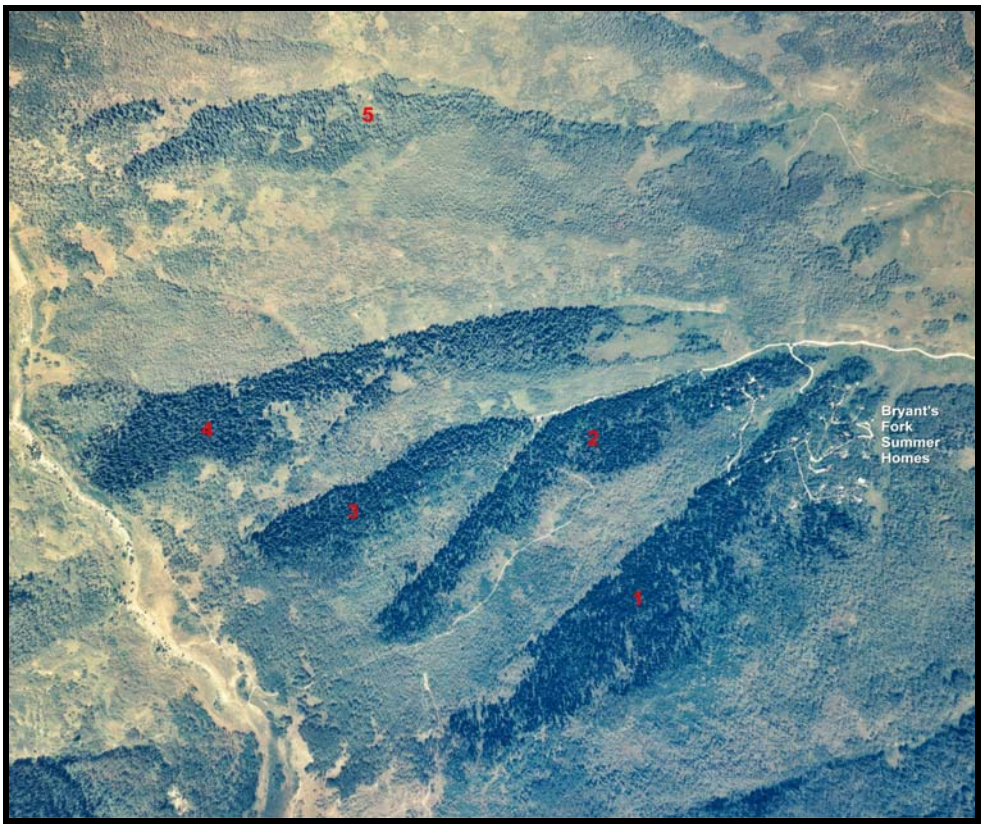
United States Department of Agriculture Forest Service	**Environmental Assessment**
September 2005	**Bryant's Fork Forest Health/Spruce Bark Beetle Treatment**
	Heber Ranger District Uinta National Forest Wasatch County, Utah
	Township 12 West; Range 3 South; Sections 26, 27, 34 & 35; Salt Lake Meridian



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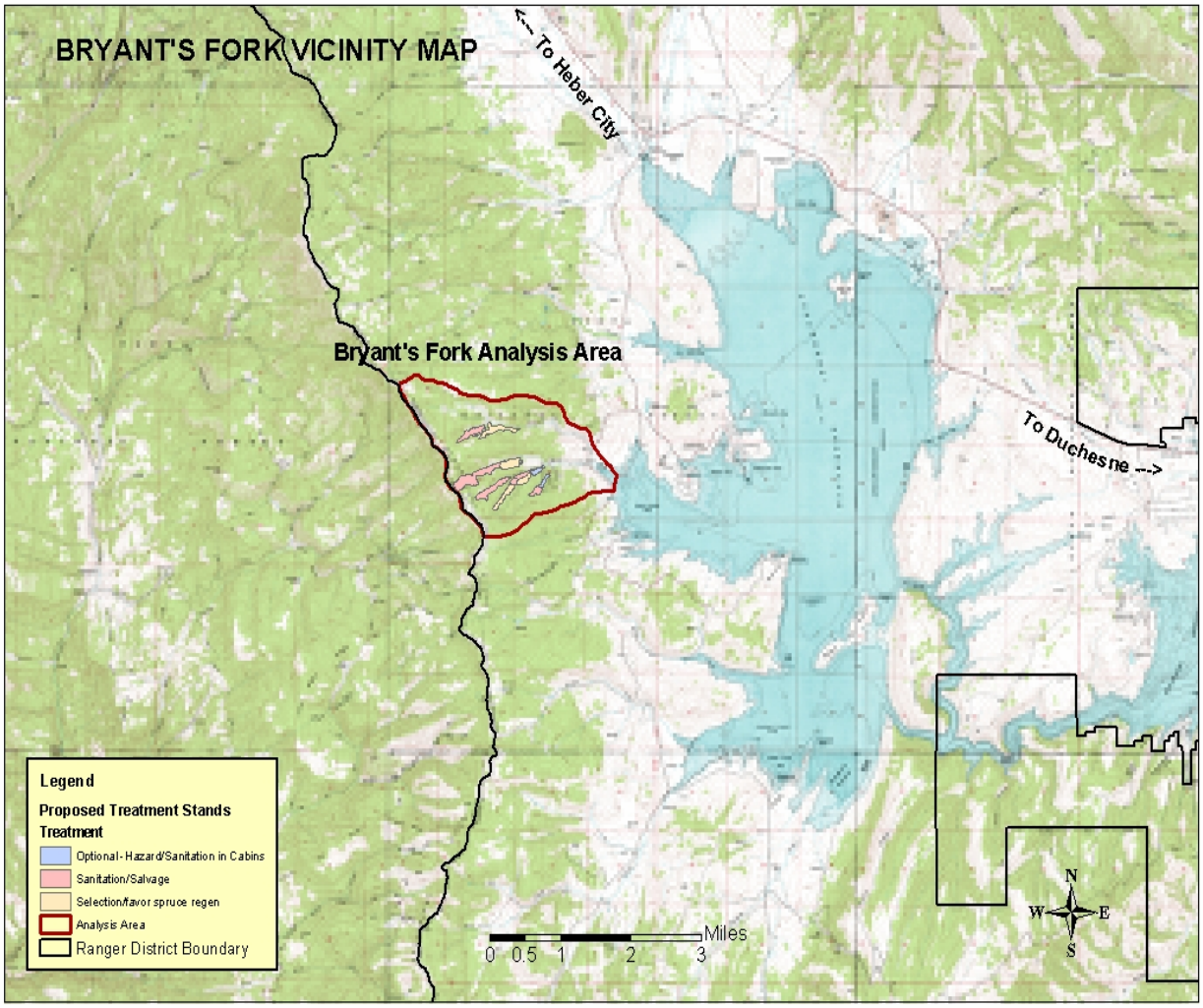
Bryant’s Fork Analysis Area Vicinity Map



The Forest Service is preparing this Environmental Assessment (EA) in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations applicable under the Healthy Forests Restoration Act (HFRA). 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 Julie King, District Ranger, at (435) 654-0470 for further information.

CHAPTER 1 - SUMMARY

Background

The Bryant's Fork Summer Home Tract is located near the southwest corner of Strawberry Reservoir in the Bryant's Fork drainage. The Forest Service has discovered an epidemic of spruce bark beetle (*Dendroctonus rufipennis*) both in the cabin area and in the Engelmann spruce (*Picea engelmannii*) stands throughout the Upper Strawberry Watershed. This epidemic threatens to cause extensive mortality in the spruce type in the watershed. This mortality adjacent to and within the cabin area could pose a public safety and fire hazard risk.

Two treatments using a combination of trap trees and funnel traps to temporarily reduce beetle populations were authorized on May 7, 2004, and May 12, 2005. The first trap tree treatment was implemented during the 2004 field season with the felling and removal of approximately 186 trap trees. Field reviews indicated that this project had a positive effect on reducing beetle populations and the number of attacks on standing green spruce trees within treated stands; however, significant and active populations still remained. The second trap tree treatment was initiated in June of 2005, with the creation of 282 trap trees scheduled for removal in the fall of 2005 or early spring of 2006. A shaded fuel break surrounding the summer homes was authorized on June 17th, 2004, and was completed on August 17th, 2004. Susceptible host spruce trees on the cabin lots were sprayed with carbaryl by the cabin owners at their expense on May 19th, 2004. Carbaryl is a preventative spray which kills the beetles as they attack the un-infested trees.

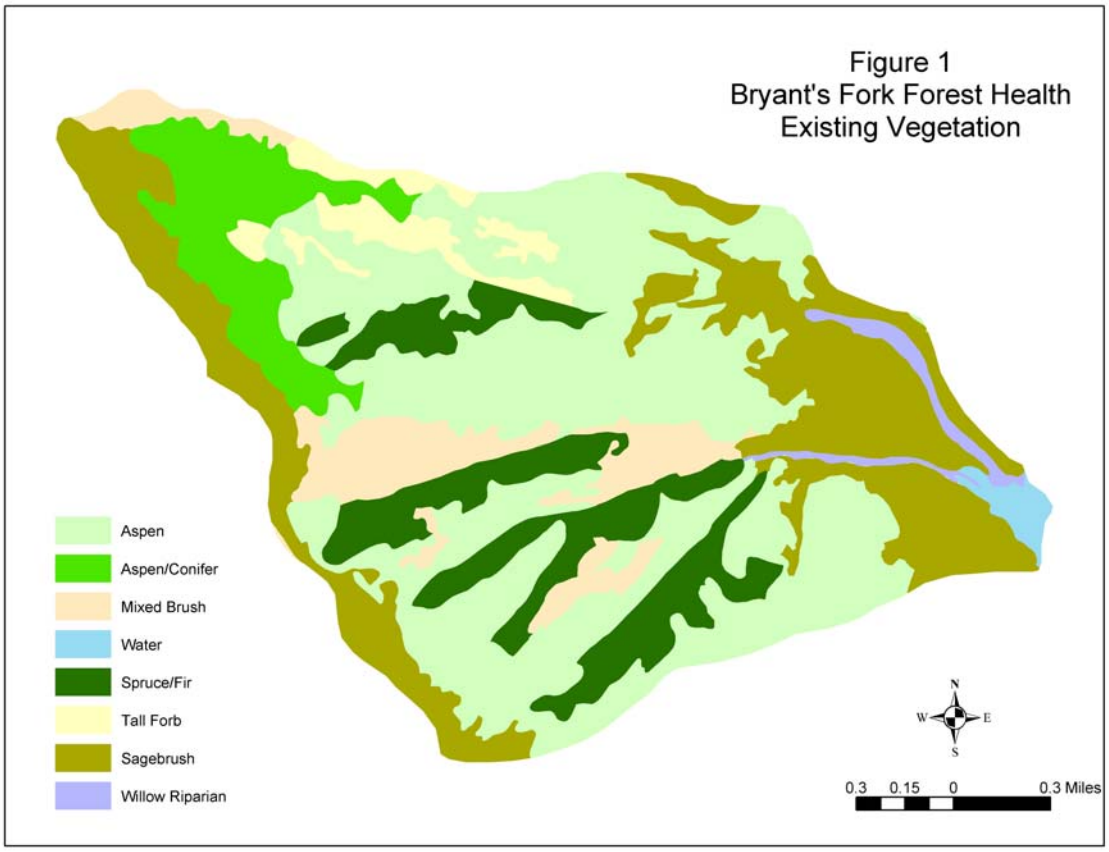
Existing Condition

The analysis area for this study is the 2,256 acre drainage area served by the Bryant's Fork Creek and its tributaries. The current vegetative structural stage distribution in all types is dominated by old and mature conditions. Table 1 shows the acreage within the area in each of the major vegetation types, and Figure 1 shows their distribution across the analysis area.

Table 1
Acres by Vegetation Type

Vegetation Type	Acres
Aspen	1,024
Aspen/Conifer	174
Mixed Brush	121
Strawberry Reservoir	22
Spruce/fir	284
Tall forb	85
Sagebrush	512
Willow / Riparian	33
Analysis Area Total	2,256

Figure 1
Analysis Area Vegetation Types



Of primary concern to this analysis are the conditions within the spruce-fir type. Table 2 shows the stand conditions as summarized from data collected in June and July of 2004 and processed using the Rocky Mountain STAND (RMSTAND) program. The stand numbers are shown in Figure 2 – map of the Proposed Action.

Table 2
Stand Characteristics [1/]

Stand ID	Basal Area 5"+	QMD 5"+	Average Height	Stand Age	% Spruce (BA)	# of 6" DBH Classes	# Trees ≥20" DBH	# of seed/saps <5"	Stand Density Index
247-06	190	16.0	90	133	68	5	29	3075	272
247-07	168	18.6	87	113	88	5	27	1120	232
247-08	147	17.9	83	129	46	6	24	1700	209
247-09	160	19.3	87	102	80	5	29	600	220
248-01	107	14.9	76	115	12	5	11	1700	176
248-02	140	16.4	65	126	11	5	29	975	199
248-03	187	18.7	98	111	93	3	29	600	264
248-04	144	19.3	95	132	44	5	21	1620	198
248-05	164	18.4	92	122	88	5	31	840	229
248-06	124	17.5	73	131	0	5	26	330	172
248-07*	147	13.5	54	170	100	5	26	1500	210

**Note that this stand is experiencing heavy mortality (50%) so the live numbers do not reflect the high basal areas, diameters and heights which would be considerably higher.*

[1/] BA = Basal Area (ft^2/acre), QMD = Quadratic Mean Diameter, DBH = Diameter Breast Height

The above summary clearly shows the lack of structural stage and age distribution within the spruce/fir type in this analysis area. While there is some variation in the percentage of spruce vs. fir in the stands and the amount of regeneration in the understory, they are all predominantly older stands, with high densities, similar average diameters, heights and number of diameter classes. There are no young or mid aged spruce stands in the analysis area. Although spruce dominates many of the stands in terms of standing volume (square feet of BA/Acre), dense stand conditions have not favored natural regeneration of spruce, which accounts for only about 5% of seedlings (trees < 1" dbh) across all stands containing spruce. Conversely, subalpine fir regeneration accounts for approximately 60% of seedlings.

Schmid (1976) developed a risk rating system for Engelmann spruce stand susceptibility to spruce beetle. Stands at greatest risk are those that occur in creek bottoms, have an average diameter greater than 16 inches, basal area greater than 150 ft^2, and more than 65% spruce in the canopy. Table 3 shows both the risk to spruce bark beetle and the level of current activity based primarily on a March, 2004 survey (Hebertson, April, 2004). Beetle risk parameters and rating were developed using the RMSTAND program. Bentz and Munson (2000) considered populations to be approaching epidemic when more than 2 clumps of 5 trees were existing on 5 acres. The number of clumps was not recorded during the March 2004 survey. However, since bark beetle activity tends to occur in clusters, it can be assumed that if the total number of trees (2 per acre) is met or exceeded, then the number of clumps is also met. Field observations

during 2004 coupled with monitoring of the Lindgren funnel trap data have reduced the number of acres actually impacted from the original "block" acreages surveyed. The analysis (Gibson, 2004) made to determine the observed activity levels listed below is on file in the project record. It is important to note that these levels reflect conditions prior to the 2004 trap tree treatment implementation. While the trap tree treatment was effective in removing large numbers of dispersing beetles from the population, high brood production in the large diameter infested standing trees resulted in further infestation and subsequent mortality of additional large spruce within mortality centers.

Table 3
Spruce Beetle Summary, Risk Characteristics
and level of Activity

Stand ID	Basal Area 5"+	%TPA Spruce	QMD 10"+	Risk Factor	Risk Rating	Observed Activity TPA
247-06	124	30	24.3	9	med	1.7
247-07	168	79	21.3	11	high	2.5
247-08	147	31	21.7	7	med	1.0
247-09	160	69	20.8	10	med-high	6.9
248-01	107	04	27.9	7	med	0.5
248-02	140	9	18.0	7	med	0.1
248-03	187	93	18.7	10	med-high	8.7
248-04	144	37	21.2	7	med	0.8
248-05	164	77	20.6	11	high	6.8
248-07*	147	100	21.5	9	medium	15.3

*Note: This stand rates medium, but this is since the stand is already mostly infested and many of the large trees are dead or infested.

Desired Condition

The proposed treatment stands are primarily in Forest Plan Prescription 5.2 (Forested Ecosystems – Vegetation Management). Stands 248-01c, 248-02c, and 248-03c (Figure 2) – listed as optional treatment units and totaling 14 acres within the summer home area are within Prescription 8.4 (Long Term use or Occupancy – Recreation Residences). The 2003 Forest Plan on page 5-124 and 125 states that the desired future condition for forested vegetation within the Strawberry Reservoir Management Area and within management prescription 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*.'

In terms of the overall Desired Future Condition (DFC) for spruce/fir forests on the Uinta, page 5-5 of the 2003 Forest Plan states that *'desired future conditions include a balanced range of age classes, with at least 40 percent of stands mature or old and at least 10 percent having old growth characteristics. Mature and old growth stands should have multilayered canopies, with densities of at least three large diameter snags (≥ 18 inches diameter at breast height) per acre,*

and at least five large diameter logs (≥12 inch mid-point diameter) per acre. Insects and disease are not causing large scale tree mortality across entire landscapes'.

Purpose and Need for Action

The Bryant's Fork Summer Home community is located near the southwest corner of Strawberry Reservoir in the Bryant's Fork drainage. 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).

A spruce beetle infestation has rapidly developed in stands located within the Bryant's Fork Wildland Urban Interface (WUI) (see USDA Forest Service and DOI Bureau of Land Management, 2004, p. 33-34 for definition of WUI for communities at risk). Several years of drought, mild winters, and dense stands with abundant susceptible host trees have contributed to the rapid expansion of endemic beetle populations to the current epidemic levels present at this time. Previous and on-going trap tree treatments have reduced the rate of increase in beetle populations over the short term, but are not effective in reducing the long term stand risk. The proposed treatment is needed to further reduce beetle populations within the Bryant's Fork drainage and limit the spread of the insect to uninfested spruce stands in adjacent watersheds. This proposal addresses the long term forest health and structural diversity issues as they relate to spruce beetle risk, Properly Functioning Condition (PFC) concepts and assessments, as well as DFCs identified in the Forest Plan.

The purpose of the proposed action is to modify the structure and composition in the spruce-fir stands within the analysis area to reduce beetle populations, reduce overall stand risk, retain a viable spruce seed source, and create opportunities for natural spruce regeneration. Retention of 2/3 of existing basal area will reduce the risk of wind throw after harvest, while retaining the overall forested character of the area, and moving towards the DFC described in the Forest Plan. This proposed action is needed because without further treatment, it is likely that spruce beetle populations would continue to rapidly expand and kill most of the spruce greater than 5 inches dbh in affected stands (Dymerski et al. 2001). Continued accumulation of dead fuel in affected stands could pose a serious risk from wildfire to the Bryant's Fork community if weather conditions suitable for ignition and fire spread were to occur, especially within the first 2-3 years while needles remain on infested trees.

Proposed Action

The proposed action is to harvest timber in affected stands focusing on sanitation and salvage of infested spruce trees to reduce beetle populations, average stand density and diameter as well as promote natural regeneration of spruce. 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 tree planting. 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 any action be taken to address the spruce beetle infestation?
- Should any action be taken to address the structural stage diversity (PFC) issue?

- What type of treatment should be implemented to address the purpose and need?

Public Involvement

The proposal has been listed quarterly in the Schedule of Proposed Actions since the Spring Edition 2004. 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 mailing list requesting comments on June 3, 2004.
- A news release was sent to the "*Provo Daily Herald*" on June 4th 2004.
- The Proposed Action was sent to the public and agencies listed on the Heber District mailing list requesting comments on February 24, 2005.
- A request for comments was published in the "*Provo Daily Herald*" on February 25, 2005.
- A corrected request for comments was published in the "*Provo Daily Herald*" on April 9, 2005 listing the proposal as a hazardous fuel reduction project as defined by the Healthy Forests Restoration Act (HFRA) of 2003.

In response, fourteen comment letters, e-mails or phone calls were received from environmental groups, federal 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 valuable in shaping the final proposed action.

CHAPTER 2 - ISSUES AND ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This section provides a detailed description of the Proposed Action and No Action Alternative, and also discusses mitigation measures proposed to lessen the project's impacts. The Proposed Action was specifically designed to achieve the purpose and need previously described; be consistent with direction in the HFRA; and to address issues raised by the public, the Forest Service, and other agencies.

HFRA establishes special procedures when agencies prepare EAs for authorized hazardous fuel reduction projects. Hazardous fuel reduction projects authorized under HFRA (Section 102 (a)) include fuel-reduction projects within WUI and projects that address insect epidemics that pose a significant threat to an ecosystem component, or forest or rangeland resource (e.g., the remainder of the proposed treatment units). Directions implementing HFRA provide that for areas inside the wildland-urban interface and within 1½ miles of the boundary of an at-risk community, the USDA Forest Service is not required to analyze any alternative to the proposed action. (Section 104 (d) (2))

Under HFRA Section 101(1), an at-risk community is defined as an interface community listed in the Federal Notice of January 4, 2001. An updated list of communities at risk was published in the Federal Register on August 17, 2001 (Vol. 66, No. 160, p 43384), and this updated list identified Bryant's Fork as a community at risk (p. 43423).

To date, Bryant's Fork has not finalized a Community Wildfire Protection Plan. Section 101(16)(B)(ii)) defines WUI for at-risk communities that have not yet designated their WUIs as part of a Community Wildfire Protection Plan:

- Extending ½ mile from the boundary of an at-risk community, OR
- Extending 1½ miles from the boundary when other criteria are met – for example, a sustained steep slope, a geographic feature that could help when creating an effective firebreak, or Condition Class 3 land; OR
- Adjacent to an evacuation route.

About one-third of the proposed treatment area lies within ½ mile of the Bryant's Fork Summer Home Tract, some of the proposed treatment area lies adjacent to an evacuation route for part of the community, and all of the proposed treatment area lies well within 1½ miles of the community, including sustained steep slopes that create the potential for wildland fire intensity and behavior that could threaten the Bryant's Fork Summer Home Tract. The proposed action is consistent with the above-described requirements, and therefore, this EA considers only the Proposed Action and No Action alternatives.

Issues

Following is a discussion on how the public responded to the Proposed Action. The Forest Service Interdisciplinary Team (IDT) separated identified issues into two groups: significant (driving) and non-significant issues (40 CFR 1501.7(a)(3)). A list of non-significant issues and discussion regarding their categorization as non-significant is found in Appendix A. These are

issues that are either mitigated through project design, previously influenced by or decided through other law, policy of forest plan, or are not within the scope of this analysis.

The Forest Service identified the following topics, raised during scoping, as significant or driving issues. These are issues that directly contribute to or influence the development of the proposed action and/or alternatives. These issues include:

- Forested vegetation structure and composition is weighted towards mature and older trees with a lack of young or mid structural stages making the affected stands at higher risk to spruce beetle.
- Forest insect and disease populations (spruce bark beetle) have increased to epidemic levels.
- Potential increases to fire fuels loading and resulting increase in fire severity/intensity.
- Loss of old growth spruce/fir habitat.
- Potential impacts to wildlife TES.
- Potential impacts to soils and soil productivity.
- Potential impacts to water quality.
- Potential impacts to livestock permittee.
- Cumulative effects in association with recent trap tree treatments.

<u>Forested vegetation structure and composition is weighted towards mature and old with a lack of young or mid structural stages.</u>.
All of the stands within the project area are old or mature. There are no early seral stands of either aspen or spruce. The Forest Plan identifies the desired condition, based on the recent Wasatch Mountains PFC and northern goshawk analyses that includes a variety of structural stages within each of the forested vegetation types.

Measurement indicator: The number of acres occurring in young, mid, and old forested vegetation within the spruce/fir type.

<u>Forest insect and disease populations have increased to epidemic levels.</u>
There are currently epidemic populations of the spruce bark beetle (*Dendroctinus rufipennis*) occurring in the stands being analyzed. High levels of tree mortality are modifying forest structure and the associated habitat.

Measurement indicators: Stand Risk Rating over time for spruce beetle based on the Schmid & Frye system (Schmid & Frye 1976). Predicted population levels and predicted tree mortality over time. FVS (Forest Vegetation Simulator) runs will be used to determine these predictions.

<u>Potential increases to fire fuels loading and resulting increase in fire severity/intensity</u>.
The spruce bark beetle infestation is currently altering both forest structure and fuels composition (from live to dead), which could increase the intensity and severity of a wildfire should one occur.

Measurement indicators: FFE (Fire and Fuels Extension of the FVS) Output for fuel loading.

Loss of old growth spruce/fir habitat
Old-growth spruce-fir forest occurs in parts of the project area. Old-growth spruce-fir forest provides a unique habitat type for plant and animal species. Unlogged old-growth spruce-fir forest also provides reference areas to which managed spruce-fir forests may be compared. The current beetle activity, as well as the proposed action may impact the area of old-growth spruce-fir forest within the analysis area.

Measurement indicators: Area of old-growth forest that would be impacted over the short term by project implementation; Area of old-growth forest within the analysis area over the longer term.

Potential impacts to wildlife TES.
The current beetle activity, as well as the proposed action, will change forest structure and thus affect wildlife TES habitat within the project area.

Measurement indicators: The level or intensity of change to existing forest structure as measured by the change in basal area/density of different tree size classes; The total area over which forest structure would be changed; the likely impacts of each alternative on population viability of TES and other species of interest (e.g., migratory birds and Management Indicator Species).

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.
All water bodies within the Bryant's Fork Project Area are currently meeting beneficial uses for water quality. Even though the watershed is not on the 303(d) List, concerns are still present. The stream is currently characterized by low annual flows, narrow incised channels, limited floodplain access, sedimentation, and narrow riparian areas except where beaver ponds are present (USDA 2004). The amount of sediment routed to or eroded within a stream channel can affect the beneficial uses of water, and is frequently used as a measure of overall water quality.

The Strawberry Reservoir is located immediately below the Project Area, and is included on the State of Utah 303(d) List of Impaired Waters for Total Phosphorous and Dissolved Oxygen. The reservoir is currently partially supporting its coldwater fishery. The Utah Department of Environmental Quality (UDEQ) – Division of Water Quality recently completed a Draft (March 2005) Total Maximum Daily Load (TMDL) study for the Strawberry Reservoir. The TMDL Report requires a long-term reduction of 10% in phosphorous from Bryant's Fork.

In managed forested areas, the main source of direct sediment is from road construction associated with timber harvest (Megahan and Kidd 1972). Channel alteration, road or other construction in or adjacent to streams, and culvert installation may result in sediment being deposited directly into a stream. Tree felling is not usually considered a major cause of increased sediment. However, methods for removing harvested timber (such as tractor yarding) can cause erosion, gouging of slopes, and alteration of soil characteristics and permeability.

Measurement indicators: Tons of sediment delivered to streams as estimated using the Water Erosion Prediction Project (WEPP) Model.

Potential impacts to livestock permittee.
Forested vegetation treatment areas will be excluded from livestock grazing until tree seedlings are of sufficient height to withstand this activity as determined by the silvicultural prescription. The exclusion of sheep grazing from the treatment areas of the proposed action could reduce the number and season of livestock being grazed and require more herding. A reduction in head months and an increase in herding could have an effect on the permittees operation and livelihood.

Measurement indicators: Number of sheep months. Change in permittee's operation.

Cumulative effects in association with recent trap tree/shaded fuel break treatments.
A beetle suppression treatment was implemented within all 5 proposed harvest units in 2004, during which 186 green trap trees were felled in June and removed in October of 2004. An additional 282 trap trees were felled in June of 2005, with removal scheduled for the fall of 2005 or early spring of 2006. A cumulative average of 2-3 trees per acre will have been removed upon completion of the second trap tree treatment. Removal of trees from the second trap tree treatment will be done using existing skid trails wherever possible; however it is probable that additional skid trails will be utilized.

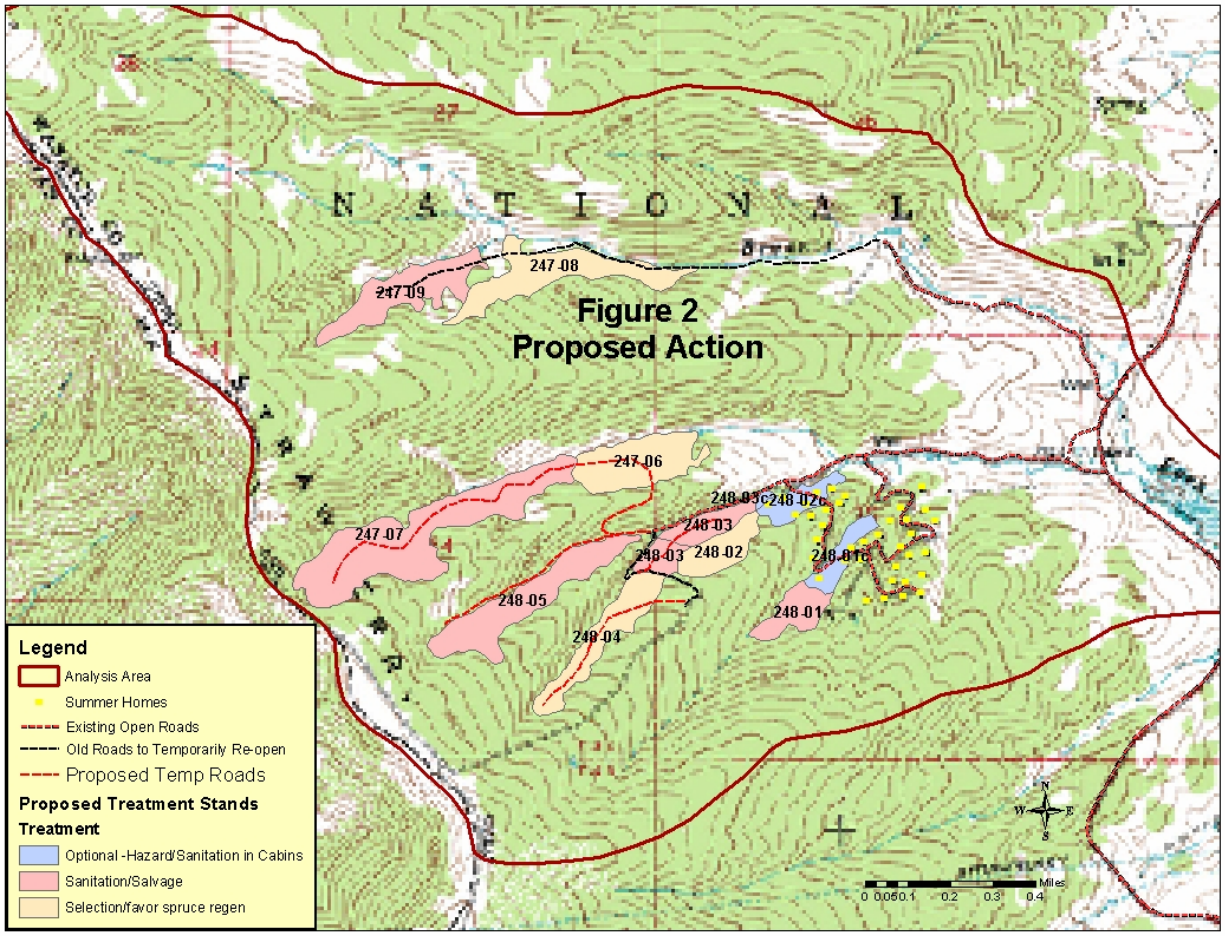
In addition a 100-foot wide shaded fuel break was completed in August 2004 around the Bryant's Fork Summer Home Community. All woody vegetation less than 8-inches DBH was cleared and remaining trees were limbed up to a height of 6-feet. Slash and downed fuels were primarily piled, however some material was chipped or piled near access roads for use by cabin owners. Prescribed burning of slash piles is scheduled for the fall or winter of 2005.

Measurement indicators: All measurement indicators previously noted are applicable.

Proposed Action

The action proposed by the Forest Service is to use a timber harvest in affected stands to reduce spruce beetle populations, reduce average stand density and diameter, as well as promote natural regeneration of spruce. These treatments will reduce susceptibility of stands to continued and future spruce beetle attacks. Where post-treatment monitoring indicates stocking is inadequate, revenues from the sale of the timber would be used to supplement reforestation in the treated stands. The following map (Figure 2) shows the proposed treatment units, treatment type and proposed temporary road locations. An estimated 2,900 ccf of sawtimber would be removed.

Figure 2
Map of the Proposed Action



Three prescription groups have been developed to address the different stand conditions, primarily in respect to species composition and incidence of bark beetles. These are described in detail below. Table 4 shows the acres of each prescription type and the general site characteristics of each:

Table 4
Prescription Group Site Characteristics

Prescription Group	Acres	Aspect	Slope Range	Elevation Range
A – Salvage/Sanitation	121	N	20 – 40%	7920 - 8600
B - Selection	55	N	15 – 30 %	7960 - 8400
C – Optional Hazard Trees	14	NE	10 – 25%	7800 - 7960

<u>Salvage / Sanitation (Group A)</u>
These are the most severely infested stands. This is due largely to the high tree density (measured in square feet of basal area per acre), high proportion of spruce, and large average

diameter of the spruce trees. Treatments would focus on salvage of dying and infested trees. Efforts would be made to keep the removals to no more than 1/3 of the basal area in order to reduce potential for wind throw following the harvest. Removals over this would have to be evaluated for wind throw potential on a case by case basis. However, there are heavily infested pockets, of up to about 2 acres which would be small patch clearcuts. Where the infestation is not as extensive, basal areas would be reduced by about 1/3 of the current level, primarily removing trees at high risk to spruce beetle infestation.

Selection (Group B)

These stands have a lower level of infestation, primarily due to the higher proportion of subalpine fir, lower basal area and smaller average spruce diameters. There are some scattered pockets of large spruce which tend to be where the infested trees are concentrated. Treatments in this group would focus on the removal of infested trees and creating micro site conditions (small group and single/two tree openings) favorable for natural regeneration of spruce in the under story. Tree selection would favor retention of the best formed dominant and co-dominant spruce and subalpine fir.

Optional Hazard Tree Removal in Cabin Area (Group C)

This area is the summer cabin lots with spruce on them. The majority of the summer home area is either aspen or sub alpine fir. However, those lots adjacent to treatment units do have spruce that is infested. A preventative spray treatment was done on approximately 112 spruce within these lots in May of 2004. Treatments in these areas would focus on removal of dead and infested spruce which pose a hazard to the cabins and to the safety of the users in the area. Under the terms of the special use permits for the cabins, the cabin owners are responsible for removal of hazard trees on their lots. However, due to the unusual amount of hazard trees present as a result of the current infestation, the difficulty of removing this amount of wood and the technical skill required to fall these trees safely, other options are being considered. This work could be incorporated into the timber sale at the discretion of the purchaser and individual cabin owners.

Design Features Common to All Prescription Groups

Conventional rubber-tired and/or tracked skidders and designated skid trails would be used in all treatment types. Equipment and its transport would be washed prior to access the project area to remove the potential for transporting noxious weed seed into the project area. In some of the steeper spots with larger trees there would be some tracked 'cat' skidding to reduce soil disturbance. Based on the Uinta Forest Plan (p3-22, timber-11) ground based skidding will be limited to slopes less than 40%. Approximately 8% of the area would be impacted by the skidding operations (15 acres total) (Paroz, July 04, personal comm). There would be approximately 14 acres cleared and used for landings.

In order to protect water quality and aquatic habitat, a number of Best Management Practices (BMPs) and design features will be utilized and are identified later in this section. These include utilization of the 100-foot (Class 3) management buffer within identified Riparian Habitat Conservation Areas (RHCAs) for all wetlands and streams with a definable bed and bank in the project area. Logging equipment will be excluded from RHCAs, except where roads/trails already exist or where the Forest Service designates crossing is necessary. No new skid trail construction or mechanized equipment entry will be permitted within these buffers. Straw bales

and wattles will be employed along sensitive stretches of existing closed roads to be utilized and other proposed temporary road locations to mitigate stream sedimentation. These mitigation measures will be left in place following obliteration of the temporary roads.

The proposed action would require approximately 3.7 miles of temporary road construction, approximately 1.6 miles of which already exist as closed roads. The 1.3 mile segment of closed road proposed for temporary use extending into Unit 5 closely parallels the stream for approximately ¾ of a mile within the RHCA. The old road prism is still well-established and largely revegetated. Utilization of the existing closed road would result in less soil disturbance than locating a new temporary road, and creating an additional "footprint" on the land. Temporary roads would remain open for the life of the timber sale (1-2 years), and would then be obliterated using a tracked excavator and any cut slopes filled in back to grade. Surface roughening techniques and seeding with an appropriate seed mix would be used to complete the operation.

In order to reduce probability of sedimentation to the North Fork Bryant's Fork drainage during or following harvest activity, the following Design Features would be implemented:

- Harvest activities will be conducted only during periods of minimal or no precipitation.
- Install erosion control devices, such as straw wattles or bales, in the following situations:
    - Along road segments and areas where sediment can drain directly into the stream channel.
    - Along road segments where the distance from the edge of the road is less than 15 feet.
    - Erosion control devices will be regularly inspected and maintained as necessary.
- Obliterate and reshape the temporary road prism back to original contour, mulch, and seed with native vegetation immediately after harvest activities are completed.
- Biodegradable erosion control devices may be left in place to reduce sediment delivery to stream during or after road prism obliteration.

In order to further reduce potential impacts to all culinary water sources within the project area, the following BMPs would be implemented:

- No activity associated with the salvage, other than discussed above, will be conducted within Zone 1 of the drinking water sources.
- Skidding and other harvest activity within Zone 2 will be minimized to the extent possible to reduce potential impact and achieve the purpose of the project.
- Landings will be located outside of Source Protection Zone 2. No fueling or storage of fuels/other potential contaminants will be allowed within the 400 meters of the water sources. This is approximately 150 meters beyond the 250 day groundwater time of travel to the wellhead or spring source (approximately 300 meters upslope and 200 meters downslope of the sources) identified in the Source Water Assessments.
- Self-contained fueling sites will be established outside of these zones and RHCAs for the duration of the project. In the event of a chemical/fuel spill, contaminated soils will be removed from site and disposed of at an approved facility unless the operator can establish that there are no hazardous materials on site and that material can be buried and stabilized with no detrimental environmental effects.

No Action

This alternative would not involve any actions by the Forest Service to manage the spruce bark beetle infestation in the Bryant's Fork drainage. Stand structural diversity would not be manipulated. The spruce beetle would continue to cause mortality in spruce trees within affected stands depending on weather and population dynamics. Populations would be monitored for informational purposes using a limited number of pheromone baited funnel traps each year.

Comparison of Alternatives

Table 5
Alternatives Compared

Alternative	Acres Treated	Skid Trails /Landing	Temp Roads	Volume Removed
1 Proposed Action	190	29 acres	3.65 mi	2,900 ccf
2 No Action	0	0 acres	0 mi	0

Alternatives Considered But Eliminated

Trap Tree Alternative

Under the Trap Tree Alternative, the Forest Service would continue to create spruce beetle trap trees and utilize pheromone-baited traps to reduce spruce beetle populations within the Bryant's Fork drainage. Each year trap trees would be identified, felled, and subsequently removed to capture a portion of that years spruce beetle flight until the populations of spruce beetle subsided to endemic levels. The number of trap trees each year would be based on the number of new hit trees observed the previous year at approximately 1 trap tree per 3-4 infested trees. Funnel traps with pheromones would also be placed strategically within the stands both for monitoring and actual population reduction purposes. In order to minimize and localize soil disturbance and long term soil productivity losses, approximately 2.4 miles of temporary roads would be constructed and 0.3 miles of road would be reopened to access and remove the trap trees. Approximately 3.25 acres of skid trails and 4 acres of landings would be used for project implementation. Like the Proposed Action, temporary roads, skid trails, and landings would be obliterated, rehabilitated and seeded following the stabilization of the beetle populations and completion of the treatments.

However, this alternative would not meet the desired purpose and need. The structure and composition of the spruce-fir stands would not be adequately modified to reduce overall stand risk. The spruce beetle populations would not be adequately reduced using the trap tree method alone, allowing the insect to continue to attack and kill the majority of spruce trees over 5 inches in diameter. This alternative would require more entries into each infested stand, leading to greater cumulative effects.

Proposed Action Including Aspen Clear Cut and Forest Road Decommissioning

The Proposed Action that initially went through the public scoping process included clearcutting

approximately 48 acres of subalpine fir/aspen (stand 248-06) in order to regenerate it back to an aspen dominated stand and to reduce the potential fire hazard to the Bryant's Fork Summer Home community. The clearcut treatment of this stand was removed from the Proposed Action because of the negative visual impacts this treatment would have on the scenic landscape and because the objective (aspen restoration/fire hazard reduction) was inconsistent with the purpose and need. Forest Road 70290 was also originally proposed for decommissioning, however, this road has gone through the Uinta National Forest Roads Analysis (USDA 2002) and was not identified for closure. Wasatch County expressed interest during scoping in keeping the road open to serve as access for recreational users.

Implementation of a 30-60 Meter Fuelbreak Around Each Summer Home Based Upon Cabin-Specific Evaluation Using Fire Wise Principles

A 100-foot shaded fuelbreak was completed in August 2004 around the Bryant's Fork Summer Home Community. This fuelbreak removed all woody vegetation less than 8 inches in diameter and limbed remaining trees up to 6 feet in height. This treatment removed the majority of ladder fuels that could contribute to tree torching or crown fire. This fuelbreak has provided an additional level of fire protection to the community that did not previously exist. Special use permittees, such as the homeowner's in the Bryant's Fork area are responsible for the treatment of fuels on their individual lots. Construction of the fuelbreak alone does not address the greater purpose and need of reducing spruce bark beetle populations both present and in the future.

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 -
Bryant's Fork is located approximately 22 miles southeast of Heber City west of Utah State Highway 40 near Daniels Summit, which is just west of Strawberry Reservoir. Summer home sites are located in lower portions of Units 1 and 2 to the east (Figure 2). Aspen occupies the largest percentage of the forested landscape within the analysis area. Stands of subalpine fir mixed with aspen occur along ridges and upper slopes while stands of mature Engelmann spruce mixed with subalpine fir occur on lower-mid slopes and in drainages on northerly aspects. The spruce-fir stands are currently infested by the spruce beetle at epidemic proportions, resulting in high rates of mortality in the spruce component.

Stand examinations were performed in June and July of 2004 and the data was analyzed using the program RMSTAND. Stand densities range from 107 to 190 ft^2 of basal area per acre in trees 5-inches dbh and larger, with the average being over 150 ft^2. The average quadratic mean diameter is 17.3" dbh in trees over 5-inches, and stands average 1278 seedlings and saplings per acre. The average tree height among stands is about 82 feet tall. All stands have at least three 6-inch diameter classes, with the majority having five. The percentage of spruce in the stands ranges from 0 to 98%, with the average being 57%. These stands are predominantly high density older stands with similar average diameters and heights. Shade tolerant subalpine fir is being favored under the predominantly closed canopy in many areas.

In terms of the Desired Future Condition (DFC) for spruce/fir forests on the Uinta, page 5-5 of the Forest Plan states that *"desired future conditions include a balanced range of age classes, with at least 40 percent of stands mature or old and at least 10 percent having old growth characteristics. Mature and old growth stands should have multilayered canopies, with densities of at least three large diameter snags (≥18 inches diameter at breast height) per acre, and at least five large diameter logs (≥12 inch mid-point diameter) per acre. Insects and disease are not causing large scale tree mortality across entire landscapes."*

Environmental Consequences-
Proposed Action – Forest Health/ Spruce Bark Beetle Treatment
Stands would be harvested using uneven-aged single tree or small group selection systems in stands with lower levels of infestation or sanitation/salvage in heavier infested stands.

The uneven-aged selection prescription would focus on removing infested trees and creating microsite conditions (1/4 – 1 acre gaps) favorable for natural regeneration of spruce. Commercial harvest would be used to treat the >8" dbh component. Tree selection would favor

retention of the best formed dominant and co-dominant spruce and subalpine fir. All size classes would be treated to promote growth, vigor and a more sustainable size class distribution. Infested pockets of spruce would also be harvested where they occur. Pre-commercial thinning following harvest would be used to treat the smaller size classes. Treatments would remove approximately 1/3 of the basal area, leaving residual stands at approximately 90 – 120 ft^2 of basal area per acre with a target composition of up to 65% spruce. The objective of this prescription is to reduce stand densities to lower spruce beetle susceptibility ratings, and improve overall health and vigor of the residual stands. Approximately 66 acres would be treated using this silvicultural prescription.

The sanitation/salvage prescription will focus on removal of dying and spruce beetle-infested trees. Dead subalpine fir and dead spruce with dry phloem and no beetles will be retained as wildlife snag trees. In order to reduce the post-harvest risk of blowdown no more than 1/3 of the basal area per acre will be removed. Removals over this would be evaluated for wind throw potential on a case by case basis. Larger infested pockets, of up to 2 acres, would be removed with patch clearcuts, which would be reforested following harvest. Where the infestation is not as extensive, basal area would be reduced by about 1/3 of current level, primarily removing high risk spruce trees (those exhibiting poor crown and low vigor). All recently dead and wind thrown spruce would be included timber (theses are trees with tight bark that provide habitat for spruce beetles). Older dead subalpine fir and spruce with dry phloem and no beetles would be retained as wildlife snag trees. Approximately 108 acres would be treated using this silvicultural prescription.

No Action
No timber harvesting would occur under this alternative. Spruce beetle infested trees would not be removed and beetle populations would likely continue to expand, killing most of the spruce greater than 5 inches dbh in affected stands. The loss of the larger diameter spruce component (trees >10 inches dbh), would eliminate most (>90%) of the existing viable seed source for natural spruce regeneration (Dymerski et al. 2001). Sites typically revert to a subalpine fir overstory with a mixed subalpine fir/spruce understory (Veblen et al. 1991). Spruce beetle populations could infest adjacent susceptible spruce stands surrounding the analysis area.

FOREST INSECT AND DISEASE POPULATIONS

Affected Environment -
Engelmann spruce mortality caused by spruce beetle was first detected in the Bryant's Fork drainage on the Heber Ranger District, Uinta National Forest in February 2004. In March of 2004, Forest Health Protection staff surveyed stands in five separate management units to document spruce beetle activity and to assess stand and landscape level risk to further attacks. The result of this survey concluded that spruce beetle populations had reached outbreak levels within the Bryant's Fork area. The vegetation management units surveyed generally rate moderate to high hazard according to the Schmid and Frye (1976) spruce beetle hazard rating system. Viable populations of spruce beetle were observed throughout all five vegetation management units. Susceptible spruce occurs in dense clumps throughout most stands and further loss of the large diameter spruce component is considered likely by Forest Health Protection Specialists who surveyed the stands.

The spruce beetle has infested trees in all but one stand, only because there is no spruce in the unaffected stand. The spruce beetle prefers downed material to standing trees. If downed material is unavailable, then standing trees may be attacked. Large diameter standing trees (>16 inches) are preferred to smaller trees. All stands that contain spruce have at least a "medium" risk rating for spruce beetle. Four out of the ten stands that contain spruce have a risk rating of "medium high" or greater (Table 3). Stands considered most susceptible to spruce beetle attack include those located in drainage bottoms with basal areas exceeding 150 ft^2, a spruce component > 65% and average spruce diameters greater than 16 inches dbh. See Table 6 of stand characteristics in the Old Growth section of this chapter.

Environmental Consequences -
Proposed Action - Forest Health/ Spruce Bark Beetle Treatment
In infested stands, or those with building spruce beetle populations, sanitation and salvage of susceptible and attacked spruce, combined with the disposal of green cull material is regarded as the most effective silvicultural method to reduce spruce beetle populations (Holsten et al. 1999, Alexander 1986, Schmid and Frye 1977).

Over the long-term, silvicultural treatments offer the greatest likelihood of reducing the susceptibility of stands to spruce beetle infestation thus minimizing the potential for unacceptable levels of spruce mortality. Empirical data addressing the efficacy of silvicultural treatments (i.e. thinning, density management) to mitigate spruce beetle effects is limited. However, existing management guidelines are based upon available research and the experience of professional forest entomologists, forest silviculturists and foresters. To reduce the long-term susceptibility of uninfested stands to spruce beetle, Alexander (1986) recommended density management, including partial cutting to remove the larger overmature trees, decreasing basal areas which would open canopies to release younger age classes and encourage regeneration. This thinning strategy will promote the growth of trees in smaller diameter classes to create the structural, species and age-class diversity necessary for perpetuating spruce and achieving other desired management objectives (Alexander 1986).

No Action
Spruce beetle populations could increase or decrease. The likelihood that spruce beetle populations will decrease is low because of the building spruce beetle populations present and the susceptible uninfested host component that remains in the Bryant's Fork watershed. Natural factors such as extreme cold temperatures in the spring, or a prolonged cold wet period during adult dispersal could suppress current populations. However, based on weather patterns over the past 10-20 years, these weather events seem unlikely.

If spruce beetle populations continue to increase, more than 90 percent of the green spruce component >10 inches dbh will be lost to spruce beetle attacks (Hebertson 2004). Surviving trees would consist of non-host (subalpine fir and aspen) and small diameter spruce. Salvage treatments would be the only commercial option to address the dead trees. Associated impacts will include the loss of a viable, natural spruce seed source and 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 (Ryan 2000, Samman and Logan

2000, Jenkins et al. 1998). Increased mortality could also provide a source of inoculum for root diseases (Kile et al. 1991).

FUELS ACCUMULATIONS, INCREASED FIRE HAZARD/INTENSITY

Affected Environment -
Conifer stands within the Bryant's Fork area are composed primarily of Engelmann spruce and subalpine fir, with minor inclusions of aspen. The spruce beetle has infested trees in each of these stands causing widespread mortality, killing groups of 10-15 trees or more. A large amount of dead timber currently exists throughout the area, much of which will be susceptible to blowdown as the root systems rot and the wood decays, creating an abundance of downed dead fuels. Recent beetle-killed trees that have not cast their needles provide fine fuels that are most prone to fire ignition and spread. Stands that have historically been composed primarily of spruce are gradually becoming dominated by subalpine fir, a shade tolerant species which often retains live limbs at or near ground level.

According to the Fire Effects Information System, subalpine fir is one of the least fire-resistant western conifers and is normally subject to highly destructive crown fires. Although fire is relatively infrequent in spruce/subalpine fir stands, typically a 100-year fire return interval or longer, fires that do occur tend to move quickly into the tree canopy and become crown fires. The prevailing wind direction in the project area is from the southwest. The Bryant's Fork summer home area is located east-northeast of the proposed treatment stands which would put the summer homes directly downwind when the wind blows from the southwest. A fire that occurs in the proposed treatment stands immediately to the south or west could threaten the summer homes when the wind is blowing in the prevailing direction.

High fire intensities and high rates of spread, such as could be expected under wind-driven conditions, would make a fire extremely difficult to control as well as making fire suppression efforts more hazardous. However, the construction of a 100-foot shaded fuel break along the perimeter of the summer home area in August of 2004 which removed existing ladder fuels has created an area of defensible space for the whole community.

Environmental Consequences -
Proposed Action – Forest Health/ Spruce Bark Beetle Treatment
Removal of dead and dying trees would decrease the existing fuel load, as well as remove trees that would eventually become downed fuels contributing to greater potential fire intensity and effects. Arrangement and continuity of fuels would be altered such that less dead material will be available and increased space between residual trees will hasten fire spread. Treated stands would be less susceptible to spruce beetle attack, leading to decreased beetle related mortality and an associated reduction in the amount of dead and down trees across the project area.

No Action
Reduction of hazardous fuels through density management and removal of dead and dying trees would not occur. Spruce tree mortality caused by the spruce bark beetle would continue unabated. Without further treatment, it is likely that spruce beetle populations would continue to rapidly expand and kill most of the spruce greater than 5 inches dbh in affected stands (Dymerski

et al. 2001). Heavy fuel loads would increase the likelihood of large and intense wildfires given an ignition source and appropriate fire weather conditions (Ryan 2000, Samman and Logan 2000, Jenkins et al. 1998). Dead fuel would continue to accumulate and were an ignition to occur, fire severity and effects would be heightened and suppression efforts made more difficult.

OLD GROWTH

Affected Environment -
An analysis of old growth conditions in the Strawberry Watershed was conducted in the summer of 2004 (Gibson 2004). The results of this analysis indicate that approximately 16% of the conifer type inventoried within the watershed met Region 4 old growth standards for structural old growth, which are detailed below in the following paragraph. Three of the sample points that fell within the Bryant's Fork analysis area were determined to have met this definition. After treatment, removal of these stands from the old growth strata still leaves 12% for the watershed. Sub-goal-2.9 on page 2-6 of the Uinta National Forest Land and Resource Management Plan directs that management projects should generally meet or move toward the following, '*Maintain adequate distribution of old growth in forested community types. Maintain at least 10 percent of each forest vegetation type in an old growth condition as defined in the Forest Service publication, Characteristics of Old Growth Forests in the Intermountain Region (USDA 1993), or subsequently modified Regional Forester-approved definition. Ensure the presence through time by providing for suitable and potential replacement areas'.* .

The spruce/fir stands in the Bryant's Fork area are predominantly older stands with high densities and increasing amounts of the more shade-tolerant subalpine fir. There are no young or mid-aged spruce stands in the analysis area. The proposed treatment stands were inventoried during June and July of 2004. Inventory data was analyzed using the program RMSTAND and summarized in the table below. U.S. Forest Service Intermountain Region (Region 4) old growth requirements for warm-moist spruce-fir stands include; 1) 25 or more trees per acre 20" dbh or greater and at least 220 years old, and 2) two or more size classes (6-inch classes), and 3) two or more canopy layers, and 4) evidence of "decadent" trees, and 5) two or more dead trees per acre 12" dbh or greater and 15 feet tall or taller, and 6) Down logs: 1 piece per acre at least 8 feet long and 12 inches in diameter (Hamilton 1993).

There are areas within the proposed treatment stands that can be classified as old growth. Several trees aged in these stands during the stand examination process were found to be over 200 years old, but most aged trees fell between 110 and 180 years old. Additional spruce beetle mortality has also occurred since the original inventory, which has affected primarily the older large diameter spruce. Actual numbers of live trees greater than 20 inches dbh, and average stand age and diameter has decreased with continued spruce beetle activity and trap tree treatments since 2004. Stands exhibiting old growth characteristics (i.e. - high density and large average diameter) tend to be more prone to spruce beetle attack (Schmid 1976). The following table shows stand characteristics in relation to some of the key Region 4 old growth requirements.

Table 6
Stand Characteristics [1/]

Stand ID	Basal Area 5"+	QMD 5"+	Stand Age	% Spruce (BA)	# of 6" DBH Classes	# Trees ≥ 20" DBH	Stand Density Index
247-06	190	16.0	133	68	5	29	272
247-07	168	18.6	113	88	5	27	232
247-08	147	17.9	129	46	6	24	209
247-09	160	19.3	102	80	5	29	220
248-01	107	14.9	115	12	5	11	176
248-02	140	16.4	126	11	5	29	199
248-03	187	18.7	111	93	3	29	264
248-04	144	19.3	132	44	5	21	198
248-05	164	18.4	122	88	5	31	229
248-06	124	17.5	131	0	5	26	172
248-07*	147	13.5	170	100	5	26	210

**Note that this stand is experiencing heavy mortality (50%) so the live numbers do not reflect the high basal areas, diameters and heights which would be considerably higher.*

[1/] BA = Basal Area, QMD = Quadratic Mean Diameter, DBH = Diameter Breast Height

Environmental Consequences -

Proposed Action - Forest Health/ Spruce Bark Beetle Treatment

Stands would be harvested using uneven-aged single tree and small group selection systems in stands with lower levels of infestation, or sanitation/salvage in heavier infested stands. The uneven-aged selection and sanitation/salvage prescriptions previously described in the Forested Vegetation Structure and Composition section would remain the same. Focus would remain on removal of infested trees, reduction of stand densities and creation of microsite conditions favorable for natural regeneration of spruce. The primary objective would be to lower spruce beetle susceptibility ratings, and improve the overall health of the stands. Treatments would remove approximately 1/3 of the basal area, leaving residual stands at approximately 90 – 120 ft^2 of basal area per acre with a target composition of up to 65% spruce.

In order to remove enough trees in the larger size classes to reduce average stand diameters below 16 inches as recommended by Schmid and Frye (1976), basal area per acre in most stands would have to be reduced by approximately 50% or more. Because of the high average diameters that currently exist in the stands, and the objective of retaining 2/3 of the basal area per acre to mitigate wind throw, residual stands would retain trees in the 20-inch diameter class and larger. Post-harvest stands would still retain old growth characteristics, but most would not meet all established Region 4 guidelines. Projects authorized under Section 102(a)(4) are exempt from the old-growth and large tree retention provisions in Sections 102(e) and 102(f) of the HFRA where the presence of an insect or disease epidemic exists. Depending on the amount of new attacks from dispersing spruce beetles in 2005, as well as the locations of those attacks, retention of 25 or more trees per acre in trees that are 20" dbh or greater and 220 years old is unlikely to be met. Two or more 6-inch size classes and canopy layers would also be retained, as well as creating conditions suitable for a new age class to replace harvest and mortality trees.

Retention of "decadent" trees would be unlikely as older, less thrifty trees are more prone to beetle attack. Standing and downed dead requirements will be easily achieved as current numbers are well in excess of those targets. A return to stands exhibiting old growth characteristics, such as existed before spruce beetle infestation, would be hastened by the timely implementation of the proposed silvicultural treatments.

No Action
No timber harvesting would occur. Spruce beetle populations will likely continue to increase and spread, killing most of the spruce greater than 5-inches dbh in affected stands (Dymerski et al. 2001). Old growth characteristics which currently exist in affected stands would diminish over time as susceptible large spruce trees continue to be attacked and killed by the spruce beetle. Replacement of old growth characteristics in the affected stands could take up to 200 years if all spruce greater than 5-inches dbh are successfully attacked and killed by the spruce beetle.

VISUAL LANDSCAPE

Affected Environment -
U.S 40, as a major travel way, has both regional and national importance. The area of proposed action is not visible from the U.S. 40 visual corridor. Visual sensitivity varies along the west side travel corridor. Exceptional views are available and seen from Strawberry Reservoir and several concentrated recreation day use areas. The general public using these areas and roads around Strawberry Reservoir are destination-type users looking for specific recreation facilities.

Environmental Consequences -
Proposed Action - Forest Health/ Spruce Bark Beetle Treatment
Disturbance caused by the construction of roads and the associated harvest of trees has an impact on visual quality. The impact is caused by contrast created between the natural forest landscape and the managed landscape. These contrasts involve changes in the existing natural form, line, color, and texture of soil and vegetation. If these changes are evident, but remain visually subordinate to the characteristic landscape, a Visual Quality Objective (VQO) of Partial Retention would be met. If changes in the characteristic visually dominate the landscape, but borrow from the naturally established form, line color or texture so completely and at such a scale that its visual characteristics are those of natural occurrences within the surrounding landscape area a VQO of Modification would be achieved.

The longest lasting visual disturbance is typically caused by soil movement, particularly from road construction. While harvested treatment units over time would recover to an unnoticed visual condition, even low standard roads can remain noticeable for generations. Disturbance to vegetation begins to heal immediately, while soil disturbance takes years to be restored. The duration of this process is directly related to the extent of disturbance. In two or three years, herbaceous vegetation will cover most disturbed sites in the decision area.

There are some positive visual effects of salvage, which will be apparent immediately, such as improvement to color and texture through removal of dead and dying timber. Reduction of the

dead, brown trees will have a positive effect in the short term. Color and texture would be increased through aspen regeneration and creation of openings in the form of meadows.

No Action
Disturbance caused by the construction of roads and harvest of trees would not occur, thus there would be no impact on visual quality other than continued mortality to spruce trees caused by the spruce bark beetle.

SENSITIVE/INVASIVE PLANTS

Affected Environment –
A few roads and trails occur within or adjacent to the project areas, providing access to motorized and non-motorized recreationists. Two of the spruce units contain portions of the Bryant's Fork recreational residence tract and associated roads and human activities. A shaded fuelbreak has been constructed in the general area. The 2004 trap tree project felled and removed with skid trails and equipment about 186 large old spruce trees while removing many beetle larvae deposited into the felled trees. A 2005 trap tree project felled approximately 282 trees, concentrated in the three middle units established in 2004. Felled trees are targeted for removal in the fall of 2005 or early spring of 2006.

The proposed project activity areas were surveyed for rare plants in August 2004. No rare plants were identified, but habitat suitable for moonworts was found, especially for slender moonwort. Because of the small and cryptic nature of moonworts, not finding a population does not guarantee their absence from any area suitable in habitat. No federally listed or Region 4 sensitive plant species were found in the project area (Freiburger 2004).

The existing condition 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 skid trails created in 2004 for trap tree access. These general conditions greatly discourage weed establishment.

The highest likelihood of current weed populations exists around the recreation residences and roads of that tract, and within the sunny riparian area adjacent to the tract. The next highest is within the recreational residence tract's shaded fuelbreak, created in 2004. This fuelbreak encircles the tract, running through some cutting units and part of the riparian area mentioned. Both the tract and the fuelbreak encourage weed establishment by human-caused soil disturbance and possible weed seed importation, and reducing shade levels.

Environmental Consequences -
Proposed Action - Forest Health/ Spruce Bark Beetle Treatment
Weed seeds could be brought into the project area by the tree fellers' vehicles and boots. Seeds could also 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 has the potential to import weed seeds. Log trucks have a relatively low opportunity for weed spread, since they rarely leave established permanent roads, however as

part of the timber contract, equipment and its transport will be required to be washed prior to entering the project area..

Skid trails, temporary roads 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. 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). In addition, 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.

Implementation of this 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 or Wasatch jamesia in the project area, the Bryant's Fork Forest Health/Spruce Beetle Treatment project is *Not Likely to Result in a Trend Towards Federal Listing* of these species. For Dainty moonwort and Slender moonwort, the proposed action *May Impact Individuals or Habitat, but Will Not Likely Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability* to the species**.**

No Action
The no action alternative would maintain the current plant population and vegetative conditions. No ground based disturbance or vegetation manipulation would occur from timber harvest, road building, road reconstruction, improvement or obliteration. Disturbance to plants beyond the existing condition will be nonexistent since no activity will occur.

HERITAGE RESOURCES

Affected Environment –
Strawberry Valley, including this project area, has been used by people for various activities for at least 8,000 years. Ancient American Indians fished in the Strawberry River and its tributaries, hunted and gathered plants all through the valley, and gathered in many places for religious, trading, and family events. Their modern Ute descendants continued these traditions, both before and after Strawberry Valley became part of the Uintah-Ouray Indian Reservation in 1865. Evidences of these activities generally take the form of temporary campsites; few of these are ever found within tree stands or on steeper slopes.

During the later 1800's, European American settlers from nearby Heber Valley began to use the valley for livestock grazing, and to a lesser degree, logging. The western portion of the Uintah-Ouray Indian Reservation was removed from the Ute Tribe in 1905 and most of the upper parts of the Strawberry watershed (including this treatment area) were added to the Uinta National Forest. However, some use of plants continues in the area by traditional Northern Ute practitioners.

The bottom of the valley was set aside for the Strawberry Valley Reclamation Project, which began in 1905. Henry Gardner of Spanish Fork built a saw mill in the Bryant's Fork area to provide lumber for the dam, tunnel, and associated buildings. It operated until at least 1913, when the tunnel was completed. Soon thereafter, a Forest Service Ranger Station was built below the treatment area in Bryant's Fork; it was covered by the rising water of the reservoir in the 1980's. After completion of the Strawberry Reclamation Project, the area continued to be used primarily for livestock grazing and recreation. The first permits in the Bryant's Fork Summer Home area were issued in 1956, and most summer homes were in place by the mid-1980's.

A complete cultural resources inventory of the treatment area was completed in the summer of 2004. Only one archaeological site was found, which is a historic and recent period livestock herder's camp. The Okelberry Patio (42WA 377) is Not Eligible for the National Register of Historic Places because most of its use occurred in the last fifty years. The exact location of the Gardner Sawmill is not currently known; however, it is known that it is not located within the proposed treatment units, or on any of the proposed temporary roads.

No known American Indian plant collection or traditional use areas occur within the treatment area. Some types of traditional use plants probably exist in the treatment areas; however, these same types of plants also occur widely along the eastern slopes of the Strawberry Ridge and elsewhere in Strawberry Valley.

Environmental Consequences -
Proposed Action - Forest Health/ Spruce Bark Beetle Treatment
The Okelberry Patio (42WA 377) is the only heritage site in the treatment area, and it is not eligible for the National Register of Historic Places. As a result, no significant heritage resources would be affected by the proposed treatments. However, the project will not affect the Patio itself in any way, so it will remain in place as a potential interpretive feature in the future.

The ability of American Indians to access and gather plants for traditional uses in Strawberry Valley will not be compromised during the project, since the biotic community within the project area occurs over a broad area that is also accessible by road. These same plants will continue to exist within the project area after it is completed.

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 –
The dominant vegetation cover types within the project analysis area (Bryant's Fork watershed) are aspen forest, sagebrush, spruce-fir forest, mixed aspen/conifer forest, and mixed brush. Of these, the spruce-fir forest type is the primary vegetation type that would be affected by the proposed action. Much of the area that would be treated meets the U.S. Forest Service

Intermountain Region (Region 4) structural definition of old-growth spruce-fir forest (USDA Forest Service 1993). Wildlife surveys were conducted within the project area during 2004 and 2005. 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 U.S. Fish and Wildlife Service has determined that the following wildlife species classified under the Endangered Species Act potentially occur in Wasatch County: bald eagle (Threatened), western yellow-billed cuckoo (Candidate), and Canada lynx (Threatened). 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). The bald eagle and western yellow-billed cuckoo are primarily found in lowland riparian habitat in Utah (Parrish et al. 2002: pages 6, 145 to 150), which is characterized as riparian habitat below approximately 5,500 feet elevation (Parrish et al. 2002:page 183). The project area contains no lowland riparian habitat; elevations within the treatment units range from about 7,800 to 8,600 feet.

There are currently no known breeding populations of Canada lynx in Utah, although a number of historical records are known from the Uinta Mountains. Lynx that were translocated to Colorado have been found in Utah in recent years, and at least two of these individuals were located on the Uinta National Forest in 2004. The Uinta National Forest has two Lynx Analysis Units (LAUs), but the nearest one is located approximately 16 miles to the north in the West Fork Duchesne River watershed. Areas outside of Lynx Analysis Units in Utah and Wasatch Counties that contain potential lynx habitat are considered lynx travel corridor. Canada lynx prey (snowshoe hares, red squirrels, and ruffed grouse), or their sign, were commonly observed in the project area during wildlife surveys.

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 goshawk surveys were conducted within the analysis area in 2004 and 2005, but none was detected, and there are no known historic goshawk nest sites in the Bryant's Fork watershed. The Uinta National Forest has been monitoring known goshawk nest areas since 1996 (http://www.fs.fed.us/r4/uinta/publications/sof/2003_sof.pdf). Similar to monitoring results in recent years, 6 goshawk nest areas (territories) were determined to be active in 2004 (USDA Forest Service 2004a).

American three-toed woodpeckers were commonly detected within the project area during wildlife surveys in 2004 and 2005, although no nests were found. Three-toed woodpeckers feed on spruce beetle larvae and other invertebrates, and three-toed woodpeckers were commonly

observed foraging on spruce beetle-infested trees throughout the project area. The Uinta National Forest conducted extensive Forest-wide surveys of three-toed woodpeckers in 2004 and 2005 (USDA 2004c Uinta National Forest Three-toed Woodpecker Monitoring Report, project file; 2005 wildlife survey forms, project file). These surveys indicate that three-toed woodpeckers are relatively common in conifer forest types on the Uinta National Forest, especially in areas with beetle activity.

Active beaver colonies are located along the lower reaches of the north fork and south fork of Bryant's Fork, downstream of the treatment units. Beavers are widely distributed across the Uinta National Forest in riparian habitats where there is sufficient stream flow and sufficient food resources. On the Uinta National Forest, beavers primarily feed on riparian and aquatic herbaceous vegetation and deciduous woody plants such as willows, aspen, alder, and cottonwoods. The Uinta National Forest conducted extensive Forest-wide surveys of beaver colonies in 2004 and 2005 (2004 Uinta National Forest Beaver Monitoring Report, project file; 2005 beaver survey forms, project file).

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 Columbia spotted frog, greater sage-grouse, peregrine falcon, northern goshawk, flammulated owl, American three-toed woodpecker, spotted bat, Townsend's big-eared bat, and fisher. 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). Northern goshawk and American three-toed woodpecker are also classified as Management Indicator Species and were discussed above in the Management Indicator Species section. Of the species listed above (excluding northern goshawk and three-toed woodpecker), species known to occur or that potentially occur within the project area are greater sage-grouse, flammulated owl, spotted bat, and Townsend's big-eared bat. Sage-grouse occur in the project area in sagebrush habitats just east of the treatment units. This sage-grouse population has declined from approximately 3,500 birds during the late 1930s to less than 300 birds currently, although the population has increased during the last couple years. A flammulated owl was detected in the project area during an owl survey conducted on June 29, 2005 (wildlife survey form, project file). Little is known about the distribution of bat species on the Uinta National Forest, and it is not known whether spotted bats or Townsend's big-eared bats occur in the project area. No caves, mines, or old buildings (common bat roosting sites) are located within the Bryant's Fork watershed.

The boreal toad, a subspecies of western toad, is classified as a Species of Concern by the state of Utah and was identified as a species of concern on the Uinta National Forest during a viability assessment completed during the Forest Plan revision process (USDA Forest Service 2003b:pages F67 to F68). It has been classified as a candidate for listing under the Endangered Species Act in New Mexico, Colorado, and Wyoming since 1995. One of the few known populations of boreal toads on the Uinta National Forest occurs along lower Bryant's Fork just east of the treatment units. This population is being monitored by personnel from the Utah Division of Wildlife Resources.

Migratory Birds and Raptors: Birds detected within the spruce-fir stands in the treatment units during 2004 and 2005 wildlife surveys include: ruffed grouse, northern flicker, hairy woodpecker, downy woodpecker, American three-toed woodpecker, western tanager, red-breasted nuthatch, brown creeper, ruby-crowned kinglet, golden-crowned kinglet, yellow-rumped warbler, hermit thrush, American robin, dark-eyed junco, pine siskin, and Cassin's finch. Of these species, only the three-toed woodpecker is listed as one of Utah's Priority Species in the Utah Partners in Flight Avian Conservation Strategy (Parrish et al. 2002:page 52). No raptor nests were detected within any of the treatment units.

Big Game Species: Elk and mule deer hunting is a significant recreational activity on the Uinta National Forest. Elk, mule deer, and moose are common within the analysis area. Because of its high elevation, the analysis area provides only summer range and no winter range. Spruce-fir stands within the treatment units are used for cover and foraging habitat. Stands with lower canopy cover and basal area have greater amounts of understory vegetation biomass and thus more forage and browse for wild ungulates and livestock.

Environmental Consequences –
Proposed Action - Forest Health/ Spruce Bark Beetle Treatment

Species Listed Under the Endangered Species Act: The proposed action would have no effect on bald eagles or western yellow-billed cuckoos because there is no suitable habitat for either species within the project area. Although the project area is not located within a Lynx Analysis Unit and lynx are not known to occur in or near the project area, the proposed action would affect lynx habitat. Red squirrels are an important prey species of Canada lynx in the southern Rockies, and the proposed action would negatively affect red squirrel habitat by reducing the number of cone-bearing spruce trees (spruce cone seed is an important food of red squirrels on the Uinta National Forest). Effects of the proposed action on snowshoe hare and forest grouse (other important lynx prey species) habitat are less clear. There would likely be an increase in the cover of understory vegetation in the gaps created by felling and removal of trees, so an indirect effect of the proposed action may be increased food and cover for snowshoe hares and forest grouse. Although the proposed action would negatively affect lynx foraging habitat by negatively affecting red squirrel habitat, there would be no significant effect on Canada lynx populations 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 project is small relative to the very large areas that individual lynx occupy or travel across; 3) the project area occurs about 16 miles south of the nearest Lynx Analysis Unit. The U.S. Fish and Wildlife Service concurred with biological determinations of *No Effect* for bald eagle and western yellow-billed cuckoo and *May Affect – Not Likely to Adversely Affect* for Canada lynx (Biological Assessment and letter from U.S. Fish and Wildlife Service dated June 23, 2005; project file).

Management Indicator Species: 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. Red squirrel habitat would be negatively affected, and red squirrels are a common prey of northern goshawks. However, goshawks prey on a wide variety of other

small mammals and birds, and some of these species such as ground squirrels and chipmunks may not be negatively affected by timber harvesting. The proposed action would negatively affect goshawk habitat but would not affect population trend or population viability of goshawks on the Uinta National Forest because 1) wildlife surveys have failed to detect any goshawks within the project area; and 2) spruce-fir forest habitat would be impacted on about 200 acres, which is only approximately 0.3% of the estimated total area of spruce-fir forest on the Uinta National Forest (USDA Forest Service 2003c: page 3-128).

Spruce 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 spruce 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 likely be lower for the next several years as a result of the proposed action compared to the no action alternative. Implementation of the proposed action would negatively affect three-toed woodpecker habitat within the project area but would likely not affect population trend or population viability of three-toed woodpeckers on the Uinta National Forest because 1) three-toed woodpecker habitat would be impacted on about 200 acres of spruce-fir forest, which is only approximately 0.3% of the estimated total area of spruce-fir forest on the Uinta National Forest (USDA Forest Service 2003c: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 Bryant's Fork watershed (2004 Three-toed Woodpecker Monitoring Report, project file; 2005 wildlife survey forms, project file).

Active beaver colonies are located along the lower reaches of the north fork and south fork of Bryant's Fork, downstream of the treatment units. Potential short-term increases in sediment into Bryant's Fork would likely not affect beaver habitat. Harvesting conifers also 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 would not affect population trend or population viability of beavers on the Uinta National Forest.

Forest Service Sensitive Species and Other Species of Concern: The proposed action would have no effects on Columbia spotted frog, peregrine falcon, and fisher because these species do not occur in the project area.

Temporary road construction and skidding operations across sagebrush habitats would negatively affect linear strips of sage-grouse habitat. These disturbances would not affect population trend or population viability of sage-grouse on the Uinta National Forest because the amount of sagebrush habitat disturbed would be small, and most of the project area occurs west of areas used by sage-grouse.

Flammulated owls are cavity nesters, so the proposed action would reduce potential nest-site availability by harvesting large, old trees. Flammulated owls are associated with open forest stand structures for foraging (McCallum 1994:page 40), and the proposed action would result in more open stand structures. 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) spruce-fir forest would be impacted on about 200 acres, which is only approximately 0.3% of the estimated total area of spruce-fir forest on the Uinta National Forest (USDA Forest Service 2003c: page 3-128); and 2) the proposed action would likely have a neutral or positive effect on flammulated owl foraging habitat.

The proposed action may affect bat foraging habitat by changing stand structure and composition, which could affect flying insect abundance or distribution. Townsend's big-eared bats are known to roost in a wide variety of roost types including tree hollows, so the proposed action may reduce potential roost site availability by a small amount. The proposed action would affect potential habitat for spotted bats and Townsend's big-eared bats but would not affect population trend of population viability of either species because the spatial scale of the project is very small relative to the amount of similar habitat available on the Uinta National Forest, and it is unlikely that either species roosts within the project area.

Biological determinations for Forest Service sensitive species are *No Impact* for Columbia spotted frog, peregrine falcon, and fisher; and *May Impact Individuals or Habitat, but Will Not Likely Contribute to a Trend Towards Federal Listing or Loss of Viability to the Population or Species* for greater sage-grouse, northern goshawk, flammulated owl, American three-toed woodpecker, spotted bat, and Townsend's big-eared bat (Wildlife Biologist Report and Biological Evaluation; project file).

The proposed action may affect boreal toads because boreal toads are known to occur along the north fork and south fork of Bryant's Fork stream, adjacent to the two primary log-hauling roads for this project. A literature review failed to find any references on the effects of stream sedimentation on boreal toad habitat (NatureServe 2005). Other potential impacts of the proposed action include accidental spills of fuel or oil into Bryant's Fork and incidental mortality caused by trucks or heavy equipment hitting dispersing toads along the north fork (Forest Service Road 290) and south fork (Forest Service Road 120) of Bryant's Fork, but these risks are considered to be small. Because most of the project-related disturbance would occur upstream of the known population or along established roads, it is unlikely that implementation of the proposed action would affect population trend or population viability of boreal toads.

Migratory Birds and Raptors: Because of the short field season at this elevation, project implementation may overlap with bird breeding season (primarily May, June, and July). Thus, nests and eggs of migratory or non-migratory bird species may be destroyed during project implementation. 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 any of these species because habitat would be impacted on only 200 acres, which is only approximately 0.3% of the estimated total area of spruce-fir 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, page 3-12).

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 analysis 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. Effects on big game habitat would be minor.

No Action
Disturbance and negative effects to wildlife habitat caused by timber harvest, skidding, and temporary road construction would not occur. Large spruce trees would likely continue to be killed by spruce beetles, and the structure and composition of the forested stands would continue to change as a result. Grasses, forbs, and shrubs would likely increase in cover as a result of reduced canopy cover of large spruce trees.

SOILS

Affected Environment -
The Bryant's Fork Forest Health/Spruce Bark Beetle Treatment analysis area encompasses 10 soil map units. The soil map units primarily affected by the proposed Bryant's Fork treatments and temporary roads are YOE and YPE are:

YOE	Bigbug-Longridge complex, 10 to 45 percent slopes
YPE	Rial-bigbug complex, 15 to 55 percent slopes

Both the Bigbug and Longridge soils have clay content that range from 27 to 35 percent and are rated as having high runoff with moderately slow permeability. The Rial soil clay content ranges from 40 to 55 percent and is rated as having a very high runoff with slow permeability. Soil map units YOE and YPE both have high clay contents and are both rated with severe road erosion hazards. Soil map unit YOE and the Bigbug soil of the YPE map unit are rated as moderate for undisturbed erosion hazard, while the Rial soil is rated as severe.

The proposed action is to use a timber harvest in these stands to reduce average stand density and diameter as well as promote regeneration of spruce. Designated skid trails would be used in all treatment types. In some of the steeper spots with larger trees there would be some tracked 'cat' skidding to reduce soil disturbance. Approximately 8% of the area would be impacted by the skidding operations (15 acres total). Landings would contribute an additional 14 acres of disturbance, for a total disturbance of 29 acres.

In addition to skid trail and landing disturbance, this alternative would require approximately 3.7 miles of temporary road construction; approximately 1.6 miles of which already exist as closed roads. Approximately 2.1 miles of temporary road will be new construction. Roads would remain open for the life of the timber sale (1-2 years). All 3.7 miles of road opened for the project will be obliterated using a tracked excavator, rehabilitated back to originally contour, surface roughing techniques implemented, and seeded following project implementation. No other projects planned for the Bryant's Fork Project Area will involve the construction,

reopening, or removal of roads. There will be a net loss of 1.6 miles of unclassified roads upon completion of the project.

Erosion Modeling

The Forest Service Watershed Erosion Prediction Program (FS WEPP) was used to estimate current conditions and the erosion/sedimentation effects of the proposed action. The FS WEPP model incorporates parameters including local climate data, soil texture, proposed treatments, slope gradient and length, treated slope area, stream buffers, vegetation, and groundcover to model sedimentation. Further discussion of existing conditions, affected environment, effects analysis, and WEPP model application/analysis is available in the Project Record and FS TEAMS Hydrology Report (USDA 2004 FS TEAMS Hydrology Report, WEPP Results, WEPP Documentation).

Environmental Consequences -

Proposed Action - Forest Health/ Spruce Bark Beetle Treatment

The main soil issues center on short-term, temporary soil disturbances that remove native ground cover/vegetation and long-term, permanent disturbance that compact the soil with repeated use. These ground disturbance impacts need to be mitigated to help protect soil and water resources as follows:

- Soil erosion and sedimentation
- Soil compaction and loss of soil structure

Even small losses of topsoil can result in poor 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 extremely erosive and difficult to revegetate. Increased soil erosion within riparian areas will increase the likelihood of sediment delivery to Strawberry Reservoir. Since phosphorus is tied closely to soil particles, increased sediment to the stream will eventually result in increased phosphorus input to Strawberry Reservoir as sediments work their way down to the reservoir. Therefore, temporary roads and timber harvest landing areas need protection from surface erosion during use (e.g., magnesium chloride treatment or gravel cap). If temporary roads are left in service, they also need continued protection from surface erosion after use.

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

- Soil Handling – avoid unnecessary and repeated movement of the soil.
- Soil Compaction – minimize vehicle traffic on resulting skid trails.
- 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 road construction, skid trail use, tree removal and log landing construction. Ground disturbance changes the physical properties of soils through compaction, damage to the soil aggregate

structure, and soil displacement, all of which lead to increased surface soil erosion, stream sedimentation, and phosphorus input to the stream. Tree removal can reduce soil strength by eliminating root structures.

Implementation of Proposed Action would involve approximately 15 acres of skid trails and 14 acres of landings. Harvest activities will result in minimal removal of cover. Selection and sanitation cuts will be used in spruce stands where estimates of canopy and groundcover are approximately 90%. It was further estimated that approximately 33% of the cover will be removed from the spruce-fir stands within the treatment areas. Modeled results show that harvest activities (excluding roads) will not deliver sediment to perennial streams within the project analysis area. The WEPP Model does indicate that localized hillslope erosion resulting from timber harvest activities (i.e.-tree felling, landing and skid trail construction) will occur within the treatment areas during the project implementation phase, but the sediment produced will be buffered by existing vegetation and well before reaching rivers and streams in the Bryant's Fork Project Area (USDA 2004 FS TEAMS Hydrology Report, WEPP Results).

Implementation of this alternative would utilize 1.6 miles of existing closed roads within the project area, and require approximately 2 miles of new temporary road construction.

Access to Unit 2 in Unnamed Tributary #1 will utilize an additional 0.3 miles of existing closed road. Although this road is currently closed, illegal use by OHV riders rendered the existing road prism in a rutted condition that produces 0.6 tons of sediment per year to Unnamed Tributary #1. WEPP Modeling results show that improvement of the existing/unclassified road decrease sedimentation by approximately 0.6 tons per year. WEPP Modeling shows 0.1 tons of sediment per year from the temporary roads will be delivered to the streams within the Unnamed Tributary (USDA 2004 FS TEAMS Hydrology Report, WEPP Results). Modeled results for temporary roads to be constructed for Units 3 and 4 resulted in zero sediment delivery to stream channels within Unnamed Tributary #1.

Access to Unit 5 in the North Fork will utilize an existing 1.3 mile segment of closed road located along the south side of Bryant's Fork and will be maintained for use as a temporary road. This segment currently produces approximately 0.8 tons of sediment per year to the Bryant's Fork. During implementation, WEPP modeling estimates an annual sediment yield of 2.2 tons of sediment per year, with increases mainly attributable to increased traffic during harvest activity (WEPP Results). The modeled sediment yield of 2.2 tons is an estimate for annual sediment delivered to the stream, and does not reflect the expected period of activity. The planned harvest activity is expected to be completed within a 3-5 week period. Because of this, the actual sediment yield in the North Fork will be substantially smaller than modeled results (USDA 2005 – Addendum to FS TEAMS Hydrology Report). Design features incorporated into the proposed action to reduce sedimentation include limiting harvest activity in Unit 5 only during period of low precipitation/dry soil conditions and installation of erosion control devices on or adjacent to the road prism. Also, immediately after harvest activity in the North Fork drainage is completed, the existing closed portion of the road will be obliterated; reshaped back to original contour, mulched, and seeded with native vegetation.

To summarize, erosion would be produced from harvest activities within the treatment areas, but sediment would be buffered well before reaching perennial streams or wetlands within the project area. During implementation, modeled results show an annual increase of 1.4 tons of sediment from the existing closed road in the North Fork of Bryant's Fork. The sediment produced from this road segment can be reduced through utilization of BMPs during harvest activity and immediate obliteration following activity, as discussed above. (Wepp Results, USDA 2005 – Addendum to FS TEAMS Hydrology Report) In Unnamed Tributary #1, road improvement and maintenance of the existing closed road will result in a reduction in net sediment yield of 0.5 tons of sediment per year (USDA 2004 FS TEAMS Hydrology Report, WEPP Results).

The WEPP Model results for road and hillslope erosion do not account for further reductions of sediment delivery through utilization of BMPs. All harvest and activities associated with construction/improvement of temporary or permanent roads will implement project design features, mitigation measures, and adhere to Forest Plan Standards and Guidelines. It is nearly impossible to completely "design out" all sediment delivery to streams resulting from existing and proposed road activities. During the implementation of the project, a minimal amount of sediment (<1 ton) may be delivered to waters within the project area during or shortly after construction and obliteration activities (USDA 2004 FS TEAMS Hydrology Report).

Following project completion, the 3.7 miles of temporary roads would be obliterated; reshaped back to original contour, mulched, and seeded with native vegetation. This constitutes a net reduction of 1.6 miles of road from existing conditions. The obliteration and re-establishment of natural vegetation would restore watershed function (soil stabilization, sediment filtration, and increased infiltration) to the portion of the watershed occupied by the temporary and existing prisms. The obliteration of the unclassified existing roads would result in an annual net reduction of 1.4 tons of sediment to Bryant's Fork over time (WEPP Results).

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 -

The hydrology analysis project area of analysis is defined as the ~3.5 square mile Bryant's Fork watershed from headwaters on Strawberry Ridge to the Strawberry Reservoir. Elevations within the Bryant's Fork Project Area range from 7,600 feet at the mouth of the watershed to 9,150 feet at the head of the Bryant's Fork drainage. The average annual precipitation in the Bryant's Fork Project Area ranges from approximately 22 inches at the mouth of Bryant's Fork to 30 inches at the headwaters. Approximately 60% of the precipitation falls as snow from late October through late March/early April. Stream flow begins to increase in late April/early May as the snow pack melts with warming spring temperatures, peaking in late May to early June. Slow release of groundwater provides stream base flow starting in mid July (USDA 2004 FS TEAMS Hydrology

Report). The Bryant's Fork watershed includes the 3rd order Bryant's Fork Creek and 2nd order Unnamed Tributary #1, totaling approximately 5 miles of perennial stream. Riparian Habitat Conservation Areas within Bryant's Fork total about 254 acres, and include 30 acres of delineated wetlands (USDA 2004 FS TEAMS Hydrology Report).

Steams within the project analysis area contribute an annual average of 2,155 acre-feet of water (3% of total inflow) to Strawberry Reservoir. Bryant's Fork and Unnamed Tributary #1 can be generally characterized by narrow valley floors with willow-dominated riparian areas spanning the entire valley floor. Streambank Erosion Surveys completed for the Strawberry Watershed Restoration Report concluded that approximately 7% of streambanks in Bryant's Fork were actively eroding. Other sediment sources within the project area include upland hillslopes and roads. Beavers are active in Bryant's Fork and Unnamed Tributary #1—however; activity is much more extensive throughout Unnamed Tributary #1. Overall, streams in the Bryant's Fork Project area are healthier than other tributaries on the west-side of Strawberry Reservoir. (USDA 2004 SWRR).

Waters from Bryant's Fork and Unnamed Tributary #1 are captured by Strawberry Reservoir. Strawberry Reservoir is approximately 17,160 surface acres at full capacity and serves as the principal irrigation water collection and distribution facilities for the Central Utah Water Conservancy District. Water is delivered to and from the reservoir via a system of aqueducts and tunnels for use along the Wasatch Front. Further discussion of Strawberry Reservoir and the Central Utah Project is contained in the FS TEAMS Hydrology Report (USDA 2004), the Strawberry River Watershed Restoration Report (USDA 2004 SWRR), The Strawberry Valley Assessment (USDA 1997), and the Strawberry Reservoir TMDL Report (UDEQ-DWQ, January 2005).

The Bryant's Fork Project analysis area includes summer home group of approximately 37 cabins and numerous out-buildings. Approximately 4.0 miles of classified Forest System Roads and 2.5 miles of unclassified roads are located within the Project analysis area (USDA 2005 – Addendum to FS TEAMS Hydrology Report).

Water Quality

Bryant's Fork is classified by the State of Utah to support beneficial uses 1C, 2B, 3B, and 4[1]. (USDA 2004 – FS TEAMS Hydrology Report). 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 in the near future. As a result, a Strawberry Reservoir Total Maximum Daily Load (TMDL) Study is currently being developed by the Utah Department of Environmental Quality (UDEQ) – Division of Water Quality. The report is expected to be finalized in the fall of 2005. The Draft TMDL

[1] 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 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.

Study (January 2005) recommends a 10% reduction in annual total phosphorus loads (lbs / year) for all streams within the Strawberry Watershed, including Bryant's Fork (UDEQ-DWQ, January 2005; USDA 2005 – Addendum to FS TEAMS Hydrology Report).

Culinary Water Sources

The Bryant's Fork Project analysis area includes three separate groundwater sources that supply culinary water for the Bryant's Fork Summer Home Group and the Strawberry Bay Recreation Complex (Hydrology Resources Map, Hydrology Specialist Report). The two Summer Home Group water sources are classified by Utah Division of Environmental Quality – Division of Drinking Water (UDEQ-DDW) as transient systems—serving primarily an itinerant population, and require development of a Source Water Assessment. For these sources, UDEQ-DDW developed Source Water Assessments identifying potential contaminants and estimating Drinking Water Source Protection Zones. The zones (UT Administrative Code R309-600) are as follows:

- Zone 1 is the area within a 100 foot radius from the wellhead or spring source.
- Zone 2 is the area within a 250 day groundwater time of travel to the wellhead or spring source.
- Zone 3 is the area within a 3 year groundwater time of travel to the wellhead or spring source.
- Zone 4 is the area within a 15 year groundwater time of travel to the wellhead or spring source.

Environmental Consequences -

Proposed Action - Forest Health/ Spruce Bark Beetle Treatment

Water Quality

Impacts to water quality from implementation of Proposed Action will be related to sediment delivery from roads to the waters within the project area. Phosphorous naturally binds to soils and sediment, so high sediment loads may produce elevated phosphorous levels, total suspended solids, and total dissolved solids in streams and reservoirs (USDA 2004 FS TEAMS Hydrology Report).

WEPP results show that implementation of this alternative would result in a net reduction of 0.6 tons of sediment per year in Unnamed Tributary #1 through the life of the project. Approximately 1.3 miles of existing closed road in the North Fork drainage will be improved for temporary use. Modeled results show that during project implementation, this road segment will increase sediment delivery to the North Fork by 1.4 tons per year. However, the sediment produced from this road segment can be reduced through utilization of BMPs during harvest activity and immediate obliteration following activity, as discussed in the Soils section of this document.

Following project completion, decommissioning of the 1.6 miles of temporary roads in the Project Area will permanently reduce sediment production in the Project Area by 1.4 tons per year as vegetation is reestablished. The long-term reduction in sediment production and delivery to the Bryant's Fork watershed can be applied toward recommended reductions for Bryant's Fork in the Strawberry Reservoir TMDL Study (WEPP Results, USDA 2005 – Addendum to FS

TEAMS Hydrology Report). Utilization of Design Features incorporated into the Proposed Action and throughout this section will further reduce potential for sediment delivery and impact to water quality and aquatic habitat during and after the project (USDA 2004 FS TEAMS Hydrology Report).

Culinary Water Sources

Implementation of this alternative will result in no direct impact to the culinary water sources within the project area. Indirect impact from implementation of this alternative may include overland delivery of sediment to source protection area.

Source #1 is located between treatment units 2 and 3. A segment of closed road to be temporarily reopened and utilized by the salvage activities is currently located within Zone 1 of this source, and will be improved to mitigate potential sedimentation in the source protection area. Improvement will include installation of road drainage features including water bars and/or rolling grade dips and regular maintenance on road segments found within Source Protection Zones 1 and 2. Approximately 0.4 miles of existing unclassified road within Source Protection Zone 2 will be similarly improved and maintained. Portions of treatment units 2 and 3 are located within Source Protection Zone 2, with proposed harvest activity including Salvage/Sanitation and Selection/ Favor of Spruce Regeneration. WEPP Modeling results show zero sediment from harvest activities leaving the treatment polygons (Project Record - WEPP Results). In order to further reduce potential transport of sediment or other contaminants from roads or treatment polygons to the collection area, sediment fence will be installed on the uphill and side slopes around Source Protection Zone 1.

Source #2 is located within the Summer Home Group, and immediately below treatment unit 1. No salvage activities will be conducted in Source Protection Zone 1. Source Protection Zone 2 includes portions of treatment units 1 and 2. Proposed harvest activity consists of Optional Sanitation/Hazard Prescription within the Summer Home Group. WEPP Modeling results show zero sediment from harvest activities leaving the treatment polygons (WEPP Results). Implementation of salvage activity would utilize only existing Classified Roads and result in no increased potential for road-related sedimentation of the source area above existing conditions.

Source #3 is located approximately one mile below treatment unit 5, in the Bryant's Fork drainage. This distance and the topography between the treatment units and the well ensures that no overland flows or sediment produced from harvest activities would directly impact the source area (WEPP Results).

In order to further reduce potential impacts to all culinary water sources within the project area, no activity associated with the salvage, other than discussed above, will be conducted within Zone 1 of the drinking water sources. Skidding and other harvest activity within Zone 2 will be minimized to the extent possible to reduce potential impact and achieve the purpose of the project. Landings will be located outside of Source Protection Zone 2. No fueling or storage of fuels/other potential contaminants will be allowed within the 400 meters of the water sources. This is approximately 150 meters beyond the 250 day groundwater time of travel to the wellhead or spring source (approximately 300 meters upslope and 200 meters downslope of the sources) identified in the Source Water Assessment. Self-contained fueling sites will be established outside of these zones

and RHCAs for the duration of the project. In the event of a chemical/fuel spill, contaminated soils will be removed from site and disposed of at an approved facility unless the operator can establish that there are no hazardous materials on site and that material can be buried and stabilized with no detrimental environmental effects (USDA 2005 – Addendum to FS TEAMS Hydrology Report).

Water Yield

Water yield is driven by the removal of cover. Approximately 2.9 acres of land currently occupied by road will be converted back to forest or meadow. This will either reduce or keep water yield stable at a localized level. Additionally, harvest activity will not remove enough cover to increase runoff at a watershed scale. Literature states that at least 15% of a watershed must be removed for increased water yields to be realized (Bosch & Hewlitt, 1982). The cumulative activities within the Bryant's Fork watershed will not remove 15% of the cover. Because of this, water yield will remain stable or decrease over time.

No Action

The no action alternative would maintain the current hydrology/watershed condition. No ground based disturbance would occur from timber harvest, road building, road reconstruction, improvement or obliteration. No direct impact to Wetlands and RHCAs will occur under this alternative. Water yield conditions will remain stable or decrease over time due to the continued movement of the forest to late seral communities.

The Proposed Action proposes to obliterate 1.6 miles of existing closed roads following project completion. Under the No Action Alternative, the 0.3 mile segment of existing closed road would remain in a rutted condition and contribute approximately 0.6 tons of sediment per year to Unnamed Tributary #1 (USDA 2004 FS TEAMS Hydrology Report). In addition, the 1.3 mile segment of closed road along the North Fork of Bryant's Fork will continue to exist in its current condition and contribute 0.8 tons of sediment per year to the stream (USDA 2005 – Addendum to FS TEAMS Hydrology Report). These existing closed roads are currently not on the Uinta National Forest Travel Management Plan, but they do exist and function as roads from a hydrological standpoint. To summarize, a total of 1.4 tons of sediment per year from closed roads would continue to reach Project Area streams with the selection of the No Action Alternative.

Water quality would continue to be impacted by current sediment rates originating from the 1.6 miles of existing closed roads within the project area. No reduction of sediment, and consequently, phosphorous to Strawberry Reservoir would occur. The No Action Alternative would not satisfy the recommendations of the Strawberry Reservoir TMDL Study (2005 UDEQ TMDL Study).

No direct or indirect impact to the Bryant's Fork Summer Home Group Culinary Water System would occur. Water yield for the Bryant's Fork drainage would not be affected through implementation of this alternative.

Under the No Action Alternative, long-term project area road density would not be reduced. No direct impact to water quality or stream and wetland resources would occur. Continued sheep grazing would not increase runoff, erosion, and sedimentation to streams as stocking rates are to

remain consistent or decline as utilization standards and guidelines are followed. However, decreases in forest canopy and groundcover due to spruce beetle infestation may result in increases in hillslope erosion and sedimentation, particularly as these will result in an increased fuel loading and fire severity, should ignition occur. Recreation would continue to be managed to control season and areas of use to limit resource damage. Reductions in phosphorous loads from Bryant's Fork and Unnamed Tributary #1 recommended in the Strawberry Reservoir TMDL Study would not be achieved through the No Action Alternative.

GRAZING MANAGEMENT

Affected Environment -
The proposed action is on two of the pastures within the Bryant's Fork S&G Allotment. The Bryant's Fork Allotment is approximately 3,494 acres in size. The Term Grazing Permit authorizes grazing of 1050 head of sheep (ewes with lambs) from 26 June to 30 September on the allotment for a total of 3,349 sheep months. The present grazing system is a three pasture rest rotation system which means that on a rotating basis one pasture is not to be grazed by livestock each year. The herding practice used by the permittee is one that keeps the sheep closer together and moving more frequently than typical of herds in the area. This allotment fits into the permittee's operation as summer range with range for the other seasons being in Arizona and California. The allotment was rested from livestock grazing for three consecutive years prior to the permittee getting a permit for this allotment.

There are two trend studies on the allotment. The nested frequency study indicates a stable trend in ground cover and an upward trend in vegetation. The riparian study indicates an upward tend with the area near late seral condition.

Environmental Consequences -
Proposed Action - Forest Health/ Spruce Bark Beetle Treatment
The areas cut during the timber harvest would be protected from livestock grazing until tree seedlings are of sufficient height to withstand livestock use in the area (Forest Plan S&G, Veg-15, page 3-19). To help accomplish this protection the existing rest rotation schedule and pasture location would be changed. The allotment would be divided into three pastures so that one pasture encompasses all the cutting units. This pasture would be rested each year and the other two pastures would be grazed with a deferred grazing system. This change in the grazing system would not change the number of head months presently permitted nor increase the amount of herding presently being done. The permittee's overall sheep operation would not be adversely affected by this alternative

Forested vegetation treatment areas would be excluded from livestock grazing until tree seedlings are of sufficient height to withstand this activity as determined by the silviculturist. The exclusion of sheep grazing from the treatment areas of the proposed action could reduce the number and season of livestock being grazed and require more herding. A reduction in head months and an increase in herding could have an effect on the permittee's operation and livelihood.

The upper portion of the north section of the Bryant's Fork Allotment could be used for the rest pasture with the ridge section between units 4 and 5 held in reserve if more forage was needed. This would mean that the rest of the allotment would be divided into two separate units and grazed on a deferred rotation basis. Because the Bryant's Fork allotment is small, this grazing scenario would work for perhaps three to four years but after that there may need to a reduction in numbers or season if vegetation and ground cover are to be maintained.

No Action
This alternative does not include the opening of the stand for regeneration and thus will not need any increased protect from livestock grazing. As a result the head months will remain the same as presently permitted and will not cause a change in the overall sheep operation.

FISHERIES

Affected Environment -
Bonneville cutthroat trout (*Oncorhynchus clarki utah*) and Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*) are identified as aquatic Management Indicator Species (MIS) for the Uinta National Forest and listed as a United States Forest Service (USFS) Region 4 (USDA Forest Service 2003b) and State of Utah sensitive species.

As aquatic MIS for the Uinta National Forest, populations of Bonneville cutthroat trout (BCT) and Colorado River cutthroat trout (CRCT) and their habitat are monitored to identify trends and changes in the status of these populations and their habitat relative to land management actions on the Forest. Population data are collected for each of the streams containing either conservation or persistence populations of BCT and/or CRCT as identified in the *Conservation Agreement and Strategy for BCT in the State of Utah* (UDNR 1997a); the Conservation Agreement and Strategy for CRCT in the State of Utah (UDNR 1997b); and the *Land and Resource Management Plan for the Uinta National Forest* (USDA Forest Service 2003a). These data include information that can be used to determine the distribution, abundance, and condition of BCT and CRCT populations on the Forest. 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).

The Bryant's Fork drainage is located within the Northeastern Geographic Unit (GU) for CRCT and streams in the watershed were historically inhabited by CRCT. The construction of Strawberry Reservoir fragmented and isolated headwater populations of CRCT, and subsequent "fisheries enhancement" activities and the introduction of non-native fish species is believed to have eliminated any remnant genetically pure CRCT populations within the Bryant's Fork drainage. Consequently, no conservation or persistence populations for CRCT have been identified within this watershed.

The Bear Lake strain of BCT have been introduced into the Strawberry River watershed and populations occur within a number of the stream systems including Bryant's Fork. Although BCT are a USFS Region 4 and State of Utah listed sensitive species, no conservation or persistence populations for BCT have been identified within the Bryant's Fork drainage.

Bryant's Fork
The Bryant's Fork drainage is located within the Northeastern GU for CRCT. Streams in the watershed were historically inhabited by Colorado River cutthroat trout. Colorado River cutthroat trout (CRCT) 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 and the introduction of non-native fish species is believed to have eliminated any remnant genetically pure CRCT populations within the Bryant's Fork drainage. Consequently, no conservation or persistence populations for CRCT have been identified within the Bryant's Fork drainage.

Because native populations of aquatic MIS for the Uinta National Forest no longer occur within the Bryant's Fork drainage, the USFS does not conduct fish population surveys in the drainage as part of the Forest-wide MIS monitoring program (Smith and Lyman 2004a). However, the USFS does conduct fish habitat and population monitoring surveys for watersheds on the Forest in which intensive land management activities and/or projects have been identified.

Fish Populations
The Bear Lake strain of BCT have been introduced into the Strawberry River drainage and populations occur within a number of the stream systems including Bryant's Fork. 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 Bryant's Fork watershed. Other native fish species believed to be present within the Bryant's Fork drainage include mottled sculpin (*Cottus bairdi*), mountain sucker (*Catostomus platyrhynchus*), Utah sucker (*Catostomus ardens*), redside shiner (*Richardsonius balteatus*), and speckled dace (*Rinichthys osculus yarrowi*). Although thought to be present in the Bryant's Fork drainage prior to the 1990 Rotenone treatment of the Strawberry River watershed, leatherside chub (*Gila copei*) and Utah chub (*Gila atraria*) are no longer found in the drainage (Sigler and Sigler 1996). (Smith 2005a)

In addition to Bonneville cutthroat trout, rainbow trout (*Oncorhynchus mykiss*) have been observed in the Bryant's Fork drainage. Other non-native fish species that may potentially occur within the watershed include Kokanee salmon (*Oncorhynchus nerka*). Sterile rainbow trout are currently stocked by the UDWR to supplement popular recreational fisheries in some locations within the management area, while hatchery operations by the UDWR on the Strawberry River support popular recreational fisheries for both cutthroat trout and Kokanee in Strawberry Reservoir. (Smith 2005a)

Amphibians
The distribution of amphibian species within the Bryant's Fork drainage is not well documented, though the boreal toad (*Bufo boreas boreas*) has been documented to occur within the management area. 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 (*Ambystoma tigrinum*), and Woodhouse's toad (*Bufo woodhousii*). (Smith 2005a)

Rare Aquatic Invertebrates

The distribution of aquatic macro-invertebrates considered by the UDWR to be rare or imperiled is not well documented. Observations of these species on the Forest are sporadic and in many cases relatively outdated. However, one species of rare aquatic snail, the glossy valvata (*Valvata humeralis*), has been documented to occur within the management area. However, there are no records of this species being observed within the Bryant's Fork drainage. (Smith 2005a)

Threatened, Endangered, and Sensitive (TES) Species

The Bear Lake strain of BCT are the only TES aquatic species believed to inhabit the Bryant's Fork drainage. This species was introduced into the watershed following the Rotenone treatment of the Strawberry Reservoir system during 1990. Because native populations of aquatic MIS for the Uinta National Forest no longer occur within the Bryant's Fork drainage, the USFS does not conduct fish population surveys in the drainage as part of the MIS monitoring program (Smith and Lyman 2004a). However, the USFS does conduct fish habitat and population monitoring surveys for watersheds on the Forest in which intensive land management activities and/or projects have been identified and this information is available for the Bryant's Fork drainage.

Because identified project related impacts to fisheries and aquatic resources will occur primarily in the North Fork of Bryant's Fork, this analysis only addresses the environmental issues associated with this tributary. Although surveys conducted in the South Fork of Bryant's Fork indicate that this stream does contain a small population of BCT below Forest Road 131, analysis of project effects show that there will be no negative effects to this population because there would be a decrease in sedimentation of approximately 0.5 tons/year through maintenance of existing closed roads.

Fish population data for the North Fork of Bryant's Fork include information collected during fish population surveys conducted by the USFS during 2003, 2004, and 2005 and the UDWR during 1985 and 1998. Fisheries surveys conducted by the UDWR during 1985 and 1998 resulted in estimated standing crop estimates for all trout species of 74 and 108 lbs/acre for respectively. During 1998, estimated fish densities in the North Fork of Bryant's Fork were 0.98 fish/m for cutthroat trout and < 0.01 fish/m for rainbow trout (Wilson et. al. 2003). (Smith 2005a)

Recent snorkel count surveys conducted by the USFS during 2003, 2004, and 2005 indicate that cutthroat trout densities in the North Fork of Bryant's Fork averaged 0.79 fish/m and ranged from 0.97 fish/m during 2004 to 0.54 fish/m during 2005. These data also show a 44 percent decline in cutthroat trout densities between the 2004 and 2005 estimates. Although cutthroat trout population data for the North Fork of Bryant's Fork show a decline in fish abundance between 2004 and 2005, the long-term population data show no statistically observable change in the abundance of cutthroat trout during the period between 1998 and 2005 ($P < 0.025$; $r^2 = 0.23$). (Smith 2005a)

The average year class composition for the cutthroat trout population in the North Fork of Bryant's Fork between 2003 and 2005 consists of 44 percent YOY (young of the year), 39 percent (1+), 16 percent (2+), and 1 percent (3+). Results of the 2005 estimate indicate a 71 percent decline in the observed abundance of YOY cutthroat trout since the 2004 estimate. This decline in YOY abundance suggests the possibility of relatively low spawning success and recruitment rates for the 2005 year class. (Smith 2005a)

Population data, using indices of overall condition (K Factor) for BCT within the North Fork of Bryant's Fork, is not sufficient to determine a statistically observable change in the average overall condition of cutthroat trout during the period between 1985 and 2005 because reliable condition data for BCT were not obtained during the surveys. (Smith 2005a)

Additional information used in this review relative to the status of BCT populations in the North Fork of Bryant's Fork are available in *Bonneville Cutthroat Trout Populations of the Uinta National Forest* (Smith 2004a), *Fisheries and Aquatic Resources Data of the Uinta National Forest* (Smith 2004b), *Bryant's Fork Forest Health Spruce beetle Treatment – Environmental Effects for Fisheries and Aquatic Resources* (Smith 2005b), and *Biological Assessment and Evaluation Fisheries and Aquatic Resources – Bryant's Fork Forest Health Spruce Beetle Treatment* (Smith 2005c).

Environmental Consequences -
Proposed Action - Forest Health/ Spruce Bark Beetle Treatment
As stated previously, erosion would be produced from harvest activities within the treatment areas, but sediment would be buffered well before reaching perennial streams or wetlands within the project area. Modeled results for the 1.3 miles road showed that 2.2 tons of sediment per year would be produced with high traffic conditions. During implementation, modeled results show an annual increase of 1.4 tons of sediment from the existing closed road in the North Fork of Bryant's Fork. The sediment produced from this road segment would be reduced through utilization of BMPs during harvest activity and immediate obliteration following activity, as discussed in the Soils and Hydrology sections of this EA. (WEPP Results, USDA 2005 – Addendum to FS TEAMS Hydrology Report)

Following review of the proposed project and potential effects of project implementation, it was determined that the greatest risk to fisheries and aquatic resources within the action area would result from increased run-off and sedimentation during project implementation. Project specific measures to reduce sediment yield and protect the stream channel and aquatic habitat have been incorporated into the proposed action. With the addition of these mitigation measures, combined with the Forest Plan Standards and Guidelines for roads and timber management, it is determined that there ***May Affect but not Likely to Adversely Affect*** aquatic species or their habitat resulting from implementation of the proposed action.

No Action
The no action alternative would maintain current aquatic habitat condition. No ground based disturbance would occur from timber harvest, road building, road reconstruction, improvement, or obliteration.

CUMULATIVE EFFECTS

This section describes other interrelated projects that may contribute to cumulative effects. Cumulative impacts 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.

With the exception of hydrology/water quality, old growth, fisheries, and wildlife resources the cumulative effects area of analysis is the Bryant's Fork Sub-Watershed which is approximately 2256 acres in size.

Past Activities:
Sheep grazing has occurred in the area since the 1860's. The Bryant's Fork Sheep Allotment has been grazed by sheep since the creation of the Uinta National Forest. Two pastures of the allotment are within the cumulative effects area. Rest/rotation of the pastures would allow grazing to continue on the allotment without overuse of any one pasture.

Several road closures have occurred within the analysis area in the recent past. The main Bryant's Fork Road, Forest Road 120, had 1.1 miles decommissioned from Strawberry Ridge down to the drainage bottom in 1989. In 1990, the upper 1.5 miles of Forest Road 290 was closed. Both closures were done for the purpose of watershed protection.

Logging activity occurred in Unit 2 (stands 248-02, 03 & 04), Unit 5 (stands 247-08 & 09), and the eastern portion of Unit 3 (stand 248-05) in the 1950s. There have been no recorded large fires within the analysis area. The Forest Geographic Information System (GIS) database shows one recorded fire occurring near the southern end of Unit 2 in stand 248-04. Walk through surveys and observations show very few fire-scarred trees or evidence of fire near the soil surface. A recent single-tree fire, with evidence of suppression was discovered near Unit 4 (outside the spruce stands); roughly to the south of where stands 247-06 & 07 meet.

The Bryant's Fork Summer Home community consists of 37 seasonal cabins adjacent to Strawberry Reservoir. Susceptible host spruce trees on the cabin lots were sprayed by the cabin owners with Carbaryl on May 19th, 2004. Carbaryl is a preventative spray which kills the beetles as they attack the un-infested trees.

In August 2004 a 100-foot wide shaded fuel break was completed around the Bryant's Fork Summer Home Community. All woody vegetation less than 8-inches DBH was cleared and remaining trees were limbed up to a height of 6-feet. Slash and downed fuels were primarily piled, however some material was chipped or piled near access roads for use by cabin owners. Prescribed burning of slash piles is scheduled for the fall or winter of 2005.
Two treatments using a combination of trap trees and funnel traps to temporarily reduce beetle populations were authorized on May 7, 2004, and May 12, 2005. The first trap tree treatment was implemented during the 2004 field season with the felling and removal of approximately 186 trap trees from each of the five units, approximately 1 tree per acre. Field reviews by Forest Health Protection Staff and district personnel indicated that this project had a positive effect on

reducing beetle populations and the number of attacks on standing green spruce trees within treated stands; however, significant and active populations still remained. Do to a lack of existing roads, and the restriction of ½ mile of temporary road construction allowed under the categorical exclusion, some trees in Unit 5 were skidded over the existing closed road for distances exceeding one mile. Portions of the closed road required slight leveling and/or widening of the road prism to facilitate safe operations. The skidding activity reduced the amount of vegetative cover that had previously existed. Obliteration and revegetation of skid trails was not performed in anticipation of re-use during subsequent entries, however water bars and debris were placed across all skid trails to minimize erosion.

The second trap tree treatment felled an additional 282 trap trees in the middle three units during June of 2005, with removal of the trap trees scheduled for the fall of 2005 or spring of 2006. Removal of the trap trees is discussed further below.

Present/Ongoing Activities:

- Sheep grazing occurs in the Bryant's Fork Watershed with a band of 1200 ewe/lamb with a season from 6/26 – 9/30 each year.

- Dispersed recreation in the Bryant's Fork Watershed consists mainly of hiking, horseback riding, hunting and ATV riding on Horse creek, Forest Development Road (FDR) 652 which is designated for ATV use. The Great Western Trail is located on top of Strawberry Ridge which is open to ATV use. There is some dispersed camping in the Bryant's Fork drainage, although it mainly occurs near the bottom of the drainage and the west side road FDR 131.

- Road maintenance in the Bryant's Fork Watershed consists of road grading annually in the summer home area by the summer home owners and on a rotation of priority for the main Bryant's Fork FDR 120, Horse Creek FDR 652 and the Right Fork of Bryant's Fork FDR 290.

- Bryant's Fork Summer Homes Special Use Permits are administered each year. Requirements include maintenance of defensible space by clearing fuels within 30 feet of residences annually, road maintenance and adhering to the terms and conditions of the permits.

- Moon Lake Electric Special Use Permit in the Bryant's Fork Watershed and in the Upper Strawberry Watershed involves maintenance of above ground and below ground power lines to the Bryant's Fork Summer Homes, Strawberry Bay Marina, Strawberry Visitors Center and all of the campgrounds. A utility corridor for power lines runs through the Upper Strawberry Watershed in the southern portion near Trail Hollow and the Willow Creek drainage. On an annual basis brush is cleared from the power line right of ways, and routine repairs are done on above ground and underground lines within the provisions of the permit.

- Noxious Weed Treatments – Treatments occur on an annual basis within the Bryant's Fork and Upper Strawberry Watershed 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 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 900 cords per year across the entire Uinta National Forest over recent years.

- Removal of Bryant's Fork Trap Trees #2 –The 282 trap trees felled in the spring of 2005 are scheduled to be removed in the fall of 2005 or spring of 2006. These trees consist of primarily large diameter (20"+ dbh) spruce which were located near pockets of recently infested trees to trap dispersing spruce beetles. In order to be effective the trap trees must be removed prior to flight the following spring. Trees will be removed using existing skid trails where possible. No new or temporary road construction will take place. The project area is approximately 129 acres and approximately 2 trees per acre will be removed.

- Watershed Project in Bryant's Fork Creek – A poorly aligned existing closed road which was utilized as a skid trail for trap tree removal, and which is contributing sediment to the creek needs water bars and installation of straw bales and check dams along the stream channel to control sediment – Scheduled for Fall 2005.

Foreseeable Future Activities:

- 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 Bryant's Fork 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.

- Off-stream Water Developments for Livestock in Bryant's Fork Creek – The Strawberry Watershed Restoration Report recommends installing a livestock water development in the lower section of Bryant's Fork Creek to pull livestock out of the bottom of the drainage and gain better distribution in the uplands. There is no specific proposed action at this time.

- Upgrade Water System in Bryant's Fork for Summer Homes – The analysis is scheduled for 2006 to consider a proposal from the home owners association to upgrade the water system on the east side of the development. The upgrade would primarily be needed for fire protection as required by Wasatch County for rural developments. This would

involve some ground disturbance for removing old tanks and burying larger tanks and new water lines.

- Aspen Regeneration and Beaver Enhancement Project – Areas will be identified were suitable beaver habitat exists and where conifer is encroaching on aspen stands. Treatment involves the removal of conifer to maintain aspen and stimulate aspen regeneration. There is no specific proposed action at this time.

Forested Vegetation Structure and Composition – Bryant's Fork Watershed
Cattle and sheep grazing will continue within the Bryant's Fork watershed. Grazing would be deferred from treatment units until regeneration is of sufficient height to withstand grazing pressure. Deferral of grazing would minimize browsing and trampling of regeneration and help to ensure the growth of established seedlings into larger size classes contributing to uneven-aged structure and age class diversity.

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. The majority of the project area is located far enough from open roads to discourage most potential gatherers. Bryant's Fork homeowners would have greater availability of downed wood and debris generated from harvest activities in the adjacent harvest unit. However, as seasonal residents, homeowner fuelwood gathering is not expected to increase significantly.

Removal of 282 trap trees from the Trap Tree II Project will occur in the fall of 2005 or spring of 2006. Trees would be removed from units 2, 3, and 4. Creation of gaps in the canopy and associated ground disturbance from skidding activities would stimulate natural regeneration of spruce and sprouting of aspen. Tree regeneration will serve to fill in these gaps providing for the establishment of a new age class and increased diversity to forest structure and composition.

In the foreseeable future activities such as aspen regeneration or beaver habitat enhancement projects would benefit forest structure and composition by removing encroaching sub-alpine fir from aspen stands and encouraging aspen sprouting. In the long term stable and healthy aspen stands would contribute to the diversity of age classes represented across the landscape.

Forest Insect and Disease Populations – Bryant's Fork Watershed
In addition to the Trap Tree I, funnel traps, and carbaryl spraying by the cabin owners, the planned activity of removing the 282 trap trees felled in the spring of 2005 will have a positive effect on reducing spruce bark beetle populations in the Bryant's Fork drainage. In general, one trap tree will absorb as many beetles as ten comparable-sized standing spruce (Nagel 1957). The subsequent removal of these trap trees will eliminate a large number of spruce beetles that would otherwise disperse from infested standing green trees in the spring of 2006 to attack nearby healthy green spruce trees. The effect of this planned activity would serve to reduce cumulative effects associated with the spruce bark beetle.

No other insects or diseases are known to exist beyond incidental or endemic levels. Trap tree removal could inadvertently cause damage to reserve trees from skidding operations leading to greater susceptibility for introduction of disease or other insect pathogens. Trap trees were

directionally felled to facilitate skidding over existing skid trails where they exist. Through timber sale administration to assure proper logging practices, it not anticipated that trap tree removal operations will lead to greater incidence of insects or disease.

Fuels Accumulations, Increased Fire Hazard/Intensity – Bryant's Fork Watershed
The ongoing activity of sheep grazing outside of the treatment areas removes fine fuels from the Bryant's Fork Sub-Watershed 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. The ongoing activity of fuels clearing by homeowners in Bryant's Fork community (≈30 feet around residences) does not contribute measurable cumulative effects to reduced fuels accumulations or fire intensity in the drainage, but does lessen the hazard of fire spreading in from outside and potentially igniting structures.

In the foreseeable future activities such as aspen regeneration treatments or beaver habitat enhancement projects would achieve a reduction of fuel accumulation by removing sub-alpine fir from aspen stands and reducing potential fire hazard in treated stands. In the long term stable and healthy aspen stands and riparian areas with active beaver would reduce fire hazard, intensity, and rate of spread within the sub-watershed.

Visual Landscape – Bryant's Fork Watershed
All projects implemented on the Forest have a site-specific assessment of their potential impacts to scenic resources. The prescribed VQOs serve as a guide for the design and implementation of management activities by being formally adopted into the revised Forest Plan. The term visual quality objective refers to the degree of acceptable visual alteration of the landscape as defined as follows: a desired level of scenic excellence based on the physical and sociological characteristic of an area. These long term VQOs or goals are based on a large scale visual inventory and management process called visual Management System.

The ongoing landscape alterations from mechanical thinning of aspen, oak, conifers to reduce fire danger around the summer homes yearly will not be evident to the casual visitor.

The Moon Lake Electric special use permit moved an existing electric power pole from one side of the road to the other side for safe vehicular access. This man made feature existed during inventory and incorporated into the Forest Plan in 2000. It is within an area inventoried as Retention. Visual effects for this modification are particularly those associated with views from the Westside road and recreation destination users of Strawberry Reservoir. This utility pole will remain a degraded element in the landscape, well into the future without any change.

Of the planned alteration activities associated with a skid trail for Bryant's Fork Creek this fall, will slightly alter the visually appearing natural riparian landscape by placing erosion control devices in Bryant's Fork Creek. This temporary alteration is a short term visual effect that will protect and enhance the visual quality of the Creek's riparian community in the long term. Visual effects for this modification will only be apparent to forest visitors hiking or recreating in the immediate creek for one season.

Of the foreseeable future projects the effects of grazing of scenery. Structural improvements such as fences may be evident to the landscape and could detract from the natural landscape if they are not properly located. Future fencing improvements are usually small and localized to have a minor effect on the visual quality of the surrounding area. Steel fencing materials are often used and offer less visual impacts, which maintains the visual quality objective for the surrounding area.

Present visual condition created by current timber harvesting and future timber harvesting for spruce beetle treatment, will potentially add slight to moderate impacts to the landscape in general. Timber management is being used to improve scenic quality, particularly where the spruce beetle infestations have been browning the existing spruce populations. In the short term, existing scenic integrity from timber management disturbances will be apparent in the natural landscape in the modification management activities from US 40 but this activity does follow Forest Plan direction by meeting the Visual Quality Objective of Modification. Long term these vegetative alterations are intended to change over time with re-growth from aspen and spruce regeneration. Once sufficient time has passed theses alterations will return to natural appearing condition.

The amount of landscape cumulative alterations will be acceptable, and maintain the scenic visual quality objectives of the Strawberry Reservoir Management Area.

Sensitive and Invasive Plants – Bryant's Fork Watershed
Virtually all ongoing, proposed, and foreseeable activities that involve humans and equipment have the potential for cumulative effects from invasive plants. Motorized vehicle and human use in the form of trap tree removal, water system upgrade, road maintenance/improvement, clearing defensible space and dispersed recreation encourage weed establishment through soil disturbance, possible seed importation, and reduction of shade. However, continued noxious weed treatments will help eliminate populations as they are discovered. Sensitive plant species, where they are known to occur will be protected from disturbance as required by federal law. Cumulative effects to sensitive and invasive plants from ongoing, proposed, and foreseeable projects can be anticipated, but through continued surveying, monitoring, and adherence to Forest Plan standards and guidelines during project development and implementation effects will be minimal.

Heritage Resources – Bryant's Fork Watershed
The ongoing, planned and foreseeable projects listed in the above section would not contribute effects cumulatively with heritage resources in the drainage. Each project would be surveyed as part of the analysis and if heritage resources were found the project design would be modified to protect them.

Grazing Management – Bryant's Fork Watershed
Harvested areas may have to be deferred from grazing to protect regeneration. Under the current proposal, the allotment would be divided into three pastures, with one encompassing all the cutting units. This pasture would be rested each year and the other two would be grazed with a deferred grazing system. The temporary change in the grazing system would not affect the

number of head months presently permitted, and would not affect the permittee's overall operation. Therefore, there would be no cumulative effects to grazing management.

Soils – Bryant's Fork Watershed

Of ongoing activities, sheep and cattle grazing cause the greatest impact to soils. The forest currently uses a rotational grazing system utilizing allotments to segregate sheep and cattle as well as to provide rest and renewal for pastures. Continued sheep grazing within the Bryant's Fork watershed will not likely increase runoff and erosion as the numbers of sheep grazed in the watershed are to remain consistent or decline with adherence to Forest Plan utilization standards and guidelines. Dispersed recreation use will be managed according to Forest Plan standards and guidelines, thus limiting resource damage. The ongoing activity of fuels clearing for defensible space by homeowners could increase surface runoff to a small extent, but it would be quickly absorbed by the surrounding vegetation. Cumulatively, ongoing activities will not have significant effects to soils.

Most planned activities would have positive cumulative effects to the soil resource through watershed restoration activities to curb erosion, stream bank stabilization and planting of riparian vegetation. The greatest ground disturbance occurs with construction of skid trails, landings and tree removal. Methods for removal of harvested timber can be the cause of increased soil erosion, such as gouging of slopes, skid trails, etc., which alter soil characteristics, permeability, and creating soil compaction. These activities could have lasting impacts on the soil and water resources if impacts are not mitigated. However, the application of Project Design, mitigation measures, and Best Management Practices (BMPs) should further minimize the extent of impacts to soils and watershed function. Trap tree removal operations will be of short duration (approximately 1 month), and will only take place during dry soil conditions. After use, skid trails will be rehabilitated with water bars and promptly reseeded. Trap tree removal will contribute to cumulative effects for soils, but through adherence to BMPs, mitigation measures and proper contract administration, effects will be short term.

Cumulative Effects for Water, Wildlife, Fisheries and Old Growth

The cumulative effects analysis area for water resources, wildlife resources, fisheries, and old growth is the Upper Strawberry Watershed which contains Bryant's Fork and 7 other sub-watersheds. The Upper Strawberry Watershed is approximately 136,000 acres.

In addition to the activities listed within the Bryant's Fork sub-watershed, the following planned and ongoing activities occur in the Upper Strawberry Watershed:

- Cattle and sheep grazing occurs in the Upper Strawberry Watershed each year with the following allotments, numbers and seasons:

Broad Hollow Sheep Allotment	1400 ewe/lamb	6/16-9/30
Chipman Sheep Allotment	1000 ewe/lamb	6/16-10/15
Mill B Sheep Allotment	1000 ewe/lamb	6/21-9/30
Mud Creek Sheep Allotment	1000 ewe/lamb	6/21-9/30
North Streeper Sheep Allotment	1200 ewe/lamb	6/21-9/30

Red Ledges Sheep Allotment	1200 ewe/lamb	7/1-9/30
South Streeper Sheep Allotment	1200 ewe/lamb	6/21-9/30
Squaw Creek Sheep Allotment	1200 ewe/lamb	7/1-9/30
Strawberry Sheep Allotment	1200 ewe/lamb	7/1-9/30
Trail Hollow Sheep Allotment	1000 ewe/lamb	6/16-10/15
Trout Creek Sheep Allotment	812 ewe/lamb	7/1-9/30
Twin Peaks Sheep Allotment	1250 ewe/lamb	6/26-10/05
East Daniels Cattle Allotment	935 cow/calf	6/21-9/30
Mud Creek Cattle Allotment	504 cow/calf	6/16-10/05
West Daniels Cattle Allotment	535 cow/calf	6/16-10/15

- Dispersed Recreation in the greater Upper Strawberry Watershed – These activities are similar to the Bryant's Fork drainage although on a larger scale. 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.

- 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.

- Upper Murdock Timber Sale (52 acres) - Harvesting of the Upper Murdock Timber Sale is expected to be completed in the fall of 2005. Harvesting focused on removal of larger diameter spruce (to reduce beetle risk rating and improve stand growth rates), defective spruce, and fir where it is competing with spruce. The smaller diameter classes were treated to remove the most defective trees and promote growth on selected superior individuals (including well formed and vigorous sub alpine fir). Average stand densities were reduced by approximately 1/3, leaving 110-120 ft^2 of basal area per acre.

- 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.

Foreseeable Future Activities:

- Telephone Hollow Timber Sale (≈220 acres) – This planned timber sale in the Upper Strawberry Watershed is composed primarily of dense lodgepole pine that has begun to convert to the more shade tolerant species. The objectives will be to maintain mature lodgepole pine, reverse the successional trend to shade tolerant species, and reduce mountain pine beetle risk. Start analysis in 2006.

- 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.

- Off-Stream Water Developments for Livestock; Horse Creek, Squaw Creek – The Strawberry Restoration Report recommends installing livestock water development in the above drainages to pull livestock away from the creeks to water and graze and achieve better distribution in the headwaters.

- Off -Stream Water Development for Sheep – This project has been proposed near the bottom section of Indian Creek to draw livestock out of the bottom of the drainage and gain better distribution in the uplands. The proposed action is to develop Baldy Spring south of Indian Creek and pipe water for the Chipman and Streeper Creek Sheep Allotments.

Old Growth

The ongoing activity of clearing fuels within 30 feet of summer homes may affect a few individual old trees either by removal or spraying with carbaryl (which may prevent successful attacks) however this amount would be very minor and incidental in the scope of old growth in the drainage. Around home sites only dead spruce would be removed in an effort to mitigate the hazards they pose to life and property if they were to fall.

During analysis it was determined that neither of the two stands to be treated in the Upper Murdock Timber Sale met all the criteria for old growth in Region 4. While both stands contained trees that meet the R4 guidelines for age and size, the guidelines indicate that trees must be both 20" dbh and greater *and* at least 220 years old. An insufficient amount of trees were present in either stand to meet the old growth criteria.

Of planned activities that are relevant to cumulative effects to old growth, only the Trap Tree #2 project contributes to cumulative effects. Some of the trap trees felled this spring which are scheduled to be hauled out in the fall of 2005 may meet the Region 4 definition of old growth (see Old Growth section in Chapter 3 for definitions)**.** The 282 trees to be removed account for approximately 2 trees per acre from the Trap Tree #2 project area, not all of which meet the required age minimum of 220 years old. Stand examination data found some trees that exceeded 200 years, but the majority of trees aged were 180 years old or less.

A survey for old growth conifer stands in the Strawberry Watershed was conducted in the summer of 2004. The survey indicated that 16% of the entire watershed met the definition for structural old growth in spruce/fir habitat. This survey only examined the conifer types within the watershed, thus there may be aspen stands that meet old growth criteria that would increase the overall percentage. The trap tree removal does contribute to an increased cumulative effect to reduction of old growth by removing a portion of trees that meet old the growth criteria. Because age data was not collected for trap trees, the exact number of trees removed that qualified as old growth is uncertain.

The planned timber sale in the Telephone Hollow area consists of consists primarily of intermediate to mature lodgepole pine, with lesser amounts of fir and aspen that do not meet old growth criteria. Therefore this planned activity will have no cumulative effects on old growth within the Upper Strawberry Watershed.

There are not any cumulative effects to old growth in the other foreseeable future projects in the Bryant's Fork sub-watershed.

Wildlife Resources

Past, present, and reasonably foreseeable future actions that have direct and indirect effects on wildlife resources similar to those of the proposed action are the 2004 and 2005 Bryant's Fork trap tree projects, other timber sales within the Strawberry Reservoir Management Area, and personal use fuelwood harvesting within the Strawberry Reservoir Management Area. These actions were considered in assessing the potential impacts of the proposed action on population trend and population viability of different wildlife species in the Environmental Consequences section of Chapter 3 and in the *Biological Assessment* and *Wildlife Biologist Report and Biological Evaluation* (project file).

The 2004 and 2005 trap tree projects occurred within the same project area as the proposed action. Approximately 186 large spruce trees were harvested and removed during the 2004 project and 282 have been felled for the 2005 project, with removal scheduled for the fall of 2005.

Past timber sales within the Upper Strawberry Watershed are primarily located along Strawberry Ridge northwest of the proposed project area. Approximately 1,300 acres have been harvested within the watershed since 1970 when accurate records began to be taken. Approximately 80 of those acres were harvested using the clearcut harvest system in aspen stands, 36 acres using the shelterwood method in lodgepole pine stands, and the remainder using single-tree and small group selection systems within the spruce-fir type. In addition, a 52-acre timber sale in spruce-fir near Murdock Hollow, approximately 8 miles northwest of the Bryant's Fork project area will be completed by 2006. A 220-acre timber sale is in lodgepole pine forest located in Telephone Hollow approximately 9 to the north is also being planned.

Personal use fuelwood harvesting is allowed within the Upper Strawberry Watershed through permits issued by the Forest Service. The sale of fuelwood permits has changed little in recent years and is not expected to change much in coming years (USDA Forest Service 2003c:page 3-26).

After assessment of the past, present, and reasonably foreseeable actions described above, the Forest Service has concluded that implementation of the proposed action would not result in significant impact to any of the wildlife species analyzed (i.e., would not impact population trend or population viability of wildlife species analyzed at the spatial scale of the Uinta National Forest). The rationale for this conclusion is that 1) the only wildlife species analyzed that is known to occur in the project area and whose population viability is of concern is the boreal toad, and the proposed action would have minimal effect on this species' aquatic and riparian habitat because of Best Management Practices and protections for Riparian Habitat Conservation

Areas (see discussion on page 30); and 2) the proposed action would impact approximately 200 acres of spruce-fir forest, which amounts to less than 1% of the spruce-fir type in the Upper Strawberry Watershed (see discussion on page 29 and 30).

Hydrology/Water Quality

Ongoing sheep grazing will not increase runoff and erosion and sedimentation to streams as stocking rates are to remain consistent or decline, and utilization standards and guidelines are to be followed. Recreation will be managed in a way as to control season and areas of use, thus limiting resource damage. The ongoing activity of fuels clearing for defensible space by homeowners could increase surface runoff to a small extent, leading to potential sediment delivery to streams. However, an ample vegetative buffer exists between the majority of the homes and area streams. Additional runoff would be adequately filtered by the surrounding vegetation.

For the ongoing Upper Murdock Timber Sale, the primary concern is erosion into streams and disturbance to unstable land masses. As previously mentioned, methods for removal of harvested timber can be the cause of increased soil erosion, such as gouging of slopes, temporary roads, skid trails, etc., which alter soil characteristics, permeability, and creating soil compaction. All streams in the area are intermittent. Temporary roads will occur on already existing closed roads which will be properly closed following harvest to prevent illegal use and reduce overall road density. Opportunities to improve conditions on system roads and lower erosion rates through resurfacing with gravel, outsloping, and improving culverts/stream crossings will be done. Through the use of Best Management Practices and Forest Plan direction, effects will be short term in nature. Cumulatively, ongoing activities will not have significant effects to hydrology or water quality.

Of the planned and foreseeable future activities, only the Trap Tree II removal and Telephone Hollow Timber Sale would contribute negative cumulative effects. Trap tree removal operations will be of short duration (approximately 1 month), and will only take place during dry soil conditions. After use, skid trails will be rehabilitated with water bars and promptly reseeded.

In addition, the watershed project in Bryant's Fork Creek will be completed before trap tree removal, mitigating much of the risk of sedimentation through the installation of straw bales, wattles, and check dams in vulnerable areas. In the long-term, decommissioning of the 1.6 miles of unclassified roads in the Project Area will permanently reduce sediment production in the Project Area by 1.4 tons per year as vegetation is reestablished. The long-term reduction in sediment production and delivery to the Bryant's Fork watershed can be applied toward recommended reductions for Bryant's Fork in the Strawberry Reservoir TMDL Study. Trap tree removal and implementation of the Telephone Hollow Timber Sale will contribute to cumulative effects for hydrology and water quality, but through adherence to BMPs, mitigation measures built into the projects, and proper contract administration, cumulative effects will be minor and short term.

The proposed action would result in no direct or indirect impacts to culinary water systems (USDA 2005 – Addendum to FS TEAMS Hydrology Report). Water yield for the Bryant's Fork drainage would not be affected through implementation (USDA 2004 FS TEAMS Hydrology Report). Therefore, there will be no cumulative impact to water yield or culinary water systems.

Fisheries
All streams in the activity area are intermittent and are not viable fisheries, with the exception of Little Hobble Creek which is stocked and is a potential natural fishery. Harry's Reservoir has an over-wintering fish population, but both Little Hobble Creek and Harry's Reservoir are located about 2 miles north and would not be affected by the timber sale either directly or indirectly.

Planned activities that may contribute to cumulative effects include the Bryant's Fork Trap Tree II removal and Telephone Hollow Timber Sales. Methods for removal of harvested timber can be the cause of increased soil erosion and lead to stream sedimentation affecting the fishery. One limiting factor for aquatic habitat suitability is the amount of fine sediment within a stream channel. The watershed project in Bryant's Fork Creek will be completed before trap tree removal, mitigating much of the risk of sedimentation through the installation of straw bales, wattles, and check dams in vulnerable areas. The Trap Tree II project and Telephone Hollow Timber Sales will likely contribute to short term cumulative effects to the Upper Strawberry Watershed fishery, but through adherence to BMPs, the Forest Plan, mitigation measures built into the projects and proper contract administration, there will be no lasting cumulative effects.

AGENCIES AND PERSONS CONSULTED

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:

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US Fish and Wildlife Service

Wasatch County Board of Supervisors

TRIBES:
Northern Ute Indian Tribe

OTHERS:
Bryant's Fork Homeowner's Association
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Appendix A
Non Significant Issues Discussion

The following discussion separates the non significant issues identified through scoping and the IDT process into three categories: 1) Issues mitigated through project design; 2) Issues outside the scope of the proposed action; 3) Issues already decided or influenced by law, regulation, Forest Plan, or other higher level decision. This section includes discussion on each of these non significant issues. The Council on Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)…"

Issues Mitigated through Project Design

Visual Quality

Achieve landscape enhancement through addition, deletion or alteration of landscape elements. Examples of these include; addition of vegetation species to introduce unique form, color, texture to existing vegetation and vegetation manipulation to open up vistas or screen out undesirable views.

Employ techniques such as feathering, leave trees, shaping cuts to duplicate naturally occurring open pockets, or aspen clones in the area, which will alleviate unnaturally appearing geometric lines and forms.

Avoid sky-lining salvage related disturbance. Objectives or naturally appearing forms become greatly exaggerated when in silhouette on the horizon; particularly when contrasted against a blue-sky or moon-lit background.

Where practical, angle skidding and logging road corridors away from any major roads and align them as close to the natural contour as possible to prevent direct views down theses corridors.

Where necessary to meet Forest Plan visual quality standard, remove or visually screen from view. In Units 247-08 and 247-09, remove all created slash which may be readily recognized within the immediate foreground view. Where practical, directionally fell trees away from roads, and cut trees at a slant (low to ground) positioning the exposed cut to face away from roads. An IDT and presale forester will visit the project area and identify visually sensitive areas to be included in the contract and apply the appropriate contract provisions.

The 2003 Uinta National Forest Land and Resource Management Plan (2003 Forest Plan) established Visual Quality Objectives (VQOs) for the Forest. Based on the 2003 Forest Plan, the VQOs for the project area are primarily Retention and Partial Retention. The attached Visual Quality Objective maps show the VQOs for the project area. Landscape design techniques that can help mitigate or minimized negative elements of the proposed activity are:

Clearings with shapes that borrow from the natural openings in the landscape surrounding Strawberry Reservoir are more visually pleasing and less noticeable to the traveler and the casual visitor.

Natural appearing edges can be achieved in vegetation manipulation by locating boundaries at existing biological edges; feathering and scalloping create a near natural appearance. Combining this technique with leaving tree islands in the opening, the result can be very desirable outcome.

In Retention, special emphasis should be placed on protecting or establishing advanced regeneration prior to the final removal of the existing stand on any harvest area. This would be facilitated by requiring skidders to stay on designated skid trails.

It is important to design the proposed harvest activity so that activities do not appear too large or to small in the existing landscape and travel corridor around US Highway 40 and Strawberry Reservoir.

User Access
Preclude public use of newly constructed roads to keep the public from becoming accustomed to driving to certain areas that were not accessible with vehicles prior to the road and skid trail construction.

Heritage Resources
The proposed treatment areas were surveyed during the summer of 2004. There are no known significant historic or cultural resource sites that could be affected by any of the proposed treatments. Contract provisions included in the action alternative would include language for protection of historic sites should any be discovered during operations.

Recreation
Potential conflicts between recreationists and logging operations will be minimized primarily by implementation of hauling restrictions during peak holiday periods and weekends. The actual project work is located in areas that are currently not heavily used except for some hunting during the deer and elk seasons. It is expected that this hunting use will be displaced during the project implementation.

Traffic Safety
Current use on the Bryant's Fork Road is primarily associated with the summer home group. Traffic signs, slow speeds and some minor reconstruction on the road will alleviate traffic safety problems.

Road Capacity
Hauling capacity on the Strawberry West Side Road is limited due to the deteriorating and thin asphalt. Restrictions limiting the season of use to dry summer months and axle weight limitations (75% of legal load/axle maximum) will be applied to trucks hauling timber from this timber sale.

Soil Erosion/Compaction
Skid Trails: Where possible, trees would be skidded to ridgetops for removal to avoid RHCAs. Where crossing a RHCA is necessary, operator must have prior approval by an authorized Forest Officer. Disturbance within 50 feet of RHCAs will be recontoured, surface gouged or pocked and littered with forest duff/mulch to decrease potential sediment delivery to streams. Avoid

repeated use of skid trails during wet periods. At the conclusion of the project, skid trails should be obliterated and revegetated. Consideration should be given to alleviate any soil compaction on heavily used skid trails using a tracked excavator to help ease soil compaction through pocking the surface soil and by mixing any slash and debris into the soil surface. At a minimum, lightly used skid trails should be covered with debris and slash. Slash will be left on site to minimize rain splash and soil erosion. Skid trails will be designated (identified and approved) prior to skidding and existing trails would be utilized where possible.

No logging equipment will operate on slopes in excess of 40%. Infested trees only shall be removed from steep areas (using cables and winches) where removal can be accomplished without causing resource damage.

Landings: Because landings incur concentrated vehicle traffic from skidders and logging trucks, these areas are very vulnerable to detrimental soil disturbance and compaction. Landings need to be completely obliterated using a tracked excavator employing deep surface roughening and pocking to alleviate soil compaction.

Non-forest System Roads: Non-forest (ghost) system roads not necessary for on-going timber sale operations should be obliterated, surface gouged or pocked, littered and revegetated to help prevent use by the general public.

Temporary Roads: During the life of the road(s), proper surface maintenance via grading and water bar placement should be done to help minimize surface runoff and sediment protection. Hay bales or straw wattles will be used where temporary roads are within or immediately adjacent to Riparian Habitat Conservation Areas (RHCAs) to reduce sediment delivery.

Hydrology/Water Quality

All streams, including intermittent, will have a protective buffer strip left intact (RHCA) as provided for in the Forest Plan. Logging equipment will be excluded from these areas, except where the Forest Service designates necessary crossing. Only infested trees would be designated and removed from RHCAs. Following project completion, roads will be obliterated, reshaped to contour, surface roughened, and seeded with native vegetation.

Where proposed temporary roads cross drainages, structures such as bridges or culverts should be installed and removed upon completion of sale activities. Crossings should be perpendicular to stream courses and measures taken to insure minimal damage to the stream course and sediment introduction to the stream. The temporary road accessing Stands 247-08 and 247-09 runs parallel to the stream course for approximately 1.5 miles and has potential for sediment introduction into the stream course. Construction of this road should be done away from the stream in every possible place; 200 feet where feasible. Avoid crossing this stream, but where unavoidable utilize structures as noted above. All temporary roads shall be properly drained to minimize sediment transport. This shall include cross-drain dips and/or hardening of the surfaces in areas where grades are in excess of 6%. Where temporary roads must exceed 12% grade they shall be kept less than 300 feet in length for continuous stretches. All temporary roads shall be cross-drained and should not be used during periods of wet conditions unless surfacing is provided and approval is given.

Rare Plants/TES
Surveys were conducted during August, 2004 within the treatment units for rare or TES plants. Suitable habitat for the moonworts (*Botrychium spp.*), a species listed as sensitive by the Forest Service, occurs within the project area. No Slender Moonworts were located in these surveys. Contract provisions requiring protection to any populations found during operations would be included.

Fisheries
Although Bryant's Fork Creek extends into the project area, stream surveys indicate the reaches of this stream occupied by fish are located well downstream from the treatments. Reduction of sediment input using the previously stated mitigation measures such as proper design, hay bale and straw wattle placement would protect these concerns.

Migratory Bird Treaty Act
Cutting operations could disturb nesting migratory birds utilizing this area. In order to mitigate this conflict, cutting will be restricted to occur after the nesting season (July 15).

Noxious Weeds
Require that equipment and their transport be washed prior to accessing the timber sale area. This includes Forest Service and Private Equipment.

Require that ATVs used in timber sale activities and their transports be washed prior to accessing the timber sale area. This includes Forest Service and Private Equipment.

Include in the timber sale contract clauses requiring monitoring for and control of weed populations found in the timber sale activity area.

Issues Outside of the Scope of the Proposed Action

District Wide Analysis of Beetle Population Expansion
Populations of bark beetles are increasing in other areas of the Heber Ranger District and an alternative should be developed to address this situation in addition to the epidemic developing in Bryant's Fork. While this is true, it is not within the scope of a site specific NEPA analysis to consider such an alternative.

Firewise Education for Cabin Owners
Firewise principles are becoming increasingly accepted and known by homeowners with structures in a forested environment. Currently the homeowners, Wasatch County, and the Uinta fire prevention and suppression staff, and the Heber Ranger District are ongoing in an effort to increase the awareness of the homeowners to these principles and develop a fire safe environment within the summer home group. Inclusion of further education activities as part of this proposal is outside the scope of this analysis which deals primarily with the health and condition of the forested stands outside of the special use area.

Issues Already Decided or Influenced by Law, Regulation, Forest Plan, or other Higher Level Decision.

Aquatic and Riparian Habitat S&G
Standards and Guidelines for aquatic and riparian habitat are found on pages 3-2 through 3-3 of the 2003 Forest Plan.

Soils and Water Quality S&G
Standards and Guidelines for soil and water resource management are found on pages 3-8 through 3-10 in the 2003 Forest Plan.

Wildlife and Fish Habitat Management S&G
Standards and Guidelines for fisheries and wildlife are found on pages 3-11 through 3-13 of the 2003 Forest Plan.

Fire Management S&G
Standards and Guidelines for fire are found on pages 3-14 through 3-15 of the 2003 Forest Plan.

Noxious Weeds Management S&G
Standards and Guidelines for noxious weeds are found on pages 3-15 through 3-17 of the 2003 Forest Plan.

Vegetation Management S&G
Standards and Guidelines for vegetation are found on pages 3-17 through 3-20 of the 2003 Forest Plan.

Timber Management S&G
Standards and Guidelines for timber management are found on pages 3-20 through 3-23 of the 2003 Forest Plan.

Grazing Management S&G
Standards and Guidelines for grazing are found on pages 3-25 through 3-28 of the 2003 Forest Plan.

Scenery Management S&G
Standards and Guidelines for scenery management are found on page 3-31 of the 2003 Forest Plan.

Range of Alternatives
Section 104 of the HFRA establishes special procedures when agencies prepare EAs for authorized hazardous fuel reduction projects. Directions implementing HFRA provide that for areas inside the wildland-urban interface and within 1½ miles of the boundary of an at-risk community, the USDA Forest Service is not required to analyze any alternative to the proposed action (Section 104 (d)(2)). Also, no feasible alternatives to the proposed action were brought forward during the scoping process. However, to more adequately address concerns regarding

the effectiveness of the proposed action, the no action alternative was also included in the analysis to aid in evaluating effects.

Public Involvement Process limited with the New Regulations

Section 104(f) of the HFRA encourages meaningful public participation during preparation of hazardous fuels-reduction projects. As summarized in the "Public Involvement" section of the EA, ample opportunity was provided for public participation. Public involvement was sought at all stages of the analysis and there will be opportunity for review prior to the final decision. Public participation related specifically to the new regulations is outside of the scope and control of this project.

Inclusion in Two Tom Hill Roadless Area

There was public comment suggesting that a substantial portion of the project area was within the boundaries of the Two Tom Hill Inventoried Roadless Area (ID #418013). The boundary of the Two Tom Hill Roadless Area identified in the 1983 inventory of roadless areas on the Uinta National Forest does include the project area (FEIS for the 1984 Uinta National Forest Land and Resource Management Plan, Appendix C, page C-46). However, the inventory of roadless areas on the Uinta National Forest was updated as part of the revision of the Uinta National Forest Land and Resource Plan (2004 Forest Plan, page B-28 through B-31), and included in Appendix C to the Final Environmental Impact Statement for the 2003 Forest Plan. The updated boundary of the Two Tom Hill Roadless Area clearly does not encompass the project area (see map of this Inventoried Roadless Area in the FEIS for the 2003 Forest Plan, page C-94).