the public and other agencies listed on the Heber District General NEPA mailing list, Daniels Summit Homeowners

and to the interested parties on the Heber District Timber Sale mailing list, requesting comments on February 13, 2004.

- A legal notice requesting comments was published in the “*Provo Daily Herald*” on February 26, 2004 and a press release was published in the Toole, Utah “*Transcript-Bulletin*”. Seven letters were received. The project was put on hold in 2004, due to other priorities on the Uinta National Forest.
- A second legal notice requesting comments was published in the “*Provo Daily Herald*” on October 24, 2004.
- A second scoping document was sent to the public and other agencies listed on the Heber District mailing list requesting comments on October 25, 2006.
- A corrected legal notice was published in the “*Provo Daily Herald*” on December 24, 2006.

Changes from the initial scoping letter are:

- The proposed acreage to be treated increased from 220 acres to 280 acres. The proposal has currently been refined to approximately 270 acres.
- The original proposal had less than ½ mile of temporary road and may have fit within the categorical exclusion for environmental analyses. With the need for additional temporary road, the proposal will be analyzed in an environmental assessment.
- Portions of the project area would be treated using an uneven-aged individual tree and group selection silvicultural prescription. Several small group selection openings (up to two acres in size) would be utilized to promote structural diversity and lodgepole pine regeneration.
- The treatments would most likely be conducted utilizing a standard timber sale rather than a stewardship contract. Areas within Strawberry Project Lands would not be part of a commercial timber sale and would be treated by piling and burning beetle infested trees.

In response, twelve comment letters, e-mails or phone calls were received from environmental groups, federal, state and county agencies as well as private citizens.

Using the comments received from the public, other Agencies and from within, the interdisciplinary team developed a list of issues to address. These comments were also used to shape the final proposed action. Comments and how they were addressed are included in Appendix A.

CHAPTER 2 - ISSUES AND ALTERNATIVES, INCLUDING THE PROPOSED ACTION

Issues

The Forest Service identified the following issues that influenced the development of the proposed action. These issues include:

- Maintenance of lodgepole pine and aspen in the landscape.
- The threat of wildland fire to homes adjacent to the project area.
- Potential impacts to soils and soil productivity.
- Potential impacts to water quality.
- Impacts to wildlife and MIS.

Maintenance of lodgepole pine and aspen in the landscape

The project area includes the most western and southern extent of the native range of lodgepole pine (*Pinus contorta*) in Utah. High stand densities within the project area are resulting in reduced growth, the onset of conversion to shade tolerant conifer species (white fir & subalpine fir), and continued susceptibility to bark beetle attack. Live ladder fuels are such that a wildland fire occurring in the stands could easily move up into the crown resulting in a crown fire that would be difficult to contain and result in a stand replacing fire. Selected aspen stands in the project area are aspen dominated but are being encroached upon by subalpine fir. The aspen in these areas range from healthy to decadent, but all have significant conifer encroachment occurring. The decadent stands where overstory aspen are dying are regenerating with sufficient aspen suckers.

Measurement indicators: Percentage of lodgepole pine or aspen in the stands.

Measurement indicators: Successful lodgepole pine and aspen regeneration in the treated stands.

The threat of wildland fire to homes adjacent to the project area

These stands contain large amounts dead and live subalpine (*Abies lasiocarpa*) and white fir (*Abies concolor*) trees with numerous branches that can cause a fire to transition from the surface into the canopy (ladder fuels); and some down trees from windthrow or insect attacks (mountain pine beetle) that can result in stand-replacing fire behavior under certain conditions. Often fire behavior in these relatively cool, north-facing stands is of a low intensity. However, fires replacing 75%-77% of the stands at an approximate interval of 90 years is part of the natural regime in these types of system (Shapiro, Specialist Report 2007). Fires of the latter type pose a potential threat to the adjacent Daniel Summit home development and the fire fighters that will protect this community in the event of a wildland fire.

Measurement indicators: Number and acreage of wildland fires. Reduction in stand densities that reduce ladder fuels and crown fire potential.

Potential impacts to soils and soil productivity

The main soil issues center on soil disturbance that removes native ground cover/vegetation and compacts the soil with repeated use. Loss of topsoil is a threat to revegetation after disturbance. Loss of vegetation or litter cover opens the soil to both wind and water erosion. Either soil structure damage through compaction or loss of topsoil through erosion will make these areas difficult to revegetate, and impact long-term site productivity.

Measurement indicators: Acres potentially impacted by accelerated erosion (soil loss), detrimental soil compaction, or loss of soils aggregate structure.

Potential impacts to water quality

The Strawberry Reservoir is included on the 2004 State of Utah 303(d) List of Impaired Waters for Total Phosphorous and Dissolved Oxygen. Water quality in the reservoir is currently partially supporting its coldwater fishery and improving, but not at a rate that would allow it to be removed from the 303 (d) List. As a result, the Strawberry Reservoir Total Maximum Daily Load (TMDL) Study was developed by the Utah Department of Environmental Quality (UDEQ) – Division of Water Quality. The report was finalized in July 2005 (UDEQ-DWQ, July 2005). Current conditions and recent trends of the reservoir’s water quality indicate that continuation of current and planned management practices will continue to improve quality and sustainability of the Strawberry Reservoir’s Fishery. The TMDL Study recommends a 75 pound reduction in annual total phosphorus loads (lbs / year) for the Strawberry River and Tributaries.

Generally, activities associated with the removal of timber and materials from the forest using mechanized equipment have the highest potential for soil disturbance and prolonged impacts to watershed functions. Tree felling, skid trail and landing construction and most notably road construction are the activities with the greatest impacts. In most instances, it is not possible to absolutely “design out” all sediment delivery coming from existing and proposed road activities. Roads often require stream crossings or the use of gently sloped lands that are most common near stream channels. The total prevention of sediment delivery to stream channels is not feasible where roads require access across, or locations parallel to and adjacent to streams. Therefore, the water quality analysis focuses on those locations where the road location is sufficiently close to stream channels to result in sediment delivery.

Measurement indicators: Tons of sediment delivered to streams as estimated using the Water Erosion Prediction Project (WEPP) Model (Jarneck, Hydrologist Specialist Report, 2007).

Alternatives

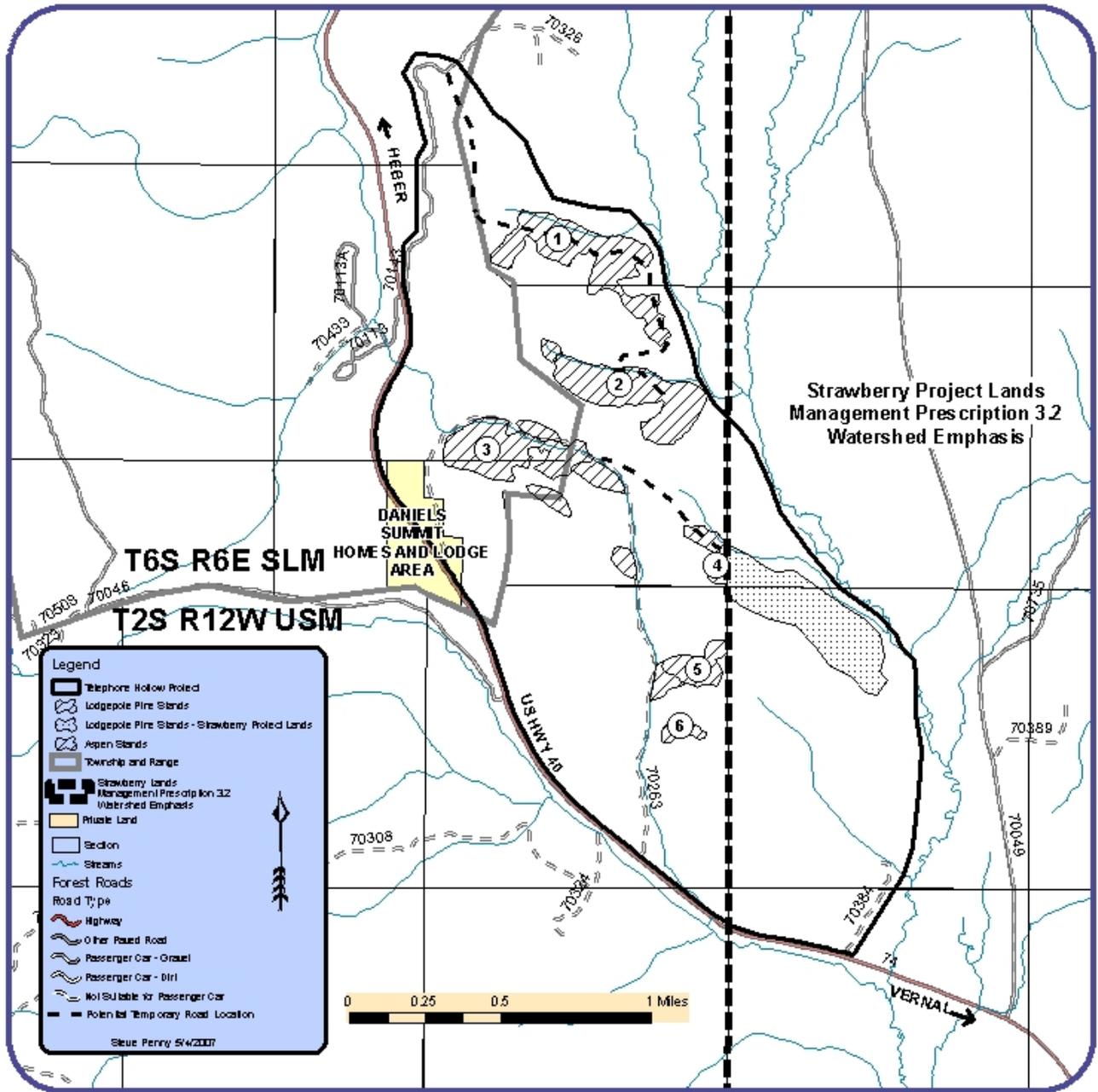
Proposed Action

The proposed action is to implement stand treatments designed to reduce stand densities and competition in approximately 270 acres of lodgepole pine and aspen forest types. Even-aged stands would be commercially thinned to increase growth and vigor, primarily retaining the larger healthier trees on the site. In conjunction with the thinning, small openings (up to 2 acres in size) would be created to promote structural diversity and lodgepole pine regeneration. Multi-

aged stands would be thinned across all age/size classes, with a focus on reducing invading shade-tolerant species which contribute to ladder fuels and conversion of the site from lodgepole pine to subalpine fir dominance. Approximately 20 acres of aspen would be manually treated to reduce subalpine fir invasion. Activity fuels (logging slash) would be treated by various means to reduce post-harvest fire potential in selected areas of the project. This may include removal, chipping, crushing, and/or piling and burning. Areas within Strawberry Project Lands would not be part of a commercial timber sale and would be treated by piling and burning bark beetle infested trees.

The following map (Figure 2) shows the proposed treatment units, treatment type and proposed temporary road locations. An estimated 2,100 ccf of sawtimber would be removed.

Figure 2
Map of the Proposed Action



Four prescription groups have been developed to address the different stand conditions, primarily in respect to species composition. These are described in detail below. Table 5 shows the acres of each prescription type and the general site characteristics of each:

Table 5
Prescription Group Site Characteristics

Prescription Group	Approximate Treatment Acres
A - Thinning (Commercial & Precommercial) with Group Selection	129
B: Low Thinning/Hazardous Fuels (Commercial & Precommercial)	54
C: Aspen Restoration/Conifer Weeding	21
D: Strawberry Project Land MPB Treatment	65
Total	269

Prescription Group A: Thinning (Commercial & Precommercial) with Group Selection

Commercial thinning will focus on the removal of low vigor, damaged, or insect and disease affected trees (>3 inch dbh); primarily lodgepole pine. Recently dead and dying trees (trees with dead foliage) that are sound, no longer provide suitable beetle habitat, and are expected to remain merchantable for 2-3 years will all also be salvaged. Aspen will not be harvested. Target basal area will be 90-120 ft² per acre, and target stand density index (SDI) will be approximately 245, or 35% of SDI_{max}. Average spacing between trees will be approximately 15 feet depending on the average stand diameter and target stocking level. Overstory stocking will be reduced by 31-43% and the currently densest stands will retain higher basal areas to mitigate risk of blowdown. Precommercial thinning (PCT)/Timber Stand Improvement (TSI) will focus on removal of suppressed or damaged lodgepole pine and overstocked shade tolerant species (<3 inch dbh). Retention preference for conifer seedlings and saplings will be given to lodgepole pine and Douglas-fir.

In order to ensure the establishment of a new age class of lodgepole pine, the group selection regeneration method will be applied to up to 20% of the 129 acres of stands included in this prescription group. Size of groups will be a minimum of the twice the height of mature trees (90' * 2 = 180' diameter opening ≈ 0.6 acre) or greater, not to exceed 2 acres. The purpose of these groups is to stimulate natural regeneration and create a new cohort of lodgepole pine. The low thinning is considered an intermediate treatment and is designed to reduce stand densities, improve tree growth and vigor, and enhance forest health. The thinning treatment does not create a regeneration need, but group selection areas will need to be monitored for adequate regeneration.

The forest plan requires that all artificially and naturally regenerated areas (group selections) be excluded from livestock grazing, bedding, trailing, and where possible, salting, fire, rodents, and other damaging agents until tree seedlings are of sufficient height to withstand these activities as determined by the silvicultural prescription (LRMP 3-19). It is felt that stand 187-02 (cutting

unit 2) has the greatest potential for impact from cattle grazing in the overlying allotment because of its position between openings. To mitigate detrimental impacts to regenerating lodgepole pine, selection groups in this stand should be located away from existing cattle trails and no salt placed in or around group selection areas. Cattle use should be monitored and funds collected from timber receipts (KV Plan) for erection of temporary fencing, if necessary, to protect regeneration groups. In addition, when rehabilitating temporary roads, enough logging slash, where available, should be pulled onto the reclaimed roads to deter use by cattle.

Logging slash should be lopped and scattered throughout the stand matrix, but dozers equipped with brush blades can be used to concentrate slash for burning in openings (group selections). Piles should be kept small to reduce the amount of heat generated. The Forest plan requires a minimum of 50 downed logs (6-inch midpoint diameter & 8 feet long) or 50 tons of large woody debris (>3 inch) per 10 acres be retained in treated areas (LRMP 3-19). Retention of this material will provide soil protection and could serve to deter cattle use of group selection areas. Because logging activities are not typically performed during winter months on the Uinta NF, infestation of slash and live trees by the pine engraver (*Ips pini*) is not expected to be an issue (high risk months = December through June). However, slash covered by early snows may still be "fresh" enough to attract pine engravers in spring, thus large diameter slash should be monitored for pine engraver activity.

Prescription Group B: Low Thinning/Hazardous Fuels (Commercial & Precommercial)

This group consists of only one stand which is located adjacent to the Daniels Summit home development. Management in this stand is a cultural treatment that will focus on maintaining a mature, park-like stand of lodgepole pine which will be resistant to wildfire that could spread up into the crown and threaten the community. This stand will be thinned from below to a target stocking of 90 ft² per acre. Average spacing between trees will be approximately 18-19 feet, but will be allowed to vary to avoid the appearance of a tree farm and to ensure that the best quality trees are retained. Regeneration is not a goal of this treatment.

The low thinning will focus on the removal of the smaller diameter trees exhibiting low vigor, serious form defect, or insect and disease damaged trees (>3 inch dbh); primarily lodgepole pine. While the treatment in this stand will target primarily the smaller diameter trees, some larger trees from the main canopy that have been attacked by beetles, are diseased, or have poor crowns and are not likely to respond to the thinning will also be harvested. Recently dead and dying trees (trees with dead foliage) that are sound, no longer provide suitable beetle habitat, and are expected to remain merchantable for 2-3 years will all also be harvested. Snag retention will not be a priority in this stand, but older snags that are unsound and have lost all foliage should be retained as wildlife trees. Treatment of the precommercial material will include harvest of all suppressed or damaged lodgepole pine and overstocked shade tolerant species (<3 inch dbh).

Logging slash may be treated by various means to reduce post-harvest fire potential. This may include removal, chipping, crushing and/or piling and burning. If piled, they should be located in open areas and/or be small enough so that scorching of reserve trees will not occur. No more than 5 tons/acre of large woody debris (>3 inches diameter, lopped & scattered) should be retained after pile/burn treatment.

Prescription Group C: Aspen Restoration/Conifer Weeding

This group consists of 5 small aspen stands that are mostly adjoined to the conifer stands to be treated. These stands are aspen dominated but are being encroached upon by subalpine fir. These aspen in these areas range from healthy to decadent, but all have significant conifer encroachment occurring. The decadent stands where overstory aspen are dying are regenerating with sufficient aspen suckers. All conifers less than 8-inches dbh will be harvested to reduce competition and encourage further suckering. Slash will be lopped and scattered on site.

Prescription Group D: Strawberry Project Land MPB Treatment

This group consists of the portion of Unit 4 that is located in the Strawberry Project Lands. Mountain pine beetle is affecting small groups (1-5 trees) of lodgepole pine in this stand and causing yearly mortality. Treatment would involve identifying and marking trees with live brood and felling them after completion of flight (July-August). Trees would be bucked into smaller pieces for drying, then piled and burned before the following year's beetle flight.

Common to All Prescription Groups

- Designated skid trails would be used in all treatment types, and where feasible existing skid trails should be utilized.
- Timber harvest will not be allowed in treatment stands that fall within MP 3.2 (LRMP 4-4, Watershed Emphasis).
- Ground based skidding will be limited to slopes less than 40% (LRMP 3-22, Timber-11).
- Within 5 years, post harvest stocking levels in stands receiving regeneration treatments will be at least 246 trees per acre as required by the Forest Plan (3-20). Stands failing to meet this requirement within 5 years will be scheduled for artificial regeneration with lodgepole pine.
- To avoid exclusion of grazing, Heber Ranger District range staff must work with permittee(s) to keep livestock out of regeneration areas (group selections). Salting must not take place within harvested units.
- Minimum downed logs (6-inch midpoint diameter & 8 feet long) will be equivalent to 50 per ten acres or large woody debris (>3 inch diameter) will equal 50 tons per 10 acres (inclusive of downed logs) as required for aspen and aspen/lodgepole cover types. Downed logs take precedent over large woody debris and if the minimum size is unavailable the largest logs available will be retained on site (LRMP 3-19).
- Avoid or minimize all types of travel, including driving and skidding, through noxious weed-infested areas (Guideline, Weeds-6). For at least three years after a project is completed, treat invading noxious weeds, as needed, on areas impacted by ground-disturbing operations (Standard, Weeds-9). Spray or remove weeds on sites to be disturbed prior to beginning ground-disturbing activities (Guideline, Weeds-12).

Harvested areas will be monitored for noxious weed infestations and funds for treatment set aside in the KV Plan. In heavily infested areas, such as along the Telephone Hollow Road,

weeds may require bi-yearly spraying, including one treatment before seasonal harvesting operations begin. Efforts should be made to begin harvesting in less infested areas to build up KV funds for weed treatment.

The proposed action would require approximately 2 miles of temporary road construction and use of 0.5 miles of existing non-system road. Roads would remain open for the life of the timber sale (1-3 years). Constructed Temporary Roads would then be obliterated using a tracked excavator or similar machine, and any cut slopes filled in back to original grade. Surface roughening techniques and seeding with an appropriate seed mix would be used to complete the operation. Sufficient logging slash, where available, will be pulled over the rehabilitated temporary roads to prevent trailing by cattle into regeneration groups. Roads will not be planted with tree seedlings. Natural regeneration of lodgepole pine on these road areas, where located in timbered areas, is expected because of abundant nearby seed sources.

No Action

This alternative would not involve any actions by the Forest Service to manage the timbered vegetation in the Telephone Hollow area. Stand structural diversity would not be manipulated. The subalpine fir would continue to encroach in the lodgepole pine and aspen stands. Fuels would not be treated in the area, leaving risk of wildland fire to the Daniels Summit community unchanged. Mountain pine beetle would continue to cause mortality in lodgepole pine trees within affected stands depending on weather and population dynamics. Populations would be monitored for informational purposes.

Comparison of Alternatives

Table 6
Alternatives Compared

Alternative	Acres Treated	Skid Trails /Landing	Temp Roads	Volume Removed
1 Proposed Action	270	29 acres	2.5 mi	2,100 ccf
2 No Action	0	0 acres	0 mi	0

Alternatives Considered But Eliminated From Detailed Analysis

Clearcutting Lodgepole Pine Stands

Clearcutting of the lodgepole pine was discussed as an alternative. This would provide for regeneration of the stands. However, this may have had possible negative effects on watersheds involved, soils and visual landscape due to complete removal of vegetation.

Prescribed Burning of Lodgepole Pine

This could provide for regeneration of lodgepole pine. This alternative was eliminated from detailed study for the following reasons. Burning merchantable timber was not desirable. The project is within two established TMDLs (Deer Creek and Strawberry reservoirs). A prescribed burn in this area could adversely impact water quality through increases in water yield and sediment delivery to Daniels Creek and Strawberry River. The visual retention of the highway 40 corridor would also be impacted. The close proximity to the Daniels Summit homes would carry additional risk.

CHAPTER 3 - AFFECTED ENVIRONMENT / CONSEQUENCES

This section provides a summary of the environmental impacts of each alternative to the significant issues or resource areas. It discusses the effects to the applicable physical, biological, social and economic environments within the project area.

Issues Effects Summary Discussion

FORESTED VEGETATION STRUCTURE AND COMPOSITION

Affected Environment -

Telephone Hollow is located approximately 18 miles southeast of Heber City west of US Highway 40 near Daniels Summit, which is just northwest of Strawberry Reservoir. Home sites are located adjacent to Unit 3 (Figure 2). Aspen occupies the largest percentage of the forested landscape within the analysis area. Stands of Douglas-fir and white fir mixed with aspen occur primarily along ridges while stands of lodgepole pine mixed with Douglas-fir and true firs occur on northerly aspects. Lodgepole pine is a dominant seral (the dominant cover type of even-aged stands with a vigorous understory of shade-tolerant species that will replace lodgepole pine in 100 to 200 years) species in cool dry habitats. Fire often plays a major role in its successional continuum, as it is intolerant to shade and thrives after fire (Burns & Honkala 1990).

The Primary habitat type in the coniferous stands across the analysis area is subalpine fir/creeping barberry (ABLA/MARE11). Aspen (*Populus tremuloides*), subalpine fir (*Abies lasiocarpa*), white fir (*Abies concolor*), and Douglas-fir (*Pseudotsuga mensiezii*) are each present in four of the six stands. Engelmann spruce (*Picea engelmannii*) was only recorded in one stand, but the actual on the ground occurrence is greater. All stands are considered to be even-aged in structure based on the FSVeg Vegetative Structural Stage Report, and are typically 2 storied consisting of an overstory dominated by lodgepole pine and an understory dominated by white fir and subalpine fir.

The average Stand Density Index (SDI) for all stands is 415, which equates to 59% of the maximum SDI for lodgepole pine. This level of stocking indicates that the stands are at full site occupancy with severe competition among trees and active density related mortality. The stands are beginning to stagnate as individual tree diameter and volume growth decline. Whole stand volume growth is beginning to decline as mortality increases and shade tolerant species establish. There is an average of 21 dead trees per acre among the proposed treatment stands.

Stand densities range from 128 to 200 ft² of basal area per acre in trees 5-inches dbh and larger (primarily lodgepole pine), with the average being approximately 149 ft². The average quadratic mean diameter is 9.9" dbh in trees over 5-inches, and stands average 1,922 seedlings and saplings per acre (75% subalpine & white fir). The average tree height among stands is about 70 feet tall. The basal area percentage of lodgepole pine in the stands ranges from 42 to 100%, with the average being 68%. Lodgepole pine accounts for only 1% of total trees per acre, but represents two-thirds of the basal area, demonstrating that stand conditions have been favorable for the establishment of shade tolerant species, creating hazardous ladder fuels and replacement of lodgepole pine.

Timber Capability and Suitability

The 2003 Uinta National Forest Land and Resource Management Plan included an analysis of and decision for timber suitability. The process used for and the results of the analysis of timber suitability are described in Appendix B (pages B-2 to B-9) to the Final Environmental Impact Statement for the 2003 Uinta National Forest Land and Resource Management Plan (LRMP FEIS). The Revised Forest Plan identifies suitable timberlands (Revised Forest Plan, Appendix E, Timber Suitability Map), which occur within the 74,840 acres allocated to Management Prescription 5.2. Of the total acres allocated to Management Prescription 5.2, 39,315 acres are suited. In addition, timber harvest activities which may produce commercial products incidental to other management objectives are allowed on another 132,710 acres across the forest. These additional 132,710 acres were not counted as part of the suitable timberlands.

Environmental Consequences-

Proposed Action – Timber Harvest, Aspen Treatment and Fuels Treatment

Over the long-term, silvicultural treatments offer the greatest likelihood of reducing the susceptibility of stands to bark beetle infestation, thus minimizing the potential for unacceptable levels of tree mortality and build up of hazardous fuels. Prevention strategies offer the greatest likelihood of reducing the susceptibility of stands in the Telephone Hollow area by reducing stand densities, creating a mosaic of structures, age classes, and species mixtures. Lodgepole pine stands would be harvested using thinning and group selection systems to reduce mountain pine beetle hazard and encourage regeneration of lodgepole pine. Invading conifer would be cut in selected aspen stands to reduce competition and encourage aspen suckering. LRMP Standard Timber-12, page 3-22 allows for timber harvest in Riparian Habitat Conservation Areas (RHCAs) where catastrophic events such as fire, flooding, wind, or insect damage result in degraded riparian conditions. Actively beetle infested trees within RHCAs may be harvested to reduce beetle populations and protect residual trees. Currently infested trees which are contributing to the continued mortality and build up of hazardous fuels would be treated in the area within Strawberry Project Lands.

The action proposed is to use a commercial timber harvest on approximately 185 acres within the project area, and non-commercial treatments on approximately 85 acres. Within conifer stands both precommercial and commercial thinning will be utilized, reducing stand densities to approximately 90-120 ft² of basal area per acre. Stands that are currently more densely stocked will retain higher basal areas to reduce the possibility of windthrow. The commercial thinning (15-20 foot average spacing) will primarily target low-vigor lodgepole pine and insect and disease affected trees of all species. The precommercial thinning will target suppressed lodgepole pine and true fir species which have created ladder fuels. In addition the uneven-aged group selection method (groups < 2 acres) will be utilized to create stand structure and provide increased opportunities for natural regeneration of lodgepole pine. Approximately 21 acres of aspen will receive a restoration weeding treatment that will remove encroaching subalpine fir < 8 inches dbh.

Forest Vegetation Simulator (FVS) simulations show that after treatment stand growth will remain relatively vigorous over the next 30 years, after which time the SDI levels will exceed 60% of maximum in at least 3 stands.

Timber Capability and Suitability

Under the Proposed Action, and applying a site-specific analysis, the Telephone Hollow Project Area contains approximately 238 acres out of 269 acres that are capable for timber. Portions of stands identified for treatment in the Proposed Action that are in the Strawberry Project Lands and within RHCAs were identified in the Forest Plan as capable but not suited for timber harvest; there are 193 suitable timber acres (Timber Capability and Suitability Evaluation/Validation).

No Action

No timber harvesting or stand treatments would occur under this alternative. Mountain pine beetle infested trees would not be removed and beetle populations would likely remain at endemic levels, resulting in continued lodgepole pine mortality in affected stands. Subalpine fir would continue to grow and invade the lodgepole pine and aspen stands.

FOREST INSECT AND DISEASE POPULATIONS

Affected Environment -

The mountain pine beetle (MPB) is currently present in the stands at low population levels (endemic) and is causing annual tree mortality. Walk through examinations since data collection in 2003 have shown that MPB populations have remained relatively stable (Hebertson 2006), with only small pockets (1-5 trees) being attacked. The mountain pine beetle plays an important ecological role in lodgepole pine forests. Endemic populations of bark beetles act as a thinning agent, attacking large older trees, creating openings for regeneration, and contributing fuel for eventual stand replacing fires (Anhold & Long 1996).

A stand hazard rating developed by Steele et al. (1996) for primary change agents was used to assess hazard ratings for Douglas-fir beetle and mountain pine beetle. Hazard ratings for MPB are moderate to moderate-high for 4 stands and high for 2 stands. The proposed treatment(s) would generally reduce two of the four variables used for the susceptibility rating system; live basal area of each stand and the percentage of lodgepole pine basal area (see Table 4, page 4).

Environmental Consequences -

Proposed Action - Timber Harvest, Aspen treatment and Fuels Treatment

Forest Vegetation Simulator (FVS) simulations show that mountain pine beetle risk ratings will be reduced or maintained over the next 20 years in all stands, but will return to current levels or worse after 20-30 years. The treated stands will benefit from reduced competition by improved growth and vigor which will allow trees to more effectively resist beetle attacks.

Table7
Post Harvest Mountain Pine Beetle Ratings for Telephone Hollow Project Area

Stand (unit)	Avg. Age[†]	QMD 5+	LBA	% LPP BA	Elev.	Rating
187-01 (1)	69 (2.2)	12.6 (3.3)	100 (2.2)	.75	8,100 (1)	5.8 – Mod
187-02 (2)	60-80 (2.2)	9.9 (3.3)	100 (2.2)	.56	8,100 (1)	4.3 – Mod
186-01 (3)	>80 (3.3)	12.8 (3.3)	90 (2.2)	.75	8,100 (1)	6.6 – M-H
195-02 (4)	85 (3.3)	10.7 (3.3)	90 (2.2)	.41	8,100 (1)	3.6 – Mod
195-03 (5)	>80 (3.3)	12.3(3.3)	100 (2.2)	.61	8,100 (1)	5.4 – Mod
195-04 (6)	>80 (3.3)	14.5 (3.3)	120 (2.2)	.99	8,100 (1)	8.7 - High

[†] Ave. Age = the average age of Douglas-fir in the stand; QMD 5+ = the quadratic mean diameter at breast height of lodgepole pine ≥ 5 inches; LBA = Live stand basal area; % LPP BA = percentage of live lodgepole pine basal area; Rating = Average stand hazard rating using Steele et al. 1996.

The proposed treatment(s) would generally reduce two of the four variables used for the susceptibility rating system; live basal area of each stand and the percentage of lodgepole pine basal area. All stands would have a reduced post treatment hazard rating with the exception of 195-03 (Table 7). The increase is attributed to the fact that this stand had the lowest percentage of lodgepole pine and the largest amount of merchantable subalpine fir. The harvest will remove more of the shade tolerant species and actually increase the overall percentage of lodgepole pine in that stand. Collectively, the average stand rating on a per acre basis will be reduced from 6.5 (medium high) to 5.5 (medium). In addition, the higher temperatures created within thinned stands will serve to reduce beetle survival and alter attack behavior of the insect (Schowalter et al. 1992).

No Action

The No Action alternative would not effectively reduce stand susceptibility and potentially result in the loss of most large diameter trees in the event of outbreaks. Surviving trees would consist of non-host and small diameter lodgepole pine/Douglas-fir leaving salvage as the only commercial option. Other costs might include the loss of viable, natural seed sources requiring artificial regeneration of the site. Extensive mortality would result in an alteration of fuel complexes and profiles. Heavy fuel loads would increase the likelihood of large and intense wildfires given an ignition source and appropriate fire weather conditions. Mortality might also provide a source of inoculum for root diseases (Forest Health Protection Report).

FUELS ACCUMULATIONS, INCREASED FIRE HAZARD/INTENSITY

Affected Environment -

Lodgepole pine (*Pinus contorta* var. *latifolia*) are thin-barked, fire-adapted trees that can grow in mostly pure stands or in combination with aspen (*Populus tremuloides*) and/or other conifers. Although well-spaced, individual mature lodgepole trees are moderately resistant to surface fire, it is common for this species to grow as they do in the Telephone Hollow area, in relatively dense stands (187 – 341 overstory trees/acre¹) with a mainly conifer-dominated (with some aspen) understory (1,860 – 3,225 understory trees/acre). These stands contain large amounts of

¹ Overstory trees are those large than 5” at breast height. Understory trees are those trees less than 5” at breast height. Data derived from stand exams.

ladder fuels (dead and live subalpine (*Abies lasiocarpa*) and white fir (*Abies concolor*) trees with numerous branches that can cause a fire to transition from the surface into the canopy; and some down trees from windthrow or insect attacks that can result in stand-replacing fire behavior under certain conditions. Often fire behavior in these relatively cool, north-facing stands is of a low intensity and results in minimal acreage burned. However, a high intensity stand-replacing fire every 100 to 200 years is part of the natural regime in these types of system. Fires of the latter type pose a potential threat to the adjacent Daniel's Summit home development and the fire fighters that will protect this community in the event of a wildfire.

Within the area encompassing all of the treatment units in the Telephone Hollow area (Figure 2; approximately 1,790 acres), the Uinta National Forest has records of ten small fires (<0.1 acres) from 1948 to 2006 (Fire Ecologist Specialist Report). Walk through surveys of the unit also showed some fire-scarred trees south and east of the fuels treatment unit. Just over half (60%) of the fires documented in this area were human-caused and all fires occurred between July and September. These records indicate that over the past 50 years, fire has played a limited role in these stands, possibly due to fire suppression or persistent moist conditions through most of the fire season. Regardless, given the variability in snow pack/drought conditions that can occur in this area and the stand age (oldest Lodgepole pines are 100 to 110 years old; see Silvicultural Prescription), these stands are susceptible to a stand-replacing crown fire.

High fire intensities and high rates of spread make crown fires extremely difficult to control as well as making fire suppression efforts much more hazardous. The propensity for crown fires to start spot fires far ahead of the main fire adds to the difficulty of controlling these fires (Cohen 1999). Although current research states that the "home ignition zone" or 100-foot area around a structure principally determines a structure's ignition potential, crown fires that occur near structures (regardless of fuel reduction treatments adjacent to the home) are especially troublesome for firefighters, as radiation from flames can harm a fire fighter or homeowner before untreated siding will ignite (Cohen 1999, Cohen and Butler 1998).

High fire intensities and high rates of spread make crown fires extremely difficult to control as well as making fire suppression efforts much more hazardous. The propensity for crown fires to start spot fires far ahead of the main fire adds to the difficulty of controlling these fires (Cohen 1999). Although current research states that the "home ignition zone" or 100-foot area around a structure principally determines a structure's ignition potential, crown fires that occur near structures (regardless of fuel reduction treatments adjacent to the home) are especially troublesome for firefighters, as radiation from flames can harm a fire fighter or homeowner before untreated siding will ignite (Cohen 1999, Cohen and Butler 1998). It is important to note that the responsibility for clearing the "home ignition zone" lies with the homeowner and cannot be mandated by the U.S. Forest Service.

Typically, the prevailing wind direction in this area is from the south/southwest. However, the terrain greatly affects wind patterns. During the morning and in the night, down canyon winds blow from Daniel's Summit towards Heber City; in the afternoon this pattern is reversed. At the Summit, erratic winds are possible. The Daniels Summit community is on the west side of the treatment area and possibly in an unfavorable position, depending on ignition location (in terms home defensibility) when the afternoon winds blow up canyon.

Environmental Consequences -

Proposed Action – Timber Harvest, Aspen treatment and Fuels Treatment

To evaluate the potential surface and crown fire behavior that could occur prior to and after treatment, the software BehavePlus was used (Andrews et al. 2005). The model was run at various wind speeds to represent the “worst-case scenario” for the Telephone Hollow area; therefore inputs were based on conditions when the moisture level in fuels is low (i.e., July to August) based mostly on area-specific data (e.g., Remote Automated Weather Station (RAWS) and field observations; Fire Ecologist Specialist Report). Where area-specific data was not available (e.g., canopy bulk density, slope, foliar moisture, and herbaceous moisture), values were derived from stand exam data and technical reports. Although modeling is meant to anticipate the fire behavior before and after hazardous fuels treatment in the unit adjacent to the Daniels Summit community, these results are also applicable to the fire behavior that could potentially occur in the surrounding timber sale units before and after treatment (Scott and Burgan 2005).

Pre-Treatment Modeling Results

Using the values documented in Shapiro, 2007, Fire Ecologist Specialist Report, it is evident that the surface fire behavior in this area would be relatively mild (maximum rates of spread: 1.4 – 2.3 chains/hr; flame lengths: 1.1 – 1.4 feet) regardless of wind speed. The relatively light fuel loading (field observation) and previously discussed fire history of small fires in this area supports these values although small fires may be more related to fire suppression in the area. If there is not a transition to crown fire, rates of spread can be expected to be low. However, the model also shows that a transition to an active crown fire (where fire spreads continuously between crowns) is possible when winds are 30 miles/hour. A crown fire is predicted to occur when the transition ratio (calculated surface fireline intensity divided by critical surface fireline intensity) is greater than 1.0, meaning that the fireline intensity (related to flame length) is greater than critical intensity needed for the fire to transition to the canopy. At wind speeds of 20 miles/hr, we could expect torching/passive crown fire behavior, while at 15 miles/hr surface fire behavior is predicted under the “worst-case scenario” moisture regimes, respectively.

Table 8. Pre-treatment output variables at various wind speeds

	Wind (miles/hour)		
	15	20	30
Max Surface Rate of Spread (chains/hour)	1.4	1.7	2.3
Surface Flame Length (feet)	1.1	1.2	1.4
Transition to Crown Ratio	0.92	1.53	2.09
Transition to Crown	No	Yes	Yes
Active Crown	No	No	Yes
Fire Type	Surface	Torching	Crowning

Post-Treatment

The values modified between pre- and post-treatment are the fuel model, canopy base height, and canopy bulk density (Shapiro, 2007, Fire Ecologist Specialist Report). While other values such as fuel moistures are certainly influenced by reducing the stand density, these values were left at pre-treatment levels for modeling simplicity.

Results indicate that fuels treatment, given the moisture scenarios and canopy conditions in this area, would eliminate the potential for active/passive crown fire or torching fire behavior at any of the modeled wind speeds (Table 9). Treatment in this area would only slightly reduce surface rates of spread (maximum surface rate of spread: 1.0 to 1.7 chains/hour) and flame length (0.9 to 1.1 feet). It is important to note that these modeling results do not include the fire behavior that would result if post-treatment activity fuels are chipped or crushed (rather than piled and burned). If activity fuels are chipped or crushed, they could potentially increase surface fire behavior (e.g., fireline intensity) by providing an increased, continuous dead fuel source across the landscape, depending on the time since chipping. However, fire in a masticated or chipped fuel bed in this area will likely have lower rates of spread due to moist conditions/poor fuel aeration and will be easier for fire fighters to suppress, as fire will likely remain on the surface. Since chips will hold considerable moisture and decompose over time, dead fuel loading will eventually be reduced.

Table 9. Post-treatment output variables at various wind speeds

	Wind (miles/hour)		
	15	20	30
Max Surface Rate of Spread (chains/hour)	1.0	1.2	1.7
Surface Flame Length (feet)	0.9	1.0	1.1
Transition to Crown Ratio	0.02	0.02	0.03
Transition to Crown	No	No	No
Active Crown	No	No	No
Fire Type	Surface	Surface	Surface

No Action

The environmental effects of the no action alternative can be inferred from the previously discussed “Pre-Treatment Modeling Results”. As mentioned previously, the model was run at various wind speeds to represent the “worst-case scenario” for the Telephone Hollow area; therefore inputs were based on conditions when the moisture level in fuels is low (i.e., July to August) based mostly on area-specific data (e.g., Remote Automated Weather Station (RAWS) and field observations (Fire Ecologist Specialist Report). Where area-specific data was not available (e.g., canopy bulk density, slope, foliar moisture, and herbaceous moisture), values were derived from stand exam data and technical reports.

In the absence of treatment, surface fire behavior in this area would likely be relatively mild (maximum rates of spread: 1.4 – 2.3 chains/hr; flame lengths: 1.1 – 1.4 feet) regardless of wind speed. However, a transition to an active crown fire (where fire spreads continuously between crowns) is possible when winds are 30 miles/hour. At wind speeds of 20 miles/hr, we could expect torching/passive crown fire behavior, while at 15 miles/hr surface fire behavior is predicted under the “worst-case scenario” moisture regimes (Fire Ecologist Specialist Report), respectively.

VISUAL LANDSCAPE

Affected Environment -

The landscape character for Strawberry Valley as follows: Scenic views include landforms that are moderately rolling with slopes generally less than 40 percent. Slopes over 40 percent are associated with the few canyon areas. Vegetation consists primarily of sage grass type with little over story. Where over story vegetation occurs, it consists of both conifer and aspen. The strongest visual element in this landscape are the water forms. While small meandering streams exist throughout the valley, the large reservoir is the most dominant feature.

Critical Visually Sensitive areas are seen as foreground from US Highway 40. Highly Sensitive are seen as middleground from US Highway 40, areas seen as foreground from secondary roads, areas seen as foreground from the major part of the reservoir, areas seen as ridge tops. Most sensitive portion of the project area is US 40. This is a major travel way, has both regional and national importance. Many of the Forest visitors traveling this route expect to see a natural landscape based on the surrounding environment. This places importance on maintaining the existing visual quality objectives to the areas adjacent to Highway 40 as sensitive to alteration. Existing management direction for the Uinta National Forest is based on the Visual Management System. (VMS) Visual Quality Objectives have been mapped for the Forest and provide current scenery management direction for the Telephone Hollow area. The project area is to be managed to provide moderate to high scenic quality by managing for Retention, Partial Retention and Modification Visual Quality Objectives.

Environmental Consequences -

Proposed Action – Timber Harvest, Aspen treatment and Fuels Treatment

Mechanical thinning and group selection cutting would result in temporary direct effects to scenic quality, including visible slash piles, roads, log decks, equipment staging areas, and tree stumps. Manual thinning of conifers would result in the formation of temporary slash piles and tree stumps. These effects are unavoidable during implementation phase, and except for tree stumps, would be short term (about one to three years). None of these direct impacts mentioned would be noticeable from the foreground of US 40. These would only be noticeable to a visitor of the secondary unpaved forest roads.

Mechanical thinning for fuels would be somewhat evident in the landscape; it would have a low visual impact leaving the forest as natural appearing with added visual depth.

Group selection units would enlarge existing and create new openings. Although group selection cuts would be evident in the landscape, their form and line would repeat at the same scale as the

natural openings common in this area. By feathering edges to minimize line contrast the potential for windthrow would increase. In most areas-grass and small plant species would cover the exposed ground after two or three growing seasons.

New temporary road construction would create temporary visible lines that are not natural appearing and often include visible cut slopes and scarring that may detract from the overall scenic quality for about three to five years.

For all units – the direct effects to scenic integrity would be minimal, maintaining moderate to high scenic integrity. Indirect effects would show improvements to scenic quality and move the treated areas toward a more sustainable, fire resilient forest landscape.

No Action

Under no action current forest landscape units without treatment over time would lose its valued and desired landscape character attributes; conifers would encroach further into the aspen and conifers would continue to die and become infested with beetles. The landscape would eventually move further from sustainable forest, and increase the risk as insect and disease epidemics visual quality sustainability would be lowered. Scenic values would be lost.

SENSITIVE/INVASIVE PLANTS/NOXIOUS WEEDS

Affected Environment –

Forest Service Threatened, Endangered and Sensitive Plant Species

Following are brief descriptions of known habitats of Endangered, Threatened and Forest Service Sensitive plants occurring in Wasatch County:

SPECIES Common Name (Status) (<i>Scientific Name</i>)	Suitable Habitat in the Project Area?	DISTRIBUTION/HABITAT ASSOCIATION
Ute Ladies'-tresses orchid (Threatened) <i>Spiranthes diluvialis</i>	N	Wet meadow communities with continually saturated soils, below 6800 feet elevation (Atwood et al. 1991).
Barneby Woody Aster (Sensitive) <i>Aster kingii</i> var. <i>barnebyana</i>	N	Rock outcrops, cliffs and ledges. On lower elevations restricted to northern aspects. Elevation range 5000-11,750 feet (Tuhy 1991).
Dainty Moonwort (Sensitive) <i>Botrychium crenulatum</i>	N	Wet meadows, marshes and bogs. In UT, only known from Silver Meadow and four to five other sites above 8700 feet (Farrar, 2004).
Slender Moonwort (Sensitive and ESA Candidate) (<i>Botrychium lineare</i>)	N	It has been found at sea level in cool climates, in Utah is most likely at higher elevations (say, 7000-9000 ft) in moist soils. Specific habitats have ranged from meadows dominated by knee-high grass, shaded woods and woodlands, grassy horizontal ledges on a north-facing limestone cliff, dense fir/aspen overstory, and a flat upland section of a river valley (Natureserve 2004). There have been two documented populations, in Wasatch and Duchesne Cos., none on the Uinta NF (Farrar 2004).
Garrett bladderpod (Sensitive) <i>Lesquerella garrettii</i>	N	Alpine, subalpine talus and rock outcrops. Davis, Salt Lake, Utah and Wasatch counties. Elevation range 8900-11,400 feet (Tuhy 1991).
Rockcress draba (Sensitive) <i>Draba densifolia</i> var. <i>apiculata</i>	N	Alpine tundra, meadows and talus in rock stripes above timberline. Spruce-fir krummholz, moist soils on receding snowbanks. Uintah Mts, rare in Wasatch range (Salt Lake Co) and Deep Creek Mts (western Juab Co.). Elevation range 9420 to 11,450 feet (Welsh et al. 1993).
Wasatch jamesia (Sensitive) <i>Jamesia americana</i> var. <i>macrocalyx</i>	N	Rock crevices and cliffs in mountain brush and spruce-fir types. Northern aspects or shaded sites at lower elevations (Welsh et al. 1993).

Noxious Weeds

The existing condition of the cutting units in the Telephone Hollow area is relatively weed free. The cutting units are for the most part densely shaded with conifer or aspen vegetation, and the conifer sites are covered with one to several inches of duff, needle-cast and woody debris. The cutting units have very little bare or disturbed soil at present, except for the existing roads. These general conditions greatly discourage weed establishment. The Uinta N. F. GIS weed

maps show narrow bands of weeds documented occurring along existing roads and a broader band of several weed species occurring along the drainage in the eastern boundary of the sale area. The weeds documented are Canada thistle, musk thistle, mullein and houndstongue.

The location of the current weed populations, along the existing roads and within the sunnier riparian areas, matches what is commonly seen nationwide. The roads encourage weed establishment by human-caused soil disturbance and possible weed seed importation, and reducing shade levels. In riparian areas, the combination of sun, mesic soil and soil disturbance from livestock, wildlife and occasional floods provide good habitat for Canada thistle and other weeds.

Environmental Consequences -

Proposed Action – Timber Harvest, Aspen treatment and Fuels Treatment

Forest Service Threatened, Endangered and Sensitive Plant Species

Implementation of the Telephone Hollow Timber Sale project will have **no effect** on the Ute Ladies'-tresses orchid, because there is no habitat for the species in the project area.

Since there is no suitable habitat for Barneby Woody Aster, Garrett bladderpod, Rockcress draba, dainty moonwort, slender moonwort or Wasatch jamesia in the timber sale area, the habitat improvement project is **not likely to result in a trend toward federal listing of these species**.

Noxious Weeds

Weed seeds can be brought into the project area by the tree fellers' vehicles and boots. Seeds can be brought in by heavy equipment and their transporting tractor-trailers during creation of temporary roads, and during obliteration of those roads. Equipment used to move, stack and load logs also have potential to import weed seeds (Westbrooks, R. 1998). Actual log trucks have a relatively low opportunity for weed spread, since they rarely leave established permanent roads.

Skid trails, temporary roads burn pile sites and landings provide relatively ideal conditions for weed establishment, in that they have disturbed, bared soil, much higher levels of light, and equipment traffic providing the opportunity for seed importation (Westbrooks, R. 1998). The general areas of the cutting units provide a middle opportunity of weed establishment, in that they sustain some soil disturbance and equipment traffic, and by losing tree canopy sustain varying levels of increased sunlight. Increased light and bare soil by themselves provide opportunities for wind-borne weed seeds not brought in by equipment, such as those of thistles (Beck, 2004; Lym and Zollinger, 2004).

Restoration activities such as erosion control, road obliteration and reseeding provide weed establishment opportunities such as equipment importing seeds, and adding seeds imported with revegetation seeds.

No Action

Noxious weed infestations in the project area would be treated as staffing and funding allows. Additional possibility of infestation associated with timber equipment would not occur.

HERITAGE RESOURCES

Affected Environment –

The affect of the timber sale on heritage resources is being analyzed under two desired conditions which are both based directly on Forest Plan Goals and Objectives (FLMP p. 2-17). Under the first, heritage sites are identified and National Register eligible sites are protected from adverse effects to the features that make them historically important. The second desired condition is that plants and areas associated with traditional uses that are culturally significant to American Indian Tribes are identified and the degree of effect to them by proposed projects is assessed. The potential effects of these will be discussed separately, as they involve two different sets of data and analyses.

Heritage Sites - The Strawberry Valley area has been used by American Indians for at least the last 8,000 years, as an area to hunt, fish, gather plants, hold social and religious gatherings, and as a travel route between the Wasatch Front and Uintah Basin. Use would have largely been seasonal due to the severe winters in the area. The archaeological sites that resulted from those activities are generally artifact scatters. Historically, the area was an important fishing and social gathering area for the Northern Ute Indians. Most of the timber sale was also part of the original Uintah and Ouray Ute Indian Reservation, first created in 1861 for the Ute who were displaced from much of the rest of Utah and northwestern Colorado.

Routine European American use of the area began while Strawberry Valley was still part of the Uintah and Ouray Reservation, and consisted of intensive livestock grazing. After the reservation boundaries were significantly reduced in 1906, most of this portion of the former reservation was either added to the Uinta National Forest or made part of the Strawberry Project. This ambitious project was the first large-scale reclamation project in this portion of the U.S. and included Strawberry Reservoir and a tunnel to convey water through the Strawberry Ridge to the Diamond Fork watershed, through which the water flowed to Utah Valley.

An unusual feature of the Strawberry Project was that 57,000 acres of land immediately around the reservoir were used by the Strawberry Water User's Association (the original proponents and beneficiaries of the project) to raise money to cover the cost of the dam and other project features. They charged fees for grazing, hunting preserves, and recreation camps until 1973, when the cost of the project was repaid. The original Strawberry Reservoir was significantly enlarged in the 1970's by the Bureau of Reclamation, and the Strawberry Project Lands were conveyed to the Forest Service in 1988 for long-term management. Since that time, the management focus in these valley-bottom lands has been watershed restoration and they are excluded from livestock grazing and timber harvest.

Since 1906, this area has been used primarily for livestock grazing, small-scale logging, prospecting, and recreation. The archaeological sites that have resulted from these activities include historic campsites, spring developments and troughs, and prospecting holes.

Traditional Plant Use - One of the ways in which Northern Utes maintain their ties with Strawberry Valley today is through plant collection. A series of plants of interest to Northern Ute traditional practitioners exist within the Strawberry watershed. These include a variety of

plants, some of which are not common within the current boundary of the Uintah-Ouray Ute Indian Reservation to the east. Some past and current plant gathering is known for the valley in general by Northern Utes; these activities are not currently widespread. However, they are an important part of some practitioners' activities.

There is only one known plant gathering location in Strawberry Valley that is used fairly regularly by Northern Ute practitioners, and it is not within the proposed timber sale area. There is no known traditional Northern Ute plant gathering occurring in Telephone Hollow or along the Strawberry Ridge at the north end of the analysis area. The extent of future use of these plants by American Indians is unknown, but projected to continue to be relatively low. Few of these plants are tied to economically important activities such as basket making, and most medicinal and ceremonial uses do not require large quantities of the plants.

Strawberry Valley in general is dominated by aspen and sagebrush vegetation types (at 39% and 34% of the total area, respectively; USDA Forest Service, Uinta National Forest 2004b:172). Most plants of interest to the Northern Utes occur in the sage and tall forbe plant communities and can be found very widely within these ecozones across Strawberry Valley.

Environmental Consequences -

Proposed Action – Timber Harvest, Aspen treatment and Fuels Treatment

Heritage Sites - A complete cultural resources inventory was completed in the fall of 2006 for all areas in which ground disturbance might occur as a result of timber sale activities (including units, skid trails, log decks, etc.). This includes existing native soil Forest Service System Roads which might also be used during the proposed timber sale. A total of 463 acres were inventoried and four archaeological sites were found. Only one of these sites is eligible for the National Register of Historic Places. This site (42WA389; UN-590) will be avoided by all project activities by removing the area containing the site from the proposed treatment unit near it. All logs within that unit will be pulled down the slope below it and there will be no equipment traffic or other project activities on or near the site. As a result of redesign of this part of the project, there will be no historic properties affected by the proposed timber sale. The Utah State Historic Preservation Office concurred with this finding on April 23, 2007.

Traditional Plant Use - No plants of interest have been identified that are specific to the lodgepole pine community, including lodgepole pines themselves. The proposed timber sale area is dominated by lodgepole pine, aspen, and sagebrush communities. Very little of the tall forbe plant community is present, and this is the community that contains the largest percentage of plants of interest. As a result, most of the plants of interest to the Northern Utes are either not present within the project area, or are not abundant. As a result, timber sale activities in this area will not affect the short- or long-term ability of traditional practitioners to gather plants of interest, since they are both far more available and abundant in other parts of Strawberry Valley.

No Action

Significant heritage resources would not be affected in any way if no vegetation treatments occur in the project area. The ability of American Indians to access and gather traditional plants in Strawberry Valley would continue.

WILDLIFE RESOURCES

Affected Environment –

Wildlife surveys were conducted within the project area during 2006 and 2007. More detailed results of wildlife surveys and wildlife analyses are found in the *Biological Assessment* and the *Wildlife Biologist Report and Biological Evaluation* (project file). The *Biological Assessment* contains analysis of potential project impacts on species listed under the Endangered Species Act, and the *Wildlife Biologist Report and Biological Evaluation* contains analyses of potential project impacts on Management Indicator Species (MIS), Forest Service sensitive species and other species of concern, migratory birds and raptors, and big game species.

Species Listed Under the Endangered Species Act: The following wildlife species in Wasatch County have been identified as threatened, endangered, or candidate species by the Utah Field Office of the U.S. Fish and Wildlife Service:

bald eagle (*Haliaeetus leucocephalus*) – Threatened
Canada lynx (*Lynx canadensis*) – Threatened
western yellow-billed cuckoo – Candidate

A description of the status and biology of each of these species can be found in the Biological Assessment (USDA Forest Service 2003: pp. E-3 – E-42) and Viability Assessment (USDA Forest Service 2003: pp.F-1 – F-111) of the Environmental Impact Statement (EIS) completed for the 2003 Forest Plan for the Uinta National Forest.

Bald Eagle

Bald eagles require habitat that will provide open water for feeding and large, mature trees for nesting, roosting, and perching (DeGraff et al. 1991). Winter habitat used by eagles includes lakes, streams or rivers utilized for feeding (Buehler 2000). In Utah, the bald eagle is primarily a winter resident, with no breeding areas known to occur on Uinta National Forest. Bald eagles have established winter roosts near the Forest in riparian areas dominated with large cottonwood trees. Occasional migrational or foraging use over the project area may occur. Foraging on the Forest involves the selection of prey species such as fish, small mammals, and carrion, none of which are likely to be in abundance during the winter months when the eagles are roosting in downstream areas.

Western Yellow-billed Cuckoo

The western yellow-billed cuckoo is a lowland riparian species which requires large blocks of riparian woodland habitat with dense understory foliage (UDWR 1999). The western yellow-billed cuckoo is rare in Utah, with no recent records of this species in the Uinta mountains. No western yellow-billed cuckoos have been found during neotropical migratory bird surveys in the Strawberry Reservoir area (project files, Heber R.D.).

Canada Lynx

The lynx was listed as threatened in March, 2000 (USDI 2000). Canada lynx inhabit high-elevation conifer forests in the Rocky Mountain region and feed on snowshoe hares, red squirrels and other small mammals, as well as some birds including forest grouse species. Lynx typically

den under logs, stumps, rocks, or thick patches of live vegetation. Average home range size for lynx in southern boreal forests is approximately 58 square miles (37,000 acres) for males and 28 square miles (18,000 acres) for females (Aubry et al. 2000:p.384). Individual lynx are known to travel hundreds of miles. Mowat et al. (2000:p.291) found, in the literature, 15 documented straight-line dispersal distances of >310 miles and one documented dispersal distance of 682 miles. There are currently no known breeding populations of Canada lynx in Utah, although a number of historical records are known from the Uinta Mountains. Surveys for lynx were conducted on the Uinta National Forest in 1999, 2000, and 2001, but none were detected (USDA Forest Service 2003b:p.F-83). Lynx that were translocated to Colorado have been found in Utah in recent years, and two of these individuals traveled through the Uinta National Forest in 2004. The Uinta National Forest has two Lynx Analysis Units (LAUs) located in the Upper Provo River and West Fork Duchesne River watersheds on the Heber Ranger District, approximately seven miles northeast of the proposed action. Areas outside of LAUs in Utah and Wasatch Counties that contain suitable lynx habitat are considered lynx travel corridor.

Management Indicator Species: There are three terrestrial wildlife Management Indicator Species on the Uinta National Forest: northern goshawk, American three-toed woodpecker, and American beaver. Information on the status of these species on the Uinta National Forest is found in Appendix B and Appendix F of the Final Environmental Impact Statement (FEIS) for the 2003 Land and Resource Management Plan (USDA Forest Service 2003b:pages B-37 to B-41 and F-67 to F-86). Northern goshawks and American three-toed woodpeckers are also classified as Forest Service sensitive-species

Field surveys in July, 2006 failed to detect northern goshawks or American three-toed woodpeckers. American beavers were observed in riparian habitat adjacent to units #1 & 2.

Northern Goshawk (*Accipiter gentiles*)

The goshawk is classified as a MIS on the Uinta National Forest, and a Forest Service Sensitive species. One of the primary reasons this species was selected as a MIS is that prey abundance, foraging habitat, and nesting habitat for the goshawk are potentially affected by important management activities on the Forest, including fire and fuels management and timber management.

The project area contains potential nesting and foraging habitat for goshawks. No historical goshawk territories are known from the project area. No goshawk was seen or heard in or adjacent to the project area during field surveys conducted in 2006.

Goshawk territory occupancy has been monitored by random surveys across Uinta National Forest with standardized protocols since 2001. Thus far, monitoring efforts are unable to identify a clear trend with this species on Uinta National Forest (USDA 2006)..

American three-toed woodpecker (*Picoides dorsalis*)

The American three-toed woodpecker (*Picoides dorsalis*) is a small bird closely associated with older conifer forests. (NatureServe 2006) The three-toed woodpecker is classified as a MIS on the Uinta National Forest. One of the primary reasons this species was selected as a MIS is because it is closely associated with mature to old conifer forests, and most of the Uinta National

Forest's timber management program and some of the forest's fire and fuels management occurs in these forest types. Information on this species was also summarized in the viability assessment conducted during the 2003 revision of the Forest Plan for the Uinta National Forest (USDA 2003c: pp. F-80 -81). More detailed reviews of three-toed woodpecker ecology are found elsewhere (e.g., Parrish et al. 2002:pp. 157 to 160, Wiggins 2004, NatureServe 2006) and/or are referenced in the Forest Plan FEIS.

In Utah this species is generally found in subalpine conifer forests above 8,000 feet (Parrish et al. 2002:p. 157). On the Uinta National Forest, it has been detected primarily in spruce/fir, Douglas-fir, and lodgepole pine forest types. Three-toed woodpeckers nest in cavities in dead or dying conifers. They primarily feed on beetle larvae and other insects in large, dead or dying conifers.

American three-toed woodpeckers have been monitored in random surveys across Uinta National Forest since 2004 using a specifically designed protocol. Based on survey results since then, it appears three-toed woodpecker populations are currently stable and well-distributed (USDA 2006).

Three-toed woodpeckers were not detected in the project area in 2006 surveys (wildlife survey forms, project file). Three-toed woodpecker nest sites can be difficult to locate, and none were found during 2006 field surveys. Surveys will be conducted again in 2007, and if any three-toed woodpecker nest tree is found prior to project implementation, it would be protected according to Forest Plan standard WL&F-7 (USDA Forest Service 2003b:page 3-11).

American beaver (*Castor canadensis*)

The American beaver (*Castor canadensis*) is the largest rodent native to North America. It occurs throughout most of North America and is fairly common in Utah. It is found in perennial slow-moving streams, ponds, small lakes, and reservoirs. The beaver is a species that uses a wide variety of riparian habitats. (USDA 2003c, page B-40; NatureServe 2006)

The American beaver is a keystone species that has profound effects on aquatic and riparian ecosystems (Naiman et al. 1986 in NatureServe 2006). The beaver is second only to man in its ability to alter its own environment. From dam and lodge construction to food storage, the beaver is a highly industrious and intelligent animal. Information on this species is summarized in the Forest Plan Revision Process documentation incorporated in Appendix B to the Forest Plan FEIS. (USDA 2003c; pp. B-40-41; F-77 -78). More detailed reviews of beaver ecology are found elsewhere (e.g., Baker and Hill 2003; NatureServe 2006).

An extensive Forest-wide survey of beaver colonies was initiated in 2004, and has continued through 2006. At this time it appears from monitoring data that beaver populations across the Forest may be declining, although additional data is needed to confirm this trend.

During 2006 field surveys, active beaver colonies were located in the southeast sector of unit #1, and along the riparian zone which extends from unit#1 to approximately the northeast boundary of unit #2.

Forest Service Sensitive Species and Other Species of Concern: Forest Service sensitive species evaluated in this document are those listed for the Uinta National Forest in the list of *Intermountain Region Proposed, Endangered, Threatened, and Sensitive Species* (USDA Forest Service 2003a). Forest Service sensitive wildlife species considered for this analysis were: peregrine falcon, boreal toad, Columbia spotted frog, greater sage-grouse, flammulated owl, spotted bat and Townsend's big-eared bat, and fisher. The American three-toed woodpecker and northern goshawk, Forest Service sensitive wildlife species, were discussed in the Management Indicator Species section. Additional information on the status of these species on the Uinta National Forest is found in Appendix F of the Final Environmental Impact Statement (FEIS) for the 2003 Land and Resource Management Plan (USDA Forest Service 2003b:pages F-67 to F-86).

Peregrine falcon (*Falco peregrinus*)

Information on the status of this species on the Uinta National Forest can be found within the viability assessment portion of the Environmental Impact Statement for the 2003 revised Forest Plan (USDA Forest Service 2003c:p. F78). Peregrine falcons typically nest on ledges on cliffs, but introduced individuals commonly nest on city buildings and artificial nest sites. Foraging habitat is primarily wetlands where avian prey concentrate, but also includes other open habitats such as sagebrush steppe, desert scrub, and grasslands. There are no records of peregrine falcons using the project area.

Boreal toad (*Bufo boreas boreas*)

Information on the status of this species on the Uinta National Forest can be found within the viability assessment portion of the Environmental Impact Statement for the 2003 revised Forest Plan (USDA Forest Service 2003c:pp. F67 - F68). The boreal toad is a subspecies of the western toad. It is classified as a Wildlife Species of Concern by the state of Utah. It's Natural Heritage conservation status in Utah is S2S3 (S2 = *Imperiled*, S3 = *Vulnerable*) (NatureServe 2005). Rocky Mountain populations have declined sharply since the 1970s, and boreal toads in the Southern Rocky Mountain Distinct Population Segment (Colorado, Wyoming, and New Mexico). However, in September 2005 the Fish and Wildlife Service removed the boreal toad from the Candidate list for eligibility under the Endangered Species Act (USFWS 2005) citing information that indicated it was not a distinct subspecies of the western toad. Population declines also have been reported in Yellowstone National Park, Yosemite National Park, and Montana (NatureServe 2005). Population declines are poorly understood. Possible causes include disease and parasites, predation, habitat loss and degradation, competition with native and non-native species, and certain fishery management practices (NatureServe 2005). Boreal toads are found in a wide variety of habitats ranging from desert springs to mountain wetlands, and it ranges into various upland habitats around ponds, lakes, reservoirs, and slow-moving rivers and streams.

Historical records suggest that the distribution of boreal toads on the Uinta National Forest has declined (USDA Forest Service 2003b:pp. F67 - F68). Although historical records are known from multiple locations across the Forest, the only recent records from the Forest are from Strawberry Valley near the reservoir. A population occurs along the north fork and south fork of Bryant's Fork. This population is being monitored by Utah Division of Wildlife Resources. No observations of boreal toads have occurred in the project area.

Columbia spotted frog (*Rana luteiventris*)

Information on the status of this species on the Uinta National Forest can be found within the viability assessment portion of the Environmental Impact Statement for the 2003 revised Forest Plan (USDA 2003c:pp. F68 - F69). In Utah, populations of this species have been located only in the Wasatch Range and in the West Desert within the Bonneville Basin. Populations are found in aquatic habitats with perennial sources of water. Breeding sites are typically pools or ponds with little or no current and that are surrounded by dense aquatic vegetation. The project area occurs within the Strawberry River watershed, which is located in the Colorado River Basin, outside of the Bonneville Basin and thus outside of the known range of this species.

Greater sage-grouse (*Centrocercus urophasianus*)

Information on the status of this species on the Uinta National Forest can be found within the viability assessment portion of the Environmental Impact Statement for the 2003 revised Forest Plan (USDA Forest Service 2003c:pp. F75 - F77). The greater sage-grouse is a sagebrush-obligate species. Only two populations are known to occur on the Uinta National Forest: one in Strawberry Valley, approximately nine miles southeast of the project area, and one within the Vernon Unit in the West Desert.

Flammulated owl (*Otus flammeolus*)

Information on the status of this species on the Uinta National Forest can be found within the viability assessment portion of the Environmental Impact Statement for the 2003 revised Forest Plan (USDA 2003c:p. F-74). The flammulated owl is a neo-tropical migrant that primarily preys on flying insects. Nesting habitat in Utah is primarily mature and old growth ponderosa pine and Douglas-fir (USDA 2003: p. F-75). Flammulated owls select open forest structure for foraging (McCallum 1994:p. 40). Although little is known about the distribution and abundance of flammulated owls on the Uinta National Forest, it has been detected in aspen, conifer, and mixed aspen/conifer stand types on the Forest. A flammulated owl was detected near the project area on 29 June 2005 (wildlife survey form, project file), with a second unconfirmed observation in the project area on 1 March, 2007..

Spotted bat (*Euderma maculatum*) and Townsend's big-eared bat (*Corynorhinus townsendii*)

Information on the status of these species on the Uinta National Forest can be found within the viability assessment portion of the Environmental Impact Statement for the 2003 revised Forest Plan (USDA 2003c:pp. F84 - F85). These species feed on flying insects, often above streams, ponds, wet meadows, and other riparian habitats. The spotted bat typically roosts in rock crevices or under loose rocks or boulders. It occupies a wide variety of habitats from low-elevation deserts to ponderosa pine forests. In Utah, Townsend's big-eared bats are typically found below about 9,000 feet elevation. They roost in rock crevices, tree hollows, buildings and other man-made structures, caves, and mines. They typically hibernate in caves and mines. Distribution of these and other bat species on the Uinta National Forest is poorly understood. It is not known whether either bat species occurs in the project area. No caves or mines are located within or near the project area. No records of either species are known within the project area.

Fisher (*Martes pennanti*)

Information on the status of this species on the Uinta National Forest can be found within the viability assessment portion of the Environmental Impact Statement for the 2003 revised Forest Plan (USDA 2003c:p. F84). Fishers are generalized predators that occur in landscapes dominated by mature forests throughout their range. Utah Division of Wildlife Resources (UDWR) considers the fisher to be extirpated from the state (<http://www.wildlife.utah.gov/pdf/utsoclist.pdf>).

Migratory Birds and Raptors: Of the 24 species identified as Priority Species in the Utah Partners in Flight Avian Conservation Strategy (Parrish et al. 2002:page 52), only the three-toed woodpecker and greater sage-grouse are known to occur in the Upper Strawberry watershed.

Big Game Species: The project area is classified as summer range, and summer range habitat is not considered to be a limiting factor for big game species within this region of Utah.

Environmental Consequences –

Proposed Action – Timber Harvest, Aspen treatment and Fuels Treatment

Species Listed Under the Endangered Species Act:

Bald Eagle

This project is not expected to directly affect bald eagles because riparian habitat will be protected from all ground-disturbing activities except disease tree removal, and is expected to occur outside of the winter season when no eagles are known to be present. In addition, there are no impaired water bodies within the project area (project files, Heber R.D.). Because there are no fish-bearing streams in the project area, it is expected there will be no effects to bald eagle prey as a result of this action. Because no eagles are known to use the project area for nesting, and riparian habitat will be protected except for the removal of a few disease trees, it is expected the proposed action will have **no effect** on bald eagles (Wildlife BA; USFWS Concurrence).

Western Yellow-billed Cuckoo

There will be no direct or indirect impacts to western yellow-billed cuckoos since the project area is a high elevation site which does not contain any large blocks of woodland riparian habitat, and thus is not suitable for this species. Because this project will occur in a high elevation area which does not have any records of this species, and since yellow-billed cuckoos are rare in Utah, it is expected this action will have **no effect** on western yellow-billed cuckoos (Wildlife BA; USFWS Concurrence).

Canada Lynx

Potential direct effects to Canada lynx include the removal of any animals or primary habitat, which is high elevation conifer forest. The proposed action occurs in suitable, high elevation conifer-dominated forest. Direct effects are expected since the area may function as lynx travel corridor, and the proposed action involves selective harvest (primarily thinning) and fuels treatment of approximately 270 acres of conifer and aspen forest. Indirect effects to prey habitat are expected to occur. Canada lynx prey (snowshoe hares, red squirrels, forest grouse) or their sign, were observed during field surveys in the project area. A primary food of red squirrels is

cone seed, and the proposed timber harvest will remove a small amount of the cone crop, thus there will be a small negative impact on red squirrel habitat. Project effects on snowshoe hares and forest grouse are unclear, since it is expected there would be an increase in the cover of understory vegetation in the gaps created by felling and removing trees, while removal of small diameter conifers will reduce cover for prey in other areas. As a result, it is expected impacts on snowshoe hares and forest grouse may be neutral. Although the proposed action would negatively affect 270 acres of conifer and aspen habitat through selective timber harvest (primarily thinning) and fuels treatments, and lynx foraging habitat by negatively affecting a small amount of red squirrel habitat, the potential response from Canada lynx would be insignificant and discountable because: 1) there is currently no known breeding population of Canada lynx in Utah, and travel through the Uinta National Forest by lynx is likely a rare event; 2) the spatial scale of the action area is small relative to the very large areas that individual lynx occupy or travel across (see Species Account above); and 3) the project area occurs about seven miles south of a Lynx Analysis Unit. Therefore it is expected the proposed action **may affect, but is not likely to adversely affect** Canada lynx (Wildlife BA; USFWS Concurrence).

Management Indicator Species:

Northern Goshawk (*Accipiter gentiles*)

The project area contains potential nesting and foraging habitat for goshawks. No historical goshawk territories are known from the project area. No goshawk was seen or heard in or adjacent to the project area during field surveys conducted in 2006 or 2007. The proposed action would negatively affect goshawk nesting habitat by reducing the density of mature conifers. The proposed action also would affect goshawk foraging habitat, since red squirrels are an important prey species of northern goshawks on the Uinta National Forest. A primary food of red squirrels is cone seed, and the proposed timber harvest will remove a small amount of the cone crop, thus there will be a slight negative impact on red squirrel habitat. However, goshawks prey on a wide variety of other small mammals and birds, and some of these species, such as ground squirrels and chipmunks which are less dependant upon live trees, may not be negatively affected by timber harvesting.

Because 1) conifer/aspen forested habitat would be impacted on about 270 acres, which is only approximately 0.3% of the estimated total area of conifer forest on the Uinta National Forest (USDA Forest Service 2003c:p. 3-128); 2) impacts to goshawk prey habitat are expected to be minor; and 3) wildlife surveys have failed to detect any goshawks within the project area, the proposed action may **have a small negative effect on individuals but is not expected to affect population viability** on the Uinta National Forest (Wildlife BE).

American three-toed woodpecker (*Picoides dorsalis*)

Mountain pine beetle larvae are an important prey of three-toed woodpeckers, so the proposed action would have short-term and longer-term negative effects on three-toed woodpecker habitat. If the proposed action achieves its goal of substantially reducing the pine beetle population in the area, fewer three-toed woodpeckers would likely immigrate into the project area, and reproductive success of three-toed woodpeckers occurring within the project area would likely be

lower, compared to the no action alternative. The result would be that three-toed woodpecker density within the project area would be lower for the next several years as a result of the proposed action compared to the no action alternative. Because 1) three-toed woodpecker habitat would be impacted on about 228 acres of conifer forest, which is only approximately 0.3% of the estimated total area of conifer forest on the Uinta National Forest (USDA Forest Service 2003b:page 3-128); and 2) three-toed woodpecker surveys indicate that three-toed woodpeckers occur at many other sites on the Uinta National Forest outside of the Telephone Hollow project area (2006 Three-toed Woodpecker Monitoring Report, project file; 2006 wildlife survey forms, project file), implementation of the proposed action **may have a small negative impact on individuals, but is not expected to affect population viability** of three-toed woodpeckers on the Uinta National Forest (Wildlife BE).

American beaver (*Castor canadensis*)

It is expected that the proposed action will not have a substantial adverse impact on beavers because only a small number of diseased trees along the stream will be removed, and since no equipment will be permitted in the riparian zone, sediment is not expected to reach the stream. Aspen treatments involve removal of encroaching conifers, and thus are expected to have a long-term beneficial impact on aspen habitat. Harvesting conifers would not likely affect beaver habitat because beavers in this area use aspen and willows for food and construction material. Therefore, implementation of the proposed action **may have a small negative impact on individuals but would not affect population viability** on the Uinta National Forest (Wildlife BE).

Forest Service Sensitive Species and Other Species of Concern:

Peregrine falcon (*Falco peregrinus*)

Information on the status of this species on the Uinta National Forest can be found within the viability assessment portion of the Environmental Impact Statement for the 2003 revised Forest Plan (USDA Forest Service 2003c:p. F78). Peregrine falcons typically nest on ledges on cliffs, but introduced individuals commonly nest on city buildings and artificial nest sites. Foraging habitat is primarily wetlands where avian prey concentrate, but also includes other open habitats such as sagebrush steppe, desert scrub, and grasslands. There are no records of peregrine falcons using the project area. The proposed action is expected to have **no impact** on peregrine falcons because the project area contains no suitable nesting habitat, and there are no observations of this species in the project area (Wildlife BE).

Boreal toad (*Bufo boreas boreas*)

Information on the status of this species on the Uinta National Forest can be found within the viability assessment portion of the Environmental Impact Statement for the 2003 revised Forest Plan (USDA Forest Service 2003c:pp. F67 - F68). The boreal toad is a subspecies of the western toad. It is classified as a Wildlife Species of Concern by the state of Utah. It's Natural Heritage conservation status in Utah is S2S3 (S2 = *Imperiled*, S3 = *Vulnerable*) (NatureServe 2005). Rocky Mountain populations have declined sharply since the 1970s. However, in

September 2005 the Fish and Wildlife Service removed the boreal toad from the Candidate list for eligibility under the Endangered Species Act (USFWS 2005) citing information that indicated it was not a distinct subspecies of the western toad. Population declines also have been reported in Yellowstone National Park, Yosemite National Park, and Montana (NatureServe 2005). Population declines are poorly understood. Possible causes include disease and parasites, predation, habitat loss and degradation, competition with native and non-native species, and certain fishery management practices (NatureServe 2005). Boreal toads are found in a wide variety of habitats ranging from desert springs to mountain wetlands, and it ranges into various upland habitats around ponds, lakes, reservoirs, and slow-moving rivers and streams.

Historical records suggest that the distribution of boreal toads on the Uinta National Forest has declined (USDA Forest Service 2003b:pp. F67 - F68). Although historical records are known from multiple locations across the Forest, the only recent records from the Forest are from Strawberry Valley near the reservoir. A population occurs along the north fork and south fork of Bryant's Fork. This population is being monitored by Utah Division of Wildlife Resources. No observations of boreal toads have occurred in the project area. Because 1) riparian habitat will be protected from all ground-disturbing activities except disease tree removal, and therefore no sediment impacts are expected to occur; and 2) since there are no known populations of boreal toads in the analysis area, it is expected the proposed action will have **no impact** on this species (Wildlife BE).

Columbia spotted frog (*Rana luteiventris*)

The proposed action is expected to have **no impact** on Columbia spotted frogs because the project area occurs outside of the known range of this species (Wildlife BE).

Greater sage-grouse (*Centrocercus urophasianus*)

Because of the short field season at this elevation, project implementation may overlap with bird breeding season (primarily April, May, and June). Thus, nests and eggs could be destroyed during project implementation. However, mitigation to address these effects will be in place such that there will be no operations during the primary breeding season of April 1-June 30). Temporary road construction and skidding operations in sagebrush habitats would negatively affect linear strips of sage-grouse habitat. However, these disturbances would not affect population trend or population viability of Strawberry Valley sage-grouse because the amount of sagebrush habitat disturbed would be very small (approximately 900'), and the project area occurs several miles west of areas used by sage-grouse. Therefore, the proposed action **may have a small negative effect on individuals, but is not expected to affect population viability** (Wildlife BE).

Flammulated owl (*Otus flammeolus*)

Because flammulated owls are cavity nesters and cavities are most commonly found in large, dead and dying trees, the proposed action would reduce nest site availability for flammulated owls. Potential effects on foraging habitat are less clear because the proposed action would result in more open forest structure, and flammulated owls select open forest structures for

foraging habitat. The proposed action would affect flammulated owl habitat but would not affect population trend or population viability of this species on the Uinta National Forest because 1) conifer forest would be impacted on about 228 acres, which is only approximately 0.3% of the estimated total area of conifer forest on the Uinta National Forest (USDA 2003b:p. 3-128); and 2) the proposed action would likely have a neutral or positive effect on flammulated owl foraging habitat. Therefore the proposed action **may have a small negative impact on individuals, but is not expected to affect population viability** (Wildlife BE).

Spotted bat (*Euderma maculatum*) and **Townsend's big-eared bat** (*Corynorhinus townsendii*)
The proposed action may affect bat foraging habitat by changing stand structure, which could affect flying insect abundance or distribution. Townsend's big-eared bats are known to roost in tree hollows, so the proposed action may reduce potential roost site availability by a small degree. Because the spatial scale of the project is very small relative to the amount of similar habitat available on the Uinta National Forest, the proposed action **may have a small negative impact on individuals but is not expected to affect population viability of either bat species** (Wildlife BE).

Fisher (*Martes pennanti*)

Although the project area contains potential fisher habitat, this species is unlikely to occur anywhere near the project area. Utah Division of Wildlife Resources (UDWR) considers the fisher to be extirpated from the state (<http://www.wildlife.utah.gov/pdf/utsoclist.pdf>). The proposed action would have **no impact** on fishers because the project area is outside of the current known range of the species (Wildlife BE).

Migratory Birds and Raptors

Based on habitat classifications found in the Utah Partners in Flight Avian Conservation Strategy, habitat within the project area is classified as subalpine conifer forest (Parrish et al. 2002:p.185). Migratory bird surveys of the project area will be completed prior to ground-disturbance. In addition, project impacts on migratory birds will be mitigated by: 1) no activities will occur during the primary nesting season of April 1 – June 30; and 2) if any Sensitive species nests are detected, they will be buffered by distances described in the LRMP (USDA 2003d: Appendix C-1).

Of the 24 species identified as Priority Species in the Utah Partners in Flight Avian Conservation Strategy (Parrish et al. 2002:page 52), only the three-toed woodpecker and greater sage-grouse are known to occur in the Upper Strawberry watershed. Impacts of the proposed project on American three-toed woodpeckers and greater sage-grouse are discussed in the Biological Evaluation (project files, Heber R.D.), and are expected to be minimal.

Implementation of the proposed action would have short-term negative effects for bird species that occur in these spruce/fir forests but would likely have no effects on population trend or population viability of these species because habitat would be impacted on only 270 acres, which is only approximately 0.3% of the estimated total area of spruce/fir and aspen forest on the Uinta National Forest (USDA Forest Service 2003c:page 3-128). No active raptor nests have been found within the project area. If any are found prior to project implementation, they would be

protected according to Guideline WL&F-11 (USDA Forest Service 2003d:p. 3-12). Therefore, it is expected the proposed action **may have a small negative impact on individuals but is not expected to affect population viability of any migratory bird species.**

Big Game Species

The proposed action would affect thermal and hiding cover for big game species. However, reduced spruce-fir canopy cover following timber harvest would likely result in increased understory vegetation production and thus increased forage and browse production for big game species. The project area is classified as summer range, and summer range habitat is not considered to be a limiting factor for big game species within this region of Utah. Therefore, the proposed action **may have a small negative impact on individuals but is not expected to affect population viability of any big game species.**

No Action

Under this alternative, no action would occur in the stands proposed for treatment. It is expected that the lodgepole pine stands would continue to be altered by succession to stands dominated by subalpine fir, with an increased susceptibility to mountain pine beetle outbreaks. The lack of fuels treatments would heighten the risk of stand-replacement wildfire, with increased threat to the adjacent residential and summer homes, and loss of landscape diversity, including lodgepole pine at the southern and western boundary of its range in Utah.

SOILS IMPACTS AND PRODUCTIVITY

Affected Environment -

Geology

The Strawberry Management Area lies at the western edge of the Uinta Basin within the Colorado Plateau. In the vicinity of the Twin Peaks area and across the northern section of the watershed, the older rocks are thrust over younger rocks in the complex area between the Uinta and the Wasatch Mountains. Within Daniels Canyon and adjacent areas, the rocks are Paleozoic siltstone, sandstone, and limestone of the Oquirrh Group. The upper elevations of Currant Creek Peak include glacially eroded and glacially depositional landforms. Post-glacial sediment occurs along many of the streams within the Strawberry Basin. Alluvial deposits lie north and south of Strawberry Reservoir within the Strawberry River, Co-op Creek, and Indian Creek drainages. In the central and southern end of the watershed, the principle geologic units include the Duchesne River and Uinta formations. These formations are composed of Oligocene sandstone, siltstone, conglomerate, and shale layers. These formations occupy the majority of this management area. These give way on the south and west to the Eocene calcareous siltstones and shales of the Green River Formation (USDA Forest Service, May 2003).

Soils

Two separate NRCS soil surveys cover the Telephone Hollow Timber sale project area:

1. Soil Survey of Strawberry Valley Area, Utah (see USDA NRCS, May 2005).
2. Soil Survey of Heber Valley Area, Utah, Parts of Wasatch and Utah Counties (see USDA NRCS, April 1976).

The soil surveys include map unit descriptions, taxonomic unit descriptions, legend, classification of soils, and tables for recreation, wildlife habitat, engineering, forestland management, and various soil property tables. Two soil map units from the Heber Valley soil survey, and three soil map units from the Strawberry Valley soil survey are mapped within the project area; these include:

Map Symbol	Mapping Unit	Affected Project Acres	Map Unit %	Undisturbed Soil Erosion Hazard	Soil Erosion Hazard	Road Suitability (natural surface)
Heber Valley Soil Survey						
CPD	Cluff Soils 15 to 25 % slopes	5	90	Moderate	Moderate	Poorly suited
RUF	Roundy-Daybell association Very steep	41				
	Roundy Daybell		50 40	Severe Very severe	Severe Severe	Poorly suited Poorly suited
Strawberry Valley Soil Survey						
ERE	Flygare-Sisna complex 10 to 60 % slopes	72				
	Flygare Sisna		70 20	Moderate Severe	Severe Severe	Poorly suited Poorly suited
UXE	Sisna-Zalano complex 10 to 60 % slopes	141				
	Sisna Zalano		80 15	Severe Moderate	Severe Severe	Poorly suited Poorly suited
XYF	Zalano-Elwood-Dex complex 5 to 60 % slopes	8				
	Zalano Elwood		55 25	Moderate Severe	Severe Severe	Poorly suited Poorly suited
	Dex, extrm. flaggy loam		10	Moderate	Severe	Poorly suited
YXA	Xo loam 0 to 2 % slopes	2	85	Slight	Slight	Poorly suited

Environmental Consequences -

Proposed Action – Timber Harvest, Aspen treatment and Fuels Treatment

Soil disturbance associated with logging has the potential to negatively impact soil aggregate structure which is the key factor for maintaining soil productivity, stability, and permeability. Soil aggregate structure is impacted by several factors associated with soil disturbance:

1. Soil Handling – movement of the soil.
2. Soil Compaction – vehicle traffic and resulting skid trails.
3. Soil Moisture Content – avoid soil disturbance when soils are either too dry or wet. Soils should be in a loose or friable condition prior to surface disturbance.

Increased surface soil erosion is primarily related to surface soil disturbance associated with constructing temporary roads, tree removal, skidding and log landing construction. Detrimental soil disturbance changes the physical properties, primarily soil aggregate structure through

compaction. Loss of soil productivity is further compounded through loss of natural ground cover including plant litter, loss of topsoil through hillslope erosion and sedimentation, soil displacement from machinery disturbance, increased water runoff from reduced ground cover and soil compaction, all of which contribute and increase surface soil erosion. Natural nutrient cycles are interrupted resulting in decreased soil-plant production. Furthermore, activities that uproot trees, shrubs, grasses, and forbs can reduce soil strength by eliminating root structures within the soil profile.

Approximately 10% of the treatment polygons will involve constructing skid trails and landings. Therefore, it is determined that there will be less than 15% detrimental disturbance to soil resources within each of the polygons.

Soil productivity is further impacted from loss of topsoil associated with temporary road construction and associated road-prism erosion. USFS Road WEPP analyses (see Hydrology Specialist Report) shows that 39 cubic yards of sediment is produced each year from temporary road prism erosion. The temporary road servicing Treatment #4 polygon is the main contributor adding 25 cubic yards of sediment per year, or 64% of the sediment load.

No Action

This alternative would not involve any action by the Forest Service. No ground based disturbance would occur from timber harvest, road building, road reconstruction, improvement or obliteration. Soil disturbance above existing condition would be nonexistent as no ground disturbing activity would occur.

HYDROLOGY /WATER QUALITY

Affected Environment -

Stream Resources

The Strawberry River Valley between above US Highway 40 and the headwaters is a broad gently sloped glacial outwash. Currently, the Strawberry River is intermittent from approximately the mouth of Bjorkman Hollow through most of the length of the valley. The lower end of the valley is restricted by landforms that make up the Willow Creek and Telephone Hollow drainage divides. Near the mouth of Willow Creek, an east-westerly trend of springs and wetland features emerge due to this valley restriction. Where the Strawberry River intersects the groundwater discharge elevation, streamflow increases and becomes perennial.

Woody-riparian vegetation (willows) in the Strawberry and Hobble Creek valleys were substantially reduced by broad scale applications of herbicides starting in 1965 through the early 1980's. Heavy grazing and removal of riparian vegetation combined with the effects of water diversions on several valley streams, resulted in extensive channel down cutting, loss of riparian habitat and degradation of fish habitat. Several important changes occurred within the past 20 years in relation to the management of Strawberry Valley tributaries and adjacent lands. One significant change was the transfer of 56,775 acres of Strawberry Valley Management Lands from the BOR to the USFS during 1989. Prior to this action, these lands were managed by the Strawberry Water Users Association to emphasize water collection and livestock production.

After the land transfer, the USFS amended its 1983 Land and Resource Management Plan to incorporate the Strawberry Valley Management Area Plan which focused on renewable resources and non-commodity use with an emphasis on wildlife and watershed values. This management adjustment removed all grazing, improved riparian habitat conditions, and reduced sediment loading to the streams on these lands. (Hydrology Specialist Report).

Sink Hollow

Sink Hollow joins the Strawberry River immediately below the large spring/wetland complex above Willow Creek and at the lower end of Strawberry Valley. The lower (southern) 0.5 miles of the Sink Hollow channel and adjacent floodplain is intermittent and maintains a sub-irrigated community willow and herbaceous riparian species. This segment includes a number of depressions within the channel that retain water through the summer months. Above the confluence with Strawberry River, the Sink Hollow channel becomes undefined and disperses flows overland through dense willow and carex vegetation. This area exhibits 100% groundcover. The uppermost (northern) 1.0 miles of stream channel is ephemeral and shows no evidence of recent flow such as channel deposits, gravel sorting, and the presence of upland grasses in the channel (Hydrology Specialist Report)

Sink Hollow Tributary 1 is the northernmost tributary in the Sink Hollow catchment. This catchment includes 0.5 miles of drainage channel. The drainage bottom is occupied by upland grasses, shrubs, conifer, and aspen. No continuous or developed channel exists within this drainage and no apparent channel or surface hydrological connection to Sink Hollow is evident (Hydrology Specialist Report).

Sink Hollow Tributary 2 is the lower tributary in the Sink Hollow catchment. This catchment includes 0.5 miles of ephemeral drainage. The drainage bottom is occupied by upland grasses, shrubs, conifer, and aspen. A skid trail from previous timber activity remains in portions of the drainage bottom. No continuous or developed channel exists within this drainage and no apparent channel or surface hydrological connection to Sink Hollow is evident (Hydrology Specialist Report).

Strawberry Tributary 1

Strawberry Tributary 1 drains directly into the Strawberry River below the Sink Hollow Confluence. This catchment includes 0.6 miles of ephemeral drainage. The drainage bottom is occupied by upland grasses, shrubs, conifer, and aspen. A pack trail is evident portions of the drainage bottom. A poorly developed channel exists within this drainage that extends to a low gradient terrace above the Strawberry River. This channel shows no evidence of recent flow such as channel deposits, gravel sorting, and the presence of upland grasses in the channel (Hydrology Specialist Report).

Strawberry River Area

This area includes the remainder of the project area not located in the catchments described above. The area consists of Strawberry River Valley and slopes or ephemeral drainages on the southern end of the project area that are located adjacent to Hobble Creek or the Strawberry River. As mentioned above, aerial spraying of woody riparian vegetation, livestock grazing, and water diversion projects have substantially impacted the stream channels, floodplain, and

wetlands in this portion of the Project Area. Approximately 1.7 miles of perennial Strawberry River –from confluence with Sink Hollow to US Highway 40 – is located in this area.

Telephone Hollow

Telephone Hollow includes 1.1 miles of intermittent, defined stream channel that flows during spring runoff/snowmelt. The channel in Telephone Hollow includes areas devoid of riparian vegetation with floodplain areas occupied by upland shrubs and grasses. A road is located in the drainage bottom adjacent to the channel. This road contributes runoff directly into the stream channel, and is a chronic source of sediment in its current rutted condition. A series of livestock watering ponds are located throughout the drainage. Below the lower livestock pond, streamflow enters a series of braided channels or overland flow through a carex-willow dominated wetland adjacent to US Highway 40. Below the meadow, overland flows are channelized and piped under the Highway to confluence with Little Hobble Creek (Hydrology Specialist Report).

Daniels Creek Tributary

Daniels Creek Tributary drains directly into Daniels Creek approximately one mile below Daniels Summit. A perennial stream channel associated with the wetland originating on private land. The perennial stream reach flows from US Highway 40 for 0.5 miles and into a canyon below Treatment Polygon #3. At this point, the entire streamflow goes underground into a bedrock fault. A defined channel exists below this point, but no evidence of recent streamflow below the fault was observed during field visit.

The drainage along the toe of Treatment Polygon #3 is ephemeral, with no developed continuous channel or evidence of flow. A road is located in the drainage bottom adjacent to the channel. This road contributes snowmelt and precipitation, and is a chronic source of sediment in its current rutted condition(Hydrology Specialist Report).

Riparian Habitat Conservation Areas (RHCAs)

RHCAs are areas within watersheds where riparian-dependent resources receive primary emphasis and management activities are subject to specific standards and guidelines. RHCAs include traditional riparian corridors, floodplains, wetlands, intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems (2003 UNF LRMP). Floodplains are land areas adjacent to rivers and streams that are subject to recurring inundation. Within the project area, active floodplains within or adjacent to the project area tend to be situated in broad willow-dominated alluvial valleys associated with Strawberry River, Sink Hollow, and Hobble Creek. Numerous springs, wetlands, riparian meadows, beaver ponds, and other small ponds typically occupy the valley floor within or adjacent to the stream channels.

The 2003 Uinta National Forest Land & Resource Management Plan identifies RHCA classes of varying widths offering varying levels of protection: Class I with width extending 300 feet from each edge of the waterbody (600 feet total); Class II with widths extending 200 feet from each edge of the waterbody (200 feet total); and Class III with widths extending 50 feet from each edge of the waterbody (100 feet total). Criteria used to determine the RHCA class for each stream is listed in the 2003 UNF LRMP, Appendix D, pg D-1 & D-2.

Streams and drainages within the Project Area are identified as one of three RHCA classes. The Sink Hollow catchment, including Tributaries 1 & 2, includes 2.6 miles of Class III RHCA. Strawberry Tributary 1 includes 0.4 miles of Class II and 0.2 miles of Class III RHCA. The Strawberry River Area includes 1.7 miles of Class I (Strawberry River) and 0.8 miles of Class II RHCA associated with an untreated ephemeral drainage on the south end of the project area. Telephone Hollow and Daniels Headwater Tributary do not include any identified RHCAs (Hydrology Specialist Report).

Wetland Resources

Wetland functions are defined as a process or series of processes that take place within a wetland. These include the storage of water, transformation of nutrients, growth of living matter, and diversity of wetland plants, and they have value for the wetland itself, for surrounding ecosystems, and for people. They provide food, water, and shelter for fish, birds, and mammals, and serve as a breeding ground and nursery for numerous species. Many endangered plant and animal species are dependent on wetland habitats for their survival (USGS 2005).

Hydrologic functions are those related to the quantity of water that enters, is stored in, or leaves a wetland. These functions include such factors as the reduction of flow velocity, the role of wetlands as ground-water recharge or discharge areas, and the influence of wetlands on atmospheric processes. Water-quality functions include the trapping of sediment, pollution control, and the biochemical processes that take place as water enters, is stored in, or leaves a wetland (USGS 2005).

The U.S. Fish and Wildlife Service partially completed the National Wetlands Inventory (NWI) for the project and adjacent area. This dataset is one of a series available in 7.5 minute by 7.5 minute blocks containing ground planimetric coordinates of wetlands point, line, and polygon features and wetlands attributes. The NWI maps do not show all wetlands since the maps are derived from aerial photo-interpretation with varying limitations due to scale, photo quality, inventory techniques, and other factors. Consequently, the maps tend to show wetlands that are readily photo-interpreted given consideration of photo and map scale. In general, the NWI maps tend to be conservative, with many forested and drier-end emergent wetlands (e.g., wet meadows) not mapped. Maps derived from color infrared photography tend to yield more accurate results except when this photography was captured during a dry year, making wetland identification equally difficult.

The Forest Hydrologist utilized the NWI coverage, NAIP 2004 aerial imagery, and GIS to complete an approximate wetland inventory for the project area. Fieldwork, reconnaissance, & the Forest Hydrologist's knowledge of project area were used to ground-truth the digitized wetland features. This process yielded approximately 40.5 acres of wetlands within the defined project area. Brief description and location of wetlands is discussed below and listed in the Hydrology Specialist Report.

Sink Hollow

Approximately 11.4 acres of wetland habitat was identified on the Sink Hollow floodplain between Tributaries 1 and 2. This habitat generally consists of a broad, floodplain-wide series of interconnected channels dominated by willow and riparian grass species. As discussed above,

Sink Hollow Tributaries 1 and 2 are ephemeral drainages and do not support any wetlands or riparian vegetation.

Strawberry River Area

The portion of Strawberry River valley within the Project Analysis Area includes 18.2 acres of emergent spring and wetland complexes below the confluence with Sink Hollow. The willow and herbaceous riparian grass dominated wetlands are fed by surface and sub-surface flows associated with the Strawberry River as discussed above. Many of these wetlands are located on the floodplain and maintained by localized and elevated water table associated with beaver dam complexes on the Strawberry River.

Telephone Hollow

The NWI identified a stock pond in the lower extent of the Telephone Hollow watershed. This modified wetland feature (0.8 acres) is comprised of a 3 foot tall earthen dam and includes wild rose, willow, and riparian grass species and is heavily impacted by livestock grazing. The stockpond is fed by seasonal runoff from the Telephone Hollow watershed and by overflow from an adjacent livestock trough. The NWI also identified a 5.8 acre herbaceous dominated wetland associated with the Hobble Creek floodplain within this catchment. This wetland feature is isolated from the rest of the floodplain by US Highway 40. The lower wetland is also maintained by seasonal runoff from Telephone Hollow and groundwater interaction associated with Hobble Creek floodplain (Hydrology Specialist Report).

Daniels Creek Tributary

The wetland inventory identified a 4.4 acre wetland within the Daniels Creek Tributary. This wetland consists of a sedge dominated emergent meadow located mostly on private land associated with the Daniels Summit Homes. Just below the Forest Boundary, the wetland transforms to a “stringer meadow” or narrow, low gradient wetland with developed channel and flowing water. Water from the wetland enters a developed stream channel below Treatment Polygon #3 (Hydrology Specialist Report).

Water Yield

Timber management activities can affect streamflow by altering the water balance or by affecting the rate at which water moves from hillsides to stream channels. Changes in vegetation density and age structure affect rates of evapotranspiration, so altered vegetation usually changes runoff volume and timing. Decreased evapotranspiration increases average soil moisture, raises dry-season water tables, and augments dry-season baseflows. These changes can increase storm peaks early and late in the wet season, but mid-season peaks are rarely affected because soil moisture is usually high at this time even before disturbance. Altered soil moisture may affect peaks more consistently in areas where precipitation is distributed throughout the year (Reid, 1993).

The more severe an alteration of the hydrologic cycle is, the greater the effect on streamflows will be. Changes in flow condition depend on many factors. Generally, the following broad generalizations usually apply:

- Harvesting activities such as road building, falling, yarding, and burning can affect

watershed hydrology and streamflow much more than can other management activities such as planting and thinning.

- Clear-cutting causes increased snow deposition in the openings and advances the timing and rate of snowmelt. The effect lasts several decades until stand aerodynamics approach those of the surrounding forest. Snowmelt can be accelerated by the large wind-borne energy inputs of warm rain falling on snow.
- Harvested areas contain wetter soils than unlogged areas during periods of evapotranspiration and hence higher groundwater levels and more potential late-summer runoff. The effect lasts 3-5 years until new root systems occupy the soil.
- Road systems, skid trails, and landings accelerate slope runoff, concentrate drainage below them, and can increase soil water content.

Water Quality

Beneficial uses

The Strawberry River and Tributaries (Colorado River Basin) within the project area of analysis are classified by the State of Utah to support beneficial uses 1C, 2B, 3B, and 4². In addition to the state designated beneficial uses, Strawberry River and Tributaries within the project area of analysis are considered “High Quality Waters – Category 1” and are subject to the State of Utah’s Anti-Degradation Policy. The policy requires that existing high water quality be maintained and that new point-source discharges are prohibited. Control of non-point sources of pollution is required to the extent feasible through implementation of best management practices (UDEQ-DWQ).

Tributaries to the Provo River within the project area of analysis include Daniels Creek. The State of Utah classified these waters to support beneficial uses 1C, 2B, 3B, and 4³.

Clean Water Act Compliance

Waters in Utah that do not meet the water quality standards for their assigned beneficial uses are the focus of the Clean Water Act’s (CWA) Section 303 (d), which requires states to identify, then develop and implement plans to improve remaining impaired waters. The Total Daily Maximum Load (TMDL) process, which identifies pollution sources and allocates maximum pollution loadings where water quality goals are not being met, is the required methodology for addressing these listed waters.

The TMDL approach targets watersheds, addressing water quality in a site-specific way tailored to local conditions and objectives. It specifies the increment of water quality improvement required, allocates responsibility for this improvement incrementally among pollution sources,

² State of Utah Beneficial Use Classifications

Class 1C – Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water

Class 2B – Protected for secondary contact recreation such as boating, wading, or similar uses.

Class 3A – Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.

Class 3B – Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.

Class 4 – Protected for agricultural uses including irrigation of crops and stock watering.

and provides a framework for remedial action. The TMDL process is coordinated with other CWA programs.

Total Maximum Daily Load (TMDL) Studies

Waters within the project area are included within two established TMDLs for the Deer Creek and Strawberry Reservoirs. Although the reservoirs are outside of the project area, the TMDL Studies recommend maintaining existing water quality or reductions in pollutant loading levels in tributaries within the project area of analysis that flow into the reservoirs.

Deer Creek Reservoir TMDL Report

Provo River Tributaries within the project area drain into the Deer Creek Reservoir. The reservoir was included on the 2000 State of Utah 303(d) List of Impaired Waters for Dissolved Oxygen, Temperature, and Total Phosphorous. The TMDL Report for Deer Creek Reservoir was completed in 2002 (PSOMAS-UDEQ 2002). In 2003, UDEQ removed the temperature impairment from the reservoir (UDEQ 2004). The remaining pollutants, Dissolved Oxygen and Total Phosphorous, continue to be targeted for maintenance or reduction in order to support the reservoir's beneficial uses. The TMDL Study also sets in-stream concentrations of 0.04 mg/L for Total Phosphorous and 0.025 mg/L for Total Dissolved Phosphorous for Daniels Creek and tributaries.

Strawberry Reservoir TMDL Report

The Strawberry Reservoir is included on the 2004 State of Utah 303(d) List of Impaired Waters for Total Phosphorous and Dissolved Oxygen. Water quality in the reservoir is currently partially supporting its coldwater fishery and improving, but not at a rate that would allow it to be removed from the 303 (d) List. As a result, the Strawberry Reservoir Total Maximum Daily Load (TMDL) Study was developed by the Utah Department of Environmental Quality (UDEQ) – Division of Water Quality. The report was finalized in July 2005 (UDEQ-DWQ, July 2005). Current conditions and recent trends of the reservoir's water quality indicate that continuation of current and planned management practices will continue to improve quality and sustainability of the Strawberry Reservoir's Fishery. The TMDL Study recommends a 75 pound reduction in annual total phosphorus loads (lbs / year) for the Strawberry River and Tributaries.

The Uinta National Forest cooperatively monitors the quality of waters within the Forest Boundaries with the Utah Department of Environmental Quality – Division of Water Quality and other partners. Water quality data from this sampling program are stored in the STORET public-accessible database maintained by the Environmental Protection Agency (EPA). The following section lists the water quality sites within or immediately downstream of the project area of analysis used to assess water quality conditions. Parameters analyzed include Dissolved Oxygen (DO), pH, Total Suspended Solids (TSS), Total Dissolved Solids (TDS), and Total Phosphorous (TP). Total Phosphorous is currently considered a Pollution indicator by the Division of Water Quality, and – where these pollution indicator levels are exceeded, investigations and analysis of other parameters should be conducted to develop more information (UDEQ-DWQ).

Site Analysis

Colorado River Basin Water Quality Sampling Sites

STORET Site #4936660 is located on the Strawberry River below the confluence with Willow Creek. Contributing watershed for this location included the Strawberry River portion of the project area, Strawberry Headwaters, and Willow Creek. The site was last sampled in 2004. Overall, water quality parameters including TSS, Total Dissolved Phosphorous, Total Phosphorous, and DO are stable or improving. Minor exceedances in pH were recorded in 2000 with no exceedances of State Standards for the remaining parameters at this site between 2000 and 2004 (Hydrology Specialist Report).

STORET Site #4936650 is located on the Strawberry River above the West-Side Road Crossing near the Strawberry Visitor Center. The contributing watershed includes the entire Colorado River Basin (Strawberry River and Hobble Creek) portion of project area. The site was last sampled in 2003. Overall TP levels have been trending downward from 1997 through present. DO values from 2000 to present continue to improve, with the highest values recorded in 2003. Sampling from 2003 resulted in exceedances of State of Utah water quality standards for DO, and minor exceedances in temperature and pH (Hydrology Specialist Report).

Great Basin Water Quality Sampling Sites

STORET Site #5913550 is located on Daniels Creek at the Forest boundary. The contributing watershed above this sampling site includes the headwaters of Daniels Creek and the entire Great Basin portion of the project area. Limited water quality data from 1981 through 2005 is available for this site. Overall, water quality parameters including TSS, Total Dissolved Phosphorous, Total Phosphorous, and DO are stable or improving. All other parameters are supporting designated beneficial uses. A single exceedance for total phosphorous was recorded at this site between 2000 through 2005 (Hydrology Specialist Report).

Drinking Water Source Protection

Congress has passed a Federal Safe Drinking Water Act (US EPA) which empowers the EPA to adopt and enforce rules which must be met by each public water system in the nation. By agreement with the EPA, Utah administers the federal act within the state. The Utah Safe Drinking Water Act (Title 19, Chapter 4 of the Utah Code) empowers the Utah Drinking Water Board to enact rules pertaining to public water systems (PWS)⁴. Thus, Utah's laws and rules regarding public drinking systems are in conformity with federal rules.

Ground Water

Currently, no underground drinking water sources or associated protection zones are located in the Project Area. An underground drinking water source and associated protection zones for the Daniels Summit Lodge is located west of the Project Area and within the Cumulative Effects Analysis Area. Utah Rule R-309 and its sub-parts outline the requirements for establishment and management of these resources within the State.

Surface Water

⁴ Public Water Systems defined in Utah Administrative Code R309-110 as a system, either publicly or privately owned, providing water through constructed conveyances for human consumption and other domestic uses, which has at least 15 service connections or serves an average of at least 25 individuals daily at least 60 days out of the year and includes collection, treatment, storage, or distribution facilities under the control of the operator and used primarily in connection with the system, or collection, pretreatment or storage facilities used primarily in connection with the system but not under his control.

As mentioned above, surface waters within the Project Area are classified by Utah Department of Environmental Quality – Division of Drinking Water to supply water to Public Water Systems (PWS). Surface waters protected for domestic purposes must be treated as required by the Utah Division of Drinking Water before distribution in PWS. Protection Zones for these waters are established in *Utah Administrative Code - Rule R309-605 - Source Protection: Drinking Water Source Protection for Surface Water Sources*. Refer to the Hydrology Specialist Report in the Project Record for further explanation of DWSP Zones.

Strawberry River and its tributaries within the Project Area are included in DWSP Zone 2 and protected for domestic use in the Uinta Basin. The domestic water intake for these waters is at Starvation Reservoir, located 55 miles downstream of the Project Area. Provo River and its tributaries, including Daniels Creek is included in DWSP Zone 4 and protected for domestic use on the Wasatch Front. The domestic water intake for these waters is located below Deer Creek Reservoir, approximately 25 miles downstream of the Project Area.

Environmental Consequences -

Proposed Action – Timber Harvest, Aspen treatment and Fuels Treatment

Environmental Effects on Water Yield

The relationship between removal of vegetation (timber harvest) and increases in water yield are well established (USDA 1976). The majority of the increase in water yield occurs during spring runoff (King 1989). Climate primarily determines the magnitude of large flood events (Dunne and Leopold 1978); however, land use practices have been shown to increase peak flows (Troendle and Kaufmann 1987). The reduction in tree density i.e. canopy cover, results in a reduction in the amount of transpiration of groundwater and also the amount of canopy interception of rainfall/snowfall which increases the amount of the precipitation available for runoff as stream flow. This is the water yield increase associated with timber harvest in a watershed. The amount of water yield declines as the tree canopy recovers with re-growth.

Watersheds exhibit great natural variability in flow, and can accommodate some increase in peak flows without damage to stream channels and aquatic organisms. Increases in average high flows can cause a variety of channel effects, including increases in channel width, depth, erosion, and sediment deposition. Substantial increases in peak flows generally lead to a subsequent increase in sedimentation. If the amount of water yield increase exceeds the capacity of the stream channel, increased streambank and channel erosion occur.

In general, changes in annual water yield from catchments where less than 20% of the timber was harvested could not be determined by hydrometric or streamflow measurements methods (Stednick 1996, Bosch and Hewlett, 1992). However, Stednick suggests by regionalization as little as 15% of a catchment area could be harvested for a measurable increase in annual water yield at the watershed level in the Rocky Mountains (Stednick 1996). Stednick reports that when 50% of catchments were harvested annual water yields ranged from 1 to 10 inch increase, and that results are variable especially when above 30% was harvested in the Rocky Mountains (Stednick 1996). Bosch and Hewlett infer that every 10% removal in cover causes approximately a 1.6 inch increase in annual water yield for coniferous forest, (Bosch and Hewlett 1992).

Analysis of the proposed action and associated vegetative treatment, temporary roads, skid trails, and landings were evaluated to determine changes in water yield. A conservative estimate of total reduction in forest disturbance for each of the delineated catchments within the project area was estimated. This process is discussed in depth in the Hydrology Specialist Report in the Project Record.

The analysis resulted in Daniels Creek Tributary and Telephone Hollow are all well below established thresholds for measurable increase in water yield. Consequently, no increase in water yield is expected to occur through implementation of the proposed action in these watersheds. Total acres of disturbance for Sink Hollow Tributary 1 & 2 and Strawberry Tributary 1 are at or approaching the established threshold for measurable water yield increase. However, the disturbance analysis is very conservative and WEPP modeling for hillslope and temporary road construction do not predict increased runoff (Hydrology Specialist Report).

Environmental Effects on Water Quality

No sediment is predicted to be delivered to drainages within the project area from the treatment polygons. WEPP: Road predicted minimal sedimentation from temporary roads to reach channels in the Sink Hollow and Strawberry River tributaries. The proposed treatments are not projected to increase water yield and will not result in channel formation in Sink Hollow Tributaries 1 & 2 or Strawberry River Tributary 1. The combination of sediment filtration by vegetated drainage bottoms of these tributaries and the distance to a perennial stream should minimize potential of any sediment transport to Strawberry River.

Road maintenance of existing classified roads is predicted to reduce sedimentation and road-related runoff in the Telephone Hollow by 25 yd³ (665 ft³) of sediment and 8.7 inches of runoff during and after the sale. Considering this analysis and utilization of Best Management Practices listed in this document, implementation of the Proposed Action would not result in increased sediment delivery or impairment to water quality or beneficial uses of Strawberry River and Hobble Creek.

Road maintenance of existing classified roads is also predicted to reduce sedimentation and road-related runoff in the Daniels Tributary by 870 ft³ of sediment during the sale and 896 ft³ following the sale. Disturbed WEPP model results for the proposed treatments resulted in virtually no sediment delivery to the ephemeral drainage along the toe of Treatment Polygon #3 and consequently, no sediment delivery to the perennial Daniels Tributary channel or wetland. Considering this analysis and utilization of Best Management Practices listed in this document, implementation of the Proposed Action would not result in increased sediment delivery or impairment of water quality or beneficial uses of Daniels Creek.

Environmental Effects on Stream, Floodplain, and Wetland Resources

Overall, the small drainages adjacent to the treatment polygons within the project area are all ephemeral. WEPP: Road predicts that maintenance of the existing roads in Telephone Hollow and Daniels Creek Tributary will result in reduced sedimentation to the channels and wetlands associated with those drainages. For temporary roads, WEPP: Road predicted minor amounts of sedimentation in Strawberry Tributary 1 and Sink Hollow Tributaries 1 & 2. The amount of sediment predicted to be delivered will be easily filtered in the vegetated ephemeral drainage

bottoms below the treatment polygons and will not affect the wetlands or stream processes associated with Strawberry River or Sink Hollow. Best management practices for drainage crossings, road maintenance, and harvest activities will be implemented to ensure that any further potential impact to these resources occurs.

No Action

Under this alternative, no action would occur in the stands proposed for treatment. It is expected that the lodgepole pine stands would continue to be altered by succession to stands dominated by subalpine fir, with an increased susceptibility to mountain pine beetle outbreaks. The lack of fuels treatments would heighten the risk of stand-replacement wildfire, with increased threat to the adjacent residential and summer homes, and loss of landscape diversity, including lodgepole pine at the southern and western boundary of its range in Utah.

GRAZING MANAGEMENT

Affected Environment -

This project is located within the Telephone Hollow pasture of the East Daniels Cattle allotment. There are 4 permittees allowed to graze a total of 935 head on the allotment from 21 June to 30 September. The grazing system for the allotment is a 7 pasture rest rotation system with use on the Telephone pasture varying from early season to late season for rest from livestock grazing. There are 3 water developments and a section of fence within the proposed treatment area.

Environmental Consequences -

Proposed Action – Timber Harvest, Aspen treatment and Fuels Treatment

The proposed action has different actions for different areas of the timber sale and thus will have different effects on the management of the livestock. The following are the effects based on the proposed actions.

Livestock in aspen: Treatment of aspen will remove encroaching conifer and existing natural regeneration of the stand will be sufficient existing herding practices. This will have little if any affect on the grazing allotment.

Livestock in the Lodgepole Pine stands. Cattle do not normally spend very much time in these stands because the lack of forage. Livestock will usually trail through and shade up along the edges of the more open stands. The group selects will open areas to increased sunlight and there will be an increase in forage. Livestock will then have a tendency to want to move to these areas and graze them. Livestock will be kept out of the group selects by blocking trails and skid roads with slash, herding away from the group selects and placing salt in areas that will draw the livestock away from these areas. In the event that livestock can not be kept out of the cut area funds from the timber sale will be used to fence the group selects. The effect will be an increased demand for herding while getting the needed regeneration started.

The open areas along the road: Telephone Hollow has several large open areas along the road that are high use areas for livestock. Cattle will bunch up near the water developments when they have water in them and often lay on the road. The increase of traffic in these areas will cause

some of the cattle to go to other places putting more grazing pressure on these other places. Also the cattle lying on the road can frustrate drivers of the vehicles. This can also cause the livestock to become unsettled and harder to herd. Operators would be advised to be patient with the cattle and give them time to move out of the way. There will be some shift of use to other areas and an increase in the need for herding.

Range improvements. There are 3 water developments in the Telephone Hollow timber sale and an allotment boundary fence on the eastern portion of the project area. The upper two developments in Telephone Hollow are ponds that catch spring run. The lower water development is a trough with an overflow into a pond. The water for this trough comes via a pipeline from a spring to the North West along highway 40. This pipeline is buried about 4 to 6 inches under ground and goes under the Telephone Hollow road. Maintenance and upgrading of this road could break or crush the pipeline. If this occurs the pipeline will need to be fixed in a timely manner so not disrupt the management of the livestock. The fence on the east is a boundary fence to keep cattle from getting onto the Project lands where grazing is not allowed. There will be portions of the fence knocked down by equipment and trees as they fall. The contractor will need to repair all damage and ensure the fence is kept up when cattle are in the area.

No Action

Under the No Action Alternative the head months will remain the same as presently permitted and will not cause a change in the overall cattle operation.

RECREATION RESOURCES

Affected Environment –

Recreation Resource – Existing Condition

There is a combination of developed recreation sites, trails, trailheads, dispersed recreation, and winter recreation in the proposed timber sale area.

Telephone Hollow Winter Recreation Trailhead. Primarily used during winter season as a cross county ski trailhead. The only facilities are vault toilet, information boards, and a gravel parking lot.

Rock Quarry Winter Recreation Trailhead. Primarily used during winter season as a cross county ski trailhead. The only facilities are vault toilet, information boards, and a gravel parking lot.

Trails. There is a system of groomed cross-country ski trails throughout the proposed timber sale area.

Dispersed Recreation. The proposed area is accessed by Forest Service Roads #263, #143, #384, #326, #327 that provide popular locations for dispersed camping, hunting, ATV riding, horseback riding, family reunions, and multiple other recreational activities. There are numerous established dispersed campsites along the roads mentioned above. The area commonly referred to as “Dock Flats” is a very popular location for large family reunions. Throughout the summer

weekends, the majority of these dispersed campsites are occupied. ATV use is popular along Forest Road #143. This also results in illegal ATV use along roads #326 and #327; additionally, illegal trails are created throughout this area.

Environmental Consequences -

Proposed Action – Timber Harvest, Aspen treatment and Fuels Treatment

Implementation of the proposed timber sale would have a short-term and minimal effect on the recreating public in the immediate area, particularly on the road corridors where the majority of summer dispersed recreation and camping occurs. Hunting activities could be impaired or interrupted by logging activity in the late summer and fall. Any temporary road construction or improvement could exacerbate illegal ATV activity. The cross-country skiing trail system could be impacted by fallen trees or debris left behind on the trail. The road system that accesses the proposed timber sale area consists primarily of single lane roads with minimal to no turnouts for vehicles that meet on the road. Public safety and uninterrupted access should be a priority.

Recommendations to minimize conflicts with the recreating public and the recreation and trails infrastructure and facilities would include:

- Ensure that proper and permanent closure of temporary roads is implemented after project completion to prevent illegal ATV activity.
- Ensure the grooming corridor for cross-country ski trails is clear from trees and debris. The trail is adequately marked with blue diamonds.
- Minimize or halt logging activity during opening weekends of general deer and elk hunts.
- Dust abatement may be needed during the most heavily used periods, primarily holidays.
- Traffic controls should be in place on single lane road corridors where vehicles are incapable of passing oncoming logging trucks.

FISHERIES

Affected Environment –

WATERSHED LEVEL POPULATION AND HABITAT STATUS

For the purpose of land management and planning, the Uinta National Forest is divided into 18 management areas (USDA Forest Service 2003a). Eleven of these management areas include streams, watersheds, and drainages that contain current or historic Bonneville cutthroat trout (BCT) populations and their habitat. This section of this document discusses BCT population and habitat conditions as well as other aquatic and semi-aquatic resources contained within the upper Strawberry River drainage located within Strawberry Reservoir Management Area and the Daniels Creek drainage located in the Deer Creek Reservoir Management Area of the Uinta National Forest.

Strawberry Reservoir Management Area

The Strawberry Reservoir Management Area is located in Wasatch County, Utah. The natural boundaries of the Strawberry Reservoir watershed, along with the Forest boundary on the east, are the boundaries for this management area. A small portion of the Uintah and Ouray Ute Indian Reservation borders the area near Soldier Creek Reservoir.

Yearly precipitation in the management area varies from approximately 19 inches near Strawberry Reservoir to over 30 inches at higher elevations. Water for livestock and irrigation are the biggest water uses within the management area. Water from the area is also used for domestic, power, and storage purposes. The management area is a part of north central Utah's upper Strawberry River system and part of the Colorado River system, flowing into the Duchesne River, which is a tributary to the Green River, which ultimately flows into the Colorado River. There are 132 miles of perennial streams and 235 miles of intermittent streams found within this management area.

Historical water diversions, overgrazing, elimination of riparian species through herbicide spraying, trapping of beaver, and removal of beaver dams have all caused detrimental impacts to the hydrology and fluvial geomorphology of the Strawberry Valley rivers and streams in the past. The system is recovering slowly as upland, riparian, and stream channel conditions are still not at their desired future condition. Grazing has been eliminated on the Strawberry Project lands until vegetative conditions improve, though the State of Utah continues to trap beaver in the valley and the dewatering of streams and rivers still occurs.

Watersheds located in the Strawberry Reservoir Management Area that are part of this analysis include the upper Strawberry River, Murdock Hollow, Clyde Creek, and Little Hobble Creek drainages.

Strawberry River

The Strawberry River is located within the Northeastern GU for Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*). Streams in the watershed were historically inhabited by CRCT. Colorado River cutthroat trout are a USFS Region 4 and State of Utah listed sensitive species and conservation agreements between the USFS and UDWR have been developed for this species. The construction of Strawberry Reservoir fragmented and isolated headwater populations of CRCT and subsequent fisheries enhancement activities during the 1990s and the introduction of non-native fish species has eliminated any genetically pure CRCT populations within the Strawberry River drainage. Consequently, no conservation or persistence populations for CRCT have been identified within the Strawberry River drainage.

Fish Populations

The Bear Lake strain of BCT has been introduced into the Strawberry River drainage and populations occur within a number of the stream systems including Strawberry River. Bonneville cutthroat trout are a USFS Region 4 and State of Utah listed sensitive species and conservation agreements between the USFS and the UDWR have been developed for this

species; however, no conservation or persistence populations for BCT have been identified within the Strawberry River drainage.

Other native fish species believed to be present within the Strawberry River include mottled sculpin (*Cottus bairdi*), mountain sucker (*Catostomus platyrhynchus*), Utah sucker (*Catostomus ardens*), redbelt shiner (*Richardsonius balteatus*), speckled dace (*Rinichthys osculus yarrowi*), and Utah chub (*Gila atraria*) (Smith 2005b). Although thought to be present in the Strawberry River prior to the 1990 Rotenone treatment of the Strawberry River drainage, leatherside chub (*Gila copei*) are no longer found in the drainage (Sigler and Sigler 1996).

In addition to BCT, rainbow trout (*Oncorhynchus mykiss*) are present in the Strawberry River. Other non-native fish species that occur within the drainage include Kokanee salmon (*Oncorhynchus nerka*). Sterile rainbow trout are currently stocked by the UDWR to supplement popular recreational fisheries in some locations within the drainage, while hatchery operations by the UDWR on the Strawberry River support popular recreational fisheries for both cutthroat trout and Kokanee in Strawberry Reservoir.

Amphibians

The distribution of amphibian species within the Strawberry River drainage has been documented through surveys conducted by the USFS and UDWR. Boreal toad (*Bufo boreas boreas*) and tiger salamander (*Ambystoma tigrinum*) have been documented to occur within the drainage. Results from the Utah GAP Analysis (USDI 1997) indicate that the management area contains critical value habitat for boreal chorus frog (*Pseudacris maculate*), boreal toad, Great Basin spadefoot toad (*Spea intermontana*), Great Plains toad (*Bufo cognatus*), northern leopard frog (*Rana pipiens brachycephala*), tiger salamander, and Woodhouse's toad (*Bufo woodhousii*). Additional information relative to the life history and distribution of amphibian populations on the Uinta National Forest is contained in *Native Amphibians of the Uinta National Forest* (Smith 2005a).

Rare Aquatic Invertebrates

No observations of State or Federally listed rare or imperiled aquatic macro-invertebrates have been reported for the Strawberry River drainage (NatureServe 2005). Although one species of rare aquatic snail, the glossy valvata (*Valvata humeralis*), has been documented to occur within the management area there are no records of this species being observed within the drainage. Additional information relative to aquatic invertebrates on the Uinta National Forest is presented in *Aquatic Invertebrate Report for Samples Collected by the Uinta National Forest 2002* (Vinson 2005).

Threatened, Endangered, and Sensitive (TES) Species

The Bear Lake strain of BCT is the only TES aquatic species believed to inhabit the Strawberry River drainage (USDA Forest Service 2003b). Although the drainage is within the historic range of Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*), this species has been removed from the system and replaced with BCT following the Rotenone treatments during the

1990s. The drainage is outside the range of June sucker (*Chasmistes liorus*) and this species is currently not found in the area (Smith 2004).

Bonneville cutthroat trout populations in the Strawberry River are assessed using standard electrofishing multiple pass removal depletion protocols (Ricker 1975), and snorkel count survey protocols (Thurow 1994). Recent surveys span the time period between 2003 through 2006 and are cataloged for reference and review in *Fisheries and Aquatic Resources Data of the Uinta National Forest* (Smith and Smith 2005). Specific sampling protocols for fish populations on the Uinta National Forest are detailed in the *Cutthroat Trout Monitoring Plan and Protocols for the Uinta National Forest* (Smith and Lyman 2004a).

Fish population data for the Strawberry River include information collected during fish population surveys conducted by the USFS during 2003, 2004, 2005, and 2006. Population data, using the abundance of BCT within the Strawberry River drainage, show an increase in the overall abundance of cutthroat trout during the period between 2003 and 2006. Estimates of cutthroat trout densities in the drainage have historically averaged 1.30 fish/m and range from 0.60 fish/m during 2003 to 2.00 fish/m during 2006. (Smith 2007a)

Population data, using indices of overall condition (K Factor) for CRCT within the Strawberry River drainage, show no change in the average overall condition of CRCT during the period between 2003 and 2005. Estimates of CRCT condition average 0.97 and range from 0.95 during 2004 to 1.00 during 2005. (Smith 2007a)

Additional information used in this review relative to the status of BCT populations in the Strawberry River drainage is available in *Capability and Suitability Analysis, Management Indicator Species – Colorado River Cutthroat Trout* (Smith and Pope 2006a); *Capability and Suitability Analysis, Management Indicator Species – Bonneville Cutthroat Trout* (Smith and Pope 2006b); and *Bonneville Cutthroat Trout Populations of the Uinta National Forest – Annual Monitoring Report 2006* (Smith 2006).

Aquatic Habitat

Aquatic habitat data for Strawberry River consists of R1/R4 habitat surveys (Overton et al. 1997) and Habitat Suitability Index (HSI) surveys (Hickman and Raleigh 1982) conducted by the USFS during 2003, 2004, 2005, and 2006. Additional surveys, using other habitat survey protocols, used in this analysis are cataloged for reference and review in *Fisheries and Aquatic Resources Data of the Uinta National Forest* (Smith and Smith 2005). Specific sampling protocols for fish habitat on the Uinta National Forest are detailed in the *Cutthroat Trout Habitat Monitoring Plan and Protocols for the Uinta National Forest* (Smith and Lyman 2004b) and *R1/R4 and HSI Survey Protocols for the Uinta National Forest* (Smith and Smith 2005b).

Habitat conditions for cutthroat trout are assessed using the equal value component model developed by the Fish and Wildlife Service (Hickman and Raleigh 1982). Components of the model are derived from habitat suitability curves which score given habitat attributes on a scale of 0.00 to 1.00 with a score of 1.00 representing highly desirable habitat attributes. These scores

are combined and an overall HSI score for the habitat area is determined and used to characterize habitat conditions for cutthroat trout within the habitat area.

Results of the R1/R4 and HSI surveys indicate that the habitat suitability for cutthroat trout in Strawberry River is very good with a combined HSI score of 0.80 and individual scores ranging from 0.79 in 2006 to 0.85 in 2004. Habitat conditions in Strawberry River are most restrictive for the embryo life stage of cutthroat trout with an HSI score of 0.65. Overall, the most limiting habitat factor identified for Strawberry River during the HSI analysis was percent spawning gravel fines < 3.00 mm with an HSI score of 0.28. (Smith 2007a)

Aquatic habitat in Strawberry River consists of run (47%), low gradient riffle (22%), pool (15%), and glide (13%) habitat types with stable (85%) but few undercut banks (6%). Pools are typically moderate in size and depth. Pool depth and size are sufficient to provide a low velocity resting area for a few adult trout. Between five and 30 percent of the pool bottom is obscure due to surface turbulence, depth, and/or the presence of structure. Available concealment cover is 52 percent for adult and 91 percent for juvenile salmonids. Available winter habitat is approximately 21 percent. Riparian vegetation consists primarily of grass/forbs (34%), riparian shrub (22%), sedge/rush (21%), and upland shrub (20%). Amounts of large woody debris are low with an estimated density of 0.02 pieces/m, 0.00 aggregates/m and 0.00 root wads/m being observed within the sample reaches. Channel substrate consists of rubble, gravel, boulders, and fines in approximately equal amounts. In spawning gravels, percent fines < 6.35 mm and < 3.00 mm are 30 and 22 percent respectively. (Smith 2007a)

After review of the available habitat survey information, it is concluded that aquatic habitat in the Strawberry River is sufficient to support existing populations of fish and other aquatic species at their present levels. Additional information used in this review relative to the life history and habitat requirements of cutthroat trout and aquatic habitat conditions on the Uinta National Forest is available in *Capability and Suitability Analysis, Management Indicator Species – Colorado River Cutthroat Trout* (Smith and Pope 2006a); *Capability and Suitability Analysis, Management Indicator Species – Bonneville Cutthroat Trout* (Smith and Pope 2006b); and *Bonneville Cutthroat Trout Populations of the Uinta National Forest – Annual Monitoring Report 2006* (Smith 2006a).

Deer Creek Reservoir Management Area

The Deer Creek Reservoir Management Area is bounded by the Uinta National Forest boundary on the north and by the natural boundaries of the Deer Creek Reservoir watershed. Less than 20 percent of the total watershed area is within the proclaimed boundary of the Uinta National Forest. The majority of the balance of the watershed is in private ownership. Precipitation at Deer Creek Reservoir averages between 16 and 20 inches per year, while the mountains in the management area average in excess of 30 inches annually. (USDA Forest Service 2003a)

The management area is a watershed for several small communities, the largest of which is Heber City with a population of approximately 5,610. Deer Creek Reservoir lies within state lands in the northern portion of the watershed. This reservoir is a major storage facility

providing culinary water to over a million people in Utah and Salt Lake Counties. (USDA Forest Service 2003a)

The main stem channel of the Provo River is located near the northern and western border of the watershed outside of the National Forest boundary. In the recent past, portions of the Main Canyon channel of the Provo River have not had perennial flow; however, the Central Utah Project Completion Act directed minimum perennial flows between Jordanelle and Deer Creek Reservoirs following the completion of Jordanelle Reservoir. The Provo River below Deer Creek Reservoir, just outside of the northwest corner of the management area, is managed as a blue ribbon sport fishery and is stocked with non-native fish species. The tributaries are perennial in the lower reaches near the Provo River, except where dewatered by irrigation diversions. Tributaries become intermittent to ephemeral in upper reaches. All areas of the watershed drain into Deer Creek Reservoir. All tributaries from Heber and South Kamas Valleys drain into the Provo River. Tributaries from Round Valley drain directly into Deer Creek Reservoir. There are approximately 38 miles of perennial and 69 miles of intermittent streams within the management area on National Forest System lands. Water uses from the management area include stock water, domestic, irrigation, and storage. (USDA Forest Service 2003a)

Watersheds located in the Deer Creek Reservoir Management Area that are part of this analysis include the Daniels Creek drainage.

Daniels Creek

Daniels Creek is located within the Northern Bonneville Geographic Unit for BCT. Bonneville cutthroat trout are a USFS Region 4 and State of Utah listed sensitive species. Conservation agreements with the Utah Division of Wildlife Resources (UDWR) have been developed for this species (UDNR 1997a; 2000a).

Fish Populations

The population of BCT within the Daniels Creek drainage has not been identified as either a persistence or conservation population in the *Conservation Agreement and Strategy for BCT in the State of Utah* (UDNR 1997a). Other native fish species believed to be present within the drainage include mottled sculpin (*Cottus bairdi*), mountain sucker (*Catostomus platyrhynchus*), reidside shiner (*Richardsonius balteatus*), and Utah chub (*Gila atraria*) (Sigler and Sigler 1996). Non-native German brown trout (*Salmo Trutta*) and rainbow trout (*Oncorhynchus mykiss*) are present within the drainage and make-up approximately one and 11 percent of the total salmonid population respectively (Table 1). Both brown trout and rainbow trout present a potential risk to the recovery and future viability of cutthroat trout populations throughout the drainage. (Smith 2005b)

The Daniels Creek drainage is also located within the identified historic range for leatherside chub, a native species that is a State of Utah listed sensitive species. The life history and habitat requirements of this species are poorly understood and its current distribution and abundance is not well known, however, observations of leatherside chub have not been reported for the drainage (Sigler and Sigler 1996).

Amphibians

The distribution of amphibian species within the Daniels Creek drainage has been documented through surveys conducted by the USFS and UDWR. Columbia spotted frog (*Rana luteiventris*) have been reported above Deer Creek Reservoir. Results from the Utah GAP Analysis (USDI 1997) indicate that the management area contains high value habitat for northern leopard frog (*Rana pipiens brachycephala*) and substantial value habitat for boreal chorus frog (*Pseudacris maculate*), boreal toad (*Bufo boreas boreas*), and Great Basin spadefoot toad (*Spea intermontana*). There is one boreal toad record from 1959 at Daniels Summit (UDNR 2002b). Additional information relative to the life history and distribution of amphibian populations on the Uinta National Forest is contained in *Native Amphibians of the Uinta National Forest* (Smith 2005a).

Rare Aquatic Invertebrates

No observations of State or Federally listed rare or imperiled aquatic macro-invertebrates have been reported for the Daniels Creek drainage (NatureServe 2005). Additional information relative to aquatic invertebrates on the Uinta National Forest is presented in *Aquatic Invertebrate Report for Samples Collected by the Uinta National Forest 2002* (Vinson 2005).

Threatened, Endangered, and Sensitive (TES) Species

Bonneville cutthroat trout is the only TES aquatic species known to currently inhabit Daniels Creek. Although Daniels Creek is located within the historic range of the Utah valvata snail (*Valvata utahensis*), the species is believed to have been extirpated from Utah and does not occur within the drainage (NatureServe 2005). The drainage is also outside the historic range of Colorado River cutthroat trout (*Oncorhynchus pleuriticus*) and June sucker (*Chasmistes liorus*) and these species are currently not found in the area (Smith 2004; 2005b).

Bonneville cutthroat trout populations in Daniels Creek are assessed using standard electrofishing multiple pass removal depletion protocols (Ricker 1975), and snorkel count survey protocols (Thurow 1994). Recent surveys occurred during 2005 and are cataloged for reference and review in *Fisheries and Aquatic Resources Data of the Uinta National Forest* (Smith and Smith 2005). Specific sampling protocols for fish populations on the Uinta National Forest are detailed in the *Cutthroat Trout Monitoring Plan and Protocols for the Uinta National Forest* (Smith and Lyman 2004a).

Fish population data for Daniels Creek includes information collected during fish population surveys conducted by the USFS during 2005. Electrofishing surveys indicate that cutthroat trout densities in Daniels Creek averaged 0.49 fish/m. Fish population data using indices of overall condition (K Factor) for BCT in Daniels Creek show that during 2005 the average overall condition of cutthroat trout in the drainage was 0.99. (Smith 2007b)

Additional information used in this review relative to the status of BCT populations in the Daniels Creek drainage is available in *Capability and Suitability Analysis, Management Indicator Species – Bonneville Cutthroat Trout* (Smith and Pope 2006) and *Bonneville Cutthroat Trout Populations of the Uinta National Forest – Annual Monitoring Report 2006* (Smith 2006).

Aquatic Habitat

Aquatic habitat data for Daniels Creek consists of R1/R4 habitat surveys (Overton et al. 1997) and Habitat Suitability Index (HSI) surveys (Hickman and Raleigh 1982) conducted by the USFS during 2005 and 2006. Additional surveys, using other habitat survey protocols, used in this analysis are cataloged for reference and review in *Fisheries and Aquatic Resources Data of the Uinta National Forest* (Smith and Smith 2005). Specific sampling protocols for fish habitat on the Uinta National Forest are detailed in *Cutthroat Trout Habitat Monitoring Plan and Protocols for the Uinta National Forest* (Smith and Lyman 2004b) and *R1/R4 and HSI Survey Protocols for the Uinta National Forest* (Smith and Smith 2005b).

Habitat conditions for cutthroat trout are assessed using the equal value component model developed by the Fish and Wildlife Service (Hickman and Raleigh 1982). Components of the model are derived from habitat suitability curves which score given habitat attributes on a scale of 0.00 to 1.00 with a score of 1.00 representing highly desirable habitat attributes. These scores are combined and an overall HSI score for the habitat area is determined and used to characterize habitat conditions for cutthroat trout within the habitat area.

Results of the R1/R4 and HSI surveys indicate that the habitat suitability for cutthroat trout in Daniels Creek is very good with a combined HSI score of 0.87 and individual scores ranging from 0.85 in 2006 to 0.88 in 2005. Habitat conditions in Daniels Creek are most restrictive for the embryo life stage of cutthroat trout with an HSI score of 0.77. Overall, the most limiting habitat factor identified for Daniels Creek during the HSI analysis was percent spawning gravel fines < 3.00 mm with an HSI score of 0.47. (Smith 2007b)

Aquatic habitat in Daniels Creek consists of low gradient riffle (36%), pool (27%), run (24%), and step pool complex (14%) habitat types with stable (100%) but few undercut banks (5%). Pools are typically moderate in size and depth. Pool depth and size are sufficient to provide a low velocity resting area for a few adult trout. Between five and 30 percent of the pool bottom is obscure due to surface turbulence, depth, and/or the presence of structure. Available concealment cover is 63 percent for adult and 77 percent for juvenile salmonids. Available winter habitat is approximately 32 percent. Riparian vegetation consists primarily of riparian shrub (64%), upland shrub (13%), grass/forbs (10%), and sedge/rush (4%). Amounts of large woody debris are low with an estimated density of 0.03 pieces/m, 0.00 aggregates/m and 0.03 root wads/m being observed within the sample reaches. Channel substrate consists of rubble, gravel, boulders, and fines in approximately equal amounts. In spawning gravels, percent fines < 6.35 mm and < 3.00 mm are 39 and 21 percent respectively. (Smith 2007b)

After review of the available habitat survey information, it is concluded that aquatic habitat in the Daniels Creek is sufficient to support existing populations of fish and other aquatic species at their present levels. Additional information used in this review relative to the life history and

habitat requirements of cutthroat trout and aquatic habitat conditions on the Uinta National Forest is available in *Capability and Suitability Analysis, Management Indicator Species – Bonneville Cutthroat Trout* (Smith and Pope 2006) and *Bonneville Cutthroat Trout Populations of the Uinta National Forest – Annual Monitoring Report 2006* (Smith 2006).

Environmental Consequences -

Proposed Action – Timber Harvest, Aspen treatment and Fuels Treatment

Strawberry Reservoir Management Area

Following review of the proposed project and potential effects of project implementation, it was determined that implementation of the proposed project within the Strawberry Reservoir Management Area will not result in any additional cumulative effects to fisheries and aquatic resources because of the proximity of the proposed project to actively flowing and/or seasonally intermittent stream channels as well as conservation measures, standards and guidelines that are identified to minimize project specific effects as part of the project proposal. Consequently, it is anticipated that the overall impact of this project will generally be negligible for fisheries and will not result in any long-term detrimental effects to existing aquatic resources beyond those that currently exist within the management area.

Therefore, it is determined that there will be **no negative long-term impacts, direct, indirect effects** to aquatic species or their habitat resulting from implementation of the proposed project within the Strawberry Reservoir Management Area.

Deer Creek Reservoir Area

Following review of the proposed project and potential effects of project implementation, it was determined that implementation of the proposed project within the Deer Creek Reservoir Management Area will not result in any additional cumulative effects to fisheries and aquatic resources because of the proximity of the proposed project to actively flowing and/or seasonally intermittent stream channels as well as conservation measures, standards and guidelines that are identified to minimize project specific effects as part of the project proposal. Consequently, it is anticipated that the overall impact of this project will generally be negligible for fisheries and will not result in any long-term detrimental effects to existing aquatic resources beyond those that currently exist within the management area.

Therefore, it is determined that there will be **no negative long-term impacts, direct, indirect effects** to aquatic species or their habitat resulting from implementation of the proposed project.

No Action

Under this alternative, no action would occur in the stands proposed for treatment and current conditions would remain unchanged.

OLD GROWTH

Affected Environment –

None of the stands to be treated currently meets the minimum criteria for old-growth as determined by the Intermountain Region Regional Forester.

Hamilton (1993) states, “The dominant seral role of lodgepole pine has it occupying the site for 100 to 200 years. In these stands more shade tolerant species are present and will replace the lodgepole pine in the absence of fire. In these circumstances old-growth characteristics are usually not found because stand density is usually too high to allow large tree sizes defined for old-growth”. The Regional Forster has provided the following direction: The minimum criteria to define old-growth forest in the Intermountain Region are: Diameter at Breast Height (**DBH**), Trees Per Acre (**TPA**), and Age (Letter dated March 2, 2007). Minimum criteria for lodgepole pine from Hamilton (1993) is as follows:

<u>DBH</u>	<u>TPA</u>	<u>Age</u>
≥ 11	≥ 25	≥ 140

Stand exam data indicates the following average current stand conditions (5”+ dbh):

<u>DBH</u>	<u>TPA</u>	<u>Age</u>
9.9	284	87

Environmental Consequences -

Proposed Action – Timber Harvest, Aspen treatment and Fuels Treatment

The only old growth criteria achieved under current stand conditions is trees per acre, which will continue to well-exceed 25 TPA after treatment. Simulations using the Forest Vegetation Simulator (FVS) indicate that the prescribed treatments will actually result in a post harvest average diameter increase to approximately 12” dbh, allowing most stands to meet 2 of the 3 criteria rather than just one.

No Action

The current stand conditions would remain unchanged, and meet one of the old growth criteria.

CUMULATIVE EFFECTS

This section describes other interrelated projects that may contribute to cumulative effects. Cumulative effects are the impacts on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

The cumulative effects area of analysis is as follows:

Visual Landscape, Soils, Old Growth and Sensitive Plants/Noxious Weeds –Project Area

Recreation – Project Area and additional area to the north and east - see the map on subsequent page

Range – East Daniels Allotment

Hydrology/Water Quality– Daniels Creek and Willow Creek/-Strawberry River sixth order HUC

Fisheries- Strawberry Reservoir Management Area

Heritage – Strawberry Valley

Wildlife Resources – Center Creek, Daniels Creek, Clyde Creek-Strawberry River and Willow Creek-Strawberry River sixth order HUCs

Past Activities in the Project Area:

Present/Ongoing Activities in or adjacent to the Project area:

- Grazing – This project is located with in the Telephone Hollow pasture of the East Daniels Cattle allotment. There are 4 permittees allowed to graze a total of 935 head of cows with calves on the allotment from 21 June to 30 September. The grazing system for the allotment is a 7 pasture rest rotation system with use on the Telephone pasture varying form early season, late season to rest from livestock grazing. There are 3 water developments and a section of fence with in the proposed treatment area. There is no grazing currently in the Strawberry Project Lands Management Area portion of the project area.
- Noxious Weed Treatments – Treatments occur in area on a rotating basis. The priority weed areas to treat are new infestations first and then treat existing epidemic infestations as time and funds allow.
- Personal Use Fuelwood Gathering – Permits for personal use firewood are typically sold from July 1st through October 15th. Down and standing dead trees can be harvested within 150 feet of designated forest roads. Standing dead conifers 18” dbh or greater may not be cut. Standing trees or down wood may not be cut or removed within 300 feet of streams or lakes. The amount of personal use fuelwood harvesting has averaged about 1,500 cords per year across the entire Uinta National Forest over recent years.

The three historic sales are all within the project area but only partially overlap current proposed cutting units. The 3-acre Sink Hollow sale overlaps Unit 1, and was divided into two cutting blocks, one of which was a clearcut of approximately 1-acre which was fenced to protect

regeneration. The 19 acre Catface Timber sale overlaps the eastern one-third of Unit 2. The 5-acre Telephone Hollow Prop sale appears to have been a precommercial thinning and took place in a stand which is not scheduled for harvest with this project.

SALE	Harvest Year	Merchantable Board Feet (green 8"+ dbh)	Additional Product(s)	Species Harvested
Telephone Hollow Prop	1975-76	31,000	500 3-8" dbh poles	Lodgepole Pine
Sink Hollow	1975-76	27,000	75 3-8" dbh poles	Lodgepole Pine
Catface	1979	20,000	Older dead – undetermined amount	Lodgepole Pine, Douglas-fir, Subalpine fir

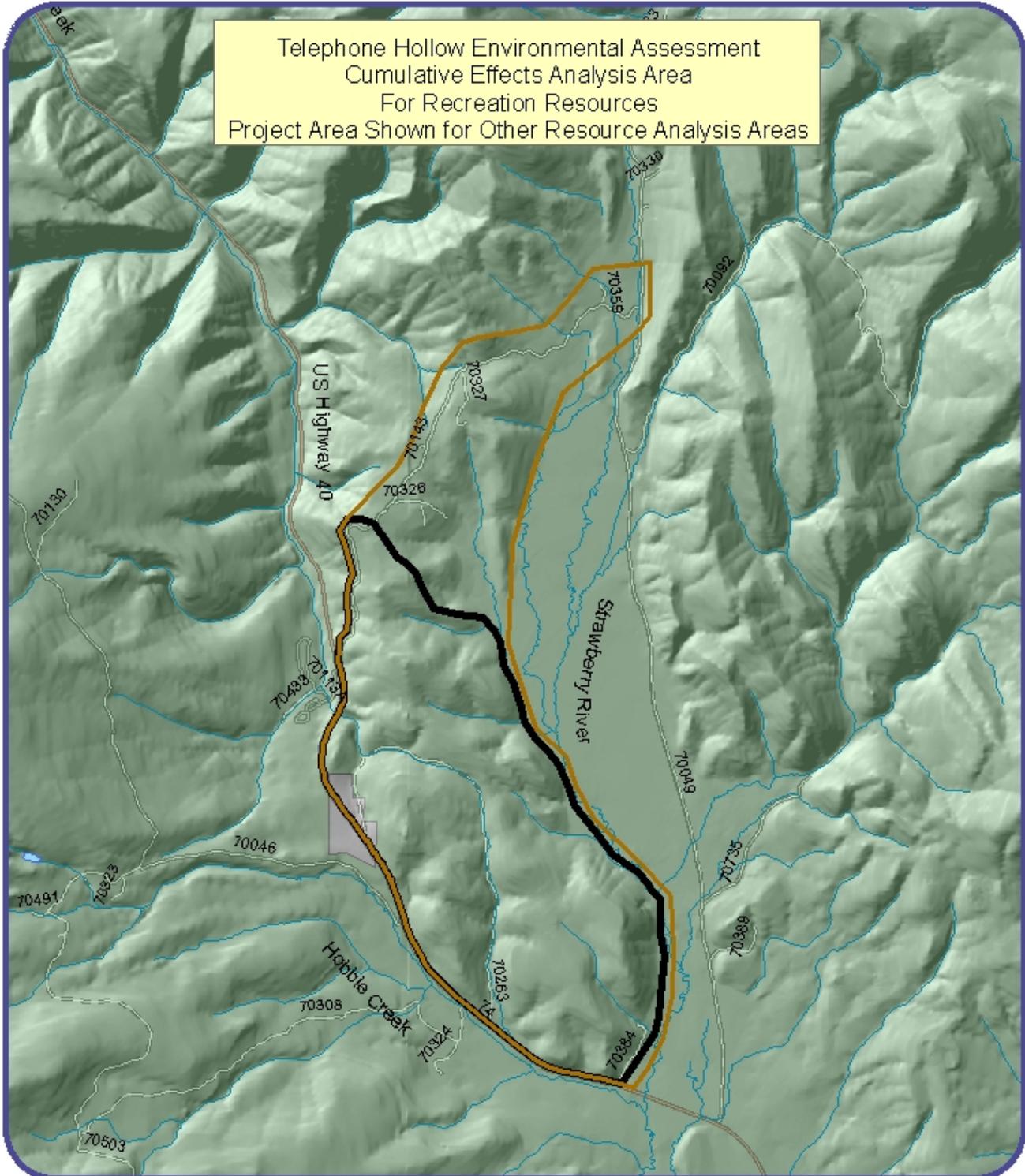
Foreseeable Future Activities:

Closure of Telephone Hollow to Snowmobiles – The Heber Ranger District is considering this closure to enhance the cross-country skiing experience in the area

In addition to the activities in the project are, these activities occur within the Recreation Resources Area of Analysis:

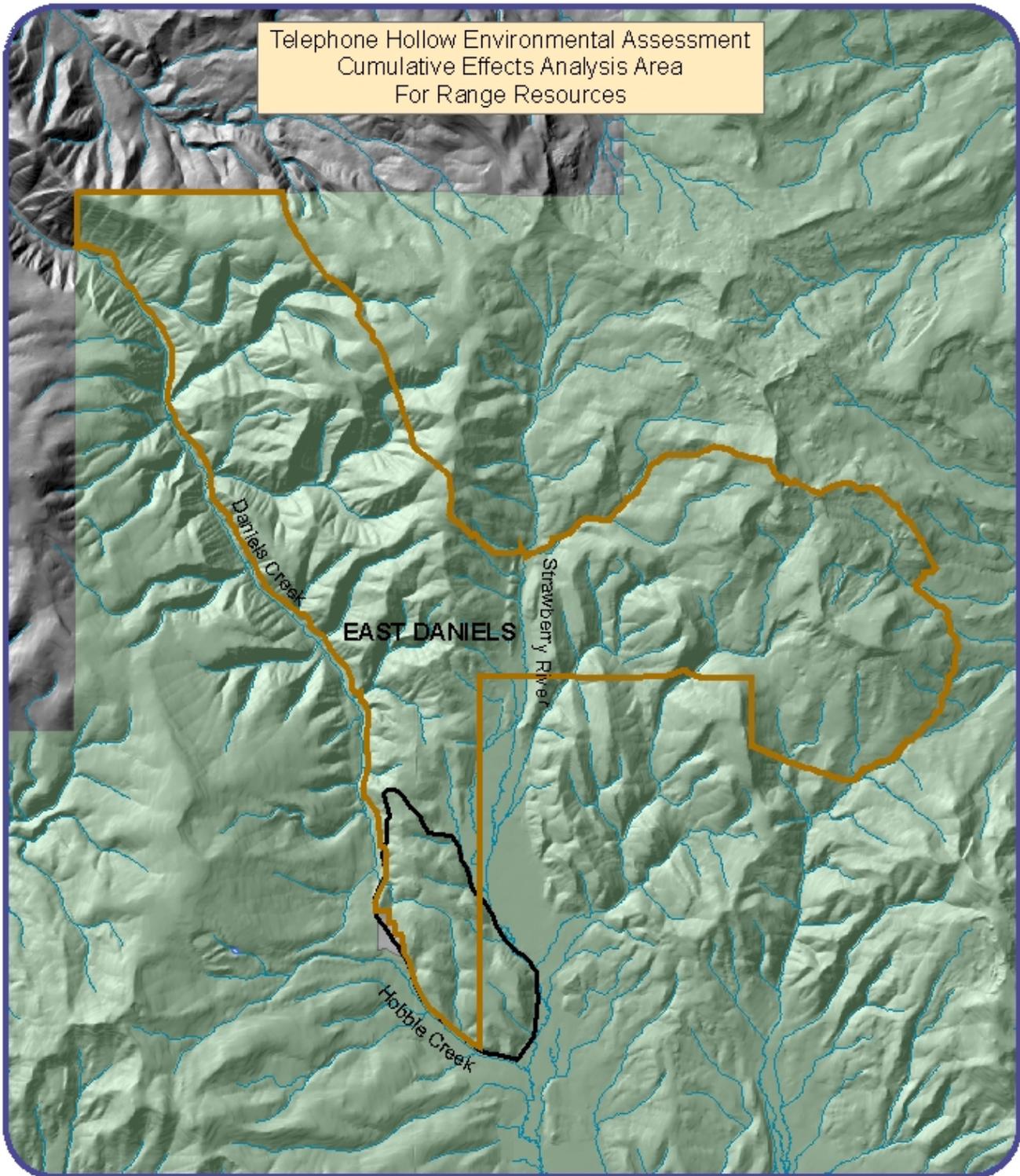
Recreation in the Telephone Hollow/Dock Flat/Sink Hollow area – There is a combination of developed recreation sites, trails, trailheads, dispersed recreation, and winter recreation in the proposed timber sale area. The Telephone Hollow Winter Recreation Trailhead and the Rock Quarry Winter Recreation Trailhead are primarily used during winter season as a cross county ski trailhead. There is a system of groomed cross-country ski trails throughout the proposed timber sale area. The area is accessed by Forest Service Roads #263, #143, #384, #326, #327 that provide popular locations for dispersed camping, hunting, ATV riding, horseback riding, family reunions, and multiple other recreational activities. There are numerous established dispersed campsites along the roads mentioned above. The area commonly referred to as “Dock Flats” is a very popular location for large family reunions. Throughout the summer weekends, the majority of these dispersed campsites are occupied. ATV use is popular along Forest Road #143. This also results in illegal ATV use along roads #326 and #327; additionally, illegal trails are created throughout this area.

Telephone Hollow Environmental Assessment
 Cumulative Effects Analysis Area
 For Recreation Resources
 Project Area Shown for Other Resource Analysis Areas

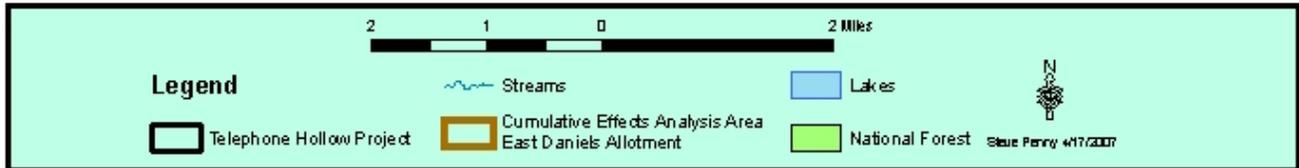


In addition to the activities in the project area, these activities occur within the Range Resources Area of Analysis:

There have been other timber sales on the allotment in the past (Roundy Basin, Smith Basin) that are now to the stage that livestock can use that area with out interfering with the regeneration. At present the only proposed vegetation project on the allotment is the treatment of sagebrush in Sink Hollow to improve vegetation diversity and ground cover. This project is in the very early planning stages and implementation date is out in the future.



Telephone Hollow Environmental Assessment
 Cumulative Effects Analysis Area
 For Range Resources



In addition to the activities previously discussed, these activities occur within the Hydrology / Water Quality Area of Analysis:

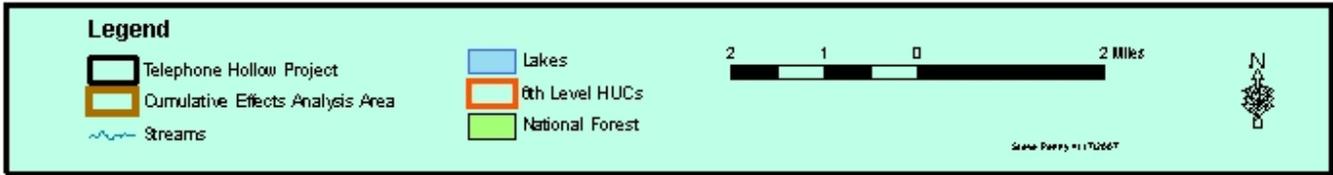
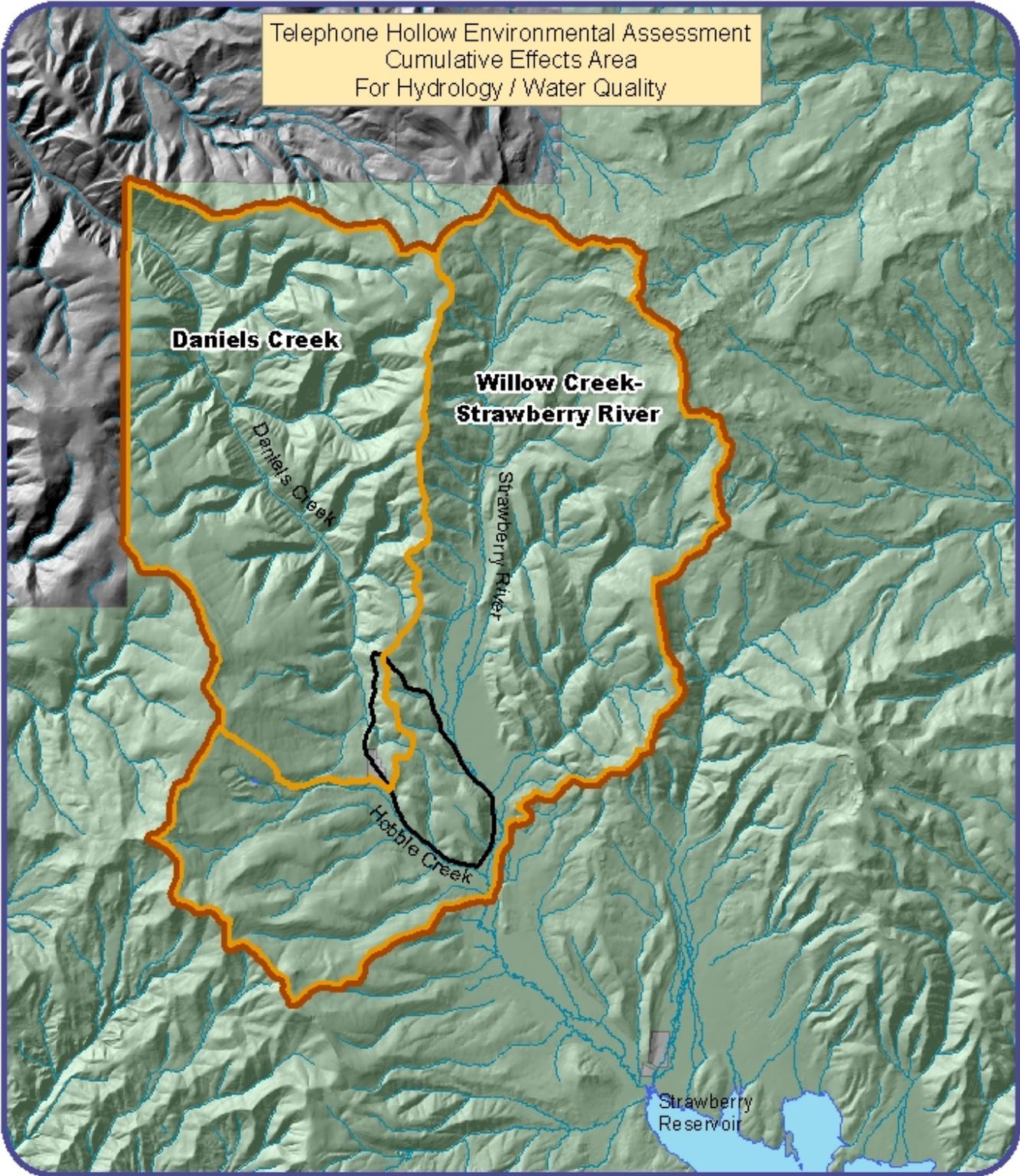
- Dispersed Recreation in the greater Upper Strawberry Watershed – There are some Forest System trails for foot and equestrian traffic only; Dry Canyon, Clegg Canyon, Upper Center Canyon, Thornton Hollow, Forman Trail, Willow Creek Trail, Sleepy Hollow, the Narrows Trail and the Mud Creek Trail. There are many more miles of level 1-2 roads (not main artery roads) that are designated for ATV use. Some illegal off road use of ATVs and Off-Highway Vehicles occurs throughout the watershed which is addressed through Forest Service law enforcement and through closure of created trails and campsites and continued maintenance of existing closures. Dispersed camping occurs throughout the watershed, mainly along drainages with the heaviest concentrations being on the drainages on the west side of Strawberry Reservoir; Mud Creek, Clyde Creek, and Horse Creek.
- Timber Sales in the Daniels Creek 6th level HUC include the following: Three Forks, selection harvest of approximately 209 ccf in 1981. Big Glade I, selection harvest of approximately 30 ccf in 1978. And Big Glade, selection harvest of approximately 58 ccf in 1981.
- Road maintenance - The Upper Strawberry Watershed Forest system roads are maintained according to priority for access, condition of roads and availability of funds. Maintenance consists of providing for drainage, grading and re-graveling graveled roads.
- Strawberry River Restoration project Phase II - This project consisted of stream channel stabilization and maintenance of 1.3 miles of boardwalk along the Strawberry River.
- Hogsback Aspen Understory Seeding II – This project would seed approximately 200 acres on the Strawberry S & G Allotment using native grass/forb seed mix. Seed would be applied to the ground surface; no surface roughing used.
- Lodgepole Pine Campground Hazard Tree Treatment – Mountain pine beetle is also present in this area. Uinta National Forest Fire personnel were used to fell, buck and chip slash of hazard trees and dying beetle infected trees in the fall of 2006.
- Other ongoing activities include Daniels Summit summer homes commercial land use , US Highway 40 use and maintenance, utility power line use and maintenance along the highway corridor, Forest Road use and maintenance, and two outfitter and guide special use operations.

Foreseeable Future Activities:

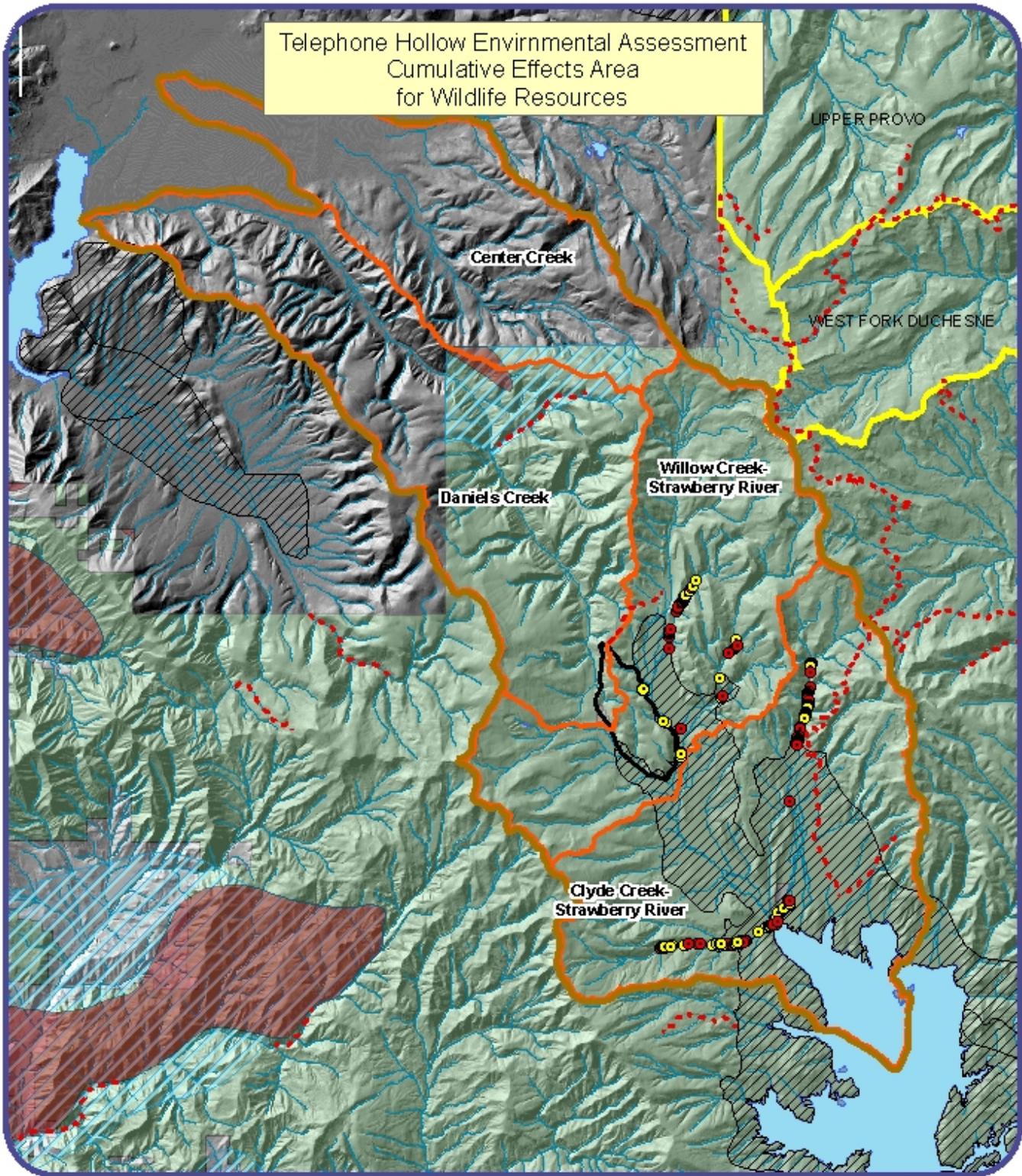
- River Restoration Work on Horse Creek, Co-op Creek, and Trail Hollow – The Strawberry Watershed Restoration Report recommends installing debris check dams and in stream structures in these creeks to trap sediment and raise the water table.

- Temporary or Permanent Fencing in Stream Segments for Protection of Boreal Toad Habitat and Other Stream Management Objectives – In the 2004 Strawberry Watershed Report there are recommendations in the Upper Strawberry Watershed for several areas where fencing to exclude livestock grazing would help preserve amphibian populations and enable stream channels/riparian areas to heal. There is no specific proposed action at this time.
- Strawberry River Restoration Phase III – Analysis will begin 2006 for restoration work north of the Utah Division of Wildlife Resources fish trap to highway 40, and then above highway 40 to the confluence of Willow Creek. The preliminary proposed action for the project would be similar to the Phase I-II projects in sloping, stabilizing and re-vegetating stream banks and installing in-stream structures. This would involve approximately four-six miles of stream
- Upper Strawberry Allotment Environmental Impact Statement - Involves the analysis of the West Daniels Cattle Allotment, the Twin Peaks Sheep Allotment and the Strawberry Sheep Allotment. The proposed action involves converting approximately half of the Twin Peaks Sheep Allotment to cattle and adding the area to the West Daniels Allotment without any increase in cattle numbers. The remainder of the Twin Peaks Allotment would remain sheep with a reduction in season or numbers. The Strawberry Sheep Allotment would also involve a partial conversion to cattle and adding the area to the East Daniels Allotment without an increase in cattle numbers. A portion of the Strawberry Sheep Allotment would be fenced off and would be managed as a special management pasture. The head waters of Strawberry River would be closed to cattle grazing.
- Co-op River Restoration – The Co-op River has been altered in the past to get water to the reservoir for irrigation purposes by the Bureau of Reclamation and the Strawberry Water Users from 1936 to 1983. A canal was constructed in 1934-36 to divert water from Currant Creek to Co-op Creek and by 1969 a 50-70 foot gorge was cut in the upper part of the canyon. Even though the diversion from Currant Creek was discontinued in 1983, the gorge still has trouble healing and needs to be rehabilitated. Another potential river restoration project would be on the lower end of Co-op Creek towards the reservoir where the water has been put in an artificial channel and needs to be restored to the original channel.
- Lodgepole Pine Campground Carbaryl/Pheromone Treatment and Thinning – In addition to the hazard tree and beetle infected tree felling, bucking and chipping in the fall of 2006, a pheromone treatment, mountain pine beetle insecticide treatment and timber sale is planned to reduce lodgepole pine mortality in this area.

Telephone Hollow Environmental Assessment
Cumulative Effects Area
For Hydrology / Water Quality



In addition to the activities previously discussed, activities occurring within the Wildlife Resources Area of Analysis include recreation use of the Strawberry Valley. This area receives over 2 million visitors per year. The majority of that recreation use centers around the reservoir itself, but many visitors fish, hunt, drive, snowmobile and camp in dispersed locations throughout the area of analysis. There are five developed camp areas around the north and west shores of Strawberry reservoir. There is dispersed, undeveloped recreation and camping throughout the Forest. Noxious weed treatments by private land owners as well as the Forest Service have occurred and would continue.



Telephone Hollow Environmental Assessment
Cumulative Effects Area
for Wildlife Resources



In addition to the activities previously discussed, these activities occur within the Fisheries Area of Analysis (please see Forest Plan for map of Strawberry Management Area) and Heritage Area of Analysis:

Strawberry Reservoir has undergone a dramatic evolution in the course of its long history as one of the most important recreational fisheries in the state of Utah. The most significant recent developments include the enlargement of the reservoir during 1985; transfer of lands controlled by the Strawberry Water Users to the USFS in 1989; the completion of the most extensive rotenone treatment ever conducted during 1990 which included the tributaries; the implementation of a variety of rehabilitation measures for reservoir tributaries during 1984 and again in 1993-95 to improve habitat degraded by intensive livestock grazing; and the return of the upper Strawberry River flows from the Daniels diversion during 2002. (Wilson et al. 2004)

The Strawberry Valley Irrigation Project was initially constructed during 1922 by the BOR. The main feature of the project was the 8,400 acre Strawberry Reservoir, which was designed to provide storage and delivery of water to the Bonneville Basin (Wasatch Front) via the Strawberry Tunnel (West Portal). Enlargement of Strawberry Reservoir began in 1973 when the Soldier Creek Dam, located approximately eight miles downstream of the Strawberry Dam, was completed. The old Strawberry Dam and Indian Creek Dike were subsequently breached during 1985, and the original 283,000 acre-foot reservoir was enlarged to provide a maximum capacity of 1,106,500 acre-feet and a total surface area of about 17,164 acres. Strawberry Reservoir is an essential feature of the Bonneville Unit of the Central Utah Project. The reservoir functions as the major storage facility for about 135,000 acre feet of water diverted from the Uinta Basin through the Strawberry Aqueduct and Collection System. The Central Utah Water Conservancy District is currently the operating agent for the enlarged Strawberry Reservoir. (Wilson et al. 2004)

Several important changes occurred within the past 15 years in relation to the management of Strawberry Valley tributaries and adjacent lands. One significant change was the transfer of 56,775 acres of Strawberry Valley Management Lands from the BOR to the USFS during 1989. Prior to this action, these lands were managed by the Strawberry Water Users Association to emphasize water collection and livestock production. After the land transfer, the USFS amended its 1983 Land and Resource Management Plan to incorporate the Strawberry Valley Management Area Plan which focused on renewable resources and non-commodity use with an emphasis on wildlife and watershed values (USDA Forest Service 1990). This management adjustment removed all grazing, improved riparian habitat conditions, and reduced sediment loading to the streams on these lands. (Wilson et al. 2004).

The UDWR accomplished an ambitious chemical reclamation project during 1990 to remove competing rough fish populations (i.e., Utah chub and Utah sucker) and rejuvenate the Valley's sport fishery. The treatment was 99 percent effective in removing these nongame fishes, and the sport fishery improved sufficiently to meet or exceed fishery objectives by as early as 1993. The treatment project also included the valley tributaries. There were some impacts to these tributaries in the form of beaver dam breaching and removal of some aquatic species. However, all native fish species except CRCT have subsequently been re-introduced, and the vast majority of macro invertebrates have returned to these streams and reaches. (Wilson et al. 2004)

The Forest Service in cooperation with other agencies and groups has accomplished a variety of rehabilitation measures in the various tributary streams with most of the work occurring during 1984 and 1993-95. These projects involved the placement of instream structures such as drop logs, vortex weirs, random boulder arrangements, spawning gravel enhancement, pool excavation, gully plugs, culvert placements, etc. In addition, a number of bank stabilization projects were undertaken with logs, juniper revetments, willow plantings, and other vegetative enhancement. These projects met with varying degrees of success depending on the chosen rehabilitation measure and site specific characteristics and techniques. During 2002, an instream habitat enhancement project was accomplished on the Strawberry River in the vicinity of the UDWR fish trap utilizing Habitat Council funding. This project focused on improving the operational efficiency of assorted fish trap structures and in promoting streambank stability in the reach between the intake structure and the electric fish barrier. Vertical banks were re-shaped, protected with root wads and coconut fiber matting, and re-vegetated (seeding and willow plantings). While it is too soon to evaluate the effectiveness of the project, this type of rehabilitation has proven very successful in other central Utah streams and riparian ecosystems (Wiley 2003). (Wilson et al. 2004)

In addition to the 2002 instream habitat improvement project, a similar project was developed and implemented in 2005 on a 1.3 mile reach of the Strawberry River below the UDWR fish trap station. Specific objectives of this project were to restore and maintain the natural dimension, pattern, and profile of the Strawberry River channel; improve upstream fish migration from the reservoir to the fish trap/egg taking station facilities; slope/stabilize eroding banks, re-seed banks and plant willow clumps to help riparian vegetation to re-establish to provide fish cover and reduce stream temperatures; and experiment with discouraging beaver access and colonization in this stream segment with fencing and other methods that would not harm any beaver (Smith 2005i). It is too soon to evaluate the extent to which the project objectives have been met; however, improvements in channel form and function as well as increases in fish habitat suitability have already been noted.

Stream dwelling trout are intimately connected to their habitat, and the population status (abundance, condition, size, etc.) can be interpreted as a direct reflection of habitat condition. The tributaries feeding Strawberry Reservoir, particularly those on Strawberry Project Lands (including upper Strawberry River, Little Hobble Creek, Clyde Creek) have suffered from heavy livestock grazing, chemical removal of willows, road system impacts, water diversions, stream alteration and channelization, channel degradation (downcutting), sedimentation and deposition of fines in spawning gravels, and invasion/expansion of rough fish populations over the past 80 years. As a result, the potential for salmonid production in nearly all of these streams has been negatively impacted. (Wilson et al. 2004)

Since these and other less dramatic actions can have profound impacts on fluvial fisheries habitat, it has been the undertaking of the UDWR and USFS to evaluate the cumulative effects of these changes on Strawberry Reservoir tributaries. One of the primary management goals for the Strawberry fishery is the production of 10 million salmonid fry from reservoir tributaries (Johnson 1987). To assist in the assessment of this goal, Habitat Quality Index (HQI) surveys were conducted in 1984/1985, 1997/1998, and again in 2002 to determine if significant improvements to aquatic habitat conditions in the tributary streams have occurred since the most recent management changes. Based on these HQI surveys, there appears to have been significant improvement in several habitat attributes between the 1984/85, 1997/98 and 2002 survey periods, the most noticeable of which are

the reduction of eroding streambanks and substantial stream narrowing. These improvements are accentuated by the presence of greater trout standing stocks in some tributary sections during 1997/98 when stream flows were near normal. The 2002 surveys were conducted during a fairly severe drought, and results of the HQI surveys were obviously influenced by the resulting low flows. (Wilson et al. 2004)

The 2002 surveys included two new stations to establish baseline data for additional stream reaches in response to the USFS development of a Strawberry Valley Watershed Rehabilitation Plan. In conjunction with and in addition to these HQI surveys, a number of fish population inventories were conducted to define game and nongame fish distribution and density. Nearly all inventoried streams contained young-of-the-year (YOY) cutthroat trout, and several held substantial numbers indicating excellent natural recruitment. During 1997, YOY trout densities in Section 4 of Indian Creek were estimated to be more than 14,000 fish per mile. (Wilson et al. 2004)

One of the primary objectives of the UDWR Strawberry Project is to promote natural reproduction of adfluvial cutthroat trout and kokanee salmon in Strawberry Reservoir tributaries. The goal that was established in the Environmental Assessment of Plans to Restore the Strawberry Valley Fishery (Johnson 1987) was a production of 10 million cutthroat fry per annum. While no specific goal was established for kokanee, the UDWR feels that significant contribution from natural recruitment is essential to the maintenance of a viable kokanee fishery as well. Efforts to support the establishment of a viable kokanee fishery include placement of fish passage structures on beaver dams in the upper Strawberry River to facilitate spawning migrations of kokanee into the upper reaches of the drainage.

Reservoir population modeling accomplished during the period 1993 to 2002 suggests that annual fry production in the tributaries has varied from 100,000 to over 6.0 million (Wilson and Ward, unpublished data). The data also suggest that natural recruitment accounts for a long-term average of 23 percent of the adult aged III+ and older cutthroat trout in Strawberry Reservoir. During 1997, nearly 60 percent of the III + and older cutthroat in the reservoir originated from natural sources (Wilson and Ward 2003). Despite the current potential for natural recruitment, it is apparent that salmonid production continues to be suppressed by poor habitat quality in some of the valley tributaries, particularly those in the Strawberry River system (Wilson et al. 2004). However, cutthroat trout population data within the upper Strawberry River drainage indicate no change in the overall abundance of cutthroat trout during the period between 1997 and 2004 (Smith 2005a).

The Heber Ranger District of the Uinta National Forest assembled a team during 2001 to collect comprehensive watershed and hydrologic data, and begin broad-based project planning for restoration work to be accomplished in Strawberry Valley. It was the intent of this team to build upon the 1997 Strawberry Valley Assessment by moving the assessment forward into the implementation phase. (Wilson et al. 2004)

The overall cumulative effects in the Strawberry Reservoir Management Area results from the combined activities associated with past and current grazing activities; logging and timber management; construction and maintenance of roads and trails; development and maintenance of recreational facilities; irrigation and water withdrawal; fisheries and aquatic habitat restoration; wildfire and vegetation management.

Cumulative Effects by Resource

Forested Vegetation Structure and Composition

Cattle grazing will continue in the proposed project area and will not be deferred from treatment units. Should there be a need to exclude cattle from group selection areas, temporary fencing will be utilized.

Fuelwood gathering is not expected to increase or decrease as a result of implementing this project. Collection of fuelwood is restricted to dead and down trees less than 18” inches in diameter.

Fuels Accumulations, Increased Fire Hazard/Intensity

The ongoing activity of cattle grazing removes fine fuels from the project area and reduces the likelihood of a low intensity ground fire spreading between stands. In contrast, effects from grazing may allow for more accumulation of dead fuels by lowering the frequency of low intensity fires which might otherwise spread and consume fuels before they accumulate.

In the foreseeable future, activities involving vegetation treatment at Lodgepole Pine Campground could reduce the mountain pine beetle population and lower the risk of beetle attack in the proposed project area. This could have the effect of reducing the large fuel accumulation in the short-term.

Visual Landscape

The project includes the improvement of vegetative conditions, maintenance for disturbance plant communities and reduction of the buildup of hazardous fuels. All these elements in the long-term potentially benefit the visual landscape.

Sensitive and Invasive Plants

The proposed action is in an area whose elevation and vegetation types are not suitable habitats for TES plant species, and where surveys found no suitable rare plant habitat. Therefore, there would be no cumulative impacts to TES plants. The Telephone Hollow Timber Sale, as mitigated, in addition to the known other effects and activities in the cumulative effects area would not have a significant effect on noxious weed occurrence.

Old Growth

This project does not meet the criteria for Old Growth, therefore there would be no cumulative effect.

Heritage

The cumulative effects analysis area for heritage and traditional plant use is the Strawberry Valley watershed since the kinds of activities or resources that attracted people to the area were broadly available, and generally included more than one part of the valley. A relatively wide variety of archaeological sites occurs in the Strawberry Valley area and includes those used by ancient American Indian as well as historic European Americans. American Indian sites have been affected by historic period activities such as livestock grazing, logging, road and reservoir construction, recreational activities (such as dispersed camping), etc. These same historic period activities also created archaeological sites (sites over 50 years of age) such as logging camps, recreation camps, etc. The overall density of sites in the area is relatively low.

Since enactment of historic preservation and environmental analysis laws in the 1960's (with implementing regulations since that time), the rate at which later activities (such as logging) affected archaeological remains of earlier activities has slowed considerably, since the affect of current activities is taken into account during project planning. For example, this project is being redesigned to avoid impacts to the only site in the project area that is eligible for the National Register of Historic Places. As a result, the overall affect of the proposed timber sale, as well as past, present, and reasonably foreseeable activities on heritage resources in Strawberry Valley is low.

Traditional Plant Use - The cumulative effects analysis area for traditional plant use is the Strawberry Valley watershed, since the area as a whole is considered a source of plants for Northern Ute traditional practitioners who travel to this area to gather. Very few of the plants of interest to the Northern Utes occur within the project area, but are widely available in a number of other areas within Strawberry Valley. Despite the historic affects of reservoir construction, livestock grazing, logging, etc., traditional practitioners have been able to continue to gather plants of interest. In addition, current day activities (such as recreation, livestock grazing, vegetation treatments, etc.) have not restricted traditional plant gatherers from being able to continue their activities. As a result, the overall affect of the proposed action, as well as past, present, and reasonably foreseeable activities is that traditional plant gatherers will be able to continue to obtain plants of interest in Strawberry Valley.

Soils

Through analysis of the proposed action alternative, it is determined that there will be a 1.3 percent increase in cumulative effects to soil resources beyond existing conditions.

Grazing Management

The indirect and direct effects listed above along with past and future effects will not affect the numbers or the grazing season of the livestock but could affect the management of the livestock.

Hydrology/Water Quality

Implementation of the Proposed Action would not result in increases in water yield for the Cumulative Effects Analysis Area. Similarly, no cumulative impacts to drinking water sources, water quality, wetlands, or stream resources within the Cumulative Effects Analysis Area are predicted to occur.

Fisheries

The action area for the proposed project is not adjacent to any flowing stream channels and is sufficiently removed from active seasonal steam channels so that the effects of implementation of the proposed project to fisheries and aquatic resources would be negligible, no cumulative impacts to fisheries would occur.

Wildlife Resources

Factors that have most affected wildlife habitat conditions historically in this area include: 1) loss of riparian habitats caused by water diversions and subsequent dewatering of stream channels; 2) loss of riparian habitats resulting from creation and expansion of Strawberry Reservoir; 3) degradation of riparian habitats caused by aerial spraying of 2,4-D from the mid-1960s to the mid-1980s to

eradicate willow communities; 4) degradation of riparian and upland habitats caused by livestock overgrazing during the late 1800s to mid 1900s; and 5) loss and degradation of riparian habitats caused by erosion and stream channel downcutting. Collectively, these factors resulted in the loss and degradation of large areas of riparian wildlife habitat within the cumulative effects analysis area. Species likely to have been most affected by the loss and degradation of aquatic and riparian habitats include fish, amphibians, beavers and other riparian-associated mammals and birds.

While there have been a broad range of human-caused and natural cumulative effects in or adjacent to the proposed action, these activities are not thought to have substantially reduced the habitat quality of high elevation conifer forest for the Species of Concern, Forest Service Sensitive Species or Threatened or Endangered species which could be affected by the proposed action.

CONSULTATION AND COORDINATION

The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment:

RESPONSIBLE OFFICIAL:

Julie King, Heber District Ranger, Uinta National Forest

ID TEAM MEMBERS:

Stephen Penny, Forester, Uinta National Forest
Shawn Martin, Forester, Uinta National Forest
Pamela Jarnecke, NEPA Coordinator, Uinta National Forest
Bernadette Barthelengi, Landscape Architect, Uinta National Forest
Charmaine Thompson, Heritage Specialist, Uinta National Forest
Denise Van Keuren, Ecologist, Uinta National Forest
Jeremy Jarnecke, Hydrologist, Uinta National Forest
Karen Hartman, Wildlife Biologist, Uinta National Forest
Michael Bornstein, Wildlife Biologist, Uinta National Forest
Jim Percy, Range Management Specialist, Uinta National Forest
Beth Corbin, Fire Ecologist, Wasatch-Cache/Uinta National Forest
Robert Davidson, Soil Scientist, Uinta National Forest
Ronald Smith, Fisheries Biologist, Uinta National Forest
Elizabeth Hebertson, Forest Health Protection Specialist, S&PF Forest Health Protection
Klein Houston, Engineer, Uinta National Forest
John Campbell, Recreation Staff, Uinta National Forest
Keith Hackbarth, Assistant Fire Management Officer, Wasatch-Cache/Uinta National Forest
Lauren B Shapiro, Fire Ecologist, Uinta National Forest
Lanson J Stavast, Fuels Technician, Uinta National Forest

FEDERAL, STATE, AND LOCAL AGENCIES:

Animal Plant Health Inspection Service
Ashley National Forest
Bureau of Reclamation, Provo Area
Bureau of Indian Affairs
Farm Bureau
Kamas City
Manti-Lasal National Forest
US Fish and Wildlife Service
Utah DEQ, Division of Air Quality
Utah Division of Water Rights
United States Department of Interior
Utah Department of Public Safety
Utah Division of Water Resources
Utah Reclamation Mitigation and Conservation Commission

Wasatch County Board of Supervisors
Wasatch County Planning Commission
Wasatch Mountain State Park

TRIBES:

Northern Ute Indian Tribe

OTHERS:

Winona Adams
Stacey Arens
Backcountry Horsemen of Utah
David Bailey
Brian Batie
Thad Beal
Senator Bob Bennett
Kent Berg
Blizzard Lumber Company
John Booth
William J. Bramwell
Craig Bryson
Ken Burton
Congressman Chris Cannon
Glen Carpenter
Dick Carter
Jim Carter
Carl Chappell
Carl Clark
Mike Clark
Jason Cody
Allen and Kathy Creer
F. Arlene Dart
Joan Degiorgio
Dave Dredickson
Fred or Jane Dedrickson
Gary and Susan Derosé
Walt Donaldson
Paul F. Dremann
Bob and Linda Ellison
Kelly Etherington
Jeff Fabrizio
Ned and Linda Fausett
Deit Fischer
Jim and Bonnie Franc
Zachary Frankel
Friends of Wasatch Mountain State Park

Frontier Lumber
Heath Gilbert
Joseph and Joyce Glen
Fred and Gloria Gowans
Mary Gracia
John Gurrola
David Hanscom
Lee Haskell
Senator Orrin Hatch
William and Leah Higbee
High Country Forest Products
J.E. and S.A. Hines
Dave Hintze
Mark Holden
Ken and Patty Hulce
Governor John Huntsman, Jr.
Helena C. Jacobsen
Dave Jarvis
Jared Jeffs
Tom Jensen
Jana Johnston
Ivan and Judy Keller
Curt Kennedy
Bryan Kilcrease
Sonya Knight
Dick and Bonnie Kofford
Keith W. Lewis
Leavitt Lumber Company
Julie Mack
Congressman Jim Matheson
Bob Mathis
Marvin McDougal
Donald and Cynthia Mecham
Reed and Lareen Mellor
David and Ginger Miller
David and Angela Miller
Paula and Wallhy Mories
Stephanie Carter Nielsen
Dr. Theron and Selma Olsen
Glen and Janice Olsen
David Lynn Olsen
Gordon L. Olsen
Lars Ortegren
Pacific Legal Foundation
F. Calvin and Betty M. Packard
Predator Education Fund

LaRen Provost
Dennis Richins
Shiri Thomlinson and David Wilkes
Paul B. and Jenean J. Sabin
Doug Sakaguchi
Sidney Sandberg
Joe Shelton
Dennis Shiozawa
Milt Shipp
Gordon and Murriel Snow
Jon Snow/Michael Klauck
Patricia Sorensen
Trevor Sweat
Mike Swenson
Renee P. Taylor
Shawn Thomas
Gerald W. Thomas
Thompson Logging
Trout Unlimited
Chip Turner
Ann A. Tuttle
Utah Environmental Congress
Utah Petroleum Association
Utah State University
Sam Walker
Alan Ward
Leona Y. Warner, Trustee
Wasatch County Public Lands Committee
Westley J. Walker
Ron and Karen Wall
Western Wood Products Incorporated
Rick E. Wilberg
Wild Utah Forest Campaign
Vern Wilson
John Wooldridge
Ron Wopsock
Clayton Wright
Glade and Darlene Wright
Dean Young
Lee Zukoski

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APPENDIX A - Response to Comments for Telephone Hollow

2004 Comments

Commentor: State Of Utah

Comment	Response
Supportive of Project	Comment Noted.

Commentor: John Wooldrige

Comment	Response
Forest Service knows the best treatment for the forest and wildlife and should be our #1 concern.	Comment Noted.

Commentor: Leah Higbee

Comment	Response
Supportive of Project	Comment Noted.

Commentor: LaRen Provost

Comment	Response
Concerned with impacts to livestock operations.	Doug Page (timber staff in 2004) responded that areas would not be closed to livestock grazing and that if there are aspen regeneration treatments small areas would need to be protected through fencing. The current proposal does not include aspen regeneration treatments, so it is no longer a concern.

Commentor: Stacey Arens

Comment	Response
How were treatment areas identified and delineated?	The area was first identified in 2004 due to the presence of mature stands of lodgepole pine that were undergoing conversion to subalpine fir. They were delineated based on stand characteristics. The aspen stands were identified based on level of true fir invasion into the stands.
How close are the treatment units to developed areas/housing and are we working with the homeowners.	One treatment unit is directly adjacent to the homes. The two scoping letters were sent to the homeowners.
Explain "road work", what is the intended use of the roads.	The planned road work consists of maintenance or re-construction of specified roads to improve drainage and provide safe transportation. This would be done on approximately 3.4 miles of native surface and graveled roads. The intended use of the roads would be for public use and transportation of forest products. (road work memo to file)
How much riparian habitat would be impacted?	No riparian habitat is expected to be directly or indirectly impacted by the proposed

	<p>treatment and associated activities. Overall, the proposed treatments are located in intermittent or ephemeral drainages that do not support riparian vegetation. No increases in sedimentation or runoff are expected from the proposed treatment. Consequently, riparian or wetland resources adjacent to or below the project area (Strawberry, Hobble, and Daniels Creek) will not be impacted</p>
Are there T& E species?	<p>The only T&E species which potentially may be affected by the project is the Canada lynx. Habitat in the project area may function as lynx travel corridor, although there are no known lynx which reside within Uinta National Forest. The proposed activity areas were surveyed for TES plants in August 2006. No TES plants or suitable habitat were found (Van Keuren, 2006). There are no aquatic T & E species present within the proposed action area.</p>
How will activity affect water quality at Hobble Creek and Strawberry Reservoir?	<p>Sediment and water yield analysis was completed for the proposed treatments. Road maintenance associated with the project would decrease stream sedimentation in Telephone Hollow drainage. Overall, the analysis sedimentation for temporary roads and treatment resulted negligible sedimentation or impact to water quality for Hobble Creek, Strawberry River. The analysis also showed that maintaining existing roads in the project area to be utilized during implementation substantially reduced sediment delivery to Daniels Creek and Telephone Hollow below current levels. Further discussion of stream resources and water quality analysis is available in the Hydrology Report, Project Record.</p>
How will the clearcutting impact erosion and will any erosion control methods be implemented. Identify clearcut areas on a map	<p>Clearcutting will not be a prescribed silvicultural treatment for this project. However, small group selection patches (1-2 acres) will be created to encourage natural regeneration of lodgepole pine. Where feasible, groups will be located above existing or temporary roads to intercept potential increased runoff. The 2003 Uinta forest Management requires that a minimum of 50 down logs per 10 acres (8 feet long and at least 6 inches at midpoint diameter) be left on site for this forest cover type. The Forest Plan also requires a minimum of 50 tons per 10 acres (including down logs) of coarse woody debris (>3 inches) be retained on site to aid in soil retention and nutrient recycling.</p> <p>Soil productivity is impacted from loss of topsoil associated hillslope erosion, temporary road construction, and associated road-prism erosion.</p> <ul style="list-style-type: none"> The USFS WEPP model (http://forest.moscowfsl.wsu.edu/fswcpp/) was used to predict hillslope soil erosion and sedimentation estimates for the Telephone Hollow treatments. Modeled values are estimates only for predicted soil erosion with a ±50% error. Based on a 30-year climate cycle, results showed that there was no significant erosion or sedimentation predicted for either pre-harvest (20 year forest) or post-harvest (5 year forest). The post-harvest, 5 year forest, ground cover estimates were based on Forest Plan Monitoring from past timber sales.

	USFS Road WEPP analyses (see Water Resources Specialist Report) shows that 39 cubic yards of sediment is produced each year from temporary road prism erosion. The temporary road servicing Treatment #4 polygon is the main contributor adding 25 cubic yards of sediment per year, or 64% of the sediment load
Will the sale of the fir offset the cost of the project and will it be sold at a fair market value price.	The majority of standing volume in the project is lodgepole pine, a viable commercial species, that would not need an “offset” to carry the project. Any true fire or Douglas-fir that is included in the proposed sale would be appraised accordingly and set an advertised rate.
Why is the project a CE?	The project will no longer meet the category established in the Forest Service Handbook. An EA will be prepared.

Commentor: USFWS

Comment	Response
Project area is adjacent to a class 3b coldwater fishery containing BCT. Consider INFISH guidelines regarding stream buffers. Riparian disturbance should be avoided.	The distance between areas where activities associated with the proposed project will occur and active stream channels containing BCT exceed INFISH guidelines regarding stream buffers. No direct disturbance to riparian vegetation is anticipated. The treatment polygons are located in ephemeral or intermittent drainages and that do not support riparian habitat. No increases in sedimentation or runoff are expected from the proposed treatment. Consequently, riparian or wetland resources adjacent to or below the project area (Strawberry, Hobble, and Daniels Creek) will not be impacted.
Additional erosion control measures should be implemented if new road construction occurs directly west of Strawberry River. Anticipated sediment yields to stream should be discussed and how to reduce it.	No road construction is planned on the valley floor west of the Strawberry River. A mid-slope temporary road will be built to access Treatment Polygons 1 & 2, both of which are located in intermittent or ephemeral drainages (see Hydrology Report in Project Record). Anticipated sediment yield from the temporary roads is negligible, and can be further reduced through implementation of recommended Best Management Practices. Recommended BMPs are included in the Hydrology Report in the Project Record.
Project area of influence affects greater sage grouse brooding habitat. Project should be timed to avoid breeding season. Look at UDWR sage grouse guidelines.	Because of the short field season at this elevation, project implementation may overlap with bird breeding season (primarily April, May, June, and July). Thus, nests and eggs could be destroyed during project implementation. However, mitigation to address these effects will be in place such that there will be no operations during the primary breeding season of April 1-June 30).
Look at potential for spreading invasive weeds. Inventories of weeds should be done.	There is an existing inventory map of weeds in the Forest GIS system, which we have consulted as part of the analysis. We have analysed the potential for spreading noxious weeds, which is documented in a specialist report (Van Keuren 2007).
Document should discuss the expected future vegetation communities created in the sale area. Activities should avoid sensitive wildlife periods and areas	We do not believe the proposed action will create new vegetative communities in the sale area, because the proposed actions, including the group selection cuts, are not of the large extent that would be needed to accomplish such community changes. The

especially migratory bird habitat.	most likely effect on vegetative communities is a shift in the age distribution and to some extent the proportion of existing species within the cutting units.
Use the Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances.	Timber harvest will be conducted in a manner that meets raptor nest and snag protection guidelines.
Goshawks are an MIS; recommend thorough cumulative effects analysis.	An analysis (Biological Evaluation) has been prepared which addresses potential impacts to goshawks, including a broad cumulative effects analysis.
USFWS provided a T/E/C list for Wasatch and Utah counties.	A Biological Assessment for this project was prepared and submitted to FWS on March 12, 2007.

Commentor: Utah Environmental Congress

Comment	Response
Use Sub-Regional Assessment of Properly Functioning Conditions for Areas Encompassing the National Forest of Northern Utah (sub-regional PFC). This supports use of prescribed fire.	The PFC assessment indicates a low risk of losing lodgepole in the Wasatch Mountains, but that most of the lodgepole on the Uinta is old, so age class diversity would be desirable (however it is created). Ideally, larger patch sizes would be preferred to mimic natural stand-replacing burn patterns. Prescribed fire alone is unlikely to create the stand-replacing disturbance events typical of this vegetation type.
Commenter asserts that proposed treatment has not been shown to suppress/avoid subsequent Mtn. Pine Beetle epidemics; beetles are natural processes.	The mountain pine beetle (MPB) plays an important ecological role in lodgepole pine forests. Endemic populations of bark beetles act as a thinning agent, attacking large older trees, creating openings for regeneration, and contributing fuel for eventual stand replacing fires. The mountain pine beetle is currently present in the project area at low population levels (endemic) and is causing some individual tree mortality annually. Using a stand hazard rating developed by Steele et al. (1996) for primary change agents, all stands were assessed for mountain pine beetle hazard. Each stand rated out to be at least a moderate hazard, with 3 of the 6 rating at medium-high or high. The proposed treatment(s) would generally reduce two of the four variables used for the hazard rating system; live basal area of each stand and the percentage of lodgepole pine basal area. Collectively, the average stand rating on a per acre basis will be reduced from 6.5 (medium high) to 5.5 (medium). In addition, the higher temperatures created within thinned stands will serve to reduce beetle survival and alter attack behavior of the insect (Schowalter et al. 1992). McGregor et al. (1987) found that basal area reduction to either 80 or 100ft ² /acre resulted in tree losses of 10 and 15 percent compared to 48 and 62 percent in the unthinned stands. It should be noted that while the prescribed treatments will reduce or maintain stand hazard ratings over the short term, stands and trees will remain moderately susceptible over the next 10-20 years and could still experience significant attacks and mortality were mountain pine beetle populations to increase to epidemic levels.
There is no explanation of how the proposed aspen patch clear cuts would address the purpose and need. Ask the forest to drop from the proposed action.	There will not be patch clearcutting prescribed for aspen vegetation types within the project area. Aspen stands in the area are in various stages of decline, but are successfully reproducing. Approximately 23 acres of aspen stands will receive a

	restoration weeding treatment to eliminate encroaching conifers (primarily subalpine fir) less than 8 inches dbh, thereby reducing competition for growing space, sunlight and nutrients. The removal of conifers is expected to further stimulate aspen “suckering”, thus perpetuating aspen and addressing the purpose and need of <i>regenerating aspen and reducing the successional trend toward conversion to subalpine fir dominated stands.</i>
Forest Plan and NFMA-scoping notice only identifies MP 5.2; sale is within 5 management prescriptions and within RHCAs.	The project was rescoped on October 25, 3006 with an additional scoping period starting on December 24, 2006. The management prescriptions are discussed in more detail in the EA (desired conditions)
Analyze impacts to amphibians and aquatic invertebrates as well as other wildlife.	A wildlife specialist report has been prepared (March 15, 2007) which addresses impacts to amphibians including the boreal toad, and impacts to other wildlife species. Additional analysis for T/E/S species was developed in a Biological Assessment (March 12, 2007) and for sensitive species a Biological Evaluation (March 15, 2007) was prepared. Impacts to rare aquatic invertebrates were assessed in publication FAR 07-01 <i>Fisheries and Aquatic Resources of Strawberry River, Utah</i> ; FAR 07-02 <i>Fisheries and Aquatic Resources of Daniels Creek, Utah</i> ; FAR 07-03 <i>Telephone Hollow Timber Sale Environmental Effects for Fisheries and Aquatic Resources</i> ; and FAR 07-04 <i>Biological Assessment and Evaluation Fisheries and Aquatic Resources Telephone Hollow Timber Sale.</i>
The Forest is required to monitor populations of all native and desirable non-native species to ensure that adequate habitat and viable populations are maintained (36 CFR 219.19). 1983 Departmental Regulation 9500-4 provides further direction to the FS.	The Forest has conducted annual Management Indicator Species monitoring. In addition, site-specific wildlife surveys were conducted on two occasions within the project area in July, 2006. Habitat and populations of aquatic MIS species were monitored in the Strawberry River drainage during 2003, 2004, 2005, and 2006; as well as in the Daniels Creek drainage during 2005 and 2006.
Concerned that the harvest and clear cutting will conflict with Forest Plan regarding Northern Goshawk.	Impacts of the proposed project on Northern Goshawk have been addressed in the Biological Evaluation (March 15, 2007). No clear cutting is proposed; group selection of less than 2 acres in size would occur over a total of less than 26 acres.
Appears that proposed activities will cause a decline of the Old Growth component as well as the mature forest component.	None of the stands to be treated currently meets the minimum criteria for old-growth as determined by the Intermountain Region Regional Forester. Hamilton (1993) states, “The dominant seral role of lodgepole pine has it occupying the site for 100 to 200 years. In these stands more shade tolerant species are present and will replace the lodgepole pine in the absence of fire. In these circumstances old-growth characteristics are usually not found because stand density is usually too high to allow large tree sizes defined for old-growth”. The Regional Forster has provided the following direction: The minimum criteria to define old-growth forest in the Intermountain Region are: Diameter at Breast Height (DBH), Trees Per Acre

	<p>(TPA), and Age (Letter dated March 2, 2007). Minimum criteria for lodgepole pine from Hamilton (1993) is as follows:</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td><u>DBH</u></td> <td><u>TPA</u></td> <td><u>Age</u></td> </tr> <tr> <td>≥11</td> <td>≥25</td> <td>≥140</td> </tr> </table> <p>Stand exam data indicates the following average current stand conditions (5”+ dbh):</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td><u>DBH</u></td> <td><u>TPA</u></td> <td><u>Age</u></td> </tr> <tr> <td>9.9</td> <td>284</td> <td>87</td> </tr> </table> <p>The only old growth criteria achieved under current stand conditions is trees per acre, which will continue to well-exceed 25 TPA after treatment. Simulations using the Forest Vegetation Simulator (FVS) indicate that the prescribed treatments will actually result in a post harvest average diameter increase to approximately 12” dbh, allowing most stands to meet 2 of the 3 criteria rather than just one.</p>	<u>DBH</u>	<u>TPA</u>	<u>Age</u>	≥11	≥25	≥140	<u>DBH</u>	<u>TPA</u>	<u>Age</u>	9.9	284	87
<u>DBH</u>	<u>TPA</u>	<u>Age</u>											
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9.9	284	87											
Standard S&W 1 mandates the Forest maintains or improves the soil productivity and hydrologic function of soil; the treatments may violate this.	This project will be designed to comply with the Forest Plan. Soils and Hydrology affects are analyzed in Chapter 3 of the EA.												
MIS monitoring – what are the base populations forest-wide and within project areas.	MIS base population information is provided in the Capability and Suitability Analysis for each MIS species. Project-area surveys were conducted in July, 2007 for MIS species. A colony of American beaver was located adjacent to, but not within, unit # 1&2. Ron												
Migratory Bird Treaty Act, Executive Order 13186, and Neotropical migrants: Activities should be conducted outside critical breeding season for migratory birds, minimize temporary and long-term habitat losses, and mitigate all unavoidable habitat losses. Status of MOU with USFWS regarding this Order/Act.	Because of the short field season at this elevation, project implementation may overlap with bird breeding season (primarily April, May, June, and July). Thus, nests and eggs could be destroyed during project implementation. However, mitigation to address these effects will be in place such that there will be no operations during the primary breeding season of April 1-June 30). The MOU is being handled at the National Level.												
Wildfire threat to structures, wildfire research, and home ignitability : As paraphrased by commentor, the Cohen paper suggest that fuels reduction further than several hundred meters from homes is ineffective. Recommended changes to proposed action. Include FireWise and evaluate ignitability of structures	<ul style="list-style-type: none"> ▪ The State of Utah has made efforts to develop a Community Wildfire Protection Plan (CWPP) for the Daniel’s Summit community. At present, no plan has been developed. If a community creates a CWPP, they can be prioritized for funding of hazardous fuels reduction projects carried out under the support of the Healthy Forests Restoration Act of 2003. The planning process for CWPPs is led by local governments and the state agency responsible for forest management. Additionally, while the Forest Service is 												

<p>Focus on 30-60 meter buffer around structures Consider non-commercial pruning as opposed to harvest and removal Federal funding for private landowners UEC attached Wildland-Urban Fire – A different Approach (Jack Cohen) and Reducing the Wildland Fire Threat to Homes: Where and How Much? (Jack Cohen).</p>	<p>willing to provide guidance on “Firewise” principals to communities that express an interest in creating a CWPP, ultimate responsibility lies with the home owner; we cannot force homeowners to modify their landscape and home construction materials. Therefore, treating lands adjacent to the Daniel’s Summit community will increase the likelihood that a fire will drop to the ground (rather than become a crown fire) and become more manageable and safer for fire fighters protecting a community that may or may no have incorporated a sufficient amount of “Firewise” principals that reduce the potential from home ignition from radiant heat.</p> <ul style="list-style-type: none"> ▪ Although Jack Cohen’s research does indicate that the 30 to 60-meter zone around a home (the home ignition zone) principally determines the home ignition potential, there are several reasons why we believe treatment in the Forest Service land adjacent to this community would benefit the Daniel’s Summit community and the improve fire fighter safety in the event of a wildfire in this area. Reasons are as follows: <ul style="list-style-type: none"> ▪ Since the homes in the Daniel’s Summit community are not currently “Firewise”, the safety risk to wildland fire fighters that would provide structure protection in the event of a wildfire is significant. If a crown fire were to ignite adjacent to these communities, fire fighters may not be able to protect the homes and could be exposed to unnecessary risk. On October 26, 2006 in California, we saw 5 wildland fire fighters tragically die while providing structure protection for community members. While the fuel type present at this incident is not the same as our fuel type, the potential for a sudden crown fire blow up where rates of spread exceed escape possibility is a possibility in this fuel type. By thinning the area adjacent to the community, we will increase the likelihood that the fire will drop to the ground and become more manageable and safer for fire fighters protecting the community. ▪ Cohen’s research is related to home ignition by radiant heat only. In his paper (Reducing the Wildland Fire Threat to Homes: Where and How Much?) he mentions that fire brands that result in home ignitions can originate from one km or more away. Although we cannot ensure that fire brands will not pose a threat to homes in the community, we believe that by strategically creating fuel breaks across the landscape will reduce this potential and as mentioned previously, will improve fire fighter safety. <p>“Non-Commercial Pruning” would be an ineffective method for reducing crown fire</p>
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	potential and providing for fire fighter safety, which as mentioned previously, is the goal of thinning the public lands adjacent to the Daniel's Summit community.
NEPA and public involvement - request opportunity to comment on analysis before decision is made. Need to prepare an EA or EIS	The public was given the opportunity to comment on the proposed action through the three comment periods. An EA will be prepared. If it is determined that there are no significant impacts, a DN/FONSI will be issued and an EIS will not be prepared.

2006/2007 Comments

Commentor: Utah Environmental Congress

Comment	Response
Incorporate 2004 comments	2004 comments have been reviewed and addressed.
Notice in paper	A revised legal notice was published. A letter to UEC was sent notifying them that a revised legal would be published.
Livestock effects on plant communities and forest health.	Beyond the first page the commentor cut and pasted from their comment letter on proposed grazing projects on the Heber and Spanish Fork district. The letter is not clear on how the timber sale and the literature cited correlate.
Availability of environmental documents for comment	See response above.
Migratory Bird Treaty Act, Executive Order 13186, and Neotropical Migrants The site-specific analysis for this project must include a rigorous analysis of efforts to migratory birds. Since the proposed activates are in the spring and summer we recommend you conduct surveys for migratory birds to assist in efforts to comply with the Migratory Bird Treaty Act. Activates should be conducted outside critical breeding season for migratory birds, minimize temporary and long-term habitat losses, and mitigate all unavoidable habitat losses.	An analysis of potential impacts to migratory birds was prepared in the Wildlife Specialist report (March 15, 2007). The only Partners-in-Flight Priority Species which is expected to occur in the project areas is the Northern three-toed woodpecker. Potential impacts to this species are addressed in the Biological Evaluation (March 15, 2007). Additional migratory bird surveys will be conducted in 2007 prior to project implementation. Because of the short field season at this elevation, project implementation may overlap with bird breeding season (primarily April, May, June, and July). Thus, nests and eggs could be destroyed during project implementation. However, mitigation to address these effects will be in place such that there will be no operations during the primary breeding season of April 1-June 30).
2 nd letter incorporates comments from 2004 and 2006 letters and in addition, incorporates the NFMA comments made on the Forest-wide leasing EIS. The commentor feels that the 2005 NFMA rules do not keep the obligations to keep at least minimum viable populations of fish and wildlife.	All previous comments were evaluated. The NFMA comments on the Oil and Gas EIS were concerns regarding the 2005 Planning Rule. On March 30, 2007, the US Forest Service was enjoined from implementing the Rule (Court Ruling/FS WO letter regarding compliance with District Court Decision).

Commentor: Wasatch County

Comment	Response
Commentor encourages commercial treatment to stands within Strawberry Lands.	Strawberry Lands are within the 2003 Uinta National Forest Land and Resource management Plan Management Prescription 3.2 Watershed Emphasis. Grazing and timber harvest are not allowed (Forest Plan p. 4-4).
Temporary roads required to harvest stands be signed and/or gated to restrict public access at the beginning of the project. Temporary roads should be closed or obliterated following harvest and reforestation efforts to prevent future recreational travel access.	No signing or gating is planned to restrict public access to the project temporary roads. Any temporary roads would be obliterated following harvest.

Commentor: Utah Reclamation Mitigation and Conservation Commission

Comment	Response
The proposed project overlaps the Upper Strawberry River watershed where restoration is underway. We want to ensure that the benefits of these restoration efforts are not compromised. Include analysis of impacts on aquatic resources, wetlands and riparian habitats, water quality, and fisheries.	Environmental analysis will include the resources of concern.