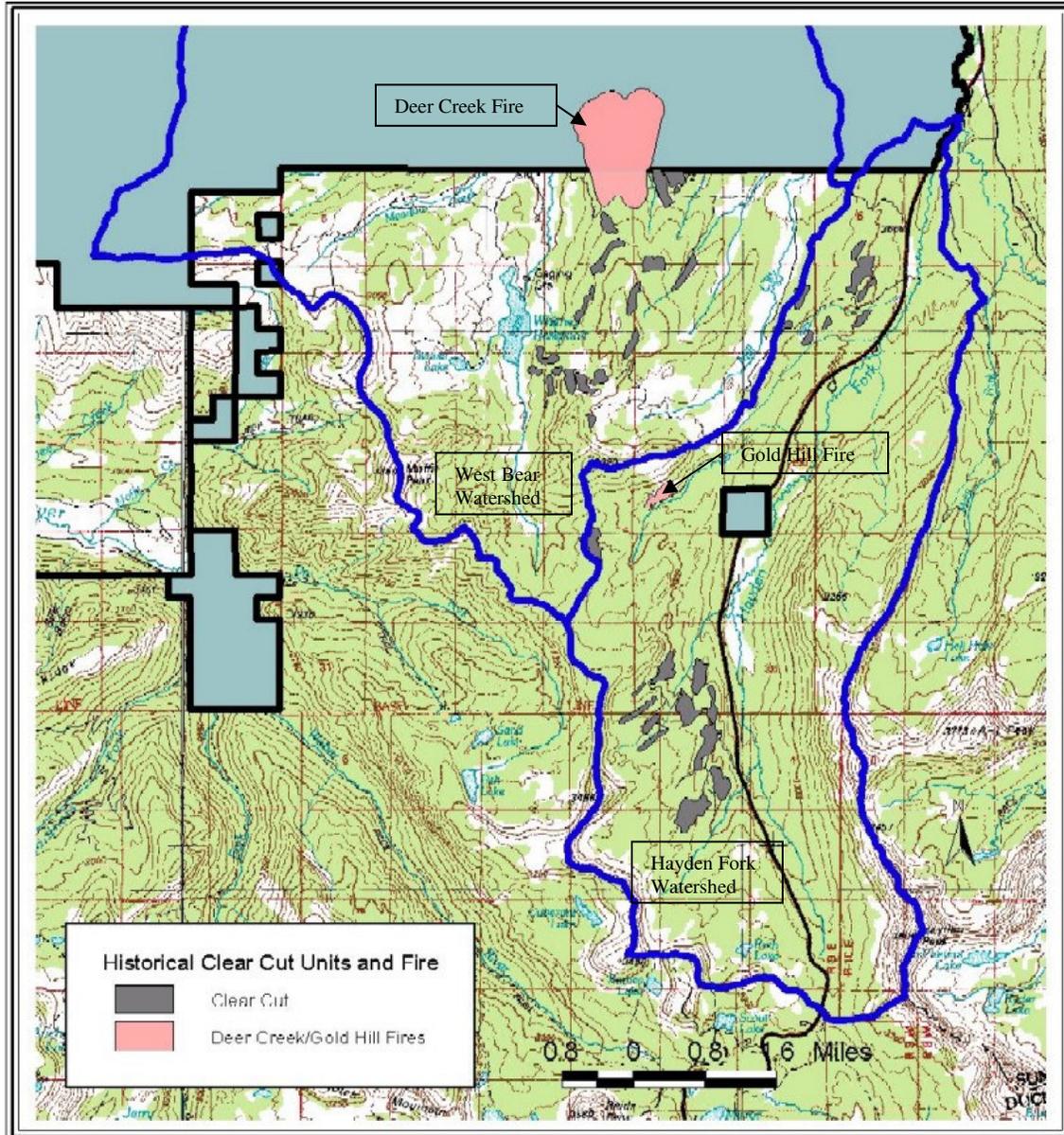


3.5 Fire and Fuels

This analysis will be used to determine the effects of the alternatives on the structural biodiversity of plant communities and on Fire Regime Condition Class in the two watersheds in which this project occurs. For direct and indirect effects, the area of analysis for vegetation is the area where the proposed activities would take place. The analysis areas for cumulative effects on vegetation are portions of the West Fork Bear and the Hayden Fork Watersheds that occur on National Forest System lands (Figure 3.5.1). Fire Regime Condition Class analysis includes the Hayden Fork watershed, an area larger than the West Bear analysis area.

Figure 3.5.1. Historical Disturbances in the West Bear and Hayden Fork Watersheds



3.5.1 Assumptions and Methodology of Analysis

The Forest Vegetation Map was overlain with 1960's allotment vegetation maps to refine the non-forested component of these watersheds. In addition, the Forest Activity Map, which includes historic harvest units and fires, was used to further refine the structure and seral stages of the plant communities within these watersheds. Fire Regime Condition Class (FRCC) seral stages were then assigned to each polygon in these watersheds where they could be reasonably assessed.

The desired conditions for FRCC seral stages are described in default reference conditions available on the FRCC web site (www.frcc.gov). These include reference conditions for the Interior West Lower Subalpine Forest #1 (Barrett 2003) and Cool Sagebrush (mountain big sagebrush) with Trees (Havlina 2003) potential natural vegetation groups. The desired watershed structure and patterns are described in the Wasatch-Cache National Forest Revised Forest Plan (USDA Forest Service 2003) guideline for biodiversity and viability (G-14).

Fire Regime Condition Class (FRCC) is a measure of the departure from the natural fire regime of a watershed. Three condition classes have been defined.

FRCC 1 – Low (0-33%) departure: Fire regimes are within the natural or historic range and the risk of losing key ecosystem components is low. Vegetation composition and structure are intact and functioning.

FRCC 2 – Moderate (34-66%) departure: Fire regimes have been moderately altered. The risk of losing key ecosystem components is moderate. Fire frequencies may have increased or decreased by one or more return intervals, causing moderate changes in fire behavior and vegetation structure.

FRCC 3 – High (67-100%) departure: Fire regimes have been substantially altered. The risk of losing key ecosystem components is high. Fire frequencies may have departed by multiple return intervals. This may result in dramatic changes in fire size, intensity/severity, and watershed patterns. Vegetation attributes have been substantially altered.

FRCC is calculated by comparing current conditions to reference conditions for fire frequency, fire severity, and the proportion of vegetation fuels classes (five seral stage and canopy cover classes) across a watershed.

As noted above, the project area covers all of the National Forest portion of one 6th order HUC (hydrologic unit code) and part of another (the West Fork Bear and Hayden Fork watersheds, respectively). Assessments on the portions of the West Fork Bear and Hayden Fork watersheds were completed that occur within the National Forest boundary, using the standard landscape method (see www.frcc.gov). For reference conditions, the default reference conditions available on the website were used (SPF11 Barrett 11/25/03 and CSAG2 Havlina 8/29/03).

The assessments were done from the office using black and white digital orthophoto quadrangles, GIS vegetation maps and acreage summaries, and the Interdisciplinary Team's extensive knowledge of this area. Fire Regime Condition Class (FRCC) seral stages were then assigned to each polygon in these watersheds where they could be reasonably assessed.

A key assumption for the analysis is that wildfires will continue to be suppressed in the West Bear Analysis area under the Wasatch Cache National Forests Fire Management Plan (USDA FS 2005) because of the developed nature of the watershed and the proximity of downwind private land and homes. Although wildfires cannot always be immediately suppressed (the East Fork Fire that escaped initial suppression resulted in an outside fire perimeter of 14,000 acres), successful fire suppression over the years has resulted in changes in species composition, age class distribution, and down woody fuel loading.

3.5.2 Existing Inventories, Monitoring, and Research Literature Review

The Forest Vegetation Map and 1960's allotment vegetation maps were used as the basis for determining forest and non-forest vegetation cover types. The Forest Activity Map, which includes historic harvest units and fires, was used to further refine the structure and seral stages of the plant communities within these watersheds.

3.5.3 Affected Environment

West Fork Bear Watershed

The West Fork Bear watershed is dominated by a variety of forested cover types. A far greater amount of Mixed Conifer communities occur in this watershed than the adjacent Hayden Fork watershed, along with Spruce/Fir, Aspen, Aspen-Conifer, and Conifer-Aspen communities. In general, most forested communities are dominated by mature trees, with the exception of that portion of the watershed which had been clearcut, and those acres included in the Deer Creek Fire, which burned in 1980, and the Gold Hill Fire, which burned in 1956 (See Figure 3.5.1).

Unlike the Hayden Fork watershed to the east, this watershed has a conspicuous component of openings dominated by either sagebrush or by tall forb communities. The topography in this watershed is much gentler and has neither the evidence of glaciation (U-shaped valleys) nor does it reach the higher elevations of the Hayden Fork watershed. This watershed begins at approximately 8,000 feet elevation at the lowest reaches of this watershed off forest. On the forest this watershed begins at approximately 9,000 feet elevation and reaches approximately 11,000 feet elevation at Moffit Peak.

Hayden Fork Watershed

The Hayden Fork watershed starts at about 8,500 feet elevation and reaches nearly 12,500 feet elevation at Hayden Peak. Like the West Fork Bear watershed, this watershed is dominated by a variety of forested cover types. Unlike the West Fork Bear watershed, however, this area has a far greater component of Lodgepole Pine and Spruce/Fir communities. And, like the West Fork Bear watershed, mature trees dominate most forested communities, with the exception of that portion of the watershed which had been clearcut. Fire has played a rather insignificant role in this watershed.

3.5.3.1. Fire Regime Condition Class Assessment

Table 3.5.1 shows the acres of *Interior West Lower Subalpine Forest #1* (SPFI1) Potential Natural Vegetation Group (PNVG) and the *Cool Sagebrush (Mountain Big Sagebrush) with Trees* (CSAG2) PNVG within the West Fork Bear and Hayden Fork watersheds. The "Other" PNVG includes a combination of Barren, Wet Meadow, Willow, and/or Tall Forb communities. The potential natural vegetation group *Interior West Subalpine Forests #1* (SPFI1) represents all of the conifer and aspen cover types within both watersheds analyzed. This includes the aspen, aspen-conifer, conifer-aspen, spruce/fir, lodgepole, and mixed conifer cover types, and is the majority of the area. The defined reference conditions for SPFI1 seem to fit this area fairly well. Sagebrush and similar cover types, such as smaller amounts of mountain shrub and tall forb communities, make up about 30% of the West Fork Bear watershed. Reference conditions described for the mountain big sagebrush with potential tree replacement, *Cool Sagebrush (Mountain Big Sagebrush) with Trees* (CSAG2), were appropriate for that stratum.

Table 3.5.1. Potential Natural Vegetation Group Summary for the West Fork Bear and Hayden Fork watersheds

| Potential Natural Vegetation Group (PNVG) | West Fork Bear | | Hayden Fork | |
|--|----------------|---------|-------------|---------|
| | Acres | Percent | Acres | Percent |
| Interior West Lower Subalpine Forest #1 (SPFI1) | 8,757 | 64.8 | 13,540 | 79.5 |
| Cool Sagebrush (Mountain Big Sagebrush) with Trees (CSAG2) | 2,490 | 18.4 | 544 | 3.2 |
| Other | 2,270 | 16.8 | 2,947 | 17.3 |
| Total | 13,517 | 100.0 | 17,030 | 100.0 |

Table 3.5.2 shows the FRCC seral stages of the SPFI1 PNVG for both watersheds, and the CSAG PNVG for the West Fork Bear watershed. These figures indicate a clear dominance of the two late seral stages (open and closed). Several acres of “undetermined” seral stage status were identified through a GIS assessment of the vegetation cover types within these watersheds. A visual assessment of these areas indicated, however, that a majority of these stands fit into the late seral, closed FRCC seral stage (ELSC) and the remaining acres fit into the late seral, open FRCC seral stage. Results of the FRCC assessments are in Table 3.5.3.

Table 3.5.2. Percentages of each FRCC Seral Stage used for FRCC Assessment based on the GIS assessment of vegetation cover types within the West Fork Bear and Hayden Fork watersheds.

| Fire Regime Condition Class Seral Stage | West Fork Bear Interior West Lower Subalpine Forest #1 (SPFI1) Percent | West Fork Bear Cool Sagebrush (Mountain Big Sagebrush) with Trees (CSAG2) Percent | Hayden Fork Interior West Lower Subalpine Forest #1 (SPFI1) Percent |
|---|--|---|---|
| Early seral post-replacement (aesp) | 5 | 1 | 1 |
| Mid-seral closed canopy (bmsc) | 1 | 1 | 0 |
| Mid-seral open canopy (cmso) | 6 | 1 | 4 |
| Late seral open canopy (dlso) | 20 | 1 | 30 |
| Late seral closed canopy | 68 | 86 | 65 |
| Uncharacteristic* | 0 | 10 | 0 |

*Uncharacteristic refers to stages currently present that were not present under reference conditions. In this case, the uncharacteristic class is conifers that have invaded sagebrush in the absence of fire.

Table 3.5.3. West Bear Project FRCC Results

| Watershed | Strata | Strata FRCC | Watershed Natural Fire Regime | Watershed FRCC Rating |
|----------------|-----------------------------------|----------------------------|---|---------------------------------------|
| West Fork Bear | Aspen/conifer (70% of watershed) | 2 (58% moderate departure) | III Infrequent (84 year), mixed severity (59% replacement) | 2 Moderately departed (66% departure) |
| | Sagebrush (30% of watershed) | 3 (86% high departure) | | |
| Hayden Fork | Aspen/conifer (100% of watershed) | 3 (65% moderate departure) | III Infrequent (111 year), mixed severity (67% replacement) | 2 Moderately departed (65% departure) |

WEST FORK BEAR WATERSHED (HUC 1601010105)

Aspen/Conifer – SPFI1 – 70% of watershed

Fire frequency: No large fires were recorded or known in this stratum. The 1980 Deer Creek Fire burned only 141 acres (about 1.5%) of the stratum, so did not significantly contribute to the watershed’s fire frequency. A figure of 111 years was used for the fire return interval, equal to the reference condition.

Fire severity: The natural fire severity is described as 67% replacement. It was decided that due to current fuel loads and stand structure, the current fire severity would be about 85% replacement, based on observations from the East Fork Fire. This resulted in a fire frequency/severity departure of only 11%.

Vegetation-fuels classes: It was determined that no uncharacteristic vegetation-fuels classes were present. Current conditions are heavy to the late seral, closed canopy class; using GIS data and Interdisciplinary Team knowledge, it was estimated that 68% of the stratum was in this class. Late seral, open canopy stands occupy about 20% of the

stratum, mostly in more rocky areas. Only small amounts of early and mid-seral stands are present, as a result of past timber treatments (e.g., Fat Chance and Gold Pass timber sales) and the Deer Creek fire.

Compared with reference conditions (which describe 70% of the watershed in mid-seral or earlier), late seral classes are moderately over-represented, while early and mid-seral are under-represented. The vegetation-fuels departure is 58%, which gives the forest stratum a FRCC rating of 2 – moderately departed.

Sagebrush – CSAG2 – 30% of watershed

Fire frequency and severity: No records or knowledge of large fires in this stratum are known, so 100 years was used for the current fire return interval (roughly corresponding to the fire suppression period), which is significantly longer than the reference fire return interval of 20 years. Current fire severity was estimated at 80% replacement (higher than the reference 40% replacement), due to the decadent sagebrush structure. Although grazing occurs, it does not significantly decrease the fine fuels enough to counteract the decadent sagebrush. Using these figures, a 65% fire frequency/severity departure was calculated.

Vegetation-fuels classes: It was decided that some conifer encroachment was occurring into sagebrush stands, and these conifers (spruce, subalpine fir, and lodgepole pine) occupy about 10% of what should be sagebrush within the watershed. This conifer encroachment was labeled as an uncharacteristic class, because it was unnatural succession due to fire suppression. Sagebrush stands in this area are primarily (86%) older, closed canopy stands. Token amounts for all other classes were estimated. Compared to reference conditions, late seral, closed canopy and the conifer encroachment areas are over-represented, while the early, mid-seral, and late-seral open stands are all under-represented. This gave us a vegetation-fuels departure of 86%, for a sagebrush stratum FRCC of 3 – highly departed.

Calculating the weighted average of the two strata for this watershed gave us a 66% departure, at the upper extreme of FRCC 2, based on vegetation-fuel class departures for both strata. In both aspen/conifer and sagebrush, late seral stands are over-represented while early and mid-seral stands under-represented, compared to reference conditions.

HAYDEN FORK Population/ (HUC 160101010101)

The FRCC analysis for this watershed included a large area outside of the West Bear Project/analysis area. In this watershed, sagebrush makes up a very small area and was not analyzed as a separate stratum. The entire watershed is represented by the SPFI1 potential natural vegetation group.

Our inputs for the FRCC analysis were similar to the West Fork Bear watershed.

- No records or knowledge of large fires exists, so 111 years was used for fire frequency (= reference conditions).
- Heavy fuels and even more continuous cover than in West Fork Bear led us to estimate the current fire severity at 90% replacement.
- Thus, the fire frequency/severity departure is 13% (FRCC 1).
- For the vegetation-fuels classes, no uncharacteristic classes are present. Stands are primarily old and dense (65% of the stratum), with some old but more open stands (30%), and token amounts of early and mid-seral (due to limited harvest units).
- The vegetation-fuels departure is 65%; this also constitutes the stratum and watershed's departure (since there is only one stratum). This is (barely) FRCC 2 – moderately departed. Again, this rating was driven by an overabundance of late seral and relative lack of early and mid-seral stands across the watershed.

3.5.4 Environmental Consequences

3.5.4.1 Effects on Fire Regime Condition Class

Table 3.5.4 includes total acreages for each treatment type in the project area (both watersheds combined). In general, Alternative 2 would maintain the general mature characteristics of a majority of the project area. Most of the area would maintain a late seral, mature to old age class structure. While not mapped in either watershed, it is

assumed that a portion of the West Fork Bear watershed includes some of the mid seral, closed (BMSC) seral stage. These areas would not be affected by treatments in either alternative. Group selection and patch cut harvests would convert late seral closed canopy to late seral open canopy conditions. Prescribed burning (with or without mechanical conifer removal) would convert late seral closed canopy to early seral stands. In reality, the prescribed burning in aspen without the conifer treatment (as proposed in Alternative 3) would likely not be able to burn the entire acreage listed hot enough to kill overstory aspen without the conifer fuels to carry the fire. However, for this analysis an assumption that both treatments would produce equal amounts early seral stands was made.

Table 3.5.4. Treatments proposed for the West Fork Bear and Hayden Fork watersheds.

| Treatment | Alternative 2 Acres | Alternative 3 Acres |
|--|------------------------|------------------------|
| Spruce/Fir Group Selection | 603 | 417 |
| Mixed Conifer Group Selection | 468 | 389 |
| Small 1 - 5 acre patch cuts (Aspen-Conifer) | 133 | 99 |
| Aspen-Conifer: Conifer Removed then Areas Burned | 285 | 0 |
| Aspen, Rx Burn Only (Between Units) | 197 | 0 |
| Aspen, Rx Burn Only | 0 | 482 |
| Total | 1,686 | 1,387 |

West Fork Bear Watershed

The West Bear Project would help improve the FRCC by somewhat increasing the proportion of early seral vegetation within the aspen/conifer cover types, in stands slated for harvest followed by burning (to promote aspen regeneration). Note that the proposed project would also convert some of the late seral closed canopy stands to late seral open canopy (through thinning not followed by burning). However, since the late seral open canopy class is not under-represented (and is in fact moderately over-represented, compared to reference conditions), this aspect of the project would not improve fire regime condition class. The objectives for the thinning are to improve remaining tree health and decrease susceptibility to bark beetles for timber management, rather than fire regime condition class improvement.

Table 3.5.5 shows the changes in FRCC seral stages under Alternatives 2 and 3 to the West Fork Bear Watershed. Alternative 2 would increase the early seral stage (AESP) from 25 acres to over 190 acres, and nearly doubles the amount of the late seral, open (DLSO) seral stage from nearly 1,200 acres to over 2,100 acres. The late seral, closed (ELSC) seral stage and undetermined seral stages both decrease by approximately 500 acres each. Alternative 3 in the West Fork Bear Watershed increases the early seral stage from 25 acres to over 190 acres. The late seral, open seral stage increases from nearly 1,200 acres to over 1,900 acres. The late seral, closed (ELSC) seral stage and undetermined seral stages both decrease by approximately 400 acres each.

Table 3.5.5. West Fork Bear Watershed changes in FRCC seral stages as a result of implementing Alternative 2 and Alternative 3

| PNVG Group | Seral Stage | Current Acres | Current Percent ¹ | Alt 2 Acres | Alt 2 Percent | Alt 3 Acres | Alt 3 Percent |
|------------|-------------------------------------|---------------|------------------------------|-------------|---------------|-------------|---------------|
| spfi1 | Early seral post-replacement (aesp) | 25 | 0.3 | 191 | 2.2 | 191 | 2.2 |
| spfi1 | Mid-seral open canopy (cmso) | 546 | 6.2 | 546 | 6.2 | 546 | 6.2 |
| spfi1 | Late seral open canopy (lsoc) | 1,184 | 13.5 | 2,158 | 24.6 | 1,953 | 22.3 |
| spfi1 | Late seral closed canopy (elsc) | 3,783 | 43.2 | 3,236 | 37.0 | 3,342 | 38.2 |
| spfi1 | Undefined | 3,219 | 36.8 | 2,666 | 30.4 | 2,725 | 31.1 |
| | Total | 8,757 | 100.0 | 8,757 | 100.4 | 8,757 | 100 |

PNVG=Potential Natural Vegetation Group; Spfi=Interior West Lower Subalpine Forest 1

Hayden Fork Watershed

The West Bear Project may also improve this watershed's FRCC by increasing acres of early seral vegetation. However, the project would have less effect in this watershed than the West Fork Bear watershed, simply due to the proportion of stands to be treated within each watershed.

Notice that both of these watersheds are on the very high end of FRCC 2, so the proposed treatments in these areas move them slightly lower in FRCC 2. However, as mentioned above, since many of the treatments would result in late seral open stands rather than early or mid-seral stands, which are most under-represented, those treatments would not result in an improved fire regime condition class.

Table 3.5.6 shows the changes in FRCC seral stages under Alternatives 2 and 3 to the Hayden Fork Watershed. With Alternative 2, the greatest changes in the Hayden Fork watershed are increases in the early seral stage, with only minor changes to any other seral stage. The early seral stage increases from about 75 acres to over 440 acres.

Alternative 3 in the Hayden Fork Watershed increases the early seral stage from about 75 acres to over 440 acres. The late seral, open seral stage decreases very slightly while the late seral, closed seral stage decreases by approximately 2 percent.

Table 3.5.6. Hayden Fork Watershed changes in FRCC seral stages of the SPFI1 Potential Natural Vegetation Group as a result of implementing Alternative 2 and Alternative 3.

| Seral Stage | Current Acres | Current Percent | Alt 2 Acres | Alt 2 Percent | Alt 3 Acres | Alt 3 Percent |
|-------------------------------------|---------------|-----------------|-------------|---------------|-------------|---------------|
| Early seral post-replacement (aesp) | 77 | 0.6 | 442 | 3.3 | 442 | 3.3 |
| Mid-seral open canopy (cmso) | 553 | 4.1 | 551 | 4.1 | 549 | 4.1 |
| Late seral open canopy (lsoc) | 3,695 | 27.3 | 3,680 | 27.2 | 3,665 | 27.0 |
| Late seral closed canopy (elsc) | 7,067 | 52.2 | 6,760 | 49.9 | 6,801 | 50.2 |
| Undefined | 2,149 | 15.9 | 2,106 | 15.5 | 2,083 | 15.4 |
| | 13,540 | 100.0 | 13,540 | 100.0 | 13,540 | 100.0 |

Table 3.5.7 shows the effects to both the SPFI1 and CSAG2 Potential Natural Vegetation Groups of the West Fork Bear and Hayden Fork Watersheds from both Alternatives 2 and 3. No change would occur to the CSAG2 PNVG because these communities would not be treated. Slight increases in the early seral stage of the SPFI1 PNVG would occur in both watersheds. In the West Fork Bear watershed, there would be no changes to the mid seral, open or mid seral, closed seral stages, while the late seral, open seral stage would increase by approximately one third under

¹ These figures do not match the percentages in Tables 3.5.2 and 3.5.7 because of the undefined seral stage class in this table. See Table 3.5.7 for a summary of changes incorporating assumptions about the undefined seral stages (mostly ELSC).

both Alternative 2 and Alternative 3. The late seral, closed seral stage would decrease by 11 percent under both action alternatives in this watershed.

Because so few acres would be treated under each alternative within the Hayden Fork watershed, there would be no changes to the mid seral, open; mid seral, closed; or late seral, open seral stages in this watershed. There would be only slight changes in the late seral, closed seral stage under both Alternative 2 and Alternative 3 and these acres would all change to the early seral stage.

Table 3.5.7. Combined watershed changes in FRCC seral stages of the SPFI1 and CSAG2 Potential Natural Vegetation Groups as a result of implementing Alternative 2 and Alternative 3.

| PNVG Group | West Fork Bear | | | | | | Hayden Fork | | |
|-------------------------------------|----------------|-------------|-------------|---------------|-------------|-------------|---------------|-------------|-------------|
| | SPFI1 Current | SPFI1 Alt 2 | SPFI1 Alt 3 | CSAG2 Current | CSAG2 Alt 2 | CSAG2 Alt 3 | SPFI1 Current | SPFI1 Alt 2 | SPFI1 Alt 3 |
| Early seral post-replacement (aesp) | 5% | 6% | 7% | 1% | 1% | 1% | 1% | 4% | 4% |
| Mid-seral closed canopy (bmsc) | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 0% | 0% |
| Mid-seral open canopy (cmso) | 6% | 6% | 6% | 1% | 1% | 1% | 4% | 4% | 4% |
| Late seral open canopy (lsoc) | 20% | 30% | 29% | 1% | 1% | 1% | 30% | 30% | 30% |
| Late seral closed canopy (elsc) | 68% | 57% | 57% | 86% | 86% | 86% | 65% | 62% | 62% |
| Uncharacteristic | 0% | 0% | 0% | 10% | 10% | 10% | 0% | 0% | 0% |

PNVG=Potential Natural Vegetation Group; SPFI1=Interior West Lower Subalpine Forest #1; CSAG2=Cool Sagebrush (Mountain Big Sagebrush) with Trees

Table 3.5.8 illustrates the changes in FRCC across both watersheds as a result of implementing Alternatives 2 and 3.

Table 3.5.8. West Bear Project FRCC Results

| Watershed | Strata | Current Strata FRCC | Watershed Natural Fire Regime | Existing Watershed FRCC Rating | Alternative 2 Watershed FRCC Rating | Alternative 3 Watershed FRCC Rating |
|----------------|-----------------------------------|---------------------|---|---------------------------------------|--|---------------------------------------|
| West Fork Bear | Aspen/conifer (70% of watershed) | 2 (58% departure) | III Infrequent (84 year), mixed severity (59% replacement) | 2 Moderately departed (66% departure) | 2 Moderately departed (65 % departure) | 2 Moderately departed (65% departure) |
| | Sagebrush (30% of watershed) | 3 (86% departure) | | | | |
| Hayden Fork | Aspen/conifer (100% of watershed) | 2 (65% departure) | III Infrequent (111 year), mixed severity (67% replacement) | 2 Moderately departed (65% departure) | 2 Moderately departed (62% departure) | 2 Moderately departed (62% departure) |

Cumulative Effects

Past Timber Harvest and Wildfires

Past timber harvesting and wildfires are included under current conditions.

Coyote/Road Hollow Vegetation Project:

This project, which is in the West Fork Bear watershed, consists of thinning and dead tree removal to reduce tree densities on about 245 acres of lodgepole pine stands in the lower elevations of the Coyote Hollow and Road Hollow drainages. The primary function of this is to maintain mature lodgepole pine in this portion of the watershed. Implementation is underway. This would change this many acres of the PNVG SPFI1 from late seral closed, to late seral open seral status. This action considered with either of the alternatives would continue a Watershed Rating FRCC of 2, Moderately departed.

Mountain Pine Beetle and Spruce Beetle Activity

Additional mortality is expected near the Coyote/Road Hollow treatment areas. Mortality from the spruce beetle has already been quite apparent at the upper elevations of the Hayden Fork watershed. These stands are currently mapped as the late seral, closed FRCC seral stage, but are likely to be more appropriately mapped as the late seral, open FRCC seral stage. These stands are also more susceptible to large-scale fires that escape initial attack fire suppression because of the growing amounts of dead and dying trees in these watersheds. This could significantly increase the amount of the early seral FRCC seral stage at some point in the future.

Livestock Grazing

All or portions of four allotments occur within these watersheds. The Humpy, Meadow Creek, West Fork Bear, and Gold Hill allotments are all currently grazed by sheep. The grazing season for these allotments is typically between early to mid July through mid September. One permittee is currently running sheep on both the Meadow Creek and Gold Hill allotments with numbers less than those on these allotments when they were under use by different permittees. Vegetation conditions appear to be stable to improving. Because of historic use in the area, there is an uncommonly high amount of coneflower (*Rudbeckia occidentalis*) and orange sneezeweed (*Helenium hoopesii*), native forbs that increase under heavy grazing. The greatest current impacts to range conditions appear to be from gopher activity in what were historic tall forb communities (Zobell 2005). There is no cumulative effect from either alternative on rangelands because sagebrush communities and riparian habitat conservation areas are not being treated.

Summary

Both Alternative 2 and Alternative 3 would slightly increase the diversity of age classes and Fire Regime Condition Class seral stages within the subalpine forest potential natural vegetation group in both watersheds. Both alternatives would move watershed FRCC ratings away from the high end of FRCC 2 to a slightly lower departure rating within FRCC 2. Although Alternative 3 has a slightly increased use of prescribed fire, the lack of fuels to carry the fire would reduce the effectiveness of the fire in regenerating aspen within the project area. Therefore, both alternatives would slightly reduce the FRCC within the watersheds. Neither alternative would have any measurable impacts to the cool sagebrush (CSAG2) potential natural vegetation group as a result of these treatments.

3.6 Wildlife

3.6.1 Methodology Used to Collect Data and Make Scientific Findings

The process for conducting biological evaluations and assessments is outlined in Forest Service Manual 2672.43. This process consists of a pre-field review, field reconnaissance and surveys, and analysis of potential impacts.

The pre-field review includes checking records and maps to determine if listed species or their habitat may be present. Species occurrence records from the Evanston Ranger District and Utah Department of Natural Resources (UDWR) were checked for the project area. A review of potential habitat was conducted using maps, aerial photographs and Forest vegetation layers for the project area. If there is no habitat in the project area, then no further analysis is needed.

At the next level, habitat may be present, but no activities are planned for any of that habitat, thus the project would have no impact on that habitat and no further analysis is needed. If potential habitat was present or indicated in old records and activities were being considered for that area, then a field reconnaissance is conducted to check for specific habitat features. Walk through checks are done for most of the proposed sites.

If the field reconnaissance shows that suitable habitat is present and activities are planned for the area, then surveys are usually conducted for those species to determine habitat use. The wildlife biologist was involved in the project planning to facilitate mitigation measures in sensitive habitat areas.

3.6.2 Inventories and monitoring data

All of the following data and information sources are located in the project record at the Evanston Ranger District:

- Goshawk Surveys
- R4 Sensitive Owl Surveys
- Three-toed woodpecker surveys
- Snowshoe hare BYU study (Bunnell unpublished 2003)
- Utah Division of Wildlife Resources – GIS layers (Heritage and 2002 species habitat, etc.)
- Utah Division of Wildlife Resources – 2004 Big Game Proclamation
- Utah Avian Conservation Strategy Ver.2.0 UDWR Publ. No. 02-27 (CD)
- Forest MIS Survey data 2003/2004/2005
- Management Indicator Species on the Wasatch-Cache National Forest (USDA FS 2006)
- The literature used for evaluation and analysis can be found in Chapter 5 - Literature Cited.
- Desired Conditions

3.6.3 Affected Environment

3.6.3.1 Threatened, Endangered, Proposed, and Candidate Species

The Fish and Wildlife Service lists four federally listed and proposed endangered, threatened and candidate species as potentially having habitat within Summit County, Utah. These species are the Bald Eagle, Western-Yellow billed Cuckoo, Black-footed Ferret, and Canada Lynx.

Habitat descriptions for these species can be found in the Wasatch-Cache Revised Forest Plan. Those species with specialized habitat (elevation, seasonal, prey base, etc.) that is not available in the analysis area will not be carried forward in further analysis.

Table 3.6.1. Threatened and endangered species within Summit County, Utah

| Species | Classification | County | Comments | Determination |
|--|----------------|--------|--|---|
| Bald Eagle (<i>Haliaeetus leucephalus</i>) | Threatened | Summit | Winter visitors to Utah, five known nest locations none found on the forest, winter habitat not present in project area. Snags and potential roosting sites may be found in the analysis area. | “May affect, but is not likely to adversely affect” |
| Canada lynx (<i>Lynx Canadensis</i>) | Threatened | Summit | Denning, foraging, and travel habitat present within activity area. Project occurs in Lynx Analysis Unit (LAU) 36. | “May affect, but is not likely to adversely affect” |
| Black-footed ferret (<i>Mustela nigripes</i>) | Endangered | Summit | Specialized habitat needs, dependant on prairie dog towns for forage and denning. No habitat found in project area. | NA |
| Western Yellow-billed cuckoo (<i>Coccyzus americanus occidentalis</i>) | Candidate | Summit | Elevation limitations, specialized habitat and structure needs for forage and reproduction. Documented occurrences along the Wasatch Front. Habitat absent from activity area. | NA |

Bald Eagle

This species is usually associated with large river or lakes because they primarily feed in open waters; however during the winter carrion is a major food source. The bald eagle is a wintering species in most of Utah and southwestern Wyoming. There are now 8 pairs nesting in Utah. None of these nests are on the Wasatch-Cache National Forest. None are known to nest in Summit County, Utah. Eagles migrate into the area from Canada and will winter in lower elevations off National Forest System lands in areas where rivers stay relatively free of ice or where big game species winter. Eagles can occur at higher densities during the winter because breeding pairs are not defending territories.

The proposed project area occurs at approximately 9,500 feet in elevation. Migrating eagles could utilize the aspen, mixed-conifer and spruce/fir habitats for roosting, nesting or foraging opportunities. There are no known roosting sites within the project or analysis area. However, the analysis area provides migrating corridors for elk and other big game species that winter in the Deer, Yellow, and Chalk Creek drainages that could occasionally provide carrion. The largest water source found in the analysis area is the Whitney Reservoir, which freezes over during the winter months. The reservoir is highly utilized during the summer months because of the fish- stocking program by the State of Utah.

Recreation use is high within the analysis area on a year round basis. The new travel plan for the Evanston and Mountain View Districts has designated ATV and other motorized routes throughout the landscape. During the winter the area is popular with snowmobile users, especially in the areas surrounding Whitney Reservoir where flatter terrain exists.

Canada Lynx

The Lynx Conservation Assessment Strategy (LCAS) has delineated lynx into geographic areas in the lower 48 states. The Uinta Mountains occur in the southern portion of the Northern Rockies geographic area. Primary habitat is Engelmann spruce, white-fir, subalpine-fir and lodgepole forests at the higher elevations. Historically lynx have occurred on the Wasatch-Cache Forest. However, there have been no recent confirmed sightings of naturally occurring individuals on the Forest. Recently three radio-collared lynx released in Colorado were recorded (tracked) in Utah in the summer and fall of 2004. Two individuals were recorded on the Wasatch-Cache National Forest. The first lynx (male) traveled north during the summer through the Ogden and Logan Districts to Idaho where it was last recorded. To date the remaining lynx (female) was last recorded on the Forest in January, 2006. This individual has been moving on and off the Forest since being discovered early in the fall. Recent attempts to relocate this individual have been unsuccessful.

Lynx occur in relatively remote, undisturbed areas and prefer large continuous stands of conifer that provide denning and foraging habitat. Home ranges of lynx are generally 6-8 square miles, but range up to 94 square miles. Lynx are closely tied to snowshoe hare, their primary food source throughout the year. In years with low snowshoe hare populations, lynx will turn to alternate prey sources such as squirrels and grouse. A Conservation Agreement and Strategy has been developed based on a Conservation Assessment that was recently completed (Ruediger et al. 2000). The Wasatch-Cache National Forest has developed lynx analysis units (LAUs) across the Forest as directed in the Canada Lynx Conservation Assessment and Strategy (Ruediger et al. 2000). The proposed project area occurs in Lynx Analysis Unit 36. In considering threats to lynx, one must consider that lynx have evolved to adapt to an ever-changing boreal forest and require a mosaic of appropriate species composition, varying stand ages, and structure to support abundant snowshoe hares, pine squirrels, and lynx denning habitat within the boreal forest. Additionally, one must consider scale. Lynx are highly mobile, moving long distances to find abundant prey, and using a large area on a landscape. To significantly impact a local lynx population, an activity would likely have to occur across a very large area (presumably at least the size of several home ranges), create a homogeneous forest that does not provide the various stand ages, species composition, and structure that are good snowshoe hare and lynx habitat, or result in a barrier that effectively precludes dispersal (USDI FWS 2003).

In 1999, 2000, and 2001 a national hair snare survey was conducted to determine presence/absence of lynx. The District Biologist established survey stations in potential habitat across the North Slope of the Uintas. A student from BYU, in conjunction with the U.S. Forest Service and the State of Utah, established survey stations as part of a graduate study. Samples collected from the Evanston and Mountain View Districts (national study) and the graduate study were sent in for analysis. Results were negative for lynx.

Lynx Analysis Unit 36 consists of 67,288 total acres. There are 28,667 acres on the National Forest. Most of the remaining 38,621 acres are on private land to the north and west of the National Forest System land but within the congressionally proclaimed National Forest boundary. Of the 28,667 acres of National Forest within the LAU, there are 20,653 primary/secondary acres and 8,014 acres of non-habitat.

Prior to active fire suppression, stand replacing fires were the source of most early successional habitat. Timber harvest has become a source for creating foraging habitat in place of fire. The most productive foraging habitats in the analysis area are past timber harvests that were conducted between 1949 and 1982 and in spruce/fir forests where gaps in the canopy have allowed understory development. Since 1949 there have been a total of 1,696 acres of spruce/fir, mixed conifer, aspen/conifer and lodgepole pine stands harvested or burned on National Forest System land in LAU 36. It has been more than 20 years since the harvest or burn on 989 acres. Recovery as foraging habitat normally occurs within 20 years on average sites on the north slope of the Uinta Mountains. These sites can also provide denning habitat if sufficient jackstrawed logs or rootwads were left after the harvest.

Aerial photos and site visits have indicated that regeneration is not uniform across all types of past harvest units. Although most past harvest units are adequately stocked for silvicultural purposes, portions of past clearcuts in the spruce/fir type and part of a 1980 wildfire do not have adequate tree canopy closure to provide security habitat for snowshoe hares. Depending on the vegetation treatment (clearcut, selection, or overstory removal), forest type, and observed recovery, a regeneration percentage was estimated and units were categorized as recovered, marginal, and/or unsuitable (West Bear Past Harvest Analysis is contained in the project file). See Tables 3.6.2 and 3.6.3 below.

Past harvest units greater than 20 years old usually have adequate regeneration and canopy closure to be suitable habitat. The acres in the marginal category do not meet these requirements so they have been added to the unsuitable acres because they only provide summer habitat and do not provide winter habitat for snowshoe hare throughout the harvest unit.

Recovered Acres – these acres are an average of the estimated percentage of recovered acres from site visits and aerial photo analysis. These areas provide the necessary characteristics of foraging and denning habitat for lynx.

Marginal Acres – these acres are estimated to have recovered enough to provide summer forage habitat for snowshoe hares. Some wintering habitat may be available along the edge where adjacent untreated areas provide security cover. Denning habitat for lynx in these areas could potentially exist where jackstrawed logs or root wads were left following timber harvest or post harvest large diameter trees have fallen to the ground or have uprooted in wind events. Although these acres provide some seasonal habitat, they are considered unsuitable for determination of compliance with the Lynx Conservation Assessment and Strategy (LCAS) standards for percentage of habitat in unsuitable condition.

Unsuitable Acres – these areas are an estimated unsuitable acreage from site visits and aerial photo analysis. These areas may provide summer forage for snowshoe hare but there may not be enough cover to provide a winter foraging area or denning habitat for lynx.

Table 3.6.2. Categorized Acres of Past Timber Harvest within LAU 36

| Past Harvest Units or Burn Areas | Acres | Recovered (Suitable) | Marginal | Unsuitable | Marginal and Unsuitable Acres |
|----------------------------------|-------|----------------------|----------|------------------|-------------------------------|
| 1995-2004 ¹ | 528 | 363 | 0 | 165 | 165 |
| 1985-1994 | 210 | 0 | 0 | 210 | 210 |
| 1975-1984 | 152 | 24 | 0 | 128 ² | 128 |
| Prior to 1975 | 806 | 516 | 290 | 0 | 290 |
| Total | 1,696 | 903 | 290 | 503 | 793 |

¹ All but 17 acres cut during the past decade were spruce salvage sales. The Humpy sale in 1995 had a high percentage of dead trees removed but an estimated 60-75% of the harvest area still provides denning and foraging habitat. The Meadow Creek sales had a smaller percentage of dead and resulted in an estimated 85-95% of denning and foraging habitat remaining post harvest. This results in a 0.8% reduction in suitable habitat in LAU 36 within the past ten years.

² The 1980 Deer Creek Fire resulted in an estimated 90% unsuitable habitat within a 141-acre area.

Table 3.6.3. Lynx Analysis Unit 36 Acreage and Percent in Unsuitable Habitat

| LAU | Total Acres | Primary / Secondary Habitat Acres | Past Harvest or Burn Acres | Recovered Acres (Suitable) | Unrecovered Acres (Unsuitable) | Percent Unsuitable | Remaining Suitable Acres |
|-----|-------------|-----------------------------------|----------------------------|----------------------------|--------------------------------|--------------------|--------------------------|
| 36 | 67,288 | 20,653 | 1,696 | 903 | 793 | 3.8% | 19, 860 |

Denning habitat should comprise at least 10 percent of an LAU (Ruediger et al. 2000). Almost all of the unharvested area in LAU 36 is mature or older forest. The spruce/fir and mixed conifer types provide the best potential denning habitat. These types occupy 6,196 acres or 55% of the 11,164 National Forest forested acres in the West Bear Ecosystem Management analysis area (Table 3.4.1). (The LAU covers more area than the West Bear Ecosystem Management analysis area.) Denning habitat by definition in the LCAS may also be found in regenerating stands greater than 20 years with large amounts of coarse, woody debris, either down logs or root wads. These areas can be found in some of the 903 acres of past timber harvest throughout the analysis area. Past selection or salvage harvest units often provide these conditions. In more recent treatments (Humpy and Meadow Creek 1995) the harvest method of salvage logging in spruce/fir and mixed-conifer types resulted in harvest similar to group or individual tree selection. These units presently provide habitat for lynx and prey species. Selective harvest allows downed woody material and other understory vegetation to remain in the stand. A canopy would still exist within the stand providing security cover for traveling lynx and prey species. Gaps created from the treatment would encourage growth of understory species. A developed understory would benefit both lynx and prey species.

A lodgepole pine thinning project in the lower end of the Coyote Hollow and Road Hollow drainages is ongoing under the Coyote Road Hollow Beetles project. It has an objective of reducing likelihood of losing the lodgepole pine stands in the area to mountain pine beetles. Effects and mitigation for that project were analyzed under a separate NEPA document (USDA FS 2004).

3.6.3.2 Region 4 Sensitive Species

Table 3.6.4. Summary of effects for the West Bear Vegetation Project activities for terrestrial sensitive species found on the Wasatch-Cache National Forest

| Species | Potential Habitat Present or effected by Project | Effect Determination |
|---|--|---|
| Spotted bat (S) (Euderma maculatum) | N | "N/A" |
| Wolverine (S) (Gulo gulo) | Y | "May impact individuals, but is not likely to cause a trend toward federal listing or a loss of viability" |
| Townsend's big-eared bat (S) (Plecotus townsendii) | N | "N/A" |
| Pygmy rabbit (S) (Brachylagus idahoensis) | N | "N/A" |
| Boreal owl (S) (Aegolius funereus) | Y | "May impact individuals, but is not likely to cause a trend toward federal listing or a loss of viability" |
| Flammulated owl (S) (Otus flammeolus) | N | "N/A" |
| Northern Goshawk (S) (Accipiter gentiles) | Y | "May impact individuals, but is not likely to cause a trend toward federal listing or a loss of viability" |
| Peregrine falcon (S) (Falco peregrinus) | Y | "No Impact" There will be no nesting sites disturbed from the proposed project. Some foraging habitat may be lost or converted, but these acres will be minimal when compared to the available foraging habitat across the landscape. |
| Northern three-toed | Y | "May impact individuals, but is not likely to cause a trend |

| Species | Potential Habitat Present or effected by Project | Effect Determination |
|---|--|--|
| woodpecker (S) (Picoides tridactylus) | | toward federal listing or a loss of viability” |
| Great gray owl (S) (Strix nebulosa) | Y | “May impact individuals, but is not likely to cause a trend toward federal listing or a loss of viability” |
| Columbian sharp-tailed grouse (S) (Tympanuchus phasianellus columbianus) | N | “N/A” |
| Greater sage-grouse (S) (Centrocercus urophasianus) | N | “N/A” |

N/A - Not applicable because the project is not located in suitable habitat. Those species with no habitat within the proposed project or with a “No Impact” determination will not be carried forward in this analysis.

Wolverine

The wolverine is the largest terrestrial mustelid and is found in the tundra, taiga, and forest zones of North America. Wolverines are typically associated with remote wilderness areas where minimal contact with humans or developments occurs. As a scavenger it depends largely on mammal carrion provided from kills by wolves and other predators. Wolverine will forage on snowshoe hare. However, because of their size, carrion of ungulate species is also necessary. Snowshoe hare can be found in past timber units where adequate forage and security cover are present. However, wolverine may not utilize the proposed units because of elevation and the level of recreation. Delayed implantation allows wolverines to give birth during the winter when ungulate carrion is more plentiful. Information on natal den sites in North America is limited to data collected in the tundra region where dens are easily located. This species was probably never common in Utah, but it previously occurred (and still may occur) in the high mountainous areas of the state (UDWR 2004). A final report “*Forest Carnivores Occurrence, Distribution & Limiting Factors: Canada Lynx and Wolverine Surveys in Utah*” (Flinders et al. 2004) reports the possibility of wolverine and/or fisher tracks in the High Uintas Wilderness. Historic records of fisher occurrences on the Wasatch Cache would indicate the tracks belong to a wolverine. The UDWR Heritage database (2002) records for fisher states “Identification of this species was based on tracks believed to be a fisher seen on two occasions (1938). A photograph of the tracks was examined by Durrant in 1952 who agreed with the identification. This record is considered questionable without further doc.” The tracks found in the Flinders et al. study were southeast of the project area. No surveys have been conducted for this species within the project area due to the species large home range and lack of a recognized protocol.

Boreal Owl

The boreal owl breeds in North America from Canada to northeastern Minnesota, local breeding populations can be found in Washington, Idaho, Wyoming, and Colorado. Forests ranging from pure deciduous to mixed and pure coniferous composition characterize boreal owl habitat in North America. Suitable habitat on the Evanston District would be old-growth Spruce/fir and high elevation mixed-conifer stands. Boreal owls are cavity dependant and typically use old woodpecker nests. Prey species typically consist of microtine rodents (red-backed vole), which are caught nocturnally. Red-backed voles and other small mammals are important food sources for foraging boreal owls. Vegetation treatments that increase habitat for prey species would benefit boreal owls in the analysis area. Habitat requirements for prey species vary from a well-developed understory to clearcuts or natural openings. Hargis and Bissonette (1995) set up live traps in four habitat types to determine use by small mammals. This study was established to determine prey base for pine marten, however it deals with habitats found within the analysis area. Of the four local habitat types identified by Hargis and Bissonette, forested, clearcut and meadows are found in the West Bear analysis area. The two important habitat types were the forest and clearcut areas. The forest type contained the largest species diversity while the clearcuts had the greatest densities. Recently there was a confirmed nesting pair on the Uinta Forest National Forest that is the first nesting pair found in Utah. There has been one confirmed Boreal owl on the Evanston District that responded to broadcast surveys and it was within a roadless portion of the West Bear Analysis Area. There have been no responses in recent years. During daytime 2004

surveys of the proposed units survey crews reported a call similar to that of a boreal owl. Common snipe make a call similar to boreal owls. Surveys conducted in March 2005 did not receive any responses. Field surveys were conducted within the project area in March 2005. There were no responses from these efforts.

Northern Goshawk

The Northern goshawk is a forest habitat generalist that uses a wide variety of forest ages, structural conditions, and successional stages. There are three main components of a goshawk's home range (6,000 acres): nesting area, post fledging-family area (PFA), and foraging area. Nest areas contain one or more stands of large, old trees with a dense canopy cover. Most goshawks have 2 to 4 alternate nest areas within their home range; alternate nest areas are used in different years, but some nests may be used for decades. The goshawk PFA surrounds the nest areas within a home range, totaling 420 acres and because of its size, includes a variety of forest types and conditions. The foraging areas are approximately 5,400 acres in size. Foraging goshawks are more often than not found within a mosaic of forest types and hunt in many forest conditions. Goshawks in the analysis area use mature lodgepole dominated stands and aspen/conifer stands. There are two known territories within the proposed project analysis area. Both of the territories were active in 2004. A lodgepole pine thinning project adjacent to one of the nests began in 2005 under the Coyote Road Hollow Beetles project that has an objective of reducing likelihood of losing the lodgepole pine stands in the area to mountain pine beetles. Effects and mitigation for that project were analyzed under a separate NEPA document (USDA FS 2004).

Three-toed Woodpeckers

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

Great Gray Owls

In North America, the great gray owl breeds from the boreal forests of Alaska, east to Ontario, and south to northeastern Minnesota, northwestern Wyoming, western Montana, Idaho, and through the Sierra Nevadas of California and Nevada. All of its range in Utah is considered range of wintering vagrants. Great gray owls use mixed coniferous and hardwood forest usually bordering small openings or meadows. They forage along edges of clearings, semi-open areas where small rodents are abundant. The long-term persistence of great gray owls south of Canada and in Alaska seems likely provided that forests of all successional stages are maintained and well dispersed on a local and regional scale. Persistence on a local geographic scale is less certain. Maintaining persistence will require special attention to the long-term persistence of mature and older forest stands on sites where natural fire is less likely to destroy the old forest and where suitable nesting platforms are abundant. These stands will be necessary to consistently produce nesting structures. Furthermore, mature and older forest provides important alternate foraging habitat during periods when crusted snow prevents great gray owls from accessing preferred rodent prey. Maintaining quality great gray owl foraging habitat should be compatible with forest management for commodity resources if management takes a long-term view. Natural meadow systems must be maintained and restored through fire management. Similarly, temporal continuity of foraging habitat must be maintained through long-term harvest planning (Hayward 1994). There has been one unconfirmed reported sighting of a great gray owl on the Wasatch-Cache in 1994. The great gray owl is still considered a winter vagrant to the Forest. Broadcast surveys have been conducted in the project area with no responses recorded.

3.6.3.3 Other Species of Interest

Gray Wolves

Gray wolves historically occurred in the state of Utah in early settlement days. Up until 2002, the last verified gray wolf taken within the State of Utah was in 1930. Wolves were extirpated from the state when bounties were offered in the late 1800's. During the past several years, sightings of wolf-like animals have occurred in Utah. Many of these have been identified as wolf-dog hybrids (UDWR 2003). In 2002, a wolf from a Yellowstone National Park pack was captured near the town of Morgan in northern Utah, southeast of Ogden. The animal was returned to Grand Teton National Park where it later rejoined its pack. In Utah, the gray wolf is not part of the US Fish and Wildlife Service experimental recovery effort being conducted in Wyoming, Idaho, and Montana. There has not been a breeding pair or a pack identified in Utah to date, only a dispersing animal. If wolves from the federal recovery areas enter Utah, they will receive protection under the Endangered Species Act. Managing the forest at or toward PFC will provide cover for wolves and habitat for prey species. Wolves are not included in the list of threatened or endangered species for any county in Utah by the Utah Field Office of the Fish and Wildlife Service. There will be no analysis of effects in this document from the proposed project on this species.

American Pine Marten

The pine marten is broadly distributed extending from the spruce/fir forests of northern New Mexico to the northern limit of trees in arctic Alaska and Canada, and from the southern Sierra Nevadas of California to Newfoundland Island. Pine marten can be found in the Uinta and Wasatch mountains with some of the higher populations in the Wilderness portion of the Forest. It is thought to be in decline due to loss of habitat and over-trapping. It relies on coniferous forests at higher elevations using old growth structure for primary denning and foraging sites (Ruggiero et al. 1994). The marten has seasonal variations in its habitat selection during winter months. Spruce/fir forests are favored over openings. This may be due to visibility against the snow, which may allow martens to be more susceptible to predators. Confinement to older age class stands for security reasons limit the use of areas within the home range. Loss of old growth forest structure would be of concern. Martens may not use clearcuts during summer months or may avoid utilization completely. In selective tree cuts, the amount of basal area removed may limit the amount of use by martens. Broadly, American martens are limited to conifer-dominated forests and vegetation types nearby. In most studies of habitat use, martens were found to prefer late-successional stands of mesic coniferous forest, especially those with complex physical structure near the ground (Ruggiero et al. 1994). The structural features that develop with successional advancement and that are important to martens include overhead cover, especially near the ground; high volumes of coarse woody debris, especially of large diameter; and small-scale horizontal heterogeneity of vegetation, including the interspersed patches of herbaceous patches with patches of large, old trees (Ruggiero et al. 1994).

Fringed Myotis

The fringed myotis is found in a range of habitats from low desert scrub to fir-pine associations. Though this species is widely distributed, it is apparently rare in Utah. This species of bat is commonly found roosting in mine tunnels, caves, and buildings. The low reproductive rates for *M. thysanodes* contributes to the reduced ability to survive catastrophic events and periods of high mortality. Human disturbance of roosts in caves, mines, and buildings may be the most serious threat to this species. Watercourses and lowland riparian areas are very important for this bat species (UDWR 2003a). No commonly used roosting structures are located near the proposed treatment areas. Although there will be removal of vegetation there is no expected effect on this species from the proposed activities.

3.6.3.4 Terrestrial Management Indicator Species

Management indicator species (MIS) are used to assess the effects of management activities on a range of species. The Wasatch-Cache Forest Plan lists the following three terrestrial species as management indicator species. The Forest is has recently updated the Management Indicator Species of the Wasatch-Cache National Forest report (USDA 2006a). The document includes background, protocol, and trend analysis.

Table 3.6.5. WCNF Terrestrial Management Indicator Species

| Management Indicator Species | Associated Plant Community (Cover Type) |
|---|--|
| Goshawk (<i>Accipiter gentiles</i>) | Aspen, Conifer, Mixed Conifer |
| Snowshoe Hare (<i>Lepus americanus</i>) | Pole/Sapling Aspen, Conifer, and Mixed Conifer |
| Beaver (<i>Castor Canadensis</i>) | Riparian |

Snowshoe Hare

Snowshoe hares on the Wasatch-Cache National Forest have been divided into two separate sub-populations (the Wasatch/Bear River Range and the Uinta Mountains / North Slope range), since the likelihood of individuals moving from one geographic area to another is low.

Uinta Mountains / North Slope Range: Bunnell (2004) has estimated 0.05 to 0.9 hares/hectare based on methods developed by Krebs et al. (2001). Bunnell's work on the Uinta Mountains from 2001 through 2003 shows an average of 0.33 hares per hectare over the three-year period within mature vegetation types. Bunnell's studies are our best indication that snowshoe hare were stable across the North Slope from fall 2000 thru summer 2003. In 2003, 61 transects (610 plots) were established across a variety of habitat types and age classes across the North Slope. A portion of Bunnell's transects were incorporated as part of the USFS Forest MIS monitoring effort. Results and analysis of Bunnell's study and comparison to data collected in 2004 can be found in the MIS report. The following tables and figures replace those in the DEIS to include data collected in 2005 and because the format for the MIS displays of data changed in the 2006 MIS report. Table 3.6.6 displays snowshoe hare estimates (hares/hectare) and mean pellet counts collected for the same transects for 5 consecutive years (130-140 plots of 580-610 plots). These survey plots were sampled in mature forest stands only. Two different plot sizes were utilized to determine snowshoe hare densities: rectangular plots for 2001-2003 and circular plot for 2003-2005. Utilization of the one meter circular plot for snowshoe hare estimates has been recommended as the most effective method.

Table 3.6.6. Snowshoe Hare Estimates and Mean Pellet Counts (Within Year Mean Pellet Count Averages).

| | 2001 (rec) Pellets/Plot | 2002 (rec) Pellets/Plot | 2003 (rec) Pellets/Plot | 2003 (circular) Pellets/Plot | 2004 (circular) Pellets/Plot | 2005 (circular) Pellets/Plot |
|--|-------------------------------|-------------------------------|-------------------------------|------------------------------------|------------------------------------|------------------------------------|
| Average: (Pellets/Plot) Mean of Transect Mean | 0.883 | 0.619 | 0.639 | 3.66 | 6.78 | 3.19 |
| Hares per Hectare* | | | | | | |
| Conservative Estimate | 0.36 | 0.26 | 0.27 | 0.92 | 1.74 | 0.81 |
| Liberal Estimate | 0.69 | 0.49 | 0.51 | 1.76 | 3.30 | 1.53 |

Mean pellet densities from the more extensive sampling effort predicted hare numbers that were higher using meter-circle versus rectangular plots. Table 3.6.7 displays conservative estimates for the Uinta Mountain range with adjustments for differences in population estimates of the rectangular vs. circular plots.

Table 3.6.7. Snowshoe Hare Conservative Estimates for the Uinta Mountain Range.

| 2001* | 2002* | 2003 | 2004 | 2005 |
|--------------------|--------------------|--------------------|--------------------|--------------------|
| 1.15 Hares/hectare | 0.89 Hares/hectare | 0.92 Hares/hectare | 1.74 Hares/hectare | 0.81 Hares/hectare |

* For 2001 and 2002, conservative estimates were proportionally adjusted based on 2003 data (0.27 rectangular = 0.92 circular estimates)

Data from this subset (130-140 plots) would suggest a decrease within the Uinta Mountain Range between 2004 and 2005, but including the entire sample-set suggests otherwise. This subset of plots sampled mature forest stands only, while the larger set (580 plots) includes immature vegetation types. Figure 3.6.1 below displays population estimates for 2001-2005 in mature forests only followed by Table 3.6.8 displaying the population estimates for combined mature and immature vegetation types.

Figure 3.6.1. Population Estimates in Mature Forest Only for the Uinta Mountains Snowshoe Hare Population

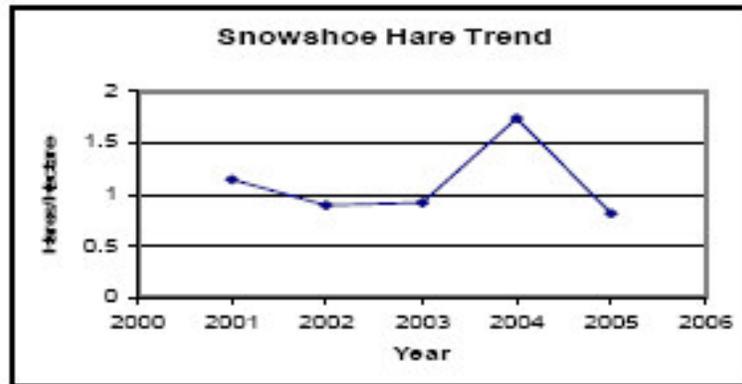


Table 3.6.8. Conservative and Liberal Estimates of Hares per Hectare Based on the Average Pellets per Plot in Mature and Immature Forest Types Between 2004 and 2005 for the Uinta Mountain Range

| | 2004 | 2005 |
|---|-----------|-----------|
| Average Pellets per Plot | 7.58 | 7.8 |
| Conservative and Liberal Estimates (Hares/ha) | 1.95-3.70 | 2.01-3.82 |

From analysis of the above data, the snowshoe hare population was stable and displayed very little overall change from the summer/fall of 2003 to the summer of 2005 for the Uinta Mountain population. Harvest data described in the Management Indicators of the Wasatch-Cache National Forest report also supports the determination of a stable trend.

There are four transects established within the West Bear analysis area. There are two transects in spruce/fir, and one each in young aspen/conifer and mature lodgepole.

Activities such as extensive conifer timber harvest, prescribed fire or wildland fires that have the potential to convert large areas to homogeneous grass/forb patches could influence snowshoe hare populations. However, to significantly impact a population these effects would have to occur over a large area in a relatively short time period.

Beaver

Beaver occur throughout most of North America and are fairly common in Utah. The Uinta Mountains are classed as “substantial value” habitat for beavers (USDI 1997). Although some individuals could move from the Uinta Mountains to other geographical areas on the Wasatch-Cache forest the likelihood is low when considering the existing barriers. Therefore the forest population has been divided into the Wasatch/Bear River Range and the Uinta Mountains / North Slope populations. The population relevant to the West Bear Project is the Uinta Mountain / North Slope population.

Table 3.6.9. Beaver Monitoring in the Uinta Mountains

| District | # of Sections |
|---------------|---------------|
| Kamas | 15 |
| Evanston | 10 |
| Mountain View | 12 |
| Total | 37 |

There are two beaver survey sections within the project analysis area. The survey locations are located at T1N, R9E, section 32 and T1N, R9E, section 11. Because of steep terrain there was no beaver activity found within section 32. In section 11 there was a lodge and utilized willows that indicate beaver activity.

In favorable habitat the density of beaver colonies ranges from 0.4 to 0.8 per km² (1.0 to 2.0 per/mi²). Home range is greatly affected by the water system in which the colony lives with colonies in the best habitat occurring as close as 300 m (328 yards) apart (Ministry of Environment, Lands and Parks Resources Inventory Branch for the Terrestrial Ecosystems Task Force Resources Inventory Committee 1998).

Hatler (1988) in Management Guidelines in British Columbia states, "In a dams' third year of existence a colony would consist of two adults, as many as three to four yearlings, and as many as four S-cubs." Utah State's 1993 report states, "Researchers from widely separated localities have found that each beaver colony contains an average of five animals, and so to determine population of a stream section it is necessary only to multiply the number of food caches by five."

As indicated in Table 3.6.10, a beaver colony often has more than one dam. Hilfiker (1991) indicates that at least one secondary dam is built downstream to relieve pressure on the main dam and reduce water loss from the pond through seepage. He states, "that when a family of beaver live in an area for a number of years, it is not unusual for three quarters of a mile or more to be terraced with dams, ponds, and water impoundments."

Table 3.6.10. Beaver population estimates

| Population | Active dams | # of colonies | Individuals | Estimated # of beavers per square mile |
|-------------------------------|-------------|---------------|-------------|--|
| Uinta Mountains / North Slope | 16 | 7 | 35 | 0.95 |

The forest has completed collection of baseline data for beavers in both populations (Wasatch/Bear River and Uinta Mountain). The Forest monitoring protocol for beaver calls for resurveying sections in 3-year intervals.

Currently there are not enough years of Forest Service monitoring population data on beaver to indicate a trend. However, there are three source documents provided by the Utah Division of Wildlife Resources that currently indicate a trend. They are the 1979-80 publication no. 80-12 (Provan 1980), the 1998-1999 Furbearer Harvest Reports publication no. 02-06 (Wolfe 2002), the 1971-1982 Beaver Distribution, and the Habitat and Population Survey (Blackwell 1993). The 1979-80 harvest and 1971-82 survey reports display beaver population estimations by units while the 1998-1999 Harvest report considers regions (Great Basin, Rocky Mountain, Uintah Basin, and Colorado Plateau). The 1993 survey merely restates the trend stated in the 1979-80 report. However, the 1993 survey estimates carrying capacities for those units found on the forest.

There are 11 units (9 Wasatch/Bear River, 2 Uinta Mountain / North Slope populations) from the Utah State carrying capacity study whose boundaries occur on the Wasatch-Cache National Forest. Considering the size of some units it is assumed that they incorporate all lands (BLM, State, Private, and FS). Therefore to try and compare the Wasatch-Cache forest survey information to harvest and study reports would be invalid because of sample size and study method.

Table 3.6.11. UDWR Carrying Capacity Study and population estimates for Units occurring in the Uinta Mountains / North Slope sub-population.

| Unit | Calculated Carrying Capacity | Beaver Population 1981 | Beaver Trapped 1980 | Status of beaver population 1981 |
|------|------------------------------|------------------------|---------------------|----------------------------------|
| 10 | 7671 | 7195 | 321 | Static |
| 11 | 1422 | 1800 | 574 | Increasing |

Both populations occur within the Rocky Mountain Management Unit. There are areas within the management unit that are closed to trapping and other areas may be designated closed because of recommendations.

Table 3.6.12. Areas Closed to Beaver Trapping.

| Population | County | Closed Creek/Area to trapping* |
|-------------------------------|--------|---|
| Uinta Mountains / North Slope | Summit | All lands east of SR-150 and south of U.S. Forest roads 058, 072, 017 and 077 (North Slope Road). |

*2004-05 Utah Furbearer Regulations section XVII, Season Dates and Bag Limits, sub-section C Beaver and Mink

On the north slope of the Uinta Mountains there are an estimated 13,708 acres of beaver habitat, see Table 3.6.13. This number was derived using the forest GIS stream and vegetation layers and by defining criteria parameters. Wet meadows, willow, bottomland hardwood, aspen, aspen/conifer and/or conifer aspen were defined as beaver habitat. A 300-foot buffer on each side of a perennial stream and a 150-foot buffer on each side of an intermittent stream were defined as within proximity of habitat utilized by beaver. Although some vegetation types included in this buffered area would not be suitable for beavers, there are probably at least as many acres of suitable pond and seep habitat outside of this area. Stream gradients between 0-15 percent were considered suitable beaver habitat. Stream gradients above 15% were considered unsuitable for beaver (Blackwell 1993). An upper elevation mark of 9500 feet was determined when developing the monitoring protocol. It was determined that beaver activity above this elevation decreased substantially due to habitat and other landscape features.

Table 3.6.13. Suitable Beaver Habitat

| Sub-population | Acres |
|-------------------------------|--------|
| Uinta Mountains / North Slope | 13,708 |

Vegetation must be within a certain distance from the stream, seep or spring to be utilized by beaver. Security cover and distance would be considered as the two main factors in beavers utilizing surrounding vegetation. Of the vegetation considered or defined as beaver habitat only the aspen/conifer and conifer/aspen types have been treated in significant amounts. However, the benefit of the treatments may be low because of the proximity to potential beaver areas.

Timber harvest, chaining or burning has been done on 6,041 acres on the north slope of the Uinta Mountains within the aspen vegetation type. However, a treated stands proximity to beaver areas would indicate whether regeneration were beneficial. The Poison Table Management Project (1997) may be one of the only projects to incorporate treatment of aspen and willow to promote age class diversity by regenerating mature stands adjacent to streams.

Some beaver habitat may be affected by grazing pressure. The UDWR report (1993) mentions there are a couple of units affected by grazing. However, it does not indicate which portion of the stream is affected, whether it is on State, private, BLM, or National Forest. It can be assumed that in areas where water is limited on the forest, grazing pressure may be affecting beaver habitat.

Because of the minimal vegetation treatments of beaver habitat adjacent to streams and better rangeland management practices (Table RN-3. Rangeland Condition and Trend, WCNF Forest Plan FEIS 3-353), it is assumed that the determinations made in the state's survey report are not changing. Therefore, it is assumed that the trend for the Uinta Mountains and Wasatch/Bear River Range populations are static.

Northern Goshawk

The goshawk uses a wide variety of forest habitats. The Wasatch-Cache Forest Plan lists goshawk as a management indicator of mature stands of aspen, conifer, and mixed conifer forests. Goshawks typically nest in mature and old growth forest stands, but goshawks utilize all forest types for foraging. In addition to being a management indicator species, the goshawk is also a Forest Service Sensitive Species (refer to previous discussion).

Goshawks are ranked globally as a G5 and they are relatively abundant and widespread throughout their range (Nature Serve Explorer 2004). It was concluded in the Conservation Strategy and Agreement for the Management of Northern Goshawk Habitat in Utah that goshawk populations in Utah were viable. This conclusion was based on the findings of Graham et al. (1999) that good quality habitat is well distributed and connected throughout the state, the absence of evidence of a population decline on National Forest System lands since 1991, and conclusions of the U.S Fish and Wildlife Service in their decision to not list the northern goshawk under the Endangered Species Act.

Table 3.6.14. Goshawk Territories – Forest-wide

| Year | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 |
|-------------------------------------|------|------|------|------|------|------|------|
| Known Territories | | | | | | | |
| Salt Lake | 1 | 1 | 1 | 2 | 2 | 5 | 6 |
| Kamas/Evanston/Mt. View | 21 | 22 | 22 | 22 | 29 | 31 | 31 |
| Ogden/Logan | 7 | 8 | 11 | 11 | 14 | 15 | 13 |
| TOTAL | 29 | 31 | 34 | 35 | 45 | 51 | 50 |
| Territories Monitored For Occupancy | | | | | | | |
| Salt Lake | 1 | 1 | 1 | 2 | 2 | 7 | 6 |
| Kamas/Evanston/Mt. View | 12 | 22 | 11 | 20 | 28 | 17 | 31 |
| Ogden/Logan | 7 | 8 | 11 | 11 | 11 | 12 | 11 |
| TOTAL | 20 | 31 | 23 | 33 | 41 | 36 | 48 |
| Occupied Territories | | | | | | | |
| Salt Lake | 1 | 1 | 1 | 2 | 1 | 4 | 4 |
| Kamas/Evanston/Mt. View | 4 | 2 | 6 | 6 | 9 | 12 | 14 |
| Ogden/Logan | 2 | 4 | 4 | 6 | 6 | 6 | 2 |
| TOTAL | 7 | 7 | 11 | 14 | 16 | 22 | 20 |
| % of Monitored Territories Active | 0.35 | 0.23 | 0.48 | 0.42 | 0.35 | 0.61 | 0.49 |

Territory occupancy has been monitored consistently on the Forest since 1999. This was the year the state wide Goshawk Amendment was released. When monitoring started in 1999, there were a total of 29 known territories on the Forest. In 1999, 20 of the known territories were surveyed of which 7 were observed as occupied. Every year a percentage of territories have been monitored and new territories found. The number of territories monitored in 1999 was divided by the number of territories monitored in the current year. This gave the percent of territories monitored for occupancy each year compared to the baseline data. The change in occupancy was obtained by dividing the number territories occupied by number of territories monitored for the current year then multiplying the percent monitored for the year and the number of territories monitored in 1999. These calculations were completed for each district and a sum was taken to show the total change in occupancy for the Forest. The following graph shows the total change in territory occupancy from 1999 to 2005. The baseline used was the 1999 territory occupancy of 7 known occupied territories. There has been a high in 2001 of 9.76 occupied territories and a low of 4.33 in 2003. These differences in years are not statistically different, showing a static trend in the goshawk population Forest-wide.

Figure 3.6.2. Total Change in occupied territories for the 25 MIS Territories

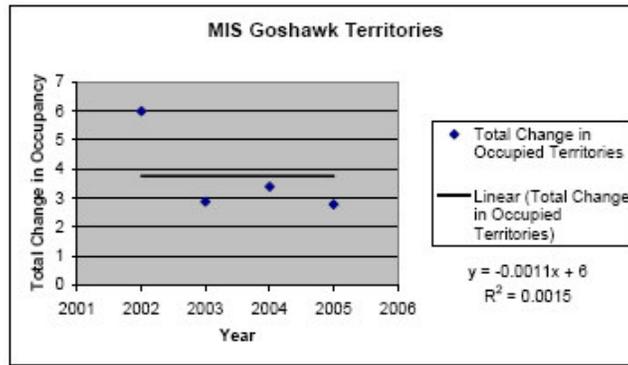


Table 3.6.15. Total Change in Occupancy Numbers From Figure 3.6.1 in Table Form.

| Year | 2002 | 2003 | 2004 | 2005 |
|---|------|-------|-------|------|
| Total Change in Occupied Territory ¹ | 6 | 2.876 | 3.389 | 2.78 |

² Sum of each District's change in territory occupancy

Nesting success has been conducted irregularly since 1999, and it was not until 2002 that at least one nest, of the 25 nests, on each District was monitored for nesting success. To calculate the proportion of fledglings to active nests, the number of young fledged was divided by the number of active nests. That number was then multiplied by the total number of territories monitored and the percent of nests monitored in the current year. Figure 3.6.3 shows the proportion of fledglings from the MIS territories monitored. This shows a static trend with a low of 8.5 fledglings in 2003 and a high of 14 fledglings in 2002. Table 3.6.16 shows the same numbers in chart form.

Figure 3.6.3. Proportion of Fledglings from MIS Monitored Territories

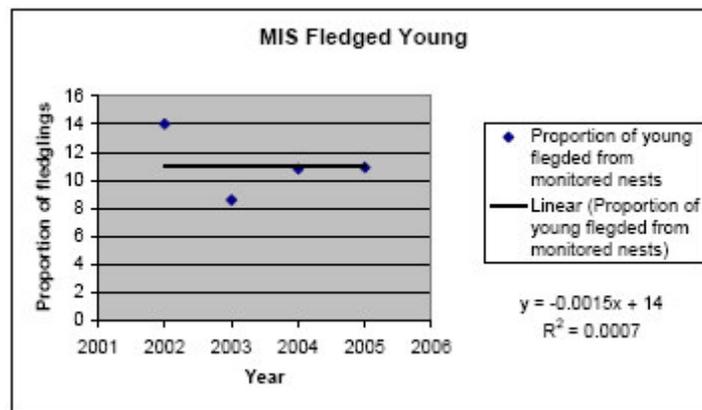


Table 3.6.16. Fledged Young Numbers From Figure 3.6.3 in Table Form

| Year | 2002 | 2003 | 2004 | 2005 |
|---|------|-------|------|------|
| Proportion of young fledged from nests ² | 14 | 8.576 | 10.8 | 10.9 |

² ((Total # young fledged / total # active nests) * total # of territories monitored * % territories monitored each year)

See Northern Goshawk under Section 3.6.3.2 for information on goshawks in the West Bear Analysis area.

3.6.3.5 Migratory Bird Species

The Utah Partners in Flight (PIF) Utah Avian Conservation Strategy Ver. 2.0 was evaluated to determine which species occurred within the project area. PIF lists the project area occurring within the Utah Mountain Physiographic Region. This region occupies 23% of Utah's land area and is made up primarily of the Wasatch and Uinta mountain ranges and their associated valleys. Elevations range from 1360m in the Salt Lake Valley at the edge of the ecoregion to 4090m on King's Peak. Most of the state's forested habitats occur within this ecoregion.

Migratory Bird Treaty Act - Established a Federal prohibition, unless permitted by regulations, to "pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention . . . for the protection of migratory birds . . . or any part, nest, or egg of any such bird." (16 U.S.C. 703)

Executive Order 13186 – Applicable excerpts include: (1) support the conservation intent of the migratory bird conventions by integrating bird conservation principles, measure, and practices into agency activities and by avoiding or minimizing, to the extent practicable adverse impacts on migratory bird resources when conducting agency actions. (4) Design migratory bird habitat and population conservation principles, measures, and practices, into agency plans and planning processes (natural resource, land management, and environmental quality planning, including, but not limited to, forest and rangeland planning, coastal management planning, watershed planning, etc.) as practicable, and coordinate with other agencies and nonfederal partners in planning efforts.

The ecological tenet underlying this process, that conservation actions focused on priority species will benefit other avian species (as well as other forms of wildlife), extends the benefits to most birds in Utah.

Migratory bird habitat - The proposed project would treat aspen/conifer (predominately aspen/lodgepole), spruce/fir and mixed-conifer habitat types found in the analysis area. The Utah Partners in Flight uses GAP analysis definitions, which describes them as aspen, lodgepole, and sub-alpine conifer vegetation types:

Sub-Alpine Conifer

Sub-alpine conifer in Utah consists primarily of Engelmann spruce and/or subalpine fir dominated communities occurring between 6,000 - 11,200 feet elevation. Approximately 497,122 hectares (1,228,388 acres; 2.3% of the total land area of Utah) of sub-alpine conifer habitat exists within the State. Of this total area, approximately 442,089 hectares (89%) occurs within the Utah Mountains physiographic region. At least 20 avian species use sub-alpine conifer as breeding habitat, and one additional species selects sub-alpine conifer habitat in winter. One priority species, the Three-toed Woodpecker occurs year-round in Utah and selects sub-alpine conifer as both a breeding and winter habitat.

Lodgepole Pine

Approximately 229,175 hectares (566,291 acres; 1.0% of the total land area of Utah) of lodgepole pine habitat occurs between 6,000 - 11,300 feet elevation primarily within the Utah Mountains physiographic region. Lodgepole pine becomes mixed with either blue spruce or subalpine fir, depending upon location. At least 201,382 hectares (88%) of lodgepole pine habitat occurs within the Utah Mountains physiographic region. Only 2 avian species select lodgepole pine as breeding habitat but none in winter. One priority species, Three-toed Woodpecker, selects lodgepole pine as a secondary habitat for breeding.

Aspen

Aspen occurs in all Utah counties in elevations ranging from 5,600 - 10,500 feet within the Utah Mountains physiographic area. In most Utah counties, aspen communities associate with mixed conifer species at appropriate elevations, and in the Uinta Mountains of northeastern Utah aspen associates with lodgepole pine. Of the total aspen in Utah, most occurs within the Utah Mountains physiographic region (631,508 ha; 84%). Of the total hectares of aspen habitat, approximately 13,618 hectares (33,650 acres; 1.8%) occur as aspen /conifer mix occurring mostly within the Utah Mountains physiographic region. At least 19 avian species select aspen habitat for breeding, but none select aspen as winter habitat. None of the 19 species selecting aspen habitat are presently listed as priority species.

There are 7 birds found on the Fish and Wildlife 2002 list of Birds of Conservation Concern and the Partners in Flight Priority Species list that utilize aspen, lodgepole, mixed-conifer and sub-alpine conifer habitat types. Two species, the flammulated owl and three-toed woodpecker, are listed on the Region 4 Regional Forester's sensitive species list. These two species are addressed in the sensitive species section of this document. Two species, Grace's warbler and pygmy nuthatch that do not have primary breeding habitat and do not occur within the project area, will not be analyzed further. Three remaining species, red-naped sapsucker, Virginia's warbler and Williamson's sapsucker are addressed in this section.

Inevitably the affect of vegetation management on species varies depending on foraging, nesting, and other lifecycle needs. Some species require late seral vegetation structural stages while other species benefit from early succession stages found in disturbed stands. Some species will be affected in the short term while others benefit and vice versa for the long-term affects.

Table 3.6.17. UPIF and USFWS Species Occurring in Project Area: Breeding Bird Survey Results 1988 through 2003 (Routes 85103, 85107, 85153, 85203, 85901, 85902, 85903, 85904)

| Species | Individuals Recorded of Each Species by Year of Survey | | | | | | | | | | | | | | | |
|------------------------|--|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 | 01 | 02 | 03 |
| Red-naped Sapsucker | - | - | - | - | 3 | 3 | 1 | 1 | 2 | 1 | 3 | 4 | 2 | 10 | 8 | 11 |
| Swainson's Hawk | - | - | - | - | - | 2 | 2 | 3 | 4 | 2 | 5 | 5 | 2 | 0 | 0 | 2 |
| Williamson's Sapsucker | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

BBS routes are found on and adjacent to the W-CNF boundary.

- No individuals observed or transect had not been established

Survey results indicate a higher number of records for red-naped sapsuckers and a lower number of records for Swainson's hawk in 2001-2003 with a consistent low occurrence of Williamson's sapsucker. Williamson's Sapsuckers are poorly sampled by BBS, so population trends are unknown (Montana PIF 2000). The Williamson's sapsucker inhabits mainly mature and old growth mixed conifer and ponderosa forests, as well as aspen stands. There are not enough records for red-naped sapsucker and Swainson's hawk to say that there is a trend for either species, but the records indicate a trend up for red-naped sapsucker and a trend down for Swainson's hawk could be developing.

Red-naped sapsucker

This species migrates north from wintering grounds in northern Mexico and the southwestern United States. In the Rocky Mountain region the breed primarily in forests with an aspen component or in pure aspen stands. They rarely breed in dominated coniferous forests. Fall migration back to winter grounds begins in early September and into October. Nesting habitat consists of live aspens that are infested with heart rot fungus. Red-naped sapsuckers typically use the same cavity tree but not the same cavity the following year. Cavity dependant species such as swallows are dependant on sapsuckers for nesting sites. Forage trees are actively pecked to facilitate sap and birds must return to the site many times a day to maintain the flow of the food source. Effects to this species are associated with the decline of aspen due to the absences of natural disturbance. Excessive grazing by livestock or big game species may affect the successful growth of regeneration stands. Treatments should be large enough to decrease over utilization by livestock and big game. Minimum size of treatments should be larger than the sapsucker's home range of 13 hectares.

Williamson's Sapsucker

This species is has been found in montane riparian woodlands as well as coniferous forests and aspen-conifer mixes. This species drills holes in trees to extract sap and the insects it attracts. A potential threat to sapsucker habitat is from a loss of snags for nesting cavities. Williamson's sapsuckers nest in both live trees and dead trees with a preference for live aspen in mixed conifer and aspen stands or snags with soft wood (Sousa 1983). Effects for this species are associated to those of the three-toed woodpecker. Unlike the three-toed woodpecker this species has not

been reported associated with burns in the Rocky Mountain area. However, overall effects on Williamson's sapsucker will be very similar to those on three-toed woodpeckers. Studies have found sapsuckers' nesting in snags in post fire areas, while foraging in adjacent live stands.

Swainson's Hawk

This species has the longest migratory route of any of the hawk species. Swainson's migrate to wintering ground in the pampas of South America. Swainson's hawks begin migration to wintering grounds from August to October. Breeding range is much of the central and western United States. Breeding habitat consists of open and semi-open country and is found around aspen groves, riparian areas and farmlands. Much of the foraging is done in the openings where small mammals and large insects can be caught. Swainson's begin nesting in March or April, usually in isolated trees or bushes. A few nesting trees include ponderosa, Douglas-fir, spruce, cottonwood and aspen. Nests are typically found between 9 and 15 feet from the ground. Effects to this species are associated with habitat loss and incidental poisoning from insecticides. As small farmlands are consolidated into larger farms trees are removed and nesting sites are lost. The use of insecticides in South America on winter grounds to control grasshoppers has resulted in an increased mortality of migrating birds.

3.6.3.6 Big Game (Elk)

Habitat requirements for elk and mule deer are similar in some types of forage selection and security cover needs. Because of the similarities the affects from the proposed treatments will address those pertaining to elk.

Elk are members of the deer or cervid family along with deer, moose, and caribou. There are six recognized subspecies of elk in North America. All of the elk in Utah are of the subspecies known as Rocky Mountain elk (*Cervus elaphus nelsoni*).

Elk males, females and young are known as bulls, cows and calves respectively. Calves are born as singles after a gestation period of approximately 8 to 8.5 months. Calves are normally born from mid May until early June and weigh approximately 13 pounds at birth. Elk often gather into large nursery bands of cows and calves in early summer. During this time, it is common to see groups of several hundred elk. Within a few weeks these nursery bands disperse into smaller groups across the summer range.

The analysis area is within what the Utah Division of Wildlife Resources refers to as the Chalk Creek Herd. Currently the herd population is 300 individuals over the objectives for the unit (objectives are set by the UDWR). Elk on this portion of the North Slope typically calve their young within the aspen and aspen/conifer vegetation types found in the analysis area. Most of the analysis area and much of High Uintas Wilderness is considered summer range for elk. Elk in this area typically spend their time in the higher elevations and migrate through the analysis area during the winter. Winter range can be found in the Yellow Creek, Deer Creek, and Chalk Creek drainages.

3.6.3.7 Corridors

Lands that serve as corridors for movement or migration reduce chances of inbreeding, overexploitation of prey, connectivity between habitat patches, and increase gene flow. Corridors therefore must be evaluated on the appropriate level when analyzing affects and species utilization. Changes in vegetation diversity, composition, and structure may affect local species differently than those that migrate through the area or vice versa.

The Nature Conservancy has designated a "Megasite" (Upper Bear) that encompasses the analysis area and is a larger portion of a designated ecoregion (Noss 2001). The megasite designation is based on the vulnerability and irreplaceability of the area using a variety of factors such as development and other physical barriers. The analysis for the corridor is done at the local level but will address the concerns for the Upper Bear Megasite.

Corridors are generally continuous, interconnected patches of similar habitat. Streams with their associated riparian areas provide habitat and corridors for movement of wildlife and aquatic species that depend on that habitat. Forests provide habitat and corridors for movement of wildlife species in a similar manner. Management of vegetation

within corridors does not preclude properly functioning conditions and can be beneficial to maintenance of the corridor by maintaining species composition and age class diversity. Silvicultural prescriptions that regenerate large patches of forest can create gaps in a forest corridor that reduces its utility while silvicultural prescriptions that change stand structure without removing a lot of the canopy cover or understory can maintain the utility of the forest corridor. Larger corridors of regional significance such as the Uinta Mountains/Bear River Range can have substantial vegetation management activity at the local level without disturbing the utility of the corridor for wildlife since many useable alternative corridors exist within the larger corridor. See Appendix A, Map 17. This map is available in color at: http://www.fs.fed.us/r4/wcnf/projects/feis/sat_corridor.pdf. The Revised Forest Plan provides the analysis at that scale. Cumulative effects of many small projects could be a concern if they cumulatively affected the utility of the corridor, so extensive analysis is required at that level. Smaller corridors such as the stream/riparian corridors and forest connectivity in the West Bear analysis area require more intensive analysis at the project level to ensure that they provide the connectivity needed within the West Bear analysis area. The West Bear area and the Weber River drainage on the Kamas District are the closest extensive forest habitat to the extensive forest habitat on the south end of the Bear River Range on the Ogden District. Migratory birds use the forest corridors as cover and forage and resting stops during their annual migrations. Migratory bird species utilize corridors in much of the same way as terrestrial wildlife. Stand structure, age and vegetation type are important characteristics for utilization by migratory birds. The physical structure of habitat, including plant species composition and foliage structure, influences habitat suitability by affecting movement and foraging.

With the exception of road stream crossings, a few dispersed campsites, and about 1.1 miles of the West Fork of the Bear River where Whitney reservoir was constructed, the riparian corridors in the West Bear areas are very similar to the willow and beaver pond dominated corridors that occurred historically. The desired future corridors within the landscape should provide connectivity between different ecosystems, providing animal migration routes under the West Fork Bear River Ecosystem Management Project 2002.

Big game, smaller mammals such as lynx and pine marten, and many migratory birds utilize the forest corridors or their edges for cover during travel or migration. Natural openings such as meadows provide foraging opportunities for big game. Most big game animals utilizing these stands are migrating from summer range in the mid to upper elevations of the Uinta Mountains to winter range found in the Bear River, Deer Creek and Chalk Creek drainages. Smaller mammals use them as year-round habitat as well as travel corridors between larger patches of habitat or occasionally in movement between ecoregions. Upper elevation forests in the roadless portion of the West Bear analysis area provide continuous forest cover for movement east and west between the Weber and Hayden Fork drainages and north and south within the analysis area. Past forest treatments have primarily been 10 to 40 acre clearcuts scattered throughout the various forest types in the analysis area, salvage logging in the spruce/fir type in the Meadow and Humpy Creek areas and a lodgepole pine thinning project in the Coyote and Road Hollow areas that is in progress. The salvage logging was in many ways similar to selection harvest although the canopy removal due to spruce bark beetles in the Humpy Creek area and small parts of the Meadow Creek area was more than would have been prescribed in a forest unaffected by beetles. Forest stands in the Meadow Creek area have changed little in their ability to function as a part of a corridor. The overstory canopy in Humpy Creek is more open but the understory has developed quickly and the utility of the stand as a movement corridor is still intact. The lodgepole pine thinning will result in a more open forest stand structure that may reduce the utility of the corridors for some species until the understory becomes more developed. The end result of past harvesting in the West Bear area is still a properly functioning condition of forest connectivity and corridors since the past harvesting did not reduce the ability of wildlife to use most of the corridors.

3.6.4 Environmental Consequences

This section describes the direct, indirect and cumulative effects to terrestrial species. The primary issues for terrestrial species are the effects on habitat availability, connectivity, and activity disturbance from timber harvest, road construction, and prescribed burning. These effects were analyzed for each alternative.

This section describes the potential effects of timber harvest, road construction, and prescribed fire and then describes the direct, indirect, and cumulative effects for each alternative on habitat availability, connectivity, and activity disturbance. The analysis area for these effects on terrestrial habitat is expanded from the general analysis

area to include additional areas for some species such as Canada lynx. The analysis area is identified for each species that is affected.

3.6.4.01 Adverse Effects of Management Actions Common to Many Species

The following potential management effects on wildlife have been considered.

Loss of habitat for wildlife can be viewed as an alteration (short-term) or destruction (long-term/permanent) affect. Depending on the wildlife affected the species may well adapt (habituate) or perish due to the environmental changes. Wildlife species with large populations and higher reproductive rates may show little adverse affects and vice versa for those species on the other side of the spectrum.

Fragmentation is the process whereby a large, continuous area of habitat is both reduced in area and divided into two or more fragments (Primack 1993). Large modified or degraded landscapes where agricultural fields separate fragments increase the affects to wildlife. Impacts to wildlife species inevitably are detrimental if the fragmented or isolated areas do not adequately provide habitat for life cycle needs. See lynx section for analysis.

Edge habitat is created by fragmentation. Important edge effects include microclimatic changes in light, temperature, wind and the incidence of fire (Primack 1993). The altered habitat may not provide all wildlife species with suitable habitat.

Noise Disturbance from motorized vehicles has an affect on wildlife species and their environment. Most researchers agree that noise can affect an animal's physiology and behavior, and if it becomes a chronic stress, noise can be injurious to an animal's energy budget, reproductive success and long-term survival.

3.6.4.02 Cumulative Effects Common to All Species

This section will discuss cumulative effects from the treatment. Table 3.6.18 shows the effects over the time period in which it would take to complete the project.

There would be three sales generated from the West Bear Vegetation project. The sales would be in sequential order beginning with the Reservoir East and Mill City and followed with the Moffit sale. It is expected that each sale would take 2 or 3 years to complete.

To estimate the affects from the proposed project on wildlife habitat and movement 0.25 miles along both sides of the haul roads were analyzed. It was determined that because of the forested condition both noise and visual disturbance decreased outside 0.25 miles.

Table 3.6.18. Affected Sale Area and Haul Road Acres and Number of Years Affected.

| Sale Area | Miles of road | Affected Acres | Expected Years of Harvest Operations | Log Haul on Whitney Road Segments |
|------------------------------|---------------|----------------|--------------------------------------|-----------------------------------|
| Coyote/Road Hollow Sale Area | 5.67 | 1676 | 2005-2007 | Middle and Lower Segments |
| Reservoir East Sale Area | 10.42 | 3449 | 2007-2009 | Middle and Lower Segments |
| Mill City Sale Area | 4.44 | 1304 | 2007-2009 | Lower Segment |
| Moffit Sale Area | 19.82 | 5307 | 2008-2010 | All Segments |

As shown in Table 3.6.18 the Mill City sale area and the area surrounding the lower Whitney Road would be impacted for a longer period of time due to log haul on the Whitney road. Although the Mill City and Reservoir East sale areas would be treated in 2007-2009, there would be hauling on the Whitney road through these areas during 2010 from the Moffit sale area. The lower Whitney road segment is approximately 2 miles from Hwy 150 to Mill City Creek, the middle is approximately 1 mile from Mill City Creek to Coyote Hollow, and the upper is

approximately 3.5 miles from Coyote Hollow to the Meadow Creek Road junction including a segment that is on private land.

Inherently the treatment objective would affect the short-term and long-term use of stands by wildlife species differently. Within the analysis area there is potential habitat for species with identified population concerns and species with abundant numbers. The effects would be more of an impact to wildlife species that are sensitive to disturbance and with low numbers of individuals in the analysis area.

The cumulative effects of alternatives and past harvesting, recreational road use, and past road construction from loss of habitat, fragmentation, edge, and noise would affect wildlife in the analysis area to some extent. It would be expected that wildlife and individuals of the species would react differently to the changes in the environment.

The cumulative effects from the ongoing operations are expected to impact the wildlife species more during the summer and fall months. Early spring movements for wildlife species are expected to be unchanged except where some species have altered their movement patterns in treated units. Because of the available habitat in the area and decreased human activity during that time of the year the impacts would be less.

There are three landscape corridors designated in the West Fork Bear River Ecosystem Management Project (USDA 2002). These corridors follow the Meadow Creek, West Bear and Mill City Creek drainages. The corridors allow animals to move north and south through the analysis area from summer to winter habitat and vice versa. Resident or local wildlife species utilize the corridors to move within their home ranges that are found in the analysis area. Although there would be a loss in some habitat (patch cuts) until a future time the function of the thinned stands would be similar to the current condition. The West Bear Analysis area is also part of a mega-corridor delineated by the Nature Conservancy that provides connectivity of habitat from the Northern Rocky Mountains into Colorado. Functionality of this corridor is dependent on maintaining landscape corridors within the West Bear analysis area as well as across private land between the Uinta Mountains and the Bear River Range.

Wildlife species utilizing the area as a corridor need horizontal and overstory security cover. Although the stand was thinned it still provides security cover for wildlife movement. The use of the corridors by some wildlife species may be affected due to log hauling on the Whitney road in addition to the normal traffic. Recreational traffic on the Whitney road is fairly high, although more so on weekends and holidays than weekdays. Assuming 1 to 10 log loads per day (EIS Table 3.8.4), and average recreational and other traffic of 10 to 20 vehicles per day, there could be a 50% to 100% increase of vehicles on the Whitney Road on some weekdays. Log hauling will not be allowed on weekends or holidays. Recreational traffic on those days is much higher than the cumulative traffic on weekdays.

Noise from the ongoing operations and motorized vehicles would displace wildlife from some areas and units. Depending on the species the noise may or may not affect their behavior or physiology. Currently in the area there is a raptor that successfully nested less than 10 feet from the Whitney Road. Other species may not be as adaptable and would be dispersed to other habitat within the analysis area. Some species may find suitable habitat for life cycle needs while others may not, which may affect those particular species populations. However, those affects may only impact the local populations and not be significant across the species distribution.

Edge habitat created due to the removal of trees and opening of the stand would be expected to decrease the available breeding, nesting or rearing habitat for some species along the perimeter. This may increase the competition for suitable habitat within the interior portion of the stand. Some predator species may benefit from "patch cuts" and "thinned areas" while their prey species would not. These actions may increase the predator population while negatively affecting the prey species populations.

Wildlife and individuals of particular species would be expected to react to the increase in disturbance differently. Some wildlife species will adapt to the noise and treated units while it can be expected that some individuals will be affected negatively. There could be affects on individual populations and home ranges. For species with larger home ranges the disturbance is likely to displace individuals. However, because of the larger home range the impact may be less because of the available habitat with fewer disturbances. The impact to local or resident species is expected to be greater. Although some of these species would disperse the available habitat may not be suitable and local populations may be affected.

3.6.4.1 Threatened, Endangered, Proposed, and Candidate Species

Bald eagle

The analysis area for direct, indirect, and cumulative effects on bald eagle is the West Bear general analysis area.

Alternative 1 – No Action

There would be no effects on potential nesting or roosting trees.

Alternative 2 – Proposed Action and Alternative 3 – Reduced Roads

The proposed project and Alternative 3 would remove potential nesting or roosting trees from the area. However, because of retaining snags under Forest Plan Guideline (G16) and the natural cycle of disease and beetles affecting tree species within the analysis area there would continue to be a number of nesting or roosting trees available across the landscape. The displacement of big game species is likely to occur within the stands that are being treated while treatment is ongoing. Big game species would move to other areas or travel corridors within the analysis area. The proposed project could displace bald eagles that may utilize the area. However, the proposed project is scheduled to end the season when snow depths no longer allow access to the units. There would be no mid or late winter logging with the proposed actions. Bald eagles traveling in search of carrion could potentially use snags or live trees within the project area as temporary resting sites. Loss of trees is considered an insignificant impact because the eagles would only be temporary, transient visitors to the area. Primary foraging habitat in winter would occur at the big game winter areas such as Deer, Yellow, and Chalk Creek drainages ten to fifteen miles from the West Bear analysis area. Past timber harvest and fires have removed potential nesting or roosting trees but the action alternatives are retaining adequate nesting or roosting trees and bald eagles in this area are only transient, so there is no cumulative effect.

The activity associated with the proposed West Bear Vegetation Project on the Evanston Ranger District “may affect, but is not likely to adversely affect” bald eagles (USDA FS 2005f; USDI 2005). This determination is based on the effects described above and is specific to the proposed action in the Environmental Impact Statement for the project.

Canada Lynx

The analysis area for direct, indirect, and cumulative effects on Canada lynx is lynx analysis unit (LAU) #36.

Alternative 1 – No Action

Under the No Action Alternative the vegetation within the analysis area would continue to provide adequate foraging and denning opportunities for lynx in the spruce/fir and mixed conifer vegetation types. Denning opportunities would be provided in mature stands where naturally occurring disturbances such as wind, insect and disease have provided downed woody material and other structures adequate for denning sites.

Alternative 1 would have an affect on the available prey base in the early successional vegetation types. Although red squirrel and snowshoe hare would be available in the mature spruce/fir habitat the gradual loss in younger age-class vegetation would have an effect on lynx prey. Snowshoe hare monitoring indicates that snowshoe hares/hectare ranged from 3.12-5.92 in young aspen/conifer compared to 1.78-3.39 in the mixed conifer habitat and from 1.52-2.90 in young lodgepole pine compared to 1.17-2.22 in the mature lodgepole habitat (Jauregui 2005).

The corridor and travel routes within the West Bear would continue to function at their existing level. No change or disturbance would be expected within those corridors except for those naturally occurring from insect, disease or wind.

Wildland fires would continue to be suppressed within the West Bear Drainage under the 2005 Uinta and Wasatch Cache National Forests Fire Management Plan (USDA FS 2005b). Diversity of habitat that is dependent on large disturbances would not occur unless fires escape suppression.

Alternative 2 – Proposed Action

The direct effects from the proposed project are analyzed in terms of effect on fragmentation, displacement, denning/foraging habitat, and travel. Indirect effects to the lynx from the proposed action would be to available prey base species. Effects to lynx would vary depending on vegetation type and management actions. The ongoing project work and the temporary and extended change in habitat would directly effect the utilization in portions of the LAU.

Fragmentation

The treatment units would increase the edge in some portions of the LAU where small patch cuts are proposed. The creation of small gaps (up to ½ acre) in the spruce/fir forest canopy and creation of small patches (up to 2 acres) of early seral forest in the mixed conifer forest canopy is what historically would be expected to have occurred naturally with disturbance from mixed fire regimes, insects, disease, and/or wind.

There are two concerns with temporary roads within treatment units. Temporary roads would fragment the stands and portions of the landscape over the time period necessary to complete the treatments. The fragmentation of habitat could increase the likelihood that lynx would avoid the area during late spring, summer and fall while operations are ongoing. These areas may be avoided until the treatments are complete and the roads are reclaimed and closed. Although no winter harvest is proposed, snowmobile use would be expected and the compressed snow is a likely corridor for predators. The new corridors and largest openings may be used until a time in the future when regeneration reaches above snow level. New temporary roads may increase the use by other predator species. Coyotes in particular may utilize these corridors and compete with lynx for snowshoe hare or other prey species. Competition by coyotes or other predators may affect lynx populations during years of low prey. These effects may be less when prey species are more readily available.

Large patch sizes will result from conifer removal and burning of mixed aspen/conifer stands. Large patch sizes resulting from stand replacing fires are historically typical of this forest type. These will not provide cover for lynx or snowshoe hares until regenerating aspen reaches an adequate height. Aspen on good sites in the East Fork Fire of 2002 are already approaching that height. Travel corridors would still be available to lynx in habitat outside of the designated treatment areas.

Firelines would be constructed using two separate methods. In areas where it is feasible, dozer lines would be constructed while other portions of the fireline would be constructed by hand crews. These lines would be reseeded once the project has been completed. The affects from the fireline are expected to be minimal when compared to the desired affect from a prescribed burn. The firelines would not be expected to impede lynx traveling within the LAU since they are within and along the edge of treatment areas.

Denning/Foraging Habitat

The LAU currently is and following treatment would have well in excess of 10% of the area in potential denning habitat. The mature and older spruce/fir and mixed conifer forest types cover an estimated 80% of the forested portions of the LAU.

Table 3.6.19. Available denning habitat in LAU 36

| LAU 36 | Current denning habitat | Past harvest in spruce/fir and mixed conifer | Spruce/fir and mixed conifer affected by Alt 2 | Post treatment minimum potential denning habitat |
|--------|-------------------------|--|--|--|
| 20,653 | 16,537 | 420 | 1,030 | 15,087 (73%) |

In LAU 36 there has been 420 acres of spruce/fir and mixed conifer harvested in the past. Some of these units do not provide the adequate dead woody debris or security cover necessary for denning sites. These units may not provide adequate forage or security cover for prey species.

Foraging habitat for prey species would continue to exist in the untreated portions of the spruce/fir and mixed conifer stands. As understory species establish and develop, foraging opportunities for prey species would develop in the treated patches. This would be expected within 10 years within the 1,030 acres of spruce/fir and mixed conifer habitat treated under this alternative. Small group selection patch cuts (¼ to 2 acres) would occupy approximately 20% of the 1,030 acres with a group selection prescription in spruce/fir and mixed conifer. Lynx would not utilize these areas until regeneration develops and densities provide adequate security cover and prey species. The removal of conifers followed by prescribed burning of mixed aspen/conifer stands in large openings is expected to result in regeneration of up to 418 acres. Small 1 to 5 acre patch cuts in aspen/mixed conifer in units 7, 24 and 25 are expected to result in regeneration of about 40 acres. The objective is to regenerate aspen, but regeneration of mixed aspen and lodgepole pine is expected where there is a lodgepole pine seed source. Snowshoe hare would be expected to use the area if aspen regeneration has a conifer component. Snowshoe hare would not utilize the area until conifer species begin to provide cover in the understory if aspen regeneration dominates the site following treatment. In the aspen/conifer designated for treatment, the use of regeneration by snowshoes is not expected to be high. Data from plots on the Ogden/Logan Districts indicate low use by snowshoe hares. This may be due to diversity in understory species.

Travel

Lynx have large home ranges and travel great distances. Lynx typically move throughout their home range in search for prey. Typically, lynx do not cross openings wider than 300 feet; however, they do travel through silviculturally thinned stands with 180 trees/acre void of shrubs (Koehler 1990). None of the harvest patches in the spruce/fir or mixed conifer will be over 300 feet across except for the 1 to 5 acre patch cuts in units 7, 24, and 25.

Treatments in the spruce/fir and mixed conifer would continue to provide adequate security cover for movement. It can be expected that lynx would avoid the 418 acres that would be in cut and burned or prescribed burned units until a future time when regeneration provides adequate cover. Considering the proximity of the units from each other the disturbance to travel would be distributed across the landscape with useable travel corridors between them. Although a travel corridor may be affected, the openings created in the spruce/fir and mixed conifer forest would not be significant enough to present a barrier to traveling lynx. The larger openings in the mixed aspen/conifer forest have good travel corridors surrounding them.

Displacement

Disturbance and displacement of any lynx in and near harvest units while harvest activities are occurring is likely.

Indirect Effects

Lynx are closely tied to their primary prey species the snowshoe hare. Red squirrels are an important alternate prey species when snowshoe hare populations are low. Snowshoe hares utilize young dense stands of regenerated lodgepole pine and mature age class stands with well developed understory. Red squirrels are typically found in mature and older stands.

In the short term there would be a negative affect from the proposed actions on both species within the treatment units. Treatments in spruce/fir and mixed-conifer stands are likely to maintain characteristics associated with mature vegetation types. In stands where understory are well established the increase in value for prey species may be lower. In those stands lacking an understory an increase in foraging habitat and value is expected for lynx prey species. Disturbance and displacement from the stands that activities are occurring is likely. It would be expected within the spruce/fir and mixed conifer that the snowshoe hare and red squirrel would utilize portions of the stand that are not being treated.

In the aspen/conifer vegetation type there would be an expected decrease in habitat for both species. Depending on the species composition of the stand the decrease in value of the stand may only pertain to snowshoe hare. Red

squirrels are not expected to be found in an aspen dominated stand where the mature conifer component is scattered lodgepole. The value of the stand would be low as regeneration of aspen dominates the site. As the conifer component establishes the value of the stand for snowshoe hare is expected to increase. The increase in value of the stand would be expected after 20 or 30 years depending on conifer regeneration.

The long-term benefits from treatments for both prey species and indirectly for lynx within the spruce/fir, mixed conifer and aspen/conifer vegetation types would be an expected increase in future habitat value.

Treatments on the aspen dominated sites are not expected to affect either of the prey species. Red squirrels would not be expected to utilize mature or regeneration aspen clones. Survey results for snowshoe hare indicate that there is a decreased use in aspen stands without some type of conifer component.

Alternative 3 – Reduced Roads

The direct and indirect effects on fragmentation, denning/foraging habitat and travel would be similar to those found in Alternative 2 with less effect from road construction. Although there would be fewer constructed roads needed for Alternative 3 the effects of roads constructed would be similar to those discussed in Alternative 2. The number of miles of constructed fireline would increase. Construction would be completed by bulldozers where feasible and hand crews. The constructed fireline would not impede traveling lynx.

The small patch cuts (approximately 30 acres within treatment units 7, 24, and 25) and prescribed burning (418 acres) within the aspen/conifer vegetation type would likely decrease the value of snowshoe hare and red squirrel habitat. Depending on the conifer species composition of the stand red squirrel use of the units may be low or nonexistent. Snowshoe hares would not be expected to use the area until a future time when regeneration of conifer species in the understory begins.

Cumulative Effects of Alternatives 2 and 3

The cumulative effects analyzed below would be common to both alternatives.

Timber Activities

The Lynx Conservation Assessment Strategy (LCAS) defines lynx habitat in unsuitable condition as areas that are in early successional stages in which vegetation has not developed sufficiently to support snowshoe hare during all seasons. Within the project area, past harvest units where spruce/fir was clearcut are generally considered unsuitable habitat. The LCAS and Wasatch-Cache Forest Plan have standards for unsuitable habitat: (S8) if more than 30 percent of lynx habitat within a LAU is currently in unsuitable condition, no further reduction of suitable conditions shall occur as a result of vegetation management activities by federal agencies and (S9) timber management projects shall not change more than 15% of lynx habitat within a LAU to an unsuitable condition. The Forest Plan also has guidelines that apply to lynx habitat: (G18) In Lynx Analysis Units design all management activities to maintain, restore, or protect desired lynx and lynx prey habitats including foraging, denning and movement, (G19) In Lynx Analysis Units with less than 10% denning habitat well-distributed, retain disturbance areas smaller than 5 acres with tree mortality that could contribute to denning habitat, and (G20) In Lynx Analysis Units maintain or restore (defer action) denning habitat in patches larger than 5 acres comprising at least 10% of habitat. In units with 1 to 5 acre patch cuts, cutting and burning, and prescribed burning, it is expected that the area would be unsuitable to lynx or prey species. These units would not provide adequate foraging opportunities or security cover for 10 to 30 years.

In the spruce/fir and mixed conifer stands where a group or individual tree selection method is proposed the time period of non-use by lynx and prey species would be shorter. This method allows for security cover to remain within the stand, while creating openings that help to regenerate understory species. In areas of the unit where no treatment occurs downed woody materials would be available for lynx denning habitat. Because of this method, a conservative estimate is that 50% of the spruce/fir and mixed conifer acres would still provide foraging, denning, and travel habitat for lynx.

Table 3.6.20. Lynx Habitat Pre and Post Vegetation Treatment

| Primary / Secondary Habitat Acres in LAU 36 | Unsuitable Habitat Prior to Treatment (Alternative 1)* | Alternative 2 | | Alternative 3 | | Cumulative % changed to unsuitable Alt. 2 | Cumulative % changed to unsuitable Alt. 3 |
|---|---|---------------|-----------------------|---------------|-----------------------|--|--|
| | | Unit Acres | Unsuitable Acres** | Unit Acres | Unsuitable Acres** | | |
| 20,653 | 1,038 | 1,686 | 1,179 (5.7%) | 1,387 | 1,003 (4.9%) | 2,225 (10.7%) | 2,044 (9.9%) |

*Includes acres from proposed Coyote/Road Hollow Timber Sale

**50% assumed suitable habitat remaining in spruce/fir and mixed conifer vegetation types.

The changes in habitat from past, present, and future projects within LAU 36 would still meet the LCAS standard for “management not to change more than 15% of the habitat to a suitable condition within a 10-year period”

Mountain Pine Beetle

The current level of mountain pine beetle activity is expected to continue within the analysis area. Depending on conditions stand beetles may affect entire stands. Most of the pure lodgepole pine stands in the analysis area are being thinned under the Coyote Road Hollow Beetle project in an attempt to prevent loss of the large diameter lodgepole pine trees. In other stands with mixed lodgepole pine, spruce, and fir, where only larger diameter lodgepole pine trees are killed the stand will provide some foraging opportunities as understory species develop and still function as a corridor for traveling lynx. Since lodgepole pine is a relatively small component of the forest types in the area, and much of it is being treated under the Coyote Road Hollow timber sale, beetle mortality is not expected to be a cumulative effect with the alternatives on lynx habitat.

Grazing

The grazing of sheep occurs within the analysis area. It is expected that some browsing of regeneration would occur within the treatment areas. There are five allotments (4 sheep/1cattle) that either occur or have some portion of the allotment within the boundaries of LAU 36. In riparian habitat within lynx habitat, ungulate forage use levels may reduce forage resources available to snowshoe hares. Browsing or grazing can have a direct effect on snowshoe hare habitat if it alters the structure or native plant species composition. Most of the effects from sheep and cattle grazing would be limited to aspen stands, meadows, and other openings within the LAU. Lack of cover limits snowshoe hare use of these areas. Much of the forested landscape is classified as non-range type due to steepness of slope and/or lack of forage. The level of grazing from sheep is not expected to affect regeneration because of low utilization and the movement by herders. The cattle allotment does not overlap any of the treatment units. A rangeland report by Richard Zobell, Rangeland Management Specialist (Zobell 2005a) indicates that seven monitoring studies have been established within the analysis area that can be used to determine ground cover conditions. Three of the six monitoring studies indicate that ground cover conditions are meeting the Forest Plan standard (S7). Of the remaining four studies, three indicate a trend towards the standard. No trend is indicated for one study not meeting Forest Plan standard (S7). A greenline transect established on Mill City Creek in 1999 shows a very high (99.6%) late seral species composition. Additional greenline transects were added in Meadow Creek Study #15-11 (with 92.4 % late seral species and Meadow Creek Study #15-14 (with 93 % late seral species) in 2005. A greenline transect (Study #15-25 with 98% late seral species) was established on the West Fork Bear River and Study #15-26, (photo points on Beaver Lake outlet stream with estimated 98% late seral species) were added in the West Fork of the Bear River drainage in 2006. The report also lists past monitoring of aspen regeneration concurrent with grazing on the north slope of the Uinta Mountains and supports the conclusion that although sheep may browse on some of the aspen, “permitting sheep grazing after harvesting aspen units should not negatively affect the successful regeneration of the shrub and tree components”. There is additional grazing by both sheep and cattle within LAU36 on a large area of private land (38,000 acres) to the north and west of the West Bear general analysis area. This area does not contain any National Forest System land but is within the proclaimed Forest Boundary. LAU 36 was drawn to include all land within the proclaimed boundary. The Forest Service does not have access to the private land for monitoring, but management of grazing on this private land is assumed to be similar to the management of grazing on National Forest System land. Since the alternatives are not treating rangelands, there is no cumulative effect.

Recreation

The analysis area is a high use recreation area. During the summer the area is popular with ATV's and in the winter the area is used by snowmobiles. Within LAU 36 there are two main routes (HWY-150 and Whitney Road) that are groomed during the winter. Recreation activities would continue at their current level and/or increase within the analysis area. Humans may exert potentially negative influences on lynx by building residences and roads in and through lynx habitat, by altering and modifying existing habitats, and by direct disturbance through recreation or travel in areas inhabited by lynx. The use of the area by lynx may be affected due to log hauling on the Whitney road in addition to the normal traffic. Recreational traffic on the Whitney road is fairly high, although more so on weekends and holidays than weekdays. Assuming 1 to 10 log loads per day (EIS Table 3.8.4), and average recreational and other traffic of 10 to 20 vehicles per day, there could be a 50% to 100% increase of vehicles on the Whitney Road on some weekdays. Log hauling will not be allowed on weekends or holidays. Recreational traffic on those days is much higher than the cumulative traffic on weekdays. However, lynx appear to readily cross highways, and several animals established home ranges adjacent to roads. Lynx may tend to avoid areas with higher levels of disturbance or greater fragmentation or habitat from development, although this has not been rigorously tested. Several studies of lynx have occurred in areas with reasonably dense rural human populations and interspersed agricultural areas, which further suggest lynx can tolerate daily human use and presence in an area (Ruggiero 1999). The alternatives will not directly increase recreational use of the area. There is a possibility that improvement of the roads could encourage a small incremental increase in recreational use following completion of the timber harvest.

Roads are currently being constructed for a new development (See FEIS Section 3.6.4.7) on 2,010 acres within 4 sections of private land (Sections 29, 30, 31, and 32 in the corner formed by the Forest Boundary on the south side and Highway 150 on the east side just north of the northeast corner of the West Bear analysis area (USDA FS 2006). This subdivision will have 31 lots clustered on lots from 11 acres to 40 acres with the rest of the area being commonly owned open space. Each lot has a designated 10 acre building site. This development will have an affect on wildlife use of that area and is likely to cause a slight increase in recreational use on the Forest. However, not much of that use is likely to occur until after timber harvest has been completed under the alternatives.

There are three undeveloped areas of private land to the west of the current development covering a much larger area that currently serve as a travel corridor and wildlife habitat. Development has also been proposed on some of this property. None of those proposals have been approved by Summit County. It is unknown whether or not they will be approved or what their designs would be, so other than the development currently in progress, effects on wildlife corridors of development of private land in and adjacent to the analysis area is not reasonably foreseeable at this point in time.

Determination

The activity associated with the proposed West Bear Vegetation Project on the Evanston Ranger District "may affect, but is not likely to adversely affect" Canada lynx (USDA FS 2005f; USDI 2005). This determination is based on the effects described above and is specific to the proposed action in the Environmental Impact Statement for the project.

3.6.4.2 R4 Sensitive Species

The analysis area for direct, indirect, and cumulative effects on sensitive species is the general analysis area identified in FEIS Section 1.3.

Wolverine

Alternative 1 – No Action

There would be minimal affect on wolverine habitat from this alternative. Much of the suitable habitat for this species exists to the south of the project area at higher elevations with fewer disturbances. Under this alternative the continued conversion of aspen to conifer dominated stands is expected. Current fire suppression actions would

eliminate natural disturbance from the ecosystem. The lack of natural disturbance in the aspen/conifer vegetation type would limit some habitat types for big game species.

Alternatives 2 and 3

Direct and indirect effects from Alternatives 2 and 3 on wolverines are based on the effects on big game species. Activities that increase availability of foods generally will affect wolverines positively, whereas those that reduce prey population will do so negatively. Some ungulate species may be enhanced by the provision of early seral stages through logging or burning (Ruggiero 1994). Because wolverines rely heavily on big game carcasses to provide a source of food, changes in migration patterns or routes may affect wolverine. The proposed project would affect some of the corridors within the analysis area but most would remain unaffected after completion of the timber harvest. Because wolverines have such large home ranges it would be expected that they would also use other suitable corridors outside of the analysis area. The proposed project would therefore only affect a portion of the wolverine home range and the minor disturbance effects of the proposed action and Alternative 3 are offset by the minor benefits in forage for big game and is therefore in accordance with Forest Plan Guideline (G21) for projects that may affect Forest Service Sensitive species, develop conservation measures and strategies to maintain, improve and/or minimize impacts to species and their habitats.

Cumulative Effects

Because wolverines are sensitive to human disturbance those cumulative activities occurring within the analysis area that introduce or contribute to new disturbance are of concern. Many of the past, present and foreseeable actions within the analysis area are in currently disturbed area, which may indicate little to no use by wolverine. However, vegetation management may provide better habitat for big game species. Snowmobile use would be the most concern for wolverines because they can get into remote portions of country including high elevation back country. Snowmobile access may not only allow competing predators access but activities may displace wolverines and their potential prey species. Road clearing and skid trails and the larger treatment units in the Mill City Creek area may slightly increase snowmobile access on level ground or during spring snow conditions when the snow hardens. Although wolverines are mostly scavengers, they can prey on ungulates under some conditions (Ruggiero 1994).

Determination

Because of the vast majority of undisturbed habitat at the higher elevations, close proximity to the High Uintas Wilderness, and the current big game populations, the proposed project would have a “may impact individuals, but is not likely to cause a trend toward federal listing or a loss of viability” (USDA FS 2005e).

Boreal Owl

Alternative 1 – No Action

Under Alternative 1 nesting habitat would continue to exist in mature stands with spruce/fir and mixed-conifer species. These stands would provide adequate nesting structures in snags or woodpecker created and/or natural cavities in live trees. Foraging opportunities would be available in meadows or openings found throughout the landscape and within forested stands. The encroachment of conifers into meadows could reduce available foraging opportunities during early spring.

Alternatives 2 and 3

Under Alternatives 2 and 3 there would be a loss in potential nesting trees. However, there would continue to be nesting trees available within stands where selective harvest occurs. The characteristics of mature stands would continue to exist with downed woody material and openings available post treatment. These characteristics would continue to provide nesting and foraging habitat. During treatment operations it would be expected that if any owls were present in the immediate vicinity, they would be displaced. The proposed treatment methods would reduce potential foraging habitat in the short term, but is expected to increase suitable habitat for prey species in a fairly short time period and is therefore in accordance with Forest Plan Guideline (G21) for projects that may affect Forest

Service Sensitive species, develop conservation measures and strategies to maintain, improve and/or minimize impacts to species and their habitats.

Cumulative Effects

Recreation would not be expected to cause significant impacts on small mammal species, however the removal of downed wood for firewood from the forest could reduce prey species denning or security habitat.

Determination

Because of the large amount of undisturbed habitat in roadless areas in the analysis area (upper West Bear drainage) and temporary minor effects on spruce/fir and mixed conifer habitat, the proposed project would have a “may impact individuals, but is not likely to cause a trend toward federal listing or a loss of viability” determination (USDA FS 2005e).

Great gray owl

Alternative 1 – No Action

Under Alternative 1 nesting habitat would continue to exist in mature stands that provide the necessary requirements. Alternative foraging habitat would continue to exist in these mature stands, without disturbance the loss of foraging habitat is expected with the encroachment of conifers into meadows and natural openings.

Alternatives 2 and 3

Under Alternatives 2 and 3 there would be a temporary loss in available nesting habitat. There would be nest trees available in the spruce/fir and mixed conifer stands where a selective harvest or group selection is used. The potential of removing a suitable nest tree within the stands is expected, however much of the stand would retain nesting characteristics and structure. It would be expected that activities associated with the vegetation treatment would displace individuals or cause a short-term abandonment of the stand while the treatment is occurring.

Within the spruce/fir and mixed conifer vegetation types, identified as forested habitat by Hargis and Bissonette (1996), there would be an expected loss in habitat. However, because of the treatment the stand would contain characteristics associated with mature forests. In 10-15 years there would be an increase in understory vegetation and an increase in the value of the stand for prey species and is therefore in accordance with Forest Plan Guideline (G21) for projects that may affect Forest Service Sensitive species, develop conservation measures and strategies to maintain, improve and/or minimize impacts to species and their habitats.

In the aspen/conifer vegetation type, small patch cuts and prescribed burn units would provide habitat for small prey species as regeneration begins to establish. This would also be expected in the aspen dominated stands where prescribed fire is planned.

Cumulative Effects

Cumulative effects of vegetation treatments within the area may reduce some potential foraging habitat. The treatment methods would be expected to provide suitable habitat for prey species in a shorter time period. Recreation would not be expected to cause significant impact on small mammal species, however the removal of downed wood from the forest could reduce denning or security habitat.

Determination

The proposed project would have a “may impact individuals, but is not likely to cause a trend toward federal listing or a loss of viability” determination (USDA FS 2005e).

Three-toed woodpecker

Alternative 1 – No Action

Under this alternative available nesting and foraging opportunities would continue to exist. Conifer tree species would be available for nesting, however aspen nest sites may be lost as the aspen component is lost in the aspen/conifer vegetation type. Foraging opportunities would continue in stands where beetle activity is present.

Alternatives 2 and 3

Under Alternatives 2 and 3 there would be a small change in the amount of available forage. Some future foraging trees may be lost, however compared to the overall mature habitat within the analysis area the loss is insignificant. Displacement or temporary abandonment for some of the units is expected during harvest activities. Foraging opportunities would be created in areas designated to burn. It is expected that there would be enough remaining standing dead trees to provide habitat for beetles. These areas would remain productive foraging areas for 3-5 years post burn.

Some nesting habitat would be lost in stands where selective harvest would occur. However, in stands where prescribed burning is proposed nesting habitat would be increased and the project is therefore in accordance with Forest Plan Guideline (G21) for projects that may affect Forest Service Sensitive species, develop conservation measures and strategies to maintain, improve and/or minimize impacts to species and their habitats.

Cumulative Effects

Proposed basal area reduction and small patch cut treatments in the analysis area would remove canopy cover but would not eliminate the major food source (bark beetles) from the landscape. Some future nest sites may be lost but compared to the available nest trees across the landscape the cumulative effect is minimal.

Determination

The proposed project would have a “may impact individuals, but is not likely to cause a trend toward federal listing or a loss of viability” determination (USDA FS 2005e).

Northern goshawk

Alternative 1 – No Action

Under this alternative the loss of potential nesting habitat in some vegetation types is likely due to decline of the aspen component. The current available habitat would continue in succession across the landscape. Nesting habitat would decline in the future with continued fire suppression and management of epidemic beetle outbreaks within the analysis area. Nesting habitat would occur in areas where some natural disturbances affect stands with blow down and endemic levels of beetle activity.

Foraging habitat would also be affected by this alternative. Prey species that require early succession vegetation habitat would be lost from the area because of the lack of natural disturbance. Available prey species would be limited to those species that require late succession habitat types. Although species requiring early succession stages could find suitable habitat in areas where natural disturbance has occurred, that habitat would be limited due to fire suppression.

Alternatives 2 and 3

Revised Wasatch-Cache National Forest Plan guideline 15 (Chapter 4, Page 42) states that within goshawk habitat management activities should be designed to maintain, restore, or protect desired goshawk and goshawk prey habitats including foraging, nesting and movement. The two territories within the analysis area have been mapped to determine the available foraging area for the territories. The foraging area for both nests total 12,360 acres of suitable habitat. Within the Foraging Area there would be 782 acres treated either by thinning, clearcut or

prescribed fire, this is a 6% change or alteration in available habitat. The Post Fledgling Area was also mapped for both territories and totaled 1032 acres. There would be 163 acres treated within the 1032 acres. This would be 22% in one post fledgling area and 9% in the other. None of the treatments would be within the nesting areas of either territory. A lodgepole pine thinning project adjacent to one of the nests began in 2005 under the Coyote Road Hollow Beetles project that has an objective of reducing likelihood of losing the lodgepole pine stands in the area to mountain pine beetles. Effects and mitigation for that project were analyzed under a separate NEPA document (USDA FS 2004).

The remaining territory that has been analyzed for the West Bear EIS has been active on and off since 1994. Forest Plan Appendix X page 2 contains "Considerations for Goshawk Nest and Post Fledgling Areas" stating that to maintain goshawk habitat, designate 2 alternate and 3 replacement nest areas. These designated nest areas have been mapped out including the nest area and alternate nest areas in similar habitat primarily to the east and south of the known nest area. The designated nest areas range from 63 to 152 acres. A post fledgling area should also be identified that encompasses the active, replacement and alternate nest sites. This area has been identified in the area east and south of the known nest site. No activities are scheduled to occur within or near the nesting area during the active nesting period. Forest vegetation manipulation within a post fledgling area should be designed to maintain or improve the habitat features, such as downed logs, snags and nest trees. No treatment is scheduled within the PFA as currently designated. Treatment in an area adjacent to this PFA will maintain snags and downed logs. However, the return interval for larger conifer nest trees and other nest characteristics will not be available in the treatment area for 60 to 80 years.

The vegetation across the landscape is composed of lodgepole, aspen/conifer, mixed-conifer and spruce/fir habitat types. The treatment units are spread across the landscape and may affect more than one pair or individual because of overlapping territories.

Some potential nesting habitat is likely to be affected by treatments in all units. This may be from the removal of individual trees or the conversion of the stand to an early succession stage. It is expected that the proposed vegetation treatments would provide for future nesting sites. In the aspen/conifer treatment units the stands would not be suitable nesting habitat for 60 to 80 years. The aspen/conifer vegetation type is an important nesting component in the lower elevations. In the mixed-conifer and spruce/fir vegetation types it would be expected that the units would still retain important stand characteristics adequate for nesting.

Goshawks are habitat generalists because of the variety of species they prey upon. Landscapes with stands that have important components such as age-class diversity, structural stages and vegetation type are essential to goshawks. Some prey species require early seral stages or late/mature vegetation types while others require a developed understory and/or adequate security cover. Some available prey species would be lost or displaced from stands or treatment units. Depending on the vegetation method displacement may be temporary. Temporary displacement is likely to occur in units where thinning or small patch cuts are proposed. In thinned units mature trees would still be available in the stand. As regeneration establishes younger vegetation would be available. In the clearcut units forage and security cover would be provided for some prey species as regeneration establishes in the future. In units with proposed prescribed burns the areas would not be suitable for prey species until regeneration provides adequate forage and security cover.

Cumulative Effects

There are a number of activities that occur within the analysis area but only the loss of habitat for foraging and nesting has a cumulative effect on the goshawk. Motorized travel and other recreation activities may cause disturbance to goshawks, however the nesting pairs in the analysis area seem to be habituated. Nests are located in or near high use areas.

There has been a total of 1602 acres of vegetation treatments in mixed-conifer, aspen/conifer, spruce/fir, and lodgepole habitat types in the analysis area over the past 50 years that has been evaluated under the current conditions. This includes the Coyote Road Hollow thinning that is currently in progress. Vegetation treatment methods differed within these habitat types and depending on the site, regeneration may not provide habitat for all prey species. However, it is expected that avian and mammal prey species would continue to exist within the regenerating units as the stands progress in age.

Since Coyote Road Hollow is a thinning project, the area may become suitable nesting habitat in a shorter time period than in areas that have been clearcut in the past. Within the analysis area there is adequate nesting habitat available. Potential foraging opportunities would be lost in the form of woodpecker or cavity nesting birds or rodents that require snags for foraging or nesting. Depending on prey species needs some thinned stands may no longer provide the necessary canopy or security cover. These prey species would be displaced from the stands to other stands within the analysis area. There are large areas within the landscape that would not be treated. Existing nest, post-fledging and foraging areas have been analyzed considering the past, ongoing and alternative treatments and would comply with Forest Plan Standard (S12) prohibiting forest vegetation treatments within active northern goshawk nest areas (approximately 30 acres) during the active nesting period and Forest Plan Guide (G15) to design all management activities to maintain, restore, or protect desired goshawk and goshawk prey habitats including foraging, nesting and movement.

Determination

The proposed project would have a “may impact individuals, but is not likely to cause a trend toward federal listing or a loss of viability” determination or affect the Forest-wide population trend (USDA FS 2005e).

3.6.4.3 Other Species of Interest

The analysis area for direct, indirect, and cumulative effects on other species of interest is the general analysis area identified in FEIS Section 1.3.

American Pine Marten

Marten home ranges are very large, a correlate of low population densities. Martens must assemble home ranges from landscapes, rather than stands (Ruggiero et al. 1994). The activities associated with the proposed treatments could affect portions of home ranges for individual marten. Temporary or long-term displacement could occur with the reduction of basal area within some older age-class stands. Some stands that lack ground structures such as down logs or root wads should have these structures in the future as leave trees die and fall to the ground. Martens prefer older age-class stands utilization of regenerating stands could come from younger animals that are forced to the area because of established home ranges of surrounding older martens. The preferred food source of the marten the Red-backed Vole prefers older-age class stands to regenerated clearcuts. Snowshoe hares are another prey species for pine marten. Snowshoe hares would utilize treatment areas when regeneration provides an adequate food source and cover. However, in the mixed-conifer and spruce/fir treatment areas it is expected that there would be sufficient old-forest characteristics remaining in the stand because of the harvest method.

Cumulative Effects

Cumulative effects of habitat fragmentation are a concern with this species. In past harvest units where regeneration is inadequate to provide security cover martens may avoid the area. ATV or other motorized use trails or roads would not be expected to fragment the landscape except where clearcuts, meadows or natural openings are adjacent. These areas are typically avoided or do not provide habitat for martens. Grazing would not be expected to contribute affects to the marten, preferred prey species can be found in non-forest and forested habitat. Proposed harvest activities in lodgepole pine stands across the landscape would not be expected to contribute to the loss of suitable habitat. Typically these stands at the lower elevation would not provide habitat because of the fire return interval, which would eliminate downed woody material within the stand.

3.6.4.4 Management Indicator Species

The analysis area for effects of the alternatives on population trends for management indicator species is the general analysis area identified in FEIS Section 1.3.

Northern Goshawk

Effects for the northern goshawks are discussed in the R4 Sensitive Species section. There have been a number of treatments within aspen/conifer, mixed-conifer and spruce/fir vegetation types within the general analysis area. Depending on the natural cyclic pattern of snowshoe hare populations, pine squirrels, and other prey species, the effects of changes in habitat could be variable and cause either an increase or decrease in populations. Group selection harvesting in the spruce/fir type may cause a slight decrease in the local snowshoe hare populations in the short term and a slight increase in the long term. Conifer removal followed by prescribed fire in the aspen conifer type will cause a substantial decline in the pine squirrel population until conifers become re-established in these stands. However, some avian species including ruffed grouse and ground squirrel populations would be likely to increase in the intervening time.

Determination

None of the alternatives would result in a downward trend in the population of northern goshawks on the Forest.

Snowshoe hare

Alternative 1 – No Action

Under this alternative it would be expected that snowshoe hare activity in aspen dominated stands would remain at their current levels or slightly decrease as the stands mature. In the aspen/conifer vegetation types it would be expected that the value of the stands would increase as conifers begin to dominate the stand. However, under this alternative it would be expected that the aspen component within the aspen/conifer stands would eventually be lost.

Habitat in the mixed-conifer and spruce/fir would continue to exist. The habitat would be available until some time in the future when a natural disturbance other than fire affects the stand.

These vegetation types are dependant on natural disturbances to perpetuate the stand or create openings for understory development. Under this alternative natural fires would continue to be suppressed allowing the stands to mature. These stands may also be susceptible to beetles, which could lead to catastrophic fire conditions due to fuel loading.

Alternatives 2 and 3

Under these alternatives the temporary loss in some habitat types is expected. Depending on the tree species and site conditions regeneration would be sufficient to provide suitable habitat for snowshoe hare within 10 to 20 years.

Within the mixed-conifer and spruce/fir vegetation types the harvest method is expected to maintain understory and downed woody material characteristics within the stands. It would be expected that regeneration in the stands would provide adequate forage and security cover for snowshoe hare. The condition of the stand would be expected to increase in value in an estimated 10-15 years.

Treatments in the aspen are not expected to either negatively or positively affect the snowshoe population. Survey results on the Ogden/Logan Districts indicated this vegetation type is producing the lowest number of snowshoe per hectare. This may be due to the understory species and composition.

Treatments in the aspen/conifer vegetation types are expected to reduce conifer competition and introduce disturbance back into the system. The regeneration within these stands would be expected to be low in value during the time when regenerated aspen dominate the site. The stand would increase in value for snowshoe hares as conifer species begin to dominate the understory in the future. This increased value would not be expected for an extended time.

Displacement of snowshoe hare is likely to occur from activities associated with the harvest. Depending on the method the displacement may be temporary or until a time when regeneration provides forage and security cover.

The numbers for the snowshoe hare per hectare are from data gathered in the summer of 2004. The numbers do not reflect cycles in the population for snowshoe hares. The number of snowshoe hares per hectare could increase or decrease in any year and within any of the vegetation types sampled.

Table 3.6.21. Snowshoe hare supported within proposed treatment hectares

| Habitat Type | Alt 2 (hectares) | Alt 3 (hectares) | Snowshoe hares per hectare* | Snowshoe hare supported Alt 2 / Alt 3 |
|---------------|---------------------|---------------------|-----------------------------------|--|
| Spruce/fir | 252 | 173 | 3.07 | 774 / 531 |
| Mixed-conifer | 168 | 136 | 2.59 | 435 / 352 |
| Aspen/conifer | 186 | 252 | 2.02 | 376 / 509 |

*Calculated mean from conservative and liberal numbers in Table 6 in the wildlife technical report (Jauregui 2005).

In the spruce/fir and mixed conifer vegetation types it is estimated that the treatment would result in 20% of the area in ¼ to 2 acre gaps in the canopy and at least 50% of the remaining area having a reduced overstory canopy cover. If the unit or stand has a well developed understory it is expected that the increase in value would be positive but low. In units or stands that are lacking a developed stand due to a dense canopy then the expected increase in value would be greater in affect.

Within the aspen/conifer component the expected increase in value would not be until a future time. As the stand begins to establish aspen would be expected to dominate. During this time period some utilization by snowshoe may occur but it is expected to be low. As conifer species (lodgepole in most stands) begins to establish in the understory the value of the stand would increase substantially. The stand would provide forage, security cover and be able to support an increased population.

Table 3.6.22. Expected increase in the snowshoe hare population post treatment.

| Habitat Type | Snowshoe/hectares supported within units prior to treatment Alt 2 / Alt 3 | Snowshoe/hectares supported post treatment* | Change in population |
|---------------|---|---|-------------------------|
| Aspen/conifer | 376 / 509 | 840 / 1,139 | +464 / +630 |

*Calculated mean from conservative and liberal aspen/conifer numbers in Table 7 in the wildlife technical report (Jauregui 2005).

Cumulative Effects

There have been a number of timber harvests in the analysis area in the past. The cumulative effects for snowshoe hare are short-term. Depending on the harvest site the habitat conditions increase in value as regeneration establishes.

Determination

The proposed project may effect the local population in the short term but would not significantly affect the population trend for this species across the Uinta Mountains / North Slope range.

Beaver

Alternative 1 – No Action

There would be no expected change in beaver habitat under this alternative.

Alternatives 2 and 3

No treatments are planned in riparian habitat. Under these two alternatives, a potential effect on beavers would be an increase in sediment into streams. If large quantities of sediment were produced, sediment would likely fill in dams at a faster rate causing beavers to move up or down the stream channel. The amount of sediment entering the stream is not expected to increase significantly (See Water Resources, Section 3.1). Aspen regeneration in the Mill City Creek area could have a positive effect on beavers building off-channel ponds.

Determination

The proposed project would have no significant effect on the population trend for this species across the Uinta Mountains / North Slope range.

3.6.4.5 Migratory Birds

Alternative 1 – No Action

Under this alternative those species that require early seral habitat would begin to decline. Suppression of landscape level disturbances would continue within the analysis area. Although some small disturbances such as wind, insect and disease would continue in isolated stands the level of disturbance may not be beneficial because of size.

The Red-naped and Williamson's sapsucker are dependant on mature to older age class vegetation types. These species would be expected to increase in population as habitats across the landscape continue to age in the aspen conifer vegetation types. However, populations would be expected to decrease if the aspen component is lost from the landscape. With continued fire suppression the loss of aspen within the aspen/conifer vegetation types is likely.

Alternatives 2 and 3

Under these alternatives there would be both positive and negative affects for some migratory bird species. The affects would be expected to be short term for those species requiring early seral vegetation types. The time period would vary depending on site conditions and species regeneration. Those species requiring mature to late seral vegetation would be expected to be affected for a longer period of time. Because some vegetation types mature at different times the time period could range from 60 to 100 years.

Disturbance and displacement of bird species is expected in stands where treatment units are proposed. Depending on a species breeding period there may be some lost or incidental take of nests within the treatment units. Timber harvest is not allowed until soils dry out in early summer. This typically does not occur in the West Bear area until some time between June 15 and July 1. Prescribed burning will be limited to the fall on this project, after nesting is over and after fuels have cured. Some species may abandon nesting areas or not breed within stands that have proposed units because of disturbance levels. This affect would be expected in those stands associated with the treatment units. However, acres of habitats similar to those found within the proposed units and stands are available within and outside of the analysis area. These habitats can be found at different elevations, densities, and seral stages across the North Slope and Wasatch-Cache National Forest.

Table 3.6.23. Proposed treatment acres and available habitat found within and outside of the analysis area.

| Cover Type | Proposed treated acres | Acres within analysis area | Uinta Mountains | Forest Total |
|---------------|------------------------|----------------------------|-----------------|--------------|
| Aspen/conifer | 684 | 2,810 | 34,000 | 55,800 |
| Spruce/fir | 603 | 3,294 | 127,600 | 153,400 |
| Lodgepole* | -- | 1,542 | 53,100 | 61,300 |
| Mixed-conifer | 427 | 2,902 | 135,700 | 151,700 |

*The acres displayed for this cover type are the areas on the forest that constitute lodgepole dominated stands. Depending on the proposed unit lodgepole in the aspen/conifer and mixed conifer stands can range between 20% and 80% of the species present.

Red-naped and Williamson's Sapsuckers

For the Red-naped and Williamson's sapsuckers a mature aspen component is important. Aspen can be found in some of the proposed units as a major or minor component of the stand.

Within the spruce/fir and mixed conifer vegetation type where individual or group selection is proposed the loss of aspen would be minimal. Individual or clumps of aspen would remain in areas where treatments are not proposed. To maintain the aspen component within the stand it would be necessary to disturb aspens to stimulate suckering. This action would be necessary to maintain nesting and foraging opportunities for the two sapsuckers.

In the aspen/conifer units where clearcut and prescribed burning is proposed the objective is to stimulate suckering and maintain the aspen component and dominance in some stands. Some aspen would be lost to the prescribed fire and disturbed in the clearcut units. However, within the proposed treatment units the overall disturbance to aspen is expected to be mosaic. This means that there would be age class diversity and structural diversity within the stand. There would be a mature aspen both live and dead available to both sapsucker species. It would be expected a sufficient amount of foraging and cavity nesting trees available well into the future.

Cumulative Effects

Some of the vegetation types found in Table 3.6.23 have been treated in the past. Depending on the site, species composition and harvest year regeneration could provide adequate habitat for both early and/or late seral dependant species.

Table 3.6.24. Period (years) and harvest acres across forest, private and state for vegetation types associated with proposed West Bear Units.

| Land ownership | Total harvested acres of all vegetation types | Aspen 1970-2002 | Spruce 1980-1998 | Lodgepole 1949-2002 |
|----------------|---|-----------------|------------------|---------------------|
| Forest Service | 40,798 | 6,162 | 1,495 | 19,707 |
| Private | 2,522 | 127 | 708 | 1,842 |
| State | 162 | 0 | 0 | 84 |

Acres based on Forest GIS layers (Timber Regeneration Units).

Some future vegetation treatments depending on a number of factors could adequately maintain canopy cover, structural stage and diversity across the landscape. These cumulative treatments would benefit both early and late seral dependant species providing adequate nesting, foraging and/or breeding habitat. Some treatments would be expected to increase habitat for only for those species that require early seral stages.

Sheep grazing may reduce the amount of growth or regeneration of some species within the units. However the cumulative impact from sheep would not be expected to significantly decrease the amount of regeneration because of herding practices. Big game species may be more apt to affect the growth of regeneration. Because the area is a travel corridor and winter transition range, use within the treatments may be high. Because of the proximity to roads and mosaic pattern of the burn big game may not be able to concentrate use directly in treated units. This may help decrease the amount of use and time of big game occupancy of the units.

Swainson's hawk

The Swainson's hawk is not likely to be negatively or positively affected by any of the alternatives. Retention of snags or live trees along meadows or natural openings under all alternatives would benefit this species. Because the project would retain nesting structures within the stands and creating potential foraging areas there would be limited effects to the Swainson's hawk.

3.6.4.6 Big Game (Elk)

Alternative 1 – No Action

Under this alternative the existing travel corridors would continue to exist within the analysis area. Security cover and foraging opportunities would be available in all the vegetation types found within the analysis area. The concern for big game would be the loss in calving areas found in the aspen/conifer component.

Alternatives 2 and 3

Under these alternatives there would be temporary displacement in the individual and group selection treatments. The displacement is expected to last the duration of the treatment. In the areas where one to five acre patch cuts and prescribed burning would occur the displacement would be expected to be longer. Some animals may move through the area when regeneration begins to reestablish. The areas may not provide adequate security cover until a time when the regeneration reaches a height that exceeds the height of the animal.

There would be an expected decrease in the available calving habitat found in the aspen/conifer type. It is expected that the area would provide adequate calving habitat as the aspen matures and the understory associated with this vegetation type establishes. The proposed treatments would affect an estimated ¼ of the available calving habitat found in the analysis area.

Temporary roads would be expected to increase habitat fragmentation within units when they are being utilized, however these roads would be closed and reclaimed once the treatments have been completed.

Foraging habitat would be created in the aspen/conifer vegetation type where conifer removal and prescribed fire is proposed. Grasses that regenerate post fire would be available to migrating animals. Aspen regeneration would be available in the early spring and summer as animals' transition from winter range to summer range.

Cumulative Effects

There are a number of activities within and outside of the analysis area that have minor cumulative effects. There would be some competition for the limited late fall / early winter forage from livestock on private lands used by migrating animals. However, competition levels would be expected to be less when other forage species (sedges, grasses, forbs and browse) are available during the summer. Motorized and non-motorized recreation is likely to remain stable or increase over time.

3.6.4.7 Corridors

Habitat connectivity including small north/south corridors has been addressed for individual and management indicator species in sections of the EIS addressing effects on those species. The analysis area for these species is the general analysis area or the Lynx Analysis Unit (LAU) for Canada lynx. However, The Nature Conservancy has designated a "Megasite" (Upper Bear) that encompasses the analysis area and is a larger portion of a designated ecoregion (Noss 2001). The megasite designation is based on the vulnerability and irreplaceability of the area using a variety of factors such as development and other physical barriers. The analysis for the corridor is done at the local level but will address the concerns for the Upper Bear Megasite including disclosure of some activities that are outside of the general analysis area or LAU.

Alternative 1 – No Action

The corridors associated with the analysis area are composed of a variety of vegetation types and age classes. It would be expected that under this alternative the corridor would remain intact. However, diversity in vegetation types may be lost to species dominance or encroachment. Natural fires would continue to be suppressed limiting naturally occurring disturbances that would maintain vegetation diversity across the landscape.

Alternatives 2 and 3

The larger regional corridor (east-west along the Uinta Mountain Range, through the West Bear analysis area and across private land and northwest to the Cache Ridge) is expected to remain functional for wildlife migrating through the analysis area. There is a large corridor along the ridge lines on the west and south sides of the West Bear analysis area that includes primarily forest areas on either side of the ridge lines that have had very little past vegetation treatments and do not have any proposed treatments (EIS Map #2). Because of the proposed uneven-aged management in units between the ridge and Whitney Reservoir, most of the corridor values would remain intact in the forested areas on both sides of the ridge. Noise and activity associated with timber harvest operations would affect some species use of portions of the corridor. Timber operators are required to complete operations in one area before beginning in another area. Therefore, it is unlikely that operations would be ongoing in more than 3 units on the west side of Whitney Reservoir at any one point in time. It is very unlikely that operations would be ongoing in more than one of the Humpy Creek, Meadow Creek, or Beaver Lake areas at the same time. Relatively low volumes of timber per acre would be removed from those units so operations in any one unit would be unlikely to be ongoing for more than 2 or 3 weeks.

Smaller north/south corridors within the analysis area would remain undisturbed by timber harvest activities including a riparian and spruce/fir corridor about ½ mile along the east side of Whitney Reservoir and a riparian and conifer/aspen corridor about ½ mile wide along the west side of the Mill City Creek Road. The proposed uneven-aged management and ongoing thinning in the Coyote Road Hollow timber sale would allow continued functions of all of the corridors west of Mill City Creek in the analysis area except when they have ongoing harvest operations that will affect some species. The Mill City treatment will result in fairly large patches of regenerated aspen/conifer, but not all of the area within the Mill City treatment area is expected to burn and wildlife travel through that area is expected to continue. As time passes that area will serve as a corridor if adjacent areas are treated. Current residential development described below is not in the path of or continuous with the north south corridor identified along the west side of Mill Creek. However, any additional development to the west could potentially interrupt some of the local north south corridor use.

Disturbance to wildlife is expected in and adjacent to those stands where treatments would occur and along the log haul routes. The disturbance is expected to last the duration of the treatment in the affected area. Disturbance in smaller analysis area corridors is likely to affect wildlife species most during the fall migration period. Those local species that are migrating to wintering areas may be displaced to other corridor routes found in the analysis area. Movement patterns may be altered to avoid areas that have recently been treated. It would be expected that regeneration within the treated units would provide adequate cover in 5-10 years depending on the treatment. The overstory cover would be expected to remain in some treatment areas but ground cover would be reduced. Some wildlife species dependent on interior forest cover would be expected to avoid the edge of the stand during movement.

The intermittent roads may affect species that migrate into or through the analysis area during the early summer. Although roads would not be expected to present a physical barrier the use of the roads during treatment would increase the level of disturbance in the stand. Stands that are being disturbed prior to arriving species may discourage the use as a corridor for some species.

Cumulative Effects

Noss (2001) identifies 6 factors that are possible threats to the Upper Bear Megasite. The Revised Wasatch-Cache Forest Plan FEIS analyzed effects on the ecoregion scale for cumulative effects and connectivity on non-National Forest System land (USDA FS 2003b). However, cumulative effects on the smaller corridors within and adjacent to the West Bear Analysis Area are appropriate to analyze at the project level.

Grazing

There are 4 sheep allotments in the West Bear Analysis area. Cumulative effects of grazing on riparian corridors could be a concern. A rangeland report by Richard Zobell, Rangeland Management Specialist (Zobell 2005a) indicates, "one monitoring study has been established within the analysis area that can be used to determine greenline seral status. This study is located on a stream that would show adverse impacts to greenline seral status if any were occurring. It recorded 99.6% late seral species, exceeding Forest Plan Guideline (G7) of 70% late seral species in class 1 riparian areas (FEIS Sec. 1.5.1.4). Additional greenline transects were established in Meadow

Creek in 2005 (Studies 15-11 and 15-14) and in West Fork of the Bear in 2006 (Study 15-25) with 92, 93 and 98 % late seral species on transects and estimated 98% late seral on photo points along the Beaver Lake outlet stream (Study 15-26), also exceeding Forest Plan Guideline G7. Experience with sheep grazing indicates that riparian areas are not being heavily impacted. Sheep do not tend to focus on riparian areas as do cattle. They access the stream to cross or drink. Those crossing/water points along the greenline are usually less than 30 feet wide and, along a given stream reach, are usually less than 1% of the total length of the stream banks. Since the action alternatives do not treat riparian habitat conservation areas, there is very little if any interaction between the alternatives and grazing.

It is expected that some browsing of aspen regeneration would occur within the treatment areas that could affect corridor diversity and continuity. However, experience with, and studies of grazing concurrent with aspen regeneration on the north slope of the Uinta Mountains indicates that the grazing does not prevent aspen from regenerating and growing into mature stands (Zobell 2005a). There are 7 studies of aspen regeneration concurrent with grazing across the North Slope, all indicating successful aspen regeneration (EIS Sec. 3.4.1) (Zobell 2005a). Recent observations of aspen regeneration concurrent with both cattle and sheep grazing inside the East Fork Fire perimeter (2002) indicate excellent regeneration of aspen. Additional plots and permanent photo points have been established to monitor effects in a conifer aspen treatment project (Dahlgreen Aspen Treatment) that is currently being treated and is very similar to the proposed treatments in aspen/conifer under the West Bear Project. Browsing by wildlife and livestock is not expected to prevent successful regeneration of aspen in treated areas and there is no cumulative effect from the alternatives.

Recreational Infrastructure Development

There are no new proposed recreation infrastructures in the analysis area. Currently the areas infrastructures consist of a guard station, one restroom facility, two viewing signs and horse hitching posts. The analysis area is popular with both summer and winter recreation and the current infrastructures are not expected to contribute to an increase or decrease of use.

Residential Development

Roads are currently being constructed for a new development on 2,010 acres within 4 sections of private land (Sections 29, 30, 31, and 32 in the corner formed by the Forest Boundary on the south side and Highway 150 on the east side just north of the northeast corner of the West Bear analysis area (USDA FS 2006). This subdivision will have 31 lots clustered on lots from 11 acres to 40 acres with the rest of the area being commonly owned open space. Each lot has a designated 10 acre building site. This development will have an affect on wildlife use of the area and is likely to slightly increase recreational use on the Forest. Due to proposed conifer removal and prescribed burning on National Forest to the south of this area, it was not considered a travel corridor. However, as the treated stands regenerate and mature over time, they would form a potential travel corridor, assuming it was still viable. There is an emergency egress road that crosses from the subdivision onto a previously existing road that is open to the public on National Forest System land at the Forest Boundary at the north end of the subdivision. Residents of the subdivision would be subject to the same travel restrictions as the general public on the National Forest. The north/south orientation of common open space land between clusters of lots is between 0.2 and 0.4 miles wide and could provide some functionality for a wildlife travel corridor. There are three undeveloped areas of private land to the west of the current development covering a much larger area that currently serves as a travel corridor and wildlife habitat. Development has also been proposed on some of this property. None of those proposals have been approved by Summit County. It is unknown whether or not they will be approved or what their designs would be, so other than the development currently in progress, effects on corridors of development of private land in and adjacent to the analysis area is not reasonably foreseeable at this point in time. Some of these discussions on the private land to the west have been in the works for a number of years while other proposals have been more recent. County ordinances and policies may prevent additional development or impede additional development for a number of years. There are also two 40 acre inholdings within the analysis area. If more development occurs, the likelihood of additional summer and/or winter recreation increases. Depending on the use and design of the developed land there would be adverse effects on wildlife because of increased disturbance from the presence of people and space occupied by facilities and fenced lots.

Private Land Timber Harvest

Inspection of aerial photos taken in 2002 of the private land surrounding the West Bear Analysis area indicates almost no visible timber harvest. Salvage logging occurred on about 200 acres of private land in the area burned by the Deer Creek Fire in 1980 adjacent to the Forest in the West Bear Drainage. Some conifer removal from mixed aspen/conifer stands has been done in the last couple of years near the confluence of the West Bear and the Bear River about 6 or 7 miles north of the West Bear Analysis area. Some conifer removal from aspen stands and removal of trees from road rights-of-way have been done in the new development just to the north of the northeast corner of the analysis area.

Energy Development

Outside of the analysis area there is a proposed exploratory oil well in the Main Fork drainage of the Bear River about 1/2 miles east of LAU 36. The operation is scheduled to occur during the summer and fall months. If the well were productive, hauling of the product would occur year round and a proposed oil field could be likely. If developed the loss of the area as a corridor could be permanent or temporary depending on the wildlife species. Those species that habituate to humans and disturbance would likely be disturbed or displace for a shorter period of time. Those species that are sensitive to human development are likely to avoid the area of oil field development and chose alternate routes through the area including the West Bear analysis area. There are a number of gas and oil facilities in the Chalk Creek area about 15 miles north of the West Bear Analysis area. Most of these facilities are in sage/grass dominated plant communities. Since the action alternatives maintain viable corridors through the West Bear analysis area, there is no cumulative effect from the alternatives.

3.7 Scenery

The analysis area for scenery is the general analysis area as described in FEIS Section 1.3. This area is part of the High Uintas, West Flank Uintas, North Slope Outwash ecological subsection. It is in a transition area for three subsections where the landform is generally rolling benches crossed by broad drainages. It contains ponds, a lake, a reservoir, and meandering streams and drainages. The vegetation pattern consists of small to moderated sized forest patches of conifer, aspen stands with large stands of conifer, and mixed conifer and aspen. Large open sagebrush flats and grass meadows with willow and dogwood line streams and drainages.

The major recreation uses are ATV touring, primitive car camping, fishing at the reservoir, vegetation management and grazing during the summer. The area is very popular for snowmobiling in the winter with a groomed snowmobile trail providing easy access. “During their visit to the forest, the top five recreation activities of the visitors were viewing natural features, relaxing, hiking/walking, viewing wildlife, and downhill skiing” (USDA Forest Service 2004a). The West Bear analysis area offers four of the five activities with the exception of downhill skiing. There are a few backcountry skiers that access the area by snowmobile and then downhill ski the open slopes. From the concentration of primitive camping around the Whitney reservoir one could draw the conclusion that it is not the just the water that brings people to the area. The intimate vignettes of closed narrow tree lined roadways opening into small meadows creates a sense of mystery as the traveler traverses the roadways into the analysis area building up to the dramatic vistas of alpine meadows of sagebrush and grass bordered by aspen, conifer aspen, and conifer. Pockets of conifer or aspen create islands of refuge or a patchwork for recreationists or wildlife. Meandering streams, and a placid lake punctuate the broad meadows of wild flowers and grasses.

The social aspect of a landscape is part of an ecosystem. Understanding how people view the landscape helps direct management activities in design or implementation. Because “people are concerned about their environment, including aesthetic values of landscapes, particularly scenery” the Scenery Management System (SMS) provides a framework to communicate the values of scenery in concert with other resources.

3.7.1 Assumptions and Methodology of Analysis

Compliance with or change in integrity is based on a comparison with the Forest Landscape Character Themes (LCT) and Forest Scenic Integrity Objection (SIO) descriptions. It is assumed that the current existing landscape is compliant with the Revised Forest Plans LCT and SIO descriptions with some minor deviations along roadways

where road cuts have some geometric dominance in the foreground views of the landscape. The characteristics described in the LCT and SIO descriptions represent the social view of the landscape and not the biological integrity of the landscape. The analysis of scenic integrity is based on "...a measure of the degree to which the landscape is visually perceived to be "complete"" (SMS) in comparison to the LCT and SIO descriptions. The analysis process to determine change or compliance with the SIO is a comparison of the Revised Forest Plan LCT and SIO descriptions and the effects of the proposed vegetative prescriptions on the perceived completeness of the landscape using professional judgment and publication comparisons (USDA Forest Service 2004b).

The general base line for the analysis is Natural Appearing LCT and a High and Moderate SIO in the Revised Forest Plan (USDA FS 2003). The purpose of this management action is vegetation management and all of the components of the LCT and SIO apply for both High and Moderate SIO. The visibility analysis represents how the landscape would be viewed without vegetation. If a unit is seen by the analysis from a particular point it is important to realize that the unit may not be seen in the field from the same point because of vegetative screening. Distance zones are: Immediate Foreground 0-300 feet, Foreground 300 feet – ½ mile, Middleground ½ mile to 3 miles and Background is 3 miles to horizon. Scenic Attractiveness mapping was not generated because of the proximity of the concentrated use area (CUA) primitive car camping points to the proposed units. CUA points rated either a 1 or 2 scenic attractiveness with a high public value, which are the top 2 values of scenic attractiveness.

All of the roads in the analysis area are concern level 2 or 3 except Mirror Lake Highway 150, which is a concern level 1. For the visibility analysis the concentrated use areas primitive car camping points were used. The CUA primitive car camping location was used because they represented a location where there is a long duration of viewing the landscape. Concern levels are based on (1) context of viewers, (2) duration of view, (3) degree of discernable detail, (4) seasonal variations, and (5) number of viewers. It was assumed that the duration of view and degree of discernable detail placed the CUA primitive car camping location at a level 2-concern level. The CUA points were hand digitized using 2-meter resolution ortho quads at a scale of 1:5000 using Arcmap software.

The Revised Forest Plan management direction SMS visibility process was used for the analysis incorporating the GIS National AML visibility analysis. Points were placed at ½ mile increments on the Mirror Lake Highway alignment along the easterly edge of the analysis area and extended 4 miles north and south of analysis area. No points were placed on the roads in the analysis area, because the CUA concern level of 2 of the primitive car camping sites were concentrated enough that placing points at ½ miles intervals on roadway would have yielded similar results.

3.7.2 Existing Inventories, Monitoring, and Research Literature Review

Seen Area Analysis, Forest Management Prescriptions, Forest Landscape Character Themes (LCT), Forest Scenic Integrity Objection (SIO), Project Harvest Unit Shapefile, Project Vegetation Layer, and Analysis Area Geographic Information System (GIS) overlays were used to create SMS tables. See Maps 12 and 13 in Appendix A.

Landscape Aesthetics, A Handbook for Scenery Management (USDA FS 1995) provides guidance for this analysis. National Visitor Use Monitoring Results, Wasatch-Cache National Forest (USDA FS 2004a) provides insights on visitor impressions and expectations on the Wasatch-Cache Forest.

3.7.3 Affected Environment

The affected environment includes all of the area within the Whitney Reservoir Basin and into Humpy Creek. The ridge line the boundary this area are Humpy Peak on the North, Moffit and Gold Hill to the South, the ridgeline between Moffit and Windy Ridge on the western edge and eastern edge is bordered by the Stillwater along Highway 150.

Landscape Character Theme

The majority of the area is Natural Appearing with the eastern edge along the Mirror Lake Highway (SR150) managed as Developed Natural Appearing.

Scenic Integrity Objective

The most western half of the analysis area is managed in the High SIO and the other half is managed as Moderate SIO except for along the Mirror Lake Highway, which is a High SIO. Along the eastern edge of the analysis area because of the high concern level of travelers on the Mirror Lake Scenic Byway, areas that are seen within 4 miles of the Scenic Byway are managed as a High SIO.

Scenic Attractiveness

The scenic attractiveness is class B typical where landform, vegetation patterns, water characteristics combine to provide a ordinary to common scenic quality with seasonal variations that exhibit characteristics of class A distinct where vegetation exhibits unique or outstanding scenic quality during the spring wild flower bloom and fall color time of the year (See Figure 3.7.1). Table 3.7.1 displays the Revised Forest Plan Management Prescription acres with their associated Landscape Character Themes and Scenic Integrity Objectives.

Photo 3.7.1. Large Meadow with Early Summer Flowers in Upper Mill City Creek with Gold Hill in the Background.

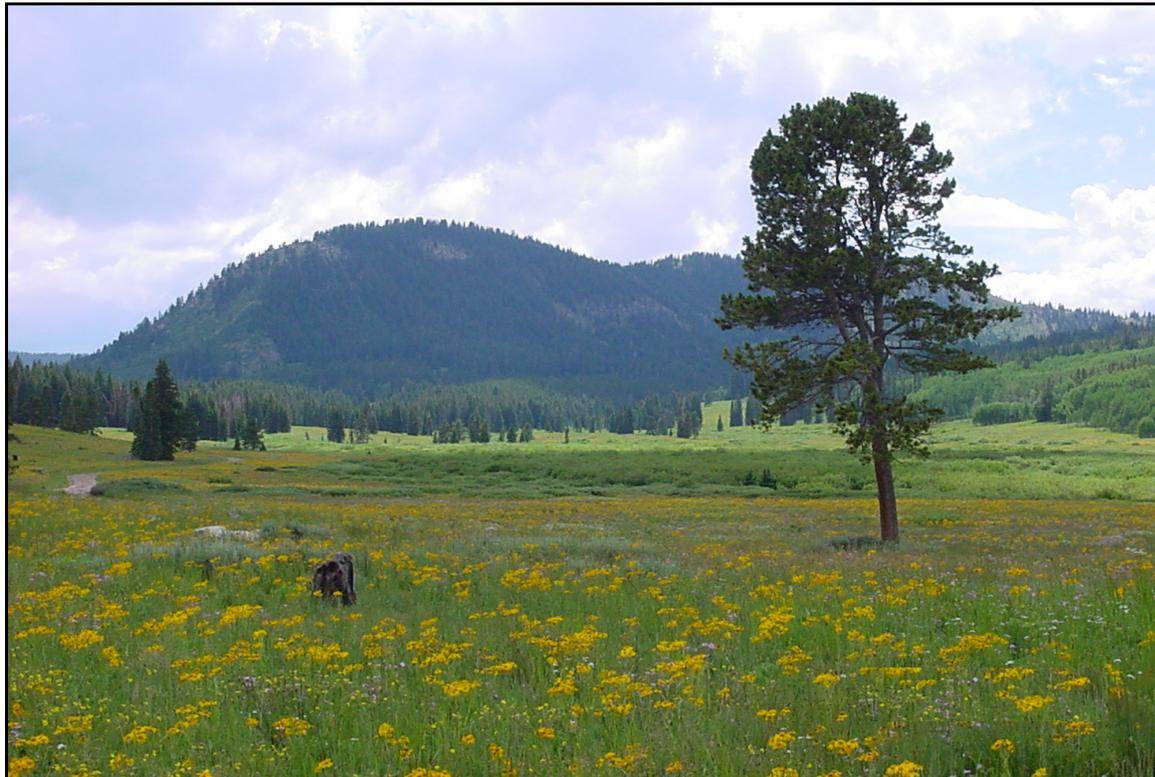


Table 3.7.1. Landscape Character and Scenic Integrity for West Bear Management Prescription Areas

| Forest Plan Management Prescription | Analysis Area Acres | Landscape Character Theme | Scenic Integrity Objective |
|-------------------------------------|---------------------|-----------------------------|----------------------------|
| 2.5 | 680 | Developed Natural Appearing | High |
| 2.6* | 1,955 | Natural Appearing | High |
| 3.1a* | 1,277 | Natural Appearing | High |

| Forest Plan Management Prescription | Analysis Area Acres | Landscape Character Theme | Scenic Integrity Objective |
|-------------------------------------|---------------------|---------------------------|----------------------------|
| 4.4 | 375 | Natural Appearing | High |
| 5.1 | 8,311 | Natural Appearing | Moderate |
| 6.1 | 3,611 | Natural Appearing | High |

Table 3.7.2 displays acres of harvest units that can be seen from concentrated use areas, primarily primitive car camping areas. All proposed harvest areas were analyzed, but only those seen portions of units that exceed 2 acres were included in the table. Areas visible from complexes are based on a GIS visual analysis that evaluates topography only (no vegetation) from primitive car camping locations within a complex also a point space ½ mile apart on Highway 150. Complexes that were used as analysis points include heavily used dispersed sites in the Meadow Creek, Carrot Hollow, Whitney Reservoir, Coyote Hollow, Upper Gold Hill, and Mill City/Gold Hill areas, the first two miles of the Whitney Road, and Mirror Lake Highway 150.

Table 3.7.2. Alternatives 2 and 3 Seen Areas, Visual Attributes, and Prescriptions

| Unit # | Seen Acres | | Distance Zone | Complex Seen From | Landscape Character Theme | Scenic Integrity Objective | Management Prescription | Vegetation Type and Harvest Prescription |
|--------|------------|--------|---|-----------------------------|---------------------------|----------------------------|-------------------------|--|
| | Alt 2 | Alt 3 | | | | | | |
| 2-6 | 0 | -- | Not Seen From Open Roads or Dispersed Sites | Humpy Creek | Natural Appearing | High | 6.1 | Spruce/fir Group Selection |
| 7 | 27.44 | 26.68 | Foreground Concern Level 1 | Meadow Creek | Natural Appearing | High | 6.1 | Mixed Conifer Group Selection |
| 8 | 16.07 | 13.99 | Foreground Concern Level 1 | Meadow Creek | Natural Appearing | High | 6.1 | Mixed Conifer Group Selection |
| 9 | 10.56 | 10.56 | Foreground Concern Level 1 | Meadow Creek, Carrot Hollow | Natural Appearing | High | 6.1 | Spruce/fir Group Selection |
| 11 | 41.85 | 31.71 | Foreground Concern Level 1 | Meadow Creek, Carrot Hollow | Natural Appearing | High | 6.1 | Spruce/fir Group Selection |
| 11 | 107.66 | 107.66 | Middleground Concern Level 1 | Meadow Creek, Carrot Hollow | Natural Appearing | High | 6.1 | Spruce/fir Group Selection |
| 12 | 35.77 | 35.77 | Foreground Concern Level 1 | Meadow Creek | Natural Appearing | High | 6.1 | Spruce/fir Group Selection |
| 13 | 6.10 | 6.10 | Foreground Concern Level 1 | Meadow Creek | Natural Appearing | High | 6.1 | Spruce/fir Group Selection |
| 14 | 4.43 | 4.43 | Foreground Concern Level 1 | Meadow Creek | Natural Appearing | High | 6.1 | Spruce/fir Group Selection |
| 15 | 21.09 | 21.11 | Foreground Concern Level 1 | Meadow Creek | Natural Appearing | High | 6.1 | Spruce/fir Group Selection |
| 16 | 8.48 | 8.48 | Foreground Concern Level 1 | Meadow Creek | Natural Appearing | High | 6.1 | Spruce/fir Group Selection |
| 17 | 20.79 | 20.79 | Foreground Concern Level 1 | Whitney Reservoir | Natural Appearing | High | 6.1 | Spruce/fir Group Selection |
| 18 | 21.20 | -- | Foreground Concern Level 1 | Whitney Reservoir | Natural Appearing | High | 6.1 | Spruce/fir Group Selection |
| 19 | 6.50 | -- | Foreground Concern Level 1 | Whitney Reservoir | Natural Appearing | High | 6.1 | Spruce/fir Group Selection |
| 20 | 20.13 | 20.13 | Foreground Concern Level 1 | Whitney Reservoir | Natural Appearing | High | 4.4 | Spruce/fir Group Selection |
| 20 | 20.73 | 20.73 | Foreground Concern Level 1 | Whitney Reservoir | Natural Appearing | High | 6.1 | Spruce/fir Group Selection |
| 21 | 4.54 | 6.40 | Foreground Concern Level 1 | Whitney Reservoir | Natural Appearing | High | 4.4 | Spruce/fir Group Selection |
| 21 | 2.00 | 0 | Foreground Concern Level 1 | Whitney Reservoir | Natural Appearing | High | 6.1 | Spruce/fir Group Selection |
| 22 | 8.21 | 9.53 | Foreground Concern | Whitney Reservoir | Natural | High | 4.4 | Spruce/fir Group |

| Unit # | Seen Acres | | Distance Zone | Complex Seen From | Landscape Character Theme | Scenic Integrity Objective | Management Prescription | Vegetation Type and Harvest Prescription |
|--------|------------|-------|------------------------------|---------------------------------|-----------------------------|----------------------------|-------------------------|--|
| | Alt 2 | Alt 3 | | | | | | |
| | | | Level 1 | | Appearing | | | Selection |
| 23 | 3.42 | 0 | Foreground Concern Level 1 | Whitney Reservoir | Natural Appearing | High | 4.4 | Spruce/fir Group Selection |
| 23 | 42.57 | 0 | Foreground Concern Level 1 | Meadow Creek, Whitney Reservoir | Natural Appearing | High | 6.1 | Spruce/fir Group Selection |
| 23 | 6.72 | 6.72 | Foreground Concern Level 1 | Meadow Creek, Whitney Reservoir | Natural Appearing | High | 6.1 | Spruce/fir Group Selection |
| 24 | 70.69 | 51.67 | Foreground Concern Level 1 | Meadow Creek, Whitney Reservoir | Natural Appearing | High | 6.1 | Small 1 to 5 Acre Patch Cuts |
| 24 | 5.57 | 0 | Middleground Concern Level 1 | Meadow Creek, Whitney Reservoir | Natural Appearing | High | 6.1 | Small 1 to 5 Acre Patch Cuts |
| 25 | 39.20 | 5.74 | Foreground Concern Level 1 | Meadow Creek | Natural Appearing | High | 6.1 | Small 1 to 5 Acre Patch Cuts |
| 26 | 11.09 | -- | Foreground Concern Level 1 | Meadow Creek | Natural Appearing | High | 6.1 | Spruce/fir Group Selection |
| 27 | 6.19 | -- | Foreground Concern Level 1 | Whitney Reservoir | Natural Appearing | High | 6.1 | Spruce/fir Group Selection |
| 27 | 15.35 | -- | Middleground Concern Level 1 | Whitney Reservoir | Natural Appearing | High | 6.1 | Spruce/fir Group Selection |
| 30 | 46.60 | 42.21 | Middleground Concern Level 1 | Coyote Hollow | Natural Appearing | Moderate | 5.1 | Spruce/fir Group Selection |
| 31 | 17.30 | 17.30 | Middleground Concern Level 1 | Coyote Hollow, Upper Gold Hill | Natural Appearing | Moderate | 5.1 | Spruce/fir Group Selection |
| 32 | 15.80 | 15.15 | Middleground Concern Level 1 | Coyote Hollow | Natural Appearing | Moderate | 5.1 | Spruce/fir Group Selection |
| 33 | 58.38 | 58.35 | Middleground Concern Level 1 | Meadow Ck, Whitney Reservoir | Natural Appearing | Moderate | 5.1 | Spruce/fir Group Selection |
| 34 | 99.12 | -- | Middleground Concern Level 1 | Meadow Ck, Whitney Reservoir | Natural Appearing | Moderate | 5.1 | Aspen/Conifer, Conifer Removal and Burn |
| 35 | 152.98 | 97.07 | Middleground Concern Level 1 | Meadow Ck, Whitney Reservoir | Natural Appearing | Moderate | 5.1 | Mixed Conifer Group Selection |
| 36 | 8.76 | 8.76 | Foreground Concern Level 1 | Upper Gold Hill | Natural Appearing | Moderate | 5.1 | Spruce/fir Group Selection |
| 36 | 38.82 | 38.82 | Middleground Concern Level 1 | Coyote Hollow, Upper Gold Hill | Natural Appearing | Moderate | 5.1 | Spruce/fir Group Selection |
| 37 | 12.70 | 12.70 | Middleground Concern Level 1 | Coyote Hollow | Natural Appearing | Moderate | 5.1 | Mixed Conifer Group Selection |
| 41 | 31.03 | -- | Foreground Concern Level 1 | Mill City / Gold Hill | Natural Appearing | Moderate | 5.1 | Aspen/Conifer, Conifer Removal and Burn |
| 42 | 39.87 | -- | Foreground Concern Level 1 | Mill City / Gold Hill | Natural Appearing | Moderate | 5.1 | Aspen/Conifer, Conifer Removal and Burn |
| 43 | 57.73 | -- | Foreground Concern Level 1 | Mill City / Gold Hill | Natural Appearing | Moderate | 5.1 | Aspen/Conifer, Conifer Removal and Burn |
| 44 | 5.01 | -- | Foreground Concern Level 1 | Whitney Road, HWY150 | Developed Natural Appearing | High | 2.5 | Aspen/Conifer, Conifer Removal and Burn |
| 44 | 60.06 | -- | Foreground Concern Level 1 | Whitney Road, HWY150 | Natural Appearing | Moderate | 5.1 | Aspen/Conifer, Conifer Removal and Burn |

3.7.4 Environmental Consequences

3.7.4.1 Spruce/fir and Mixed Conifer, Group Selection

Alternative 1 – No Action

This alternative is currently compliant with a Landscape Character Theme of Natural Appearing and meets Scenic Integrity Objectives of High and Moderate under Forest Plan Guideline (G59).

Alternative 2 – Proposed Action

Group Selection would remove an estimated 100% of the canopy in ¼ to ½ acre patches in spruce/fir and 1 to 2 acre patches in lodgepole pine covering 20% of the unit area. Thinning between patches would remove up to another 20% of the canopy. Overall there would be up to 36% of the canopy removed.

Units 2-6 are not seen from any open Forest Service Roads and may not be seen from any private roads to the North and portions of other units included in this alternative may not been seen. See Table 3.7.2 for details of seen area analysis in proposed Spruce/Fir Group Selection units.

From foreground, middleground and background views the proposed management activity as described for spruce/fir and mixed conifer group selection should remain intact and meet a High and Moderate Scenic Integrity Objectives for a casual visitor and meet Forest Plan Guideline (G59).

For the High Scenic Integrity Objective “the valued landscape character "appears" intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely, and at such scale, that they are not evident. (FP) These activities should maintain the mature character of the stand and increase texture and variety in the viewed landscape.

Units 27, 30-33, and 35-37 are being managed in a Moderate Scenic Integrity Objectives for a majority of the units. Even though these units are being managed as Moderate they should be able to meet a High Scenic Integrity Objective as noted in the above.

Alternative 3 – Reduced Roads

This alternative would have the same effects for spruce/fir and mixed conifer group selection units as alternative 2. See Table 3.7.2 for details of seen area analysis.

3.7.4.2 Conifer/Aspen, Small 1 to 5 Acre Patch Cuts

Patch cuts within the perimeters of units 7, 24, and 25 would remove the canopy except for snags and snag replacement trees. These units have an aspen component that would be encouraged to regenerate within the patch cuts. Dense spruce components within these units would also be thinned where they occur to reduce beetle susceptibility.

Alternative 1 – No Action

This alternative maintains dense conifer stands with a mosaic of small openings of ½ to 2 acres. These units are compliant with a High Scenic Integrity Objective in a Natural Appearing Landscape Character Theme. The proposed units are within the foreground viewshed of concentrated use primitive car camping areas of Meadow Creek Complex and Whitney Road Complex and also Forest Service Road #80032 – Whitney Road.

Alternative 2 – Proposed Action

For foreground, middleground and background views units 7, 24 and 25 should be compliant with a High Scenic Integrity Objective and would become more diverse as the patch cut canopy reach mature heights and meet Forest

Plan Guideline (G59). Concentrated use primitive car camping areas would be filtered and screened from management activities as recreationists view into the stand.

Alternative 3 – Reduced Roads

This alternative would have the same effect as Alternative 2 except that the acreage within the perimeter of unit 24 was reduced by 33%.

3.7.4.3 Aspen/Conifer, Conifer Removal and Prescribed Burn

Conifers except for snag and snag replacement trees would be removed in units 34 and 41 through 44 to create fuels for subsequent prescribed burning. A mosaic of aspen regeneration intermingled with mature unburned aspen would develop following the burn.

Alternative 1 – No Action

This is an aspen / conifer mix with high diversity of vegetation. The units are currently being managed as moderate Scenic Integrity Objective with areas that are seen from the Scenic Byway (Highway 150) managed as a High Scenic Integrity Objective. This landscape is currently intact and is compliant with both Scenic Integrity Objectives.

Alternative 2 – Proposed Action

Views from the Scenic Byway would be minimized if not eliminated because of the screening of adjacent conifer and aspen stand canopies. Because of the screening from this vegetation all but 5 acres of the units would be managed as moderate and would be in compliance with FP guideline G61. Based on a Moderate Scenic Integrity Objective, where “Noticeable deviations remain visually subordinate to the valued landscape character being viewed” (USDA FS 2003), the proposed management activities would be compliant with the Moderate Scenic Integrity Objective for a Natural Appearing Landscape Character Theme with mitigation and meet Forest Plan Guideline (G59).

Alternative 3 – Reduced Roads

This alternative would have a similar effect to Alternative 2 except the number of units would be reduced to units 34, 41, 42 and there would be no conifer removal.

3.7.4.4 Road Construction and Decommissioning

Alternative 1 – No Action

The existing road network varies from road surface that are built for sedan travel to administrative roads closed to public use. Roads in the analysis area serve a number of users ranging from equestrians and hikers to high clearance vehicles. These roads are considered part of the character of the landscape and have specific integrity descriptions found in the Forest Plan. For a majority of the analysis area the roads are compliant with a High Scenic Integrity Objective although there are a number of roads where cuts and fills reflect the geometry of the travelway into the landscape and are not compliant. Beaver Lake – FS Road #80309 is an example of road alignment that affects the integrity of the landscape by creating a strait shoreline bank for Beaver Lake.

Alternative 2 – Proposed Action

The proposed temporary roads in units 18-21, 24, 25, 35 and 41-44 would have no effect, to a short-term effect on the scenic integrity of the analysis area. Once vegetation management is completed in these units they would be incorporated back into the landscape by ripping, re-contouring and seeding with native seed.

The Decommissioning and realignment of Meadow Creek Old road - FS Road # 80334, Beaver Lake – FS Road #80309 and Moffit Pass 4X4 – FS Road #80135 would improve integrity in the landscape that they are in by

reducing unwanted user created trails to get around wet bogging areas and allowing the shore line of Beaver Lake to meander and have a more natural appearing northeasterly shore line. These road modifications should comply with both High and Moderate Scenic Integrity Objective and meet Forest Plan Guideline (G59).

Alternative 3 – Reduced Roads

This alternative would have the same effects as Alternative 2 except for the temporary roads to unit 18, 19, and the road re-alignment on Moffit Pass 4X4 that would not be implemented.

Cumulative Effects

The cumulative effects for the impact on scenery are past, present, and foreseeable impacts of vegetation management past, insect infestations, and both summer and winter recreation.

Vegetation management has occurred in the analysis since the late 1800's. Effects of these activities are evident on the eastern slope of the Whitney Reservoir drainage and in other parts of the analysis area. For the most part these past vegetation-managed areas are compliant with Forest Plan direction for scenery. Present vegetation treatments such as the Coyote Road Hollow Beetles Project are implementing Forest Plan direction and it is intended that future management continue to provide as diverse and intact management as possible to help maintain a natural appearing landscape.

Insect infestations are the most dynamic and potentially devastating cumulative effect on landscape maintenance of a large conifer component as part of the landscape character of the analysis area. This could have a long-term effect on the desired character of the landscape until natural succession is completed and large conifers that are characteristic of this landscape return.

The Whitney area has maintained a significant recreation character to the landscape since roads have been opened into the area. Primitive camping (dispersed camping) has long been a pastime of people from the Wasatch-Front within 1 ½ hours and with some local use coming from Wyoming. Another major use of the area is off highway vehicle (OHV) and all terrain vehicle (ATV) use and the numbers are increasing. Increased education and enforcement of use under the recent Mountain View and Evanston Travel Plan is expected to result in less illegal use over the next few years. Winter recreation has a minimal effect on scenery because of the minimal amount of evidence left by oversnow machinery.

All of the alternatives would meet Forest Plan Guidelines for scenic resources.

3.8 Recreation

The analysis area for recreation is the general analysis area as described in FEIS Section 1.3. The West Fork Bear analysis area offers a variety of recreation settings. These settings are differentiated by the amount of development and other attributes incorporated into a recreation-planning tool called the Recreation Opportunity Spectrum (ROS). The Forest is using this mapping and classification system to distinguish between different types of recreation settings in the Forest. The ROS system provides a way to help managers and recreation users understand what recreation experiences to expect and where they are available across the Forest. ROS classifications are descriptive so they can help people visualize the variety of natural outdoor settings, the types of activities that can be pursued, and how many other people might be found in an area of the Forest.

3.8.1 Assumptions and Methodology of Analysis

Assumptions made in this analysis include the following:

- That there would be little effect on winter recreation users from vegetation management operations because management activities would occur during the off snow season of July through the first part of December.

- That managerial interaction with recreation users would be similar to what it has been in the past, except when vegetation management or log hauling occurs in near proximity to the recreation user.
- That people would continue to camp in the same location even though the physical setting has been modified by vegetation management activities.
- Camping generally begins the first part of July and extends through the deer hunt in October.
- Assume 3 truckloads per day haul rate and 5 loads per day production for falling, skidding, and decking. (Hatch 2005a)
- The analysis area is broken into three sale areas: Moffit – includes units 2-27; Reservoir East – includes units 30-37; and Mill City – includes units 41-44 and burn.
- Assume that harvest activities within ½ mile of a concentrated use area (CUA) would have the greatest effect on recreation users from the visibility of harvest operations and noise created by cutting, loading and hauling operations.

For the WCNF planning process, the Forest was divided into six recreation opportunity categories and one sub-category that are differentiated by the physical setting (remoteness and human modification), social setting (the amount of social interaction between users) and managerial setting (the amount of managerial presence and information). The West Fork Bear analysis area is made up of three ROS classifications Rooded Natural (RN), Semi-primitive motorized (SPM) and Semi-primitive non-motorized (SPNM). See ROS Table 3.8.1 for acres of each classification. RN classification attributes include ½ mile on both sides of the Whitney Road. This classification informs recreationists that they have the potential of having a higher interaction with both other recreationists and Forest managerial staffs along this corridor. SPM recognizes that there is a higher possibility of being more self-reliant and that roadways are mostly being managed for high clearance vehicles. The southwestern edge of the analysis area ROS classification of SPNM means there are no motorized trails or roadways in this area since it is being managed for even greater self-reliance than SPM and a higher provability that the user would have a moderate to low chance of interacting with other recreationists in the social setting.

The area of analysis includes the general West Bear Vegetation Management Project analysis area.

Harvest operations could have a negative effect on recreationist camping, OHV riding and fishing within the analysis area. The amount of impact that the harvest operation varies somewhat based on the specific individual and their tolerance level of noise and dust from harvest operations. This analysis shows the relationship of inventoried primitive car camping areas and the harvest operation. The length of time and scheduling of harvest operations in each area is a factor in the effects but is very difficult to precisely predict. Assumptions of timber production described above were used to weigh effects due to duration of disturbance. A ½ mile buffer was placed around each harvest unit using GIS to represent distance used in the ROS protocols and a count of the number of CUAs found within the buffer was determined. Within these buffers a recreationist may hear or see vegetation management activities. The days of effect from harvest operation are based on the proposed sale of units which were broken into three sale areas including:

- Moffit – This area includes units 2-27
- Reservoir East – This area includes units 30-37 in Alternative 2 and 29-37 in Alternative 3.
- Mill City – This area includes units 41-44 and burn.

The total number of days in the area may vary based on the capability of the company that may purchase the sale. The analysis estimates 3 loads/day haul rate and 5 loads/day production rate for falling, skidding, decking for each sale. Some overlap in operations of these sales is expected.

3.8.2 Existing Inventories, Monitoring, and Research Literature Review

Forest Management Prescriptions, Recreation Opportunity Spectrum (ROS), Project Harvest Unit Shape file, Concentrated Use Area, and Analysis Area Geographic Information System (GIS) overlays and a table estimating time required for timber harvest operations were used to create tables included in this section and analyze effects of the alternatives on recreational uses. See Maps 14 and 15 in Appendix A. These sources of information are contained in the Project File. Section 3.7.2 includes references used in analysis of effects on scenery.

National Visitor Use Monitoring Results, Wasatch-Cache National Forest provides insights on visitor impressions and expectations on the Wasatch-Cache Forest.

3.8.3 Affected Environment

The affected environment includes all of the area within the Whitney Reservoir Basin, Humpy Creek, Coyote and Road Hollows, Mill City Creek and the west side of the Hayden Fork between an unnamed drainage on the south and the Forest property line on the north.

Recreation Setting

The majority of the West Bear analysis area is classified as Semi-Primitive Motorized or Roaded Natural under the Recreation Opportunity Spectrum with a small portion of the area in the upper West Fork Bear River drainage classified as Semi-Primitive Non-motorized (See Table 3.8.1). Detailed descriptions of the characteristics expected under these classifications can be found in Table 11, Chapter 4 of the Revised Forest Plan. A summary of these is as follows:

Semi-primitive Motorized: Predominantly a natural appearing landscape character with minimal improvements to protect resources. Roads and motorized trails are primitive and vegetation treatment areas are small in number, widely disbursed, and consistent with natural vegetation patterns.

Roaded Natural: Predominantly a natural appearing and developed natural appearing landscape character with nodes and corridors of development such as campgrounds, trailheads, boat launches, small scale resorts, and recreation residences. Roads are higher standard and motorized and non-motorized trails are present. Changes to the natural vegetation patterns are apparent, but in harmony with natural environment.

Semi-primitive Non-motorized: Predominantly a natural evolving/natural appearing landscape character with minimal rustic improvements to protect resources. Closed and temporary roads may be present with predominantly natural vegetation. Vegetation treatment areas may be present to enhance forest health, but are few and widely dispersed.

Table 3.8.1. Recreation Opportunity Spectrum Acres

| ROS Classification | ACRES |
|-------------------------------------|-------|
| Private (Pvt) | 103 |
| Roaded Natural (RN) | 5,213 |
| Semi-Primitive Motorized (SPM) | 9,015 |
| Semi-Primitive Non-Motorized (SPNM) | 1,984 |

A National Visitor Use Monitoring publication found that visitors to the Wasatch Cache identified viewing natural features, relaxing, hiking/walking, viewing wildlife, and downhill skiing as the primary activities they participated in. The West Bear analysis area offers four of the five activities with the exception of downhill skiing. There are a few backcountry skiers that access the area by snowmobile and then downhill ski on the open slopes.

Activities that are common in the West Bear area include fishing, hunting, OHV use (ATV, motorcycle, and high clearance vehicles), camping, picnicking, boating (small outboard motors), equestrian use, and snowmobiling. Though some of the activities are seasonal (hunting, snowmobiling) the area offers a high diversity of semi-primitive to less developed experiences where visitors use their skills of self reliance with minimal managerial interaction.

Recreation use especially around the Whitney reservoir has increased over the past years because of construction of the reservoir, road improvements from oil exploration, and vegetation management projects. The main access into the analysis area is via the Whitney Road # 80032 from Highway 150. Whitney road was realigned and constructed to accommodate large vehicles used for oil exploration. These improvements have allowed passenger cars to access Whitney Reservoir. Enhancements to the roads may have expanded the primitive car camping impacts to many of the stands of conifer and aspen within 300 feet of the roads in the analysis area. There are 131 primitive car camps or concentrated use areas (CUAs) within the analysis area with concentrations of CUAs around the Whitney Reservoir and at intersections of the Whitney Road with other roadways. This information is based on an inventory using District knowledge and GIS to digitize the approximate locations on maps. See Map 14 in Appendix A.

Fishing at Whitney Reservoir and Beaver Lake are the popular non-motorized recreation activities and bring in non-campers to the area with many of these individuals coming from recreation residences adjacent to the north boundary of the Forest along the Mirror Lake Highway.

The CUAs around the Whitney Reservoir support the majority of camping and OHV use in the area during the months of July – September with CUAs in the Roaded Natural setting reaching 100% capacity on the weekends and holidays, dropping to approximately 35% occupancy during the week based on ocular estimates of recreation managers. During the elk and deer hunts camping spreads out from the Whitney Reservoir area into the semi-primitive motorized setting of the analysis area, occupying about 50% of the CUAs (Hatch 2005a).

With the many primitive high clearance to better than primitive roads in the analysis area, OHV use is a popular amenity to the campers experience. There is some OHV specific use in the area, but that is low because people are required to trailer their OHVs into the area. Most of the OHV use occurs from the campers who bring their own OHV as part of their camping activities.

For the snow off-season there are two other vehicle access routes into the analysis area. One enters from Highway 150 via Gold Hill road (FS Road 80081), and the other from Chalk Creek to the north on a County road through privately owned lands. These roads require high clearance vehicles and range from moderate to difficult for recreational access. There are a minimal number of CUAs along these routes and they are primarily occupied during the elk and deer hunts in the fall.

Winter recreation is very popular in the analysis area because of the diversity of terrain and open play areas. The area is accessed by a groomed trail that follows Whitney Road # 80032 with jump off points at major drainages such Mill Creek, Whitney and Moffit. The entire analysis area is open to snowmobiling with no restrictions. It is popular for both local summer residences on the northern edge of the Forest and to recreationists from the Wasatch front who use the Bear River Snowpark to access Forest lands.

3.8.4 Environmental Consequences

3.8.4.1 Infrastructure Access – Road Construction, Decommissioning and Management

Alternative 1 – No Action

The existing road network varies from road surface that are built for sedan travel to administrative roads. Roads in the analysis area serve a number of users ranging from equestrians and hikers to high clearance vehicles. These roads are considered part of the ROS setting and define different experience that individuals may have as a result of the condition of the road. The roads within the analysis area the roads are compliant with the ROS classification they are in Roaded Natural or Semi-Primitive Motorized.

Alternative 2 – Proposed Action

There would be no change in the maintenance level or any added designated routes. The proposed temporary roads in units 18-21, 24, 25, 35 and 41-44 should have no effect on the recreation users since they will not be open for public use. These temporary roads will be scarified and re-seeded. Once vegetation has been re-established after

ripping, re-contouring and seeding with native seed, the roads would be gated or blocked to discourage entry of vehicles. These temporary roads could create a temporary managerial issue because some users do not recognize or obey road closures.

Portions of Meadow Creek Old road - FS Road # 80334; Beaver Lake – FS Road #80309; and Moffit Pass 4X4 – FS Road #80135 would be decommissioned and have new alignments constructed on better locations to reduce resource impacts. A portion of FS Road #80324 southeast of Unit #16 would be relocated to provide better drainage. The Meadow Creek stream crossing on Road #80324 is currently being armored with gravel surfacing. The realignment of the Beaver Lake Road #80309 would have some effect on some users because it would move the road out of the muddy bog adjacent to the lake, eliminating several lakeshore campsites and replacing them with dispersed campsites on a ridge overlooking the lake. The other two realignments would have no adverse effects since they would eliminate boggy sections of roads and replace them with good road surfaces.

A small portion of Semi-Primitive Non-Motorized (SPNM) ROS classification area will be affected by noise on the southern edge of the Whitney basin. There are no maintained trails in this area and all travel is cross-country.

Alternative 3 – Reduced Roads

Alternative 3 would have the same effects as Alternative 2 except that the Beaver Lake road and the road to Moffit Pass would not be realigned.

3.8.4.2 Vegetation – Change in Structure, Patterns, and Overstory.

Alternative 1 – No Action

The conifer component is dense in many concentrated use areas (dispersed primitive car camping areas) and would continue to maintain a similar structure and climatic relief for recreationists.

Alternative 2 – Proposed Action

Units 12-16, 20-23 and 25 would have the greatest effect on recreation users by thinning and opening some of the canopy adjacent to concentrated use areas. Since most of the canopy providing shade would be retained adjacent to these sites the effects are minimal. See Section 3.7 for change in the landscape character of the area.

Alternative 3 – Reduced Roads

Same as Alternative 2.

3.8.4.3 Managerial – Change in Management

Alternative 1 – No Action

There would be no change in management.

Alternative 2 – Proposed Action

There would be an increased presence of forest managers and warning signs during the vegetation management operations to provide for the safety and health of the public.

Alternative 3 – Reduced Roads

Same as Alternative 2.

3.8.4.4 Social – Sights and Sounds of Other Users and Vegetation Operations.

Alternative 1 – No Action

There would be no change in sights and sounds of other users or management.

Alternative 2 – Proposed Action

Recreationists use the analysis area from about mid June until the end of the deer hunt in October, which is approximately 138 days or 19 weeks. There would be a potential for approximately 470 persons at one time using 94 concentrated use areas to be directly affected by the proposed timber harvest noise and traffic if concentrated use areas were at full capacity and timber operations were conducted on high use days (weekends or holidays). Limiting operations to weekdays reduces the estimated number of persons potentially affected at one time to about 109. That effect assumes that all three sales were hauling logs at the same time (See Table 3.8.3). Weekend visitors could encounter log haul on Friday afternoon but would be unlikely to be affected after 6:00 pm. The users that occupy the Meadow Creek, Whitney Road, Coyote Hollow, and Mill City/Gold Hill CUA complexes would have the greatest effect from trucking operations (See Table 3.8.4). However, due to low weekday use of these sites and the option to select sites further from the haul roads, the log haul may not affect many people. The Whitney road has relatively high recreational vehicle traffic so additional log truck traffic would be an incremental increase in the disturbance from traffic. On the low end would be Carrot Hollow complex where no truck hauling would occur on adjacent roads.

Noise created by timber operations would have a significant effect on users specifically in the Whitney Reservoir Basin where the residual sound from chain saws and other operations could cover the entire basin. Some units in Reservoir East sale where portions of the sale unit face the Whitney Basin and all of the units in the basin would affect Carrot Hollow, Meadow Creek, Whitney Reservoir CUA complexes to some extent with sounds from operations. Fishing and hunting activities would be affected by these operations in this area (See Tables 3.8.2, 3.8.3 and 3.8.4). The effects on Whitney Reservoir concentrated use areas would be fairly high during operations in units 17-22, 25, and 27 but of a shorter duration than sites along the Whitney Road since the Whitney Reservoir concentrated use areas would not be substantially affected by operations or log haul from other units. It should take less than three months to complete operations in units 17 through 22 and units 25 and 27 that affect the Whitney Reservoir CUA. Meadow Creek and Carrot Hollow sites would not be affected by operations in the Whitney Reservoir area. Progressively longer duration of effects from log haul would occur on concentrated use areas along the Whitney Road proceeding from west to east because the farthest east sites would be affected by log haul from all of the units. It is likely that many recreational users on weekdays will look for and be able to find concentrated use areas in the West Bear analysis area that are far enough away from timber harvest activities to avoid the disturbance of log hauling and noise from operations. The disturbance during operations near Whitney Reservoir would be unavoidable if recreational users wish to camp near the reservoir.

Harvest units 34 and 41 through 44 would be burned in the spring or fall following harvesting operations. Spring burning would occur in May, prior to most recreational use of the area and would therefore have little effect on recreational users. Depending on weather conditions, fall burning would be likely to be done in late September or October at about the same time leaves have turned color or fallen. Burn windows depend on weather forecasts for good smoke dispersal but smoke tends to hang in valleys for several days after the burn. The activity of burning and the resulting smoke could have adverse effects on hunters and hunter camps in the vicinity. Smoke from Unit 34 would be most likely to affect camps in the Whitney Reservoir area and in Coyote Hollow. Smoke from Units 41 through 44 would be most likely to affect camps in Mill City Creek and along Highway 150 between the Stillwater and Beaver View Campgrounds.

The proposed management activities would have an overall substantial effect on recreation users in the analysis area during timber operations and prescribed burning. Once harvest is completed in each of the areas, recreation activities should resume as in the past with the exception of the some change to the seen landscape. The character of roads would change from road improvements made during timber operations with a potentially adverse indirect effect of increasing easy access and therefore potentially drawing more people into the area.

The benefit of this alternative is maintenance of a diverse landscape and the benefits derived from that in reducing the likelihood of catastrophic events.

Alternative 3 – Reduced Roads

The social effects of noise and truck hauling would be similar to Alternative 2 except that there would be less disturbance due to reduced total timber harvest activity. Effects of burning would be the same as Alternative 2.

Table 3.8.2. Affected Concentrated Use Areas Within ½ Mile of Harvest Unit or Haul Road

| Concentrated Use Complexes | Proposed Timber Sale Areas | | | | | |
|-------------------------------|----------------------------|-------|---------------------------------|-------|----------------------------|-------|
| | Moffit (Units 2-27) | | Reservoir East (Units 30-37) | | Mill City (Units 41-44) | |
| | Alt 2 | Alt 3 | Alt 2 | Alt 3 | Alt 2 | Alt 3 |
| Carrot Hollow (3 areas) | 3 | 3 | 0 | 0 | 0 | 0 |
| Meadow Creek (8 areas) | 8 | 8 | 0 | 0 | 0 | 0 |
| Whitney Res. (48 areas) | 48 | 48 | 0 | 0 | 0 | 0 |
| Coyote Road Hollow (13 areas) | 13 | 13 | 13 | 13 | 13 | 13 |
| Mill City/Gold Hill (2 areas) | 2 | 2 | 2 | 2 | 2 | 2 |
| Whitney Road (19 areas) | 19 | 19 | 19 | 19 | 19 | 19 |
| Main fork/gold hill (1 area) | 0 | 0 | 0 | 0 | 1 | 1 |
| Total (94 areas) | 93 | 93 | 34 | 34 | 35 | 35 |

Table 3.8.3. Number of Visitors Affected Daily Within ½ Mile of Harvest Unit or Haul Road During Ongoing Operations (Assumes 35% Occupancy of Whitney Reservoir and 10% Occupancy of other Concentrated Use Areas on Non-holiday Weekdays and is based on 5 people at one time in each concentrated use area.)

| Concentrated Use Complexes | Number of People Affected Daily by Proposed Timber Operations | | | | | | | |
|-------------------------------|---|-------|---------------------------------|-------|----------------------------|-------|--------|-------|
| | Moffit (Units 2-27) | | Reservoir East (Units 30-37) | | Mill City (Units 41-44) | | Total* | |
| | Alt 2 | Alt 3 | Alt 2 | Alt 3 | Alt 2 | Alt 3 | Alt 2 | Alt 3 |
| Carrot Hollow (3 areas) | 2 | 2 | 0 | 0 | 0 | 0 | 2 | 2 |
| Meadow Creek (8 areas) | 4 | 4 | 0 | 0 | 0 | 0 | 4 | 4 |
| Whitney Res. (48 areas) | 84 | 84 | 0 | 0 | 0 | 0 | 84 | 84 |
| Coyote Road Hollow 13 areas) | 7 | 7 | 7 | 7 | 0 | 0 | 7 | 7 |
| Mill City/Gold Hill (2 areas) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Whitney Road (19 areas) | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Main fork/gold hill (1 area) | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| Total (94 areas) | 108 | 108 | 18 | 18 | 12 | 12 | 109 | 109 |

* Assumes all three sales operating at once.

Table 3.8.4. Estimated Number of Weekdays For Timber Operations Affecting Each Concentrated Use Area*

| Concentrated Use Complexes | Number of Days Proposed Concentrated Use Areas are Affected by Timber Operations | | | | | | | |
|-------------------------------|--|-------|---------------------------------|-------|----------------------------|-------|---------|-------|
| | Moffit (Units 2-27) | | Reservoir East (Units 30-37) | | Mill City (Units 41-44) | | Total** | |
| | Alt 2 | Alt 3 | Alt 2 | Alt 3 | Alt 2 | Alt 3 | Alt 2 | Alt 3 |
| Carrot Hollow (3 areas) | 20 | 20 | 0 | 0 | 0 | 0 | 20 | 20 |
| Meadow Creek (8 areas) | 147 | 119 | 0 | 0 | 0 | 0 | 147 | 119 |
| Whitney Res. (48 areas) | 50 | 37 | 0 | 0 | 0 | 0 | 50 | 37 |
| Coyote Road Hollow 13 areas) | 213 | 171 | 148 | 123 | 0 | 0 | 290 | 221 |
| Mill City/Gold Hill (2 areas) | 213 | 171 | 148 | 123 | 49 | 0 | 308 | 221 |
| Whitney Road (19 areas) | 213 | 171 | 148 | 123 | 49 | 0 | 308 | 221 |
| Main fork/gold hill (1 area) | 0 | 0 | 0 | 0 | 49 | 0 | 10 | 0 |

* Assumes 3 log loads/day produced from sale units affecting concentrated use areas.

** Assumes overlap in timber sale contract periods with an average of four log loads/day exiting the analysis area. Actual daily loads hauled will vary from 0 to possibly a few more than 9.

Cumulative Resource Impacts

The cumulative effects for the impact on recreation are all within the analysis area. The effects of past, present and reasonably foreseeable activities in the future are vegetation management (past, ongoing and proposed), insect infestations, and recreation (summer and winter).

Vegetation management has occurred in the analysis area since the late 1800's. Effects of these activities are evident on the eastern slope of the Whitney reservoir drainage and in other parts of the analysis area. For the most part these past vegetation-managed areas are compliant with FP direction for ROS classifications. Present vegetation treatments such as the Coyote Hollow Beetles Project are implementing FP direction and it is intended that future management continue to maintain a diverse and natural appearing landscape.

Insect infestations are a dynamic and potentially adverse cumulative effect on the landscape. Maintaining large conifer trees as a component of the landscape is important. Replacement of this landscape with large diameter spruce and other conifers by a landscape with a high percentage of dead trees could have a long-term effect resulting in recreational users seeking other sites.

The Whitney area has maintained a significant roaded natural to primitive recreation character since roads have been opened into the area. Primitive camping (dispersed camping) has long been a past time of people from the Wasatch-Front within 1 ½ hour drive and with some locals from Wyoming. Another major use of the area is OHV and ATV and numbers are increasing. Continued growth in recreational use of this area could result in less satisfaction of the recreational experiences in the area.

3.9 Financial Efficiency

The analysis area for determining financial efficiency of the alternatives is the general analysis area as described in FEIS Section 1.3. FSM 2432.12 requires a financial efficiency analysis for timber sale proposals that are expected to exceed \$100,000 in value. FSH 2409.18 Chapter 32.4 specifies that financial efficiency analysis must include costs and benefits for 60 years into the future.

3.9.1 Assumptions and Methodology of Analysis

Financial efficiency considers the estimated direct expenditures with estimated financial revenues. This analysis displays market costs and benefits, although there are many non-market benefits and costs that are not assigned dollar values. Examples of non-market benefits that are not included in this analysis are watershed and wildlife habitat restoration, application of Best Management Practices (BMPs) to project area roads, and activities to reduce the spread of noxious weeds. Examples of non-market costs are erosion, scenic integrity degradation, and invasion of weeds onto National Forest System land. This section focuses on the market costs and benefits of implementing the alternatives and relies on the various other resource reports to identify the non-market benefits and costs that implementation would produce. Table 3.8.2 displays the Present Net Value (PNV) of each category of activities included in each alternative, and the Total PNV for each alternative. The cost of environmental document preparation is not shown, because those costs are incurred regardless of the final alternative chosen in the Record of Decision. Present Net Value calculations are contained in the West Bear Vegetation Management Project EIS project file.

Management of the forest is expected to yield positive benefits, but not necessarily financial benefits. Economic effects are assessed within the managerial context of the Wasatch-Cache National Forest Revised Forest Plan, as a part of an integrated approach to multiple-use management.

3.9.2 Existing Inventories, Monitoring, and Research Literature Review

Costs for various vegetation and road management activities are based on experienced costs and professional judgment, and represent the estimated costs to implement the alternative. Costs include sale preparation (marking/cruising, appraisal, contract preparation, advertising, etc.), sale administration, road maintenance, temporary road construction and obliteration, and post-sale activities (slash treatment, planting, and regeneration surveys). Road maintenance, temporary road construction and obliteration and slash treatments are all appraisal costs and are subtracted from the value of the timber to derive the stumpage value. The other costs are determined outside the appraisal process and are shown as separate costs. The financial efficiency analysis is calculated for a 60 year period. It was necessary to make some assumptions about future entries to complete the 60 year analysis. Two future entries were used to represent potential scenarios. However, the future entries are potential entries only; no entries have been scheduled or proposed at this time. The PNV analysis does not establish a precedent for any future actions.

Non-commodity values were not included in this analysis because these resources are evaluated under each specific resource section. Title 40, Code of Federal Regulations for NEPA (40 CFR 1502.23) states “For the purposes of complying with the Act, the weighing of the merits and drawbacks of the various alternatives need not be displayed in a monetary cost-benefit analysis and should not be when there are qualitative considerations”. Effects on resources are documented in individual resource sections in this chapter.

Additional information on unit costs and sale revenues used to develop PNV estimates are in the project file. Spreadsheets used to summarize IMPLAN employment and income impacts are included in the Forest Plan planning records, and the FEIS.

The estimated cost of environmental document preparation has not been included in the analysis, because the cost is the same for all alternatives. By comparing the cost of each management activity with the level of outcomes and the description of effects in each resource section of this chapter, the reader can get a sense of any tradeoffs associated with the activity. Timber harvest is the only proposed activity that has a revenue component as well as costs. Proposed reforestation, road work and other activities only have a cost component.

3.9.3 Affected Environment

Economic impacts for the timber program have been addressed at the forest level in the revised Forest Plan. That analysis estimated employment and employee compensation estimated to result from the implementation of each alternative. Estimates of job and income impacts were made with IMPLAN Input-Output models. IMPLAN estimates combine direct, indirect and induced effects into the total impact. The measure for “jobs” includes both full and part-time jobs. The measure for “income” is employee compensation. Impact areas (the counties affected by implementation) were based on U.S. Department of Commerce, Regional Economic Information System, 2000. These areas are defined as functioning economies based on commuting patterns. Each economic area includes, as far as possible, both the place of work and the place of residence of the labor force. The Forest plan analysis determined that the timber program on the Wasatch-Cache provides an annual average of 37 wood products related jobs, and \$800,000 annually in labor income under the Wasatch-Cache National Forest Revised Forest Plan FEIS, Tables SE-10 and SE-11, pages 3-472 and 3-473 (USDA Forest Service 2003b).

3.9.4 Environmental Consequences

The analysis displays the project-level financial attributes (predicted costs and revenues) of each alternative. Alternatives 2 and 3 would include timber harvest. The appraisal system estimates the predicted stumpage value of timber sales as if the sales were sold in September 2003. The actual appraised value of forest products will change between now and the time any projects are actually advertised for bids because of constant changes in stumpage market prices. For example, the value of dead wood is generally less than the value of live timber. However, one of the most valuable products within the Intermountain Region at this time are large diameter dead spruce trees suitable for houselogs. The stumpage values used in the analysis represent an average value for dead timber, which is significantly less than what would be expected for houselog material.

The Mill City Sale would have an estimated volume of about 1,140 CCF of merchantable conifers that would be harvested under Alternative 2 and burned under Alternative 3. There is up to 100 CCF of merchantable timber outside of harvest units under Alternative 2 that could be burned. The value of these conifers could be used to offset some of the costs of prescribed burning. The costs of burning are highly variable and have not been presented in the following tables.

State and local economies would be directly and indirectly affected by the monetary inputs this project represents. Timber products provided to the raw material markets through direct timber sales would contribute to the continuing operation of lumber mills. This would add directly and indirectly to the local and state economies through employment and tax revenues. This project represents opportunity for input to local and regional economies because of the proposed harvest activities. Employment opportunities in the wood products industries would be available. Employment would also be available in the reforestation and road projects. Table 3.9.1 compares the economic efficiency of the alternatives, and reflects the costs and benefits associated with the proposed action and alternatives to the proposed action. The Total Discounted Costs, Total Discounted Benefits and PNV reflect the value over a 60 year time period and are displayed in Table 3.9.2.

Table 3.9.1. Economic Efficiency Comparison of Alternatives. Compares the costs and benefits associated with the proposed action and alternatives

| Timber Sales | Alternative 1 | Alternative 2 | Alternative 3 |
|--|---------------|---------------|---------------|
| Acres | 0 | 1,489 | 864 |
| Volume (CCF) | 0 | 10,220 | 6,582 |
| Total Timber Value (\$1000) | 0 | \$868 | \$559 |
| Temp. Road Construction Cost (\$1000)* | 0 | \$75 | \$15.8 |
| System Road Construction Cost (\$1000) | 0 | \$38 | 0 |
| Mark/Cruise Cost (\$1000) | 0 | \$163.6 | \$105.3 |
| Sale Admin. Cost (\$1000) | 0 | \$153.2 | \$98.7 |
| Contract Prep Cost (\$1000) | 0 | \$21.4 | \$21.4 |
| Planting Cost (\$1000) | 0 | \$16 | \$12 |

*Estimated timber value is determined from the value of the timber, minus the road maintenance, temporary road construction and obliteration, and slash costs. Construction costs are shown here for comparison purposes only.

Table 3.9.2. Present Net Value of the Alternatives Over 60 Years.

| Timber Sales | Alternative 1 | Alternative 2 | Alternative 3 |
|--------------------------------------|---------------|---------------|---------------|
| Total Discounted Costs (\$1000) | 0 | -\$644.10 | -\$438.30 |
| Total Discounted Benefits (\$1000) | 0 | \$1,096.20 | \$694.60 |
| Overall PNV for Alternative (\$1000) | 0 | \$452.00 | \$256.00 |

Alternative 1 – No Action

Alternative 1 would produce no economic outputs. There would be no return on the cost of environmental study. No timber volume is harvested in this alternative. Present Net Value of the project is 0 (refer to Table 3.9.2)

Alternative 2 – Proposed Action

Alternative 2 would provide an estimated 10,220 CCF (4.9 MMBF) of timber volume offered for sale, the greatest amount of any alternative. This is approximately 50% of the annual volume needed to supply local mills. Planting would be accomplished the same as Alternative 1. The total PNV for this alternative over 50 years is estimated at \$452,008 (refer to Tables 3.9.1 and 3.9.2).

Alternative 3 – Reduced Roads

Alternative 3 would provide an estimated 6,582 CCF (3.1 MMBF) of timber volume offered for sale. If all the timber volume were sold and harvested, this alternative would provide approximately 30% of the annual volume needed to supply local mills. This alternative would also maintain roads, but because of the lower level of harvest, some roads would not be used and therefore not maintained. Planting would occur as with the other alternatives. The Present Net Value of the alternative over 60 years is \$256,347 (refer to Tables 3.9.1 and 3.9.2).

3.10 Short-term Uses and Long-term Productivity _____

NEPA requires consideration of “the relationship between short-term uses of man’s environment and the maintenance and enhancement of long-term productivity” (40 CFR 1502.16). As declared by the Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

Harvesting timber provides timber products for public use and jobs associated with the timber harvest and manufacturing of products (FEIS Sec. 3.9.4). Using timber harvest and prescribed fire as tools to maintain or improve forest species and age class diversity mimics some of the natural historic disturbance agents (FEIS Sec. 3.4.4). Maintaining or improving forest species and age class diversity insures continued long-term productivity of the forest resource (FEIS Sec. 3.4.4) and wildlife habitat (FEIS Sec. 3.6.4) as well as reducing the likelihood or severity of catastrophic insect infestations and fire (FEIS Sec. 3.4.4).

3.11 Unavoidable Adverse Effects _____

Unavoidable adverse effects are similar under both action alternatives and differ only in the scale of the effects. They include a slight increase in peak flows and sedimentation of stream channels (FEIS Sec. 3.1.4), a low rate of soil erosion and soil compaction (FEIS Sec. 3.2.4), a slight increase in sediment effects on aquatic species (FEIS Sec. 3.3.4), a slight increase in fragmentation of forest stands from road construction (FEIS Sec. 3.3.4), increased wildlife disturbance from noise and traffic during harvest operations (FEIS Sec. 3.6.4), temporary decrease in habitat for wildlife species that depend on old forest conditions (FEIS Sec. 3.6.4), and effects on recreational opportunities due to visual effects (FEIS Sec. 3.2.7) and noise and dust from timber harvest activities (FEIS Sec. 3.2.8).

3.12 Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power line rights-of-way or road.

There are no irreversible effects of the alternatives.

Irretrievable effects are limited to road construction. The clearing limits of intermittent service roads under Alternative 2 would be kept in place over the long term although they would be revegetated with grass and forbs following each timber harvest. Temporary roads would be constructed under both alternatives but would be revegetated and reforested following timber harvest.

3.13 Cumulative Effects _____

All cumulative effects (FEIS Tables 3.02.1 and 3.02.2) that are applicable to each resource are discussed in the environmental consequences section under each of the resources. Along with the effects of the alternatives on each of the resources, these include ambient pollution effects on air quality (FEIS Sec. 3.03), timber harvest, prescribed fire and road construction effects on water quantity and quality and wetlands (FEIS Sec. 3.1.4.01 and 3.1.4.02), livestock grazing and recreation impacts on soils (FEIS Sec. 3.2.4.1 and 3.2.4.2), effects of existing roads and off-road vehicle travel on aquatic species (FEIS Sec. 3.3.4.1) and amphibians (FEIS Sec. 3.3.4.4), effects of past harvest and fire on old forest (FEIS Sec. 3.4.4.4), effects of past harvest, beetle activity, and grazing on fire and fuels (FEIS Sec. 3.5.4.1), effects of past harvest, road construction, and existing recreational use on wildlife in general (FEIS Sec. 3.6.4.02), effects of past harvest, beetle activity, grazing, and recreational uses on Canada lynx (FEIS Sec.

3.6.4.1), effects of recreational use on wolverines, grazing and recreational use on boreal and great gray owls, grazing and beetle activity on three-toed woodpeckers, and recreational use and past harvest on northern goshawks (FEIS Sec. 3.6.4.2), effects of past harvest on snowshoe hare, (FEIS Sec. 3.6.4.4), effects of grazing and recreational use on big game (FEIS Sec. 3.6.4.6), effects of grazing, irrigation, recreation infrastructure, recreation developments, residential development, logging practices, and energy development on wildlife movement corridors (FEIS Sec. 3.6.4.7).

3.14 Other Required Disclosures ---

NEPA at 40 CFR 1502.25(a) directs “to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with ...other environmental review laws and executive orders.”

Endangered Species Act - This Act directs that all Federal departments and agencies shall seek to conserve endangered, and threatened (and proposed) species of fish, wildlife and plants. This obligation is further clarified in a National Interagency Memorandum of Agreement (dated August 30, 2000), which states our shared mission to “...enhance conservation of imperiled species while delivering appropriate goods and services provided by the lands and resources.” Based on the disclosure in Chapter 3, concerning threatened and endangered or proposed wildlife, plant or fish species, correspondence with the USFWS and the Biological Assessment, it has been determined there are no adverse effects to populations of endangered, and threatened (and proposed) species of fish, wildlife and plants relative to this decision.

American Antiquities Act of 1906 and the National Historic Preservation Act of 1966 – All surveyed and inventoried cultural resource sites in the sale area will be protected from entry and excluded from any resource management activities. New sites discovered during sale operations will be protected by provisions in the timber sale contract (C6.24#). Other non-timber sale related activities would be under the same obligations of avoidance and protection that the law requires.