

Table 14. Crucial value winter elk habitat on the Logan Ranger District* with and without winter motorized access (only USFS managed lands) by alternative.

	Alternative 1 and Alternative 1b	Alternative 1a	Alternative 1c	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
Elk Crucial Winter Range Acres without Winter Motorized Access* (includes non-motorized and wilderness)	55,383	55,281	54,993	54,701	54,912	55,583	54,701 (south non-motorized) 54,100 (north non-motorized)	54,912	55,116
Elk Crucial Winter Range Acres with Winter Motorized Access*	25,745	25,848	26,136	25,745	26,217	25,745	25,826 (north motorized) 26,427 (south motorized)	26,217	26,013
Alternating Access Acres*	None	none	None	682	none	none	none	none	none

* Values reflect the amount of crucial value elk winter range within the Logan Ranger District excluding the Wellsvilles.

Note: For all alternatives 10,151 acres of crucial winter/spring habitat occurs within non-motorized winter recreation or wilderness.

Table 15. Miles of existing and the new proposed snow trail through non-motorized access areas classified as *crucial value winter elk* habitat by alternative on the Logan Ranger District. *

	Alternative 1	Alternative 1a	Alternative 1b	Alternative 1c	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
Miles of Existing Snowmobile Trail	11.56	10.34	11.56	10.34	10.34	10.34	10.34	10.34	10.34	10.34
Miles of New Proposed Snowmobile Trail	0.7**	0.7**	None	0.7**	none	none	none	none	0.85**	none/0.7***

* This table represents the miles of snowmobile trail through non-motorized areas within elk crucial winter range by alternative on the Logan Ranger District. The table does not represent the total amount of snowmobile trails on the district or those trails through motorized or directly adjacent to motorized areas. Maps are located within the project record.

** Note: This is not the total length of the proposed trail since only a portion occurs through elk winter range.

*** Note: In alternative 7 the proposed trail is adjacent to the motorized access area (or the boundary of the motorized and non-motorized area) thus the effects are displayed in Table F regarding acres.

Alternative 1

This alternative would have a total of 25,745 acres along with a total of 12.26 miles of snowmobile trail within elk crucial winter habitat (see Tables 14 and 15). Of the 12.26 miles, 0.7 miles of the proposed groomed trail occurs within crucial winter elk habitat.

Neumann and Merriam (1972) found that snowmobiles could severely damage or eliminate small plots of specific vegetation types. For elk, trail construction (i.e. removal of shrubs), trail grooming, and snowmobile use on the trail when there is little snow will affect shrub vegetation/habitat conditions. Reduced shrub density will affect browse habitat. Table 9 displays vegetation types and the number of acres affected by the proposed groomed connector trail. Alternative 1 will reduce shrub cover and may affect ground cover within approximately 6 ½ acres of upland habitat. In comparison among the alternatives, this alternative would have moderate effects to elk.

Alternative 1A

This alternative would have a total of 25,848 acres along with a total of 11.04 miles of snowmobile trail within elk crucial winter habitat (see Tables 14 and 15). Of the 11.04 miles, 0.7 miles of the proposed groomed trail occurs within crucial winter elk habitat. Table 10 displays vegetation types and the number of acres affected by the proposed groomed connector trail. Alternative 1A will reduce shrub cover and may affect ground cover within approximately 10 ½ acres of upland habitat. In comparison among the alternatives, this alternative would have moderate effects to elk; slightly greater than Alternative 1.

Alternative 1B

This alternative would have a total of 25,745 acres along with a total of 11.56 miles of snowmobile trail within elk crucial winter habitat (see Tables 14 and 15). A new trail would not be constructed within this alternative. In comparison among the alternatives, this alternative would have a lesser effect to elk, similar to Alternative 4.

Alternative 1C

This alternative would have a total of 26,136 acres along with a total of 11.04 miles of snowmobile trail within elk crucial winter habitat (see Tables 14 and 15). Of the 11.04 miles, 0.7 miles of the proposed groomed trail occurs within crucial winter elk habitat. Table 9 displays vegetation types and the number of acres affected by the proposed groomed connector trail. Alternative 1C will reduce shrub cover and may affect ground

cover within approximately 6 ½ acres of upland habitat. In comparison among the alternatives, this alternative would have a larger effect on elk, similar to alternatives 2, 6, 7, and 5 (southern portion motorized).

Alternative 2

This alternative would have 26,427 acres of winter-motorized and alternating access acres combined along with a total of 10.34 miles of snowmobile trail within elk crucial winter habitat (see Tables 14 and 15). This alternative would have the most acres with winter-motorized use. A new trail would not be constructed within this alternative. This alternative would not limit activities to a designated trail through elk winter range. This alternative would alternate motorized and non-motorized uses every two weeks within 682 acres of elk crucial winter range. In comparison among the alternatives, this alternative would have a larger effect on elk, similar to alternatives 1C, 6, 7, and 5 (southern portion motorized).

Alternative 3

This alternative would have 26,217 winter-motorized acres; along with a total of 10.34 miles of snowmobile trail within elk crucial winter habitat (see Tables 14 and 15). A new trail would not be constructed within this alternative. In comparison among the alternatives, this alternative would have moderate/high effects to elk.

Alternative 4

This alternative would have 25,745 winter-motorized acres; along with a total of 10.34 miles of snowmobile trail within elk crucial winter habitat (see Tables 14 and 15). A new trail would not be constructed within this alternative. In addition, 682 acres of elk crucial winter range would be closed to all winter recreation activities. This alternative would have the least affect on elk.

Alternative 5

This alternative would alternate motorized and non-motorized uses every other year. This alternative would have 25,826 acres of winter-motorized when the northern portion is motorized and in alternating years 26,427 acres of winter-motorized when the southern portion is motorized, along with a total of 10.34 miles of snowmobile trail within elk crucial winter habitat (see Tables 14 and 15). A new trail would not be constructed within this alternative. This alternative would not limit activities to a designated trail through elk winter range. The years in which the motorized use would occur within the southern portion would have greater effect to elk vs. motorized use of the northern portion. In comparison among the alternatives, this alternative would vary from the largest (southern portion motorized) effect to nearly the lowest (northern portion motorized) effect on elk.

Alternative 6

This alternative would have a total of 26,217 acres along with a total of 11.04 miles of snowmobile trail within elk crucial winter habitat (see Tables 14 and 15). Of the 11.2 miles, 0.85 miles of the proposed groomed trail occurs within crucial winter elk habitat. Table C displays vegetation types and the number of acres affected by the proposed groomed trail. Alternative 6 will reduce shrub cover and may affect ground cover within approximately 3.8 acres of upland habitat. In comparison among the alternatives, this alternative would have a larger effect on elk, similar to alternatives 1C, 2, 7, and 5 (southern portion motorized).

Alternative 7

This alternative would have a total of 26,013 acres along with a total of 10.34 miles of snowmobile trail within elk crucial winter habitat (see Tables 14 and 15). A new trail would be constructed within this alternative. In this alternative, the proposed trail is adjacent to the motorized access area (or the boundary of the motorized and non-motorized area) thus the effects are displayed in Table 14 regarding acres within elk winter habitat. Seven-tenths of a mile of the proposed groomed trail occurs within crucial winter elk habitat. For this alternative the trail is the boundary of the motorized area to the west, thus the possible benefits of concentrating use and making human motorized use predictable would be decreased in this alternative. Table 9 displays vegetation types and the number of acres affected by the proposed groomed connector trail. Alternative 7 will reduce shrub cover and may affect ground cover within approximately 6 ½ acres of upland habitat. In comparison among the alternatives, this alternative would have a larger effect on elk, similar to alternatives 1C, 2, 6, and 5 (southern portion motorized).

Moose

Moose seem to be somewhat tolerant of human activity. Colescott and Gillingham (1998) found that snowmobile traffic along a groomed trail did influence moose behavior within 300 meters (984 feet) and did displace moose to less favorable habitats though it did not appear to alter moose activity significantly. They found that when snowmobilers arrived, moose gradually moved farther from the trail. In addition, the disturbance did not cause moose to permanently leave the area, they did move farther into willow stands. When snowmobiles drove through the willows, moose reacted overtly and in doing so exerted considerable energy. They recommended that snowmobile trails be located in conifer habitat (i.e. screening) or uplands to maximize the separation between the disturbance and moose in the riparian vegetation.

Ferguson and Keith (1982) found that cross-country skiing did influence the general overall distribution of moose based on pellet count data. Moose utilization near heavily skied trails was about 60% of areas near lightly skied trails. They also found that additional skiers on a given day did not cause further displacement of moose.

In areas where paved roads are present and vehicles can travel at highway speeds, moose can be susceptible to mortality by vehicle collisions (e.g. Highway 89).

The potential effects of the alternatives to the moose are compared by the amount of *crucial value winter moose* habitat on the Logan Ranger District with and without winter-motorized access (Table 16) and the number of miles of existing and new proposed snowmobile trail through non-motorized access areas classified as *crucial value winter moose* habitat (Table 17). The differences between alternatives vary between the extremes of affecting approximately 5,235 acres along with 5.5 miles of snowmobile trail within moose crucial winter habitat crucial winter range on the Logan Ranger District (USFS ownership only). The Logan Ranger District (only USFS managed lands) has 102,962 acres of moose crucial winter habitat. Total acres of moose crucial winter habitat within the UDWR Cache Wildlife Management Unit is 281,812 acres, of which 127,226 acres occurs on the Wasatch-Cache NF (portions of the Ogden and Logan Ranger Districts).

Table 16. Crucial value winter moose habitat on the Logan Ranger District* with and without winter motorized access (only USFS managed lands) by alternative

	Alternative 1 and Alternative 1b	Alternative 1a	Alternative 1c	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
Moose Winter Range Acres without Winter Motorized Access* (includes non-motorized and wilderness)	43,128	42,973	41,858	39,255	43,111	44,489	42,751 (south non-motorized) 40,912 (north non-motorized)	43,111	41,225
Moose Winter Range Acres with Winter Motorized Access*	59,834	59,988	61,104	58,472	59,851	58,472	60,210 (north motorized) 62,049 (south motorized)	59,851	61,736
Alternating Access Acres*	none	none	none	5,235	none	none	none	none	none

- Values reflect the amount of crucial value moose winter range within the Logan Ranger District excluding the Wellsvilles.

Table 17. Miles of existing and new proposed snowmobile trail through non-motorized access areas classified as crucial value winter moose habitat by alternative on the Logan Ranger District *

	Alternative 1	Alternative 1a	Alternative 1b	Alternative 1c	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
Miles of Existing Snowmobile Trail	9.84	7.5	9.84	6.95	6.95	8.66	6.95	6.95 (north motorized) 8.66 (south motorized)	8.66	6.95
Miles of New Proposed Snowmobile Trail	2.51**	2.51**	None**	2.51**	none	none	none	none	3.77**	none**

* This table represents the miles of snowmobile trail through non-motorized areas within moose crucial winter range by alternative on the Logan Ranger District. The table does not represent the total amount of snowmobile trails on the district or those trails through motorized or directly adjacent to motorized areas. Maps are located within the project record.

** In addition, two private property access trails (not groomed) consisting of 1.28 miles are not included in the total but are part of alternative 1, 1a, 1b, 1c, and 7. See alternative descriptions for additional details. Note: This is not the total length of the proposed trail since a portion occurs adjacent to the motorized access area. The entire length of the proposed trail occurs within moose winter range. In alternative 7 the proposed trail is adjacent to the motorized access area (or the boundary of the motorized and non-motorized area) thus the effects are displayed in Table F regarding acres.

Alternatives 1, 1A, 1C, 6, and 7: These alternatives would establish a groomed trail through winter range habitat. The entire length of the proposed groomed trail occurs within crucial winter moose habitat. The trail could possibly reduce the effects of disturbance by limiting activities to the trail, thus concentrating disturbance to a specific area and making human use more predictable. For Alternative 7 the trail is the boundary of the motorized area to the west, thus the possible benefits of concentrating use and making human motorized use predictable would be decreased in this alternative. Wildlife maps in Appendix D display the proposed trail in relationship to crucial elk and moose habitat with buffers at 100, 300, 500, and 1000 meters.

Alternative 1

This alternative would have a total of 59,834 acres along with a total of 12.35 miles of snowmobile trail within moose crucial winter habitat (see Tables 16 and 17). Of the 12.35 miles, 2.51 miles of the proposed groomed trail occurs within crucial winter moose habitat. In addition, two private property access trails (not groomed) consisting of 1.28 miles would occur within crucial winter moose habitat. The proposed trail is parallel to Highway 89 and disturbance could cause moose to move within the highway corridor, thus increasing the potential of vehicle/moose collisions. In comparison among the alternatives, this alternative would have moderate effects to moose.

Alternative 1A

This alternative would have a total of 59,988 acres along with a total of 10 miles of snowmobile trail within moose crucial winter habitat (see Tables 16 and 17). Of the 10 miles, 2.51 miles of the proposed groomed trail occurs within crucial winter moose habitat. In addition, two private property access trails (not groomed) consisting of 1.28 miles would occur within crucial winter moose habitat. The proposed trail is parallel to Highway 89 and disturbance could cause moose to move within the highway corridor, thus increasing the potential of vehicle/moose collisions. In comparison among the alternatives, this alternative would have moderate effects to moose; slightly greater than alternative 1.

Alternative 1B

This alternative would have a total of 59,834 acres along with a total of 9.84 miles of existing snowmobile trail within moose crucial winter habitat (see Tables 16 and 17). A new trail would not be constructed within this alternative. Two private property access trails (not groomed) consisting of 1.28 miles would occur within crucial winter moose habitat. In comparison among the alternatives, this alternative would have a lesser effect to moose, similar to Alternative 3.

Alternative 1C

This alternative would have a total of 61,104 acres along with a total of 9.46 miles of snowmobile trail within moose crucial winter habitat (see Tables 16 and 17). Of the 9.46 miles, 2.51 miles of the proposed groomed trail occurs within crucial winter moose habitat. In addition, two private property access trails (not groomed) consisting of 1.28 miles would occur within crucial winter moose habitat. The proposed trail is parallel to Highway 89 and disturbance could cause moose to move within the highway corridor, thus increasing the potential of vehicle/moose collisions. In comparison among the alternatives, this alternative would have a large effect on moose, only slightly less than alternatives 2, 6, 7, and 5 (southern portion motorized).

Alternative 2

This alternative would have 63,707 acres of winter-motorized and alternating access acres combined along with a total of 6.95 miles of snowmobile trail within moose crucial winter habitat. This alternative would have the most acres with winter-motorized use. This alternative would not limiting activities to a designated trail through moose winter range. This alternative would alternate motorized and non-motorized uses every two weeks within 5,235 acres of moose crucial winter range. A portion of the area open to alternating use is adjacent to highway 89 and disturbance could cause moose to move within the highway corridor, thus increasing the potential of vehicle/moose collisions. In comparison among the alternatives, this alternative would have the greatest affect to moose.

Alternative 3

This alternative would have 59,851 acres of winter-motorized acres, along with a total of 8.66 miles of snowmobile trail within moose crucial winter habitat. A new trail would not be constructed within this alternative. In comparison among the alternatives, this alternative would have a lesser effect to moose, similar to Alternative 1B.

Alternative 4

This alternative would have 58,472 winter-motorized acres, along with a total of 6.95 miles of snowmobile trail within moose crucial winter habitat. A new trail would not be constructed within this alternative. In addition, 5,235 acres of moose crucial winter range would be closed to all winter recreation activities. This alternative would have the least affect on moose.

Alternative 5

This alternative would alternate motorized and non-motorized uses every other year. This alternative would have 60,210 (northern portion motorized) to 62,049 (southern portion motorized) winter motorized acres along with a total of 6.95 (portion when south non-motorized) and 8.66 (portion when north non-motorized) miles of snowmobile trail within moose crucial winter habitat (see Tables 14 and 15). A new trail would not be constructed within this alternative. This alternative would not limit activities to a designated trail through moose winter range. A portion of the area open to alternating annual use is adjacent to Highway 89 and disturbance could cause moose to move within the highway corridor, thus increasing the potential of vehicle/moose collisions. In comparison among the alternatives, this alternative would have a large effect on moose, especially when the southern portion of the area is open to motorized use. The effects to moose from this alternative are similar to alternatives 2 and 7.

Alternative 6

This alternative would have a total of 59,851 acres along with a total of 12.43 miles of snowmobile trail within moose crucial winter habitat (see Tables 16 and 17). Of the 12.43 miles, 3.77 miles of the proposed groomed trail occurs within crucial winter moose habitat. This alternative proposes groomed ski trails and a ski center approximately 1 mile to the north and south of the Franklin Basin and Logan Highway junction on USFS managed lands. This activity would likely displace moose within an area of 600 acres or more depending on the extent and location of groomed trails. Both the proposed groomed ski trail area (and ski center) and the proposed trail are parallel to Highway 89 and disturbance could cause moose to move within the highway corridor, thus increasing the potential of vehicle/moose collisions. In comparison among the alternatives, this alternative would have a large effect on moose.

Alternative 7

This alternative would have a total of 61,736 acres along with a total of 6.95 miles of existing snowmobile trail within moose crucial winter habitat (see Tables 16 and 17). A new trail would be constructed within this alternative. In addition, two private property access trails (not groomed) consisting of 1.28 miles would occur within crucial winter moose habitat. In this alternative, the proposed trail is adjacent to the motorized access area (or the boundary of the motorized and non-motorized area) thus the effects are displayed in Table 16 regarding acres within moose winter habitat. The entire length of the proposed groomed trail occurs within crucial winter moose habitat. For this alternative, the trail is the boundary of the motorized area to the west, thus the possible benefits of concentrating use and making human motorized use predictable would be decreased in this alternative. The proposed trail is parallel to Highway 89 and disturbance could cause moose to move within the highway corridor, thus increasing the potential of

vehicle/moose collisions. In comparison among the alternatives, this alternative would have a large effect on moose. The effects to moose from this alternative are similar to alternatives 2 and 5 (southern portion motorized).

Small Mammals

Information in the literature related to the effects of winter recreation on small mammals is limited (Hickman et al 1999). Snow cover is important for small mammals since it provides protection from predation and reduces the direct exposure to severe winter weather. Snow compaction by snowmobiles reduces the insulating value of snow thus subjecting small mammals to greater temperature stress and increases barriers to under snow movement (Hickman et al 1999). They also list direct mortality; population reduction; energy expenditure due to disturbance; displacement; habitat modification (including change in the microclimate); forage removal; and cover removal as impacts from snowmobile activities. Hickman et al (1999) specified that studies of snow compaction conducted by Schmid (1972) displayed that mortality markedly increased under snow compaction. Table 18 displays the number of acres of winter motorized access by alternative. Due to the lack of information regarding impacts to small mammals from winter recreational use it is difficult to draw conclusions, but there is the potential for increased mortality from snow compaction.

Alternative 1

This alternative would have 127,250 winter-motorized acres, moderate/high among the alternatives and construct a groomed snowmobile trail. Alternative 1 will reduce shrub and tree cover and may affect ground cover within approximately 6 ½ acres of upland habitat. This alternative would have the moderate/high amounts of snow compaction and thus possibly moderate/high effects to small mammals.

Alternative 1A

This alternative would have 127,405 winter-motorized acres, moderate/high among the alternatives and construct a groomed snowmobile trail. Alternative 1a will reduce shrub and tree cover and may affect ground cover within approximately 10 ½ acres of upland habitat; this alternative would have the largest effect on small mammal habitat (vegetation). This alternative would possibly have moderate/high effects to small mammals.

Alternative 1B

This alternative would have 127,405 winter-motorized acres, moderate/high among the alternatives. A new trail would not be constructed within this alternative. This alternative

would have the moderate/high amounts of snow compaction and thus possibly moderate/high effects to small mammals.

Alternative 1C

This alternative would have 129,429 winter-motorized acres, high among the alternatives and construct a groomed snowmobile trail. Alternative 1c will reduce shrub and tree cover and may affect ground cover within approximately 6 ½ acres of upland habitat. This alternative would have high amounts of snow compaction in comparison with the other alternatives; only alternatives 2 and 7 are higher.

Alternative 2

This alternative would have 134,863 winter-motorized acres and alternating access acres combined, the most acres with winter motorized use. Snow compaction would not likely vary due to the alternating two-week period of non-motorized use since compaction affecting small mammals probably is most detrimental at the snow/ground interface (i.e. different than supporting the weight of predators as described in the lynx section). This alternative would have the highest amounts of snow compaction and thus possibly the greatest effect to small mammals.

Alternative 3

This alternative would have 125,368 winter-motorized acres, moderate among the alternatives. A new trail would not be constructed within this alternative. This alternative would have the moderate amounts of snow compaction and thus possibly moderate effects to small mammals.

Alternative 4

This alternative would have 110,575 winter-motorized acres, the least acres with winter-motorized use. In addition, 24,288 acres would be closed to all winter recreation activities. This alternative would have the least snow compaction; thus possibly the least effect on small mammals.

Alternative 5

This alternative would have a total of 121,011 (northern portion motorized) to 125,368 (southern portion motorized) winter motorized acres, moderate among the alternatives. A new trail would not be constructed within this alternative. In this alternative, higher

elevation areas are open to snowmobiling within the closed portion after April 15, thus the amount of motorized area affected after this date will be greater. This alternative would have moderate amounts of snow compaction and thus possibly moderate effects to small mammals.

Alternative 6

This alternative would have 123,774 winter motorized acres, low among the alternatives and construct a groomed snowmobile trail. Alternative 6 will reduce shrub and tree cover and may affect ground cover within approximately 3.8 acres of upland habitat. This alternative would have lower amounts of snow compaction and thus possibly lesser effect to small mammals, except for Alternative 4.

Alternative 7

This alternative would have 132,007 winter-motorized acres, 2nd highest amount among the alternatives and construct a groomed snowmobile trail. Alternative 7 will reduce shrub and tree cover and may affect ground cover within approximately 6 ½ acres of upland habitat. This alternative would have the 2nd largest amount of snow compaction and thus possibly the 2nd largest effect to small mammals among the alternatives; only alternative 2 is higher.

Gray Wolf

Because there has not been a breeding pair or a pack identified in Utah to date, only a dispersing animal, there are no direct or indirect effects to the gray wolf from the proposed action or any of the alternatives. If wolves from the federal recovery areas (Wyoming, Idaho, and Montana) were to enter Utah, they would receive protection under the Endangered Species Act. However, the gray wolf is not on the threatened or endangered species list for Cache County. Currently the State of Utah is developing a plan for management of wolves within Utah.

Management Indicator Species

Northern goshawk

The northern goshawk is an Intermountain Region Sensitive Species and is also a WCNF Management Indicator Species. Goshawk nests are not known to occur within the project area; surveys have been conducted in the location of the proposed connector trail with no response. Winter recreation activities occur primarily outside of breeding season time period other than the territory establishment phase. During this time, goshawks seem somewhat tolerant of these activities, for example establishing nests within a few 100 feet

of actively groomed snowmobile trails (S.Blatt personal observation). For Alternative 1, 1c, and 7 a very small proportion of the trail occurs within conifer stands; 8.5 percent of the trail distance; slightly greater than ½ acre of conifer habitat. For Alternative 1a with a 20 foot width, almost 1 acre of conifer habitat would be affected. For Alternative 6 a very small proportion of the trail occurs within conifer stands; 3.1 percent of the trail distance; slightly greater than 1/10th acre of conifer habitat.

Since no nest territories are known to occur within the project area, winter recreation activities occur primarily outside of the breeding season, and most winter recreation activities especially snowmobiling occurs in more open terrain; the alternatives would likely have no effect on the northern goshawk and consequently, no effect on the population trend.

Additional information regarding Forest Plan monitoring and trend is contained within the project record (USFS. 2006. Management indicator species of the Wasatch-Cache National Forest).

Snowshoe Hare

As discussed in the small mammal section, information in the literature related to the effects of winter recreation on small mammals is very limited (Hickman 1999). Neumann and Merriam (1972) studied animal activity along a repeatedly used snowmobile trail in Canada and found that snowshoe hares use within 76 meters (250 feet) of the trail was significantly lower and that red fox activity was much greater close to the same trail. As displayed within Table 5 of Chapter 3, Wildlife, snowshoe hares primarily utilize forested stands with a preference for conifer and early successional conifer. Table 5 also displays that pure aspen stands are utilized by snowshoe hares, but at substantially reduced levels compared to conifer stands. Wolfe et al (1982) found that in three years of monitoring of plots in dry meadows (shrub/grass/forb openings), no pellets were found and they considered this habitat type not to be snowshoe hare habitat within any season of the year.

Tables 12 and 13 display the percentage of habitat along the proposed connector trail and Tables 9, 10, and 11 display the acres of habitat affected by type. Within alternatives 1, 1C, and 7, the amount of conifer and aspen/conifer vegetation types totals approximately ¾ acre, while including the aspen type would bring the total up to approximately 2 acres of affected area. For alternative 1A, the amount of conifer and aspen/conifer vegetation types totals approximately 1.3 acre, while including the aspen type would bring the total up to approximately 3.8 acres of affected area. For Alternative 6, the amount of conifer and aspen/conifer vegetation types totals approximately 1/3 acre, while including the aspen type would bring the total up to approximately 2 1/3 acres of affected area. The average home range size for a snowshoe hare has typically been found to be approximately 10 hectares (~ 25 acres), though there is some overlap between home-ranges.

The alternatives could modify habitat, cause disturbance which may affect behavior, and/or affect the use of adjacent areas. But, considering the vast abundance of snowshoe hare habitat, and that most winter recreation activities (especially snowmobiling) occur in more open terrain, the effects on snowshoe hare habitat and their populations would not be significant and differences would be very minor between alternatives. The only difference between alternatives, which could likely affect snowshoe hare or influence the snowshoe hare population within the project area, would be changes in access or ease of access associated with the snowshoe hare hunting season. Alternative 4 would restrict access to hunting within the area closed to all winter recreation activities (24,288 acres) during the time when snow is present. Alternative 2 would limit the means of access (motorized vs non-motorized) during alternating 2 week periods. No substantial change in snowshoe hare population numbers is expected with implementation of any of the alternatives and consequently, no effect on the population trend would occur.

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

Beaver

Waller et al. (1999) specified that the effects of recreational activities related to disturbance to semi-aquatic mammals is poorly understood. Within the project area, beaver are or have been present in the recent years at Tony Grove Lake, White Pine Lake, White Pine Creek, and along the Logan River. Since the beaver is primarily nocturnal, the effect of winter recreation activities, which are usually more prevalent during the day, may be minimal. Beavers can be vulnerable to the effects of trapping. Improved access for the trapping of beavers could affect beavers. The majority of beaver habitat and activity is associated with the Logan River with a portion occurring on private land. The only difference between alternatives, which could likely affect beaver or influence the beaver population within the project area, would be changes in access or ease of access associate with trapping. Alternative 4 could possibly limit access to beaver trapping within the area closed to all winter recreation activities (24,288 acres) (the Logan River is part of the boundary of this area) during the time when snow is present. Alternative 2 could possibly limit the means of access (motorized vs non-motorized) during alternating 2 week periods. No substantial change in beaver population numbers is expected with implementation of any of the alternatives, and consequently, no effect on the population trend would occur.

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

Federally Listed Threatened, Endangered, Proposed, and Candidate Species

Canada lynx

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

In August/September 2004, a transplanted lynx released in southwestern Colorado traveled on to the Wasatch-Cache National Forest and has moved northward through both the Ogden and Logan Ranger Districts into Idaho (off of the forest) (Map of Lynx Locations dated 2 November 2004 in the project file).

The Logan Ranger District is a “travel corridor” between two larger habitats areas (in Idaho and within the Uinta Mountains of Utah) and is not considered permanent resident habitat. As stated above, the area within the Logan Ranger District was reclassified in 2002 from a Lynx Analysis Unit (LAU) to Linkage Area, due to a low percentage of primary lynx habitat found here.

The Lynx Conservation Strategy (Ruediger et al 2000) specifies that “Staples (1995) described lynx as being generally tolerant of humans.”; “Other anecdotal reports also suggest that lynx are not displaced by human presence, including moderate levels of snowmobile traffic (Mowat et al. 2000, J. Squires pers. comm. 1999, G. Byrne pers. comm. 1999) and ski area activities (Roe et al.1999)”. Also, the Lynx Conservation Strategy (Ruediger et al 2000) specifies that “Widespread human activity (snowshoeing, cross-country skiing, snowmobiling, snow cats) may lead to patterns of snow compaction that make it possible for competing predators such as coyotes and bobcats to occupy lynx habitat through the winter, reducing its value to and even possibly excluding lynx (Bider 1962, Ozoga and Harger 1966, Murray et al. 1995, O’Donoghue et al 1998).”

The Lynx Conservation Strategy (Ruediger et al 2000) does not specify any specific conservation measures to address “*movement and dispersal*” of lynx related to snowmobiling, cross-country skiing, or groomed trails, but does specify the following project planning standards and guidelines related to ski areas/large resorts and associated activities: “When planning new or expanding recreational developments, ensure that key linkage areas are protected” and “Plan recreational development, and manage recreational and operational uses to provide for lynx movement and to maintain effectiveness of lynx habitat”.

The July 3, 2003 U.S. Fish and Wildlife Service Notice of Remanded Determination of Status for the contiguous United States distinct population segment of the Canada Lynx (USDI 2003) specified that no evidence exists that certain risk factors pose a threat to individual lynx, lynx populations, or lynx habitat. They specify that competition with any other species (e.g. bobcat, coyote, and mountain lion) is not a threat in all four regions

and “because no evidence has been provided that packed snowtrails facilitate competition to a level that negatively affects lynx, we do not consider packed snowtrails to be a threat to lynx at this time.” They also specify the theory of competition has neither been proven or disproven.

In relationship to effects to the wildlife corridor, the following is pertinent from the Notice: “To significantly impact a local lynx population, an activity would 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.” The effects of alternatives would not create any of the above conditions, and hence, would not significantly affect the corridor or any potential lynx population.

Although the lynx is not a permanent resident here, the potential effects of alternatives to the lynx could possibly be related to snow compaction and competition from other predators. Thus, Table 18 displays the changes by alternative for winter motorized access and non-motorized access within the Logan Ranger District, Table 19 displays the number of miles of existing and new proposed snowmobile trail through non-motorized access areas, and Table 20 displays winter motorized and non-motorized access by primary and secondary lynx habitat type (only USFS managed lands) by alternative.

Table 18. Winter motorized and non-motorized access (only USFS managed lands) by alternative on the Logan Ranger District*.

	Alternative 1 and Alternative 1b	Alternative 1a	Alternative 1c	Alternative 2	Alternative 3	Alternative 4	Alternative 5 **	Alternative 6	Alternative 7
Winter Non-Motorized Acres* (includes non-motorized and wilderness)	119,901	119,747	117,723	112,289	121,784	136,577 (includes 24,288 acres of no winter recreation use)	126,140 (south non-motorized) 121,341 (north non-motorized)	123,377	115,145
Winter Motorized Acres*	127,250	127,405	129,429	110,575	125,368	110,575	121,011 (north motorized) 125,811 (south motorized)	123,774	132,007
Alternating Access Acres*	none	None	None	24,288	none	none	none	none	none

* Acres are for the Logan Ranger District, excluding the Wellsvilles.

** Higher elevation areas are open to snowmobiling within the closed portion after April 15., thus the amount of motorized area affected after this date will be greater.

Table 19. Miles of existing and new proposed snowmobile trail (groomed) through non-motorized access areas by alternative on the Logan Ranger District. *

	Alternative 1	Alternative 1a	Alternative 1b	Alternative 1c	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
Miles of Existing Snowmobile Trail	14.61	12.31	14.61	11.72	11.72	14.44	11.72	11.7 (north motorized) 15.4 (south motorized)	14.43	11.72
Miles of New Proposed Snowmobile Trail	2.51**	2.51**	None**	2.51**	none	none	none	none	3.97 ***	none**

* This table represents the miles of snowmobile trail through non-motorized areas within each alternative on the Logan Ranger District. The table does not represent the total amount of snowmobile trails on the district or those trails through motorized or directly adjacent to motorized areas. Maps are located within the project record.

** In addition, two private property access trails (not groomed) consisting of 1.28 miles are not included in the total but are part of alternative 1, 1a, 1b, 1c, 7. See alternative descriptions for additional details. Note: This is not the total length of the proposed trail since a portion occurs adjacent to the motorized access area.

*** Within alternative 6, the trail continues west for another 2.2 miles but is not groomed. See alternative descriptions for additional details.

Table 20. Winter motorized and non-motorized access by primary and secondary lynx habitat type (only USFS managed lands) by alternative on the Logan Ranger District*.

	Alternative 1 and Alternative 1b		Alternative 1a		Alternative 1c		Alternative 2		Alternative 3	
	Primary Habitat	Secondary Habitat	Primary Habitat	Secondary Habitat	Primary Habitat	Secondary Habitat	Primary Habitat	Primary Habitat	Primary Habitat	Secondary Habitat
Winter Non-Motorized Acres* (includes non-motorized and wilderness)	8,021	43,601	8,021	43,572	7,973	41,968	7,359	38,399	8,796	44,365
Winter Motorized Acres*	16,149	64,788	16,149	64,817	16,197	66,421	12,939	55,143	15,374	64,024
Alternating Access Acres*	none	none	none	none	none	none	3,872	14,847	none	none

* Acres are for the Logan Ranger District, excluding the Wellsvilles.

Table L (continued). Winter motorized and non-motorized access by primary and secondary lynx habitat type (only USFS managed lands) by alternative on the Logan Ranger District*.

Continued	Alternative 4		Alternative 5 **		Alternative 6		Alternative 7	
	Primary Habitat	Secondary Habitat	Primary Habitat	Secondary Habitat	Primary Habitat	Secondary Habitat	Primary Habitat	Secondary Habitat
Winter Non-Motorized Acres* (includes non-motorized and wilderness)	11,231 <small>(includes 3,872 acres of no winter recreation use)</small>	53,246 <small>(includes 14,874 acres of no winter recreation use)</small>	8,790 (south non-motorized) 9,005 (north non-motorized)	46,940 (south non-motorized) 44,442 (north non-motorized)	9,304	45,218	7,565	40,198
Winter Motorized Acres*	12,939	55,143	15,380 (north motorized) 15,164 (south motorized)	61,449 (north motorized) 63,947 (south motorized)	14,866	63,171	16,605	68,191
Alternating Access Acres*	none	none	none	none	none	none	none	none

* Acres are for the Logan Ranger District, excluding the Wellsvilles.

** Higher elevation areas are open to snowmobiling within the closed portion after April 15, thus the amount of motorized area affected after this date will be greater.

Though specified as an area open to winter motorized access, use on the ground will vary considerably depending on the type of terrain, vegetative cover, snow conditions and accessibility. Areas which have fewer trees (e.g. sagebrush habitat) will likely have greater snow compaction, while forested areas may see little motorized use. Snow skiing/snowshoing activities will likely have little or a smaller amount of snow compaction capacity as compared to snowmobiles with greater weight, track width, and range.

Lynx trapping is not open within the Utah (2004-2005 UDWR Furbearer Proclamation), though unintentional accidental trapping could occur. Differences in access or methods of access for trapping between the alternatives should not influence the lynx.

Alternative 1

This alternative would have a total of 127,250 winter motorized acres, moderate/high among the alternatives. In addition, 17.12 miles of existing and new proposed snowmobile trail (2.51 miles) would occur through non-motorized access areas. This alternative would have a total of 16,149 and 64,788 winter motorized acres within primary and secondary habitat respectively, moderate/high among the alternatives. This alternative would have the moderate/high amounts of snow compaction and potential competition from other predators in comparison with the other alternatives.

Alternative 1A

This alternative would have a total of 127,405 winter motorized acres, moderate/high among the alternatives. In addition, 14.82 miles of existing and new proposed snowmobile trail (2.51 miles) would occur through non-motorized access areas. This alternative would have a total of 16,149 and 64,817 winter motorized acres within primary and secondary habitat respectively, moderate/high among the alternatives. This alternative would have the moderate/high amounts of snow compaction and potential competition from other predators in comparison with the other alternatives.

Alternative 1B

This alternative would have a total of 127,405 winter motorized acres, moderate/high among the alternatives. In addition, 14.61 miles of existing would occur through non-motorized access areas. A new trail would not be constructed within this alternative. This alternative would have a total of 16,149 and 64,817 winter motorized acres within primary and secondary habitat respectively, moderate/high among the alternatives. This alternative would have the moderate/high amounts of snow compaction and potential competition from other predators in comparison with the other alternatives.

Alternative 1C

This alternative would have a total of 129,429 winter motorized acres, high among the alternatives. In addition, 14.23 miles of existing and new proposed snowmobile trail (2.51 miles) would occur through non-motorized access areas. This alternative would have a total of 16,197 and 66,421 winter motorized acres within primary and secondary habitat respectively, high among the alternatives. This alternative would have high amounts of snow compaction and potential competition from other predators in comparison with the other alternatives; only alternatives 2 and 7 are higher.

Alternative 2

This alternative would have a total of 134,863 winter motorized acres and alternating access acres combined, the most acres with winter motorized use. In addition, 11.72 miles of existing snowmobile trail would occur through non-motorized access areas. A new trail would not be constructed within this alternative. This alternative would have a total of 16,811 and 69,990 winter motorized acres and alternating access acres combined within primary and secondary habitat respectively, highest among the alternatives. Snow compaction that would support the weight of potentially competing predators may vary depending on the timing and amount of snow accumulation and could actually be less in this alternative than the other alternatives (except for alternative 4) during alternating two-week period of non-motorized use. This alternative could have varied amounts (highest to 2nd lowest) of snow compaction and potential competition from other predators in comparison with the other alternatives.

Alternative 3

This alternative would have a total of 125,368 winter motorized acres, moderate among the alternatives. In addition, 14.44 miles of existing snowmobile trail would occur through non-motorized access areas. A new trail would not be constructed within this alternative. This alternative would have a total of 15,374 and 64,024 winter motorized acres within primary and secondary habitat respectively, moderate among the alternatives. This alternative would have the moderate amounts of snow compaction and potential competition from other predators in comparison with the other alternatives.

Alternative 4

This alternative would have a total of 110,575 winter motorized acres, the least acres with winter motorized use. In addition, 24,288 acres would be closed to all winter recreation activities. A new trail would not be constructed within this alternative. This alternative would have a total of 12,939 and 55,143 winter motorized acres within primary and

secondary habitat respectively, the least acres with winter motorized use. This alternative would have the least snow compaction and potential competition from other predators; thus possibly the least effect on the lynx.

Alternative 5

This alternative would have a total of 121,011 (northern portion motorized) to 125,368 (southern portion motorized) winter motorized acres, moderate among the alternatives. In addition, 11.7 (northern portion motorized) to 14.82 (southern portion motorized) miles of existing snowmobile trail would occur through non-motorized access areas. This alternative would have a total of 15,164 (south motorized) to 15,380 (north motorized) and 61,449 (north motorized) to 63,947 (south motorized) winter motorized acres within primary and secondary habitat respectively. In this alternative, higher elevation areas are open to snowmobiling within the closed portion after April 15, thus the amount of motorized area affected after this date will be greater. This alternative would have the moderate amounts of snow compaction and potential competition from other predators in comparison with the other alternatives.

Alternative 6

This alternative would have a total of 123,774 winter motorized acres, low among the alternatives. In addition, 18.4 miles of existing snowmobile trail and new proposed snowmobile trail (3.97 miles) would occur through non-motorized access areas. This alternative would have a total of 14,866 and 63,171 winter motorized acres within primary and secondary habitat respectively, low among the alternatives. This alternative would have lower amounts of snow compaction and potential competition from other predators in comparison with the other alternatives, except for alternatives 2 and 4.

Alternative 7

This alternative would have a total of 132,007 winter motorized acres, highest among the alternatives. In addition, 11.72 miles of existing snowmobile trail would occur through non-motorized access areas. A new trail would be constructed within this alternative. In this alternative, the proposed trail is adjacent to the motorized access area (or the boundary of the motorized and non-motorized area) thus the effects are displayed in Table 18. This alternative would have a total of 16,605 and 68,191 winter motorized acres within primary and secondary habitat respectively, highest among the alternatives. This alternative would have the largest amount of snow compaction and potential competition from other predators in comparison with the other alternatives, thus possibly the most effect on the lynx.

Forest Service Intermountain Region Sensitive Species

Northern goshawk

The Northern goshawk is also Management Indicator Species (MIS) for the Forest and is described in detail in the MIS section above.

Flammulated owl

Information in the literature related to the effects of roads and motorized trails suggests that flammulated owls may tolerate some human disturbances (Hayward and Verner 1994) (Hamann et al 1999). Oleyar (2000) suggested that human activities at a developed site (Maples Campground area adjacent to SnowBasin) fledged significantly fewer young than at a site with less disturbance activities (Mantua area near Dock Flat) (both sites are within the Ogden Ranger District). Mika (2003) found the opposite trend within the same study area and specified that prey abundance and natural fluctuations were mostly responsible, though shifts in the amount of disturbance did occur between the study sites. Mika (2003) did observed nervous flammulated owl behavior and flushing from nests caused by human activity.

All disturbance associated with the trail construction activities will be mitigated by implementation during the late summer and fall time period. Where possible, minor adjustments to the trail location should be made to avoid snags with existing cavities, which may be used by owls. All other activities would occur outside of the breeding time period for flammulated owls.

Alternative 1, 1c, and 7

This alternative would clear mature trees and snags for the connector trail. The loss of snags associated with trail construction can have affects on cavity nesting species. In comparison to all alternatives, this alternative would have a moderate effect on flammulated owl habitat. Approximately 36.5 percent of the proposed groomed connector trail occurs within forested habitat (conifer, aspen, and aspen/conifer). Approximately 2 acres of forested habitat would be cleared. In the perspective of the total available habitat for flammulated owls, this modification of habitat would be insignificant.

Alternative 1A

This alternative is the same as alternatives 1, 1c, and 7, with the exception that the entire trail width would average 20 feet. Approximately 3.8 acres of forested habitat would be cleared. In the perspective of the total available habitat for flammulated owls, this modification of habitat would be insignificant. This alternative would have the largest effect on flammulated owl habitat.

Alternative 1B, 2, 3, 4, and 5

This alternative does not propose the construction of trail and all winter recreation activities would occur outside of the breeding time period for flammulated owls; thus no effect.

Alternative 6

This alternative would clear mature trees and snags for the connector trail. The loss of snags associated with trail construction can have affects on cavity nesting species. In comparison to all alternatives, this alternative would have a moderate effect on flammulated owl habitat. Approximately 60.7 percent of the proposed groomed trail occurs within forested habitat (conifer, aspen, and aspen/conifer). Approximately 2.3 acres of forested habitat would be cleared. In the perspective of the total available habitat for flammulated owls, this modification of habitat would be insignificant.

Three-toed woodpecker

Information in the literature related to the effects of motorized trails did not suggest that disturbance from recreation presented a problem to woodpeckers and cavity nesters as a group (Hamann et al 1999). Parrish et al (2002) did not suggest any recommendations related to management of motorized trails in regards to the conservation of the three-toed woodpecker. Loss of snags can have affects on cavity nesting species.

Disturbance of wildlife associated with the trail construction and trail maintenance activities will be mitigated with implementation only occurring during the late summer and fall time period. This will minimize or eliminate the effects to nesting/breeding birds. Where possible, minor adjustments to the trail location should be made to avoid snags with existing cavities. All other winter recreation activities would occur outside of the breeding time period for the three-toed woodpecker. The effects of any the alternatives would not likely affect the three-toed woodpecker.

Alternative 1, 1c, and 7

In this alternative, approximately 12.5 percent of the proposed groomed connector trail occurs within forested habitat that may be utilized by the three-toed woodpecker (primarily conifer and aspen/conifer). The clearing of trees associated with the proposed connector trail is so small (~ ¾ acre), any affect would be insignificant in comparison to the amount of total habitat.

Alternative 1 a

This alternative is the same as alternatives 1, 1c, and 7, with the exception that the entire trail width would average 20 feet. The clearing of trees associated with the proposed connector trail is approximately 1.3 acres. In the perspective of the total available habitat, this modification would be insignificant. This alternative would have the largest effect on three-woodpecker habitat.

Alternative 1B, 2, 3, 4, and 5

This alternative does not propose the construction of trail and all winter recreation activities would occur outside of the breeding time period for three-woodpecker; thus no effect.

Alternative 6

In this alternative, approximately 9.4 percent of the proposed groomed trail occurs within forested habitat that may be utilized by the three-toed woodpecker (primarily conifer and aspen/conifer). The clearing of trees associated with the proposed trail is so small (~ 1/3 acre), any affect would be insignificant in comparison to the amount of total habitat.

Townsend's Big-eared Bat

Townsend's big-eared bat is very sensitive to human disturbance within their colonies. A significant colony of Townsend's Big-eared Bats occurs within Logan Cave on the Logan District, outside of the project area. Townsend's Big-eared Bats may occur in other areas of the Forest where there is suitable cave or cliff roosting habitat. Additional cave surveys have been conducted within the Logan Ranger District, but no other significant populations of Townsend's Big-eared Bats have been found. None of the alternatives would affect known Townsend's Big-eared bat roosting sites, maternity colonies, or hibernacula. The effects to foraging habitat for bat species, mainly in riparian habitat areas, would be minor and not be significant. Tables 9, 10, and 11 display the total number of acres affected by the proposed groomed trail. These changes in vegetation could influence insect (prey), but any affect would be insignificant in comparison to the amount of total habitat. The effects of the alternatives would not affect the Townsend's Big-eared bat or influence bat numbers.

Wolverine

Claar et al (1999) specified that wolverine habitat could be affected due to recreational impacts to specialized habitat such as subalpine cirques and remote refugia. As with the

lynx, snow compaction has been suspected to possibly facilitate range extension of other competing predators for food resources. Also, displacement of big game species (as prey and carrion) may have negative effects on wolverine. See the lynx section for the changes by alternative in winter motorized and non-motorized access and the elk and moose sections for effects by alternative.

Boreal owl

The boreal owl is known to occur on the Logan Ranger District, but primarily in areas that contain large stands of conifer habitat. Information in the literature related to the effects of roads and motorized trails suggests that boreal owls may tolerate some human disturbances (Hamann et al 1999) (Hayward and Verner 1994).

Winter recreation activities would occur during a portion of the breeding period for the boreal owl. Information in the literature related to the effects of roads and motorized trails suggests that boreal owls may tolerate some human disturbances (Hamann et al 1999) (Hayward and Verner 1994). The alternatives could cause disturbance which may affect behavior and/or affect the use of adjacent areas, but considering that most winter recreation activities especially snowmobiling occurs in more open terrain, the effects on boreal owl habitat and their populations would be not be significant. The effects of the alternatives would not likely affect the boreal owl.

Disturbance of wildlife associated with the trail construction and trail maintenance activities will be mitigated with implementation only occurring during the late summer and fall time period. Where possible, minor adjustments to the trail location should be made to avoid snags with existing cavities, which may be used by owls.

Alternatives 1, 1A, 1C, 6, and 7

Loss of snags can have affects on cavity nesting species. The proposed groomed trail occurs within a small amount of conifer habitat (less than 1 acre within these alternatives) that may be utilized by the boreal owl (see Tables 9, 10, and 11). The clearing of trees associated within this alternative is such as small amount of habitat, the effects would be insignificant.

Alternatives 1B, 2, 3, and 5

This alternative does not propose the construction of trail, thus effects to snags/trees (potential nesting cavities) would not occur. Winter recreation activities would occur during a portion of the breeding period for the boreal owl. Information in the literature related to the effects of roads and motorized trails suggests that boreal owls may tolerate some human disturbances (Hamann et al 1999) (Hayward and Verner 1994). The alternative could cause disturbance which may affect behavior and/or affect the use of

adjacent areas, but considering that most winter recreation activities especially snowmobiling occurs in more open terrain, the effects on boreal owl habitat and their populations would be not be significant. The effects of the alternative would not likely affect the boreal owl.

Alternative 4

This alternative does not propose the construction of trail and winter recreation activities would not be permitted; thus no effect.

Great gray owls

As discussed above, it is felt that the great gray owl is a winter vagrant which only occasionally visits Utah. The effects of any of the alternatives would be negligible on great gray owl habitat or populations.

Neo-tropical Migratory Birds

Executive Order (EO) 13186, signed January 10, 2001, lists several responsibilities of federal agencies to protect migratory birds, including “Support the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions.” Additional direction comes from the Memorandum of Understanding (MOU) between USDA Forest Service and USDI Fish and Wildlife Service, signed January 17, 2001. The purpose of this MOU is to strengthen migratory bird conservation through enhanced collaboration between the Forest Service and Fish and Wildlife Service, in coordination with state, tribal and local governments. The MOU identifies specific activities for bird conservation, pursuant to EO 13186, including “Strive to protect, restore, enhance, and manage habitat of migratory birds, and prevent the further loss or degradation of remaining habitats on National Forest System lands.” This includes, identifying management practices that impact populations of high priority migratory bird species, including nesting, migration, or over-wintering habitats, on National Forest System lands, and developing management objectives or recommendations that avoid or minimize these impacts.

As displayed in project record, numerous neo-tropical migratory birds occur within the project area. This analysis focuses on those species with priority status under the Partners in Flight (PIF) ranking and those identified by USFWS as birds of conservation concern. Based on the Tony Grove survey route, these are the Brewer’s sparrow, broad-tailed hummingbird, red-naped sapsucker, and Williamson’s sapsucker.

Alternatives 1, 1A, 1C, 6, and 7

These alternatives include the construction of a proposed groomed trail. Construction of the trail includes the clearing of trees and the removal of some shrub vegetation. Disturbance of nesting birds associated with the trail construction and trail maintenance activities will be mitigated with implementation only occurring during the late summer and fall time period.

The construction of motorized trails may fragment habitat and the associated disturbance may disrupt breeding activity and may cause displacement of birds (Hamann et al 1999). Additionally, trail grooming or snowmobile use on the trail during times when there is little snow could affect vegetation/habitat conditions. Tables 9, 10, and 11 display the total number of acres affected by the proposed groomed trail. These alternatives would have the largest effect on neo-tropical bird habitat. Alternative 1, 1c, and 7 will reduce shrub and tree cover and may affect ground cover within approximately 6 ½ acres of upland habitat; while Alternative 1a would affect approximately 10 ½ acres of upland habitat; and Alternative 6 would affect almost 4 acres. Modification of habitat will be beneficial for some neotropical bird species and not for others.

For the *broad-tailed hummingbird*, trail construction (i.e. removal of shrubs), trail grooming, and snowmobile use on the trail when there is little snow will affect shrubby vegetation/habitat conditions. The effects to hummingbird habitat, primarily riparian habitat areas, would be minor and not be significant. Tables 9, 10, and 11 display vegetation types and the number of acres affected by the proposed groomed connector trail. Alternative 1, 1c, and 7 will reduce shrub and tree cover and may affect ground cover within approximately 6 ½ acres of upland habitat (other types utilized by the broad-tailed hummingbird); while Alternative 1a would affect approximately 10 ½ acres of upland habitat; and Alternative 6 would affect almost 4 acres. These changes in vegetation could influence foraging habitat but any affect would be insignificant in comparison to the amount of total habitat. The effects of any the alternatives would not likely influence broad-tailed hummingbird numbers.

For the *Brewer's sparrow*, trail construction (i.e. removal of shrubs), trail grooming, and snowmobile use on the trail when there is little snow will affect sagebrush vegetation/habitat conditions. Reduced sagebrush shrub density will likely affect Brewer's Sparrow nesting habitat. Tables A, B, and C display vegetation types and the number of acres affected by the proposed groomed trail. In alternatives 1, 1c, and 7, the trail would occur within approximately 4 ½ acres of sagebrush/forb/grass habitat and in alternative 1a the trail would occur within 6 ½ acres. For these alternatives, approximately ¼ of the sagebrush/forb/grass vegetation type consists of areas with concentrations of Mules-ear (wyethia) (most is located closest to Franklin Basin) which would not be utilized as Brewer's sparrow nest sites. In alternative 6, the trail would occur within approximately 1 ½ acres of sagebrush/forb/grass habitat.

For the *red-naped sapsucker* and *Williamson's sapsucker* see the effects section for the flammulated owl.

Species at Risk

Fringed Myotis (*Myotis thysanodes*)

For the fringed myotis the effects would be similar to those regarding the Townsend's Big-eared Bat, though the fringed myotis has not been found to occur on the Logan Ranger District.

American Pine Marten (*Martes Americana*)

Marten are vulnerable to the effects of trapping, which can be influenced by access. Marten trapping is not open within the Logan Ranger District and currently is only open in the northeastern portion of Utah (2004-2005 UDWR Furbearer Proclamation), though unintentional accidental trapping could occur. None of the alternatives would likely affect the marten. See small mammal section for potential effects on marten prey species.

Alternatives 1, 1C, and 7

In these alternatives, approximately 12.5 percent of the proposed groomed connector trail occurs within forested habitat that may be utilized by marten (primarily conifer and aspen/conifer). The clearing of trees associated with the proposed connector trail within these alternatives is so small (~ ¾ acre), any affect would be insignificant in comparison to the amount of total habitat.

Alternative 1A

This alternative is the same as alternatives 1, 1C, and 7, with the exception that the entire trail width would average 20 feet. The clearing of trees associated with the proposed connector trail is approximately 1.3 acres. In the perspective of the total available habitat, this modification would be insignificant.

Alternatives 1B, 2, 3, 4, and 5

These alternatives do not propose the construction of a trail thus there would be no effects.

Alternative 6

In this alternative, approximately 9.4 percent of the proposed convenience trail occurs within forested habitat that may be used by marten (primarily conifer and aspen/conifer).

However, the area cleared of trees associated with the proposed trail is so small; any affect would be insignificant in comparison to the amount of total habitat.

Cumulative Effects

The area of influence for the wildlife cumulative effects analysis is the Logan Ranger District for a majority of the species. Management of adjacent lands can have an effect on local populations of some species, such as big game. Deer, elk and moose are managed by UDWR within harvest units which include a portion of National Forest and other ownership (primarily private land). For species with large home ranges and territories, such as lynx and wolverine, the area of influence is larger than the Logan Ranger District. For this analysis that portion of the wildlife corridor (which has regional importance in providing linkage to other larger habitat areas) within the Logan Ranger District is used because this is the appropriate scale for effects analysis.

The following past, present, and reasonable foreseeable future ground disturbing activities were considered in the cumulative effects analysis. These influences on wildlife and their habitats within and adjacent to the Logan Ranger District include livestock grazing, fire suppression, and roads, trails, and recreation use.

The direct and indirect effects resulting from these past, present, and future actions are non significant. Cumulatively, the effects of implementing any of the alternatives in combination with any of the above actions would maintain species viability as required by the National Forest Management Act (NFMA). See Wildlife Specialist Report in the project file for additional information.