Caribou-Targhee NF

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Final Environmental Impact Statement

Caribou Revised Forest Plan
Appendix D—Wildlife, Rare Plants, Fisheries

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Part 1 Wildlife Analysis Process

Species Richness/Hot Spots

Hot spots of high species richness can be produced for any group of interest (reptiles, birds, etc). Typically, hot spots are areas of high habitat diversity (Noss and Cooperrider, 1994). Species rich areas are important because they represent opportunities to protect large numbers of species efficiently. A map of vertebrate species in Idaho (Scott) shows that southeast Idaho has the highest diversity in the state (in Noss and Cooperrider, 1994). This is probably due to the highly complex pattern of habitats in this part of the state.

Stein, *et al*, (2000) suggest that using the species richness method has problems. Species that are widespread have a disproportionate affect on creating areas of high diversity. They recommend using overall species richness, but also factoring in the relative rarity of its species. This "rarity-weighted richness" approach tends to favor the identification of hot spot clusters that represent concentrations of limited-range species.

An analysis of species rarity and endemism and hot spots of biodiversity was completed as part of the Interior Columbia Basin broad-scale analysis (USFS, 1996). **While there were some areas identified in the state of Idaho, none were in the southeast part of the state that was analyzed in this analysis.**

The Nature Conservancy has been preparing eco-regional biological conservation assessments to aid them in conservation planning. These conservation plans are meant to be dynamic and responsive to changing conditions. The result of most ecoregional planning efforts is an identification of generalized areas of biodiversity significance. They are not meant to identify conservation sites where the targets, threats, and strategies/plans to abate threats have been analyzed with considerably more rigor than in ecoregional planning (Groves, *et al*, 2000).

The Utah-Wyoming Rocky Mountain Ecoregional Assessment was completed in July 2001. This plan has identified and prioritized megasites, which if managed sustainably, would contribute to conservation goals. The approach taken in this analysis is generally consistent with the approach the Nature Conservancy has taken. However, this assessment has placed more emphasis on the use of focal species to identify and prioritize megasites (Noss, *et al*, 2001).

The eastern part of the Caribou Forest has been analyzed in one of these broad-scale analyses, "A Biological Conservation Assessment for the Utah-Wyoming Rocky Mountains Ecoregion" (Noss, *et al*, 2001). They used a process where they incorporated special element mapping (fine-filter species), representation analysis (coarse-filter species) and focal species (umbrella concept). They then did modeling using the goals that they would 1) maintain 100 percent of viable occurrences of G1/G2 species (**Note:** G1= globally critically imperiled, G2= globally imperiled) and 2) maintain at least 10 percent occurrences of other species; and 3) protect habitat capable of supporting at least 50-70 percent of the population of each focal species.

Each of forty-three "megasites" was ranked according to irreplaceability and vulnerability. They then used these rankings to place each megasite in one of four quadrants. Those placed in Quadrant 1 are those megasites that are highly irreplaceable and highly vulnerable, giving them the highest priority for conservation. Megasites that include part of the Caribou National Forest and fell into Quadrant 1 are:

1) South Caribou/Grays Lake (Tincup north to McCoy)
2) Portneuf (Bannock Range and southwest side of Portneuf Range)

More information from Noss, *et al*, has been incorporated into the wildlife analysis for roadless areas in Appendix R. Management proposed in the Plan will not have any affect on known areas of species richness and rarity. The high biodiversity of the public lands on the Caribou will be maintained through managing vegetation towards proper functioning condition (see Comparison of Alternatives for movement towards PFC in Chapter 2 of the FEIS).

The South Caribou/Grays Lake Quadrant has been put into several different prescription areas in Alternative 7R. These include Recommended Wilderness, Caribou City Special Emphasis Area, Non-motorized Recreation and Wildlife Security, Semi-primitive – restoration, Rangeland Vegetation and Winter Range. Most of these prescriptions into a goal of "Maintain the natural role of ecological processes and disturbance regimes compatible with other resource goals." These prescriptions should allow conservation of habitats and species using these habitats and maintenance of potential linkage habitat to the Targhee NF.

The Portneuf Quadrant is a mix of many small, diverse prescription areas in Alternative 7R. These include a municipal watershed, two RNAs, Dispersed Camping, Forest Vegetation, Winter Range, Semi-primitive recreation, Semi-primitive restoration, Rangeland Vegetation, and Visual Quality Management. These prescriptions allow a mix of maintenance of natural processes, restoration treatments and movement towards PFC, and management for recreation. Because of the small size of these mountain ranges, and heavy development around the ranges, habitat for wide-ranging species like large carnivores (lynx, wolves, wolverine) is limited in this area. These prescriptions should allow conservation of habitats and species currently using these habitats.

References cited in above section:

Noss, R.F. and A.Y. Cooperrider. 1994. Saving Nature's Legacy: Protecting and Restoring Biodiversity. Island Press, Washington DC.

Noss, R., G. Wuerthner, K. Vance-Borland and C. Carroll. 2001. A Biological Conservation Assessment for the Utah-Wyoming Rocky Mountains Ecoregion. Conservation Science Inc. Corvallis, OR.

Stein, B.A., L.S. Tutner and J.S. Adams eds. 2000. Precious Heritage: the Status of Biodiversity in the United States. Joint Project of the Nature Conservancy and Association for Biodiversity Information. Oxford University Press, New York, NY.

USFS. 1996. Status of the Interior Columbia Basin: Summary of Scientific Findings. General Technical Report PNW-GTR-385. Portland, OR. USDA, Forest Service, Pacific Northwest Research Station; USDI, Bureau of Land Management. 144 pp.

Corridors

Corridors can be defined as avenues along which wide-ranging animals can travel, plants can propagate, genetic interchange can occur, populations can move in response to environmental changes and natural disasters, and threatened species can be replenished from other areas. A corridor can function at several scales (Samson, *et al*, 1997). Corridors may be used for dispersal from home ranges into new areas. Dispersal distances for some large or wide-ranging species are very large (lynx, wolverine). Corridors also act as migration routes between winter and summer ranges. Animals may also use corridors on a daily or weekly basis. Travel corridors are narrow paths similar to highways, that wildlife use to move from one area to another. Samson (n.d.) defines corridors as an area through which species can move from one place to another over time in response to changes in the environment.

In 1996, Terrestrial Protocols were developed by R1of the Forest Service and were later adopted by R4. These protocols include one developed for assessing connectivity. Connectivity refers to the abundance and spatial patterning of habitat and the ability of members of a population to move from patch to patch of similar habitat (Samson, *et al*, 1996). An approach to providing connectivity is through a corridor "a narrow strip, stepping stones or a series of stepping stones of hospitable territory traversing inhospitable territory, providing access from one area to another that were connected in historical time." They identified five categories of corridors.

Table 1. Types of Corridors Identified by Samson, *et al*, 1996.

Type of Corridor	Number of Species	Spatial Scale	Function of Corridor
Biogeographic	Many and often unrelated taxa	Continental, transcontinental	Evolution and distribution
Seasonal migration (linkage zone)	Groups of related species, single sp.	Continental, transcontinental to local and elevational	Behavioral and Physiological for ecological survival
Dispersal and emigration	Population	Varies by species	Use unoccupied habitat, maintain current habitat
Travel	Individual	Within a home range	Daily life history requirements
Invasive	Exotic and alien species	All scales	Extend ranges of non-native species

The process that they identified to assess connectivity includes the following steps:

1. Assess historic patterns in vegetation and relative connectivity
2. Assess current patterns in vegetation and relative connectivity including the impacts of human disturbance or physical barriers (highways, croplands, etc.)
3. Compare historic and current patterns and relative connectivity to determine if animal movement opportunities have been significantly interrupted.
4. Consider measures to restore historic animal movements using the following steps; review each of five corridor types when raised as an issue; consider the need for each type of corridor based on its ecological function as outlined; recommend application of the concept where an ecological function served by the corridor type can be clearly documented with minimal negative ecological consequences; and provide a consistent and well-documented justification for the application of the concept.

Mapping Efforts/Corridor Identification

Most of the efforts to date to map corridors have focused on large-scale dispersal corridors, generally from the Northern Rockies (Glacier NP) to the Greater Yellowstone Ecosystem. The USFWS, in efforts to conserve large carnivores in the Northern Rocky Mountains has developed the concept of linkage zones. The linkage zone is an area between habitat fragments able to support both movement and low-density occupancy. The distinction between a linkage zone and a corridor is the width of habitat- that is the ability to support low-density occupancy by species (Samson, *et al*, 1997).

Ruediger, *et al*, (2000) drafted a map titled "IGBC Wildlife Habitat Linkage in the Northern Rocky Mountains." This map also includes the northeastern portion of the Caribou in the mapped north-south linkage zone. Other agencies and groups have done mapping, as well. American Wildlands (2000) has mapped corridors in the Northern Rockies, but did not include the Caribou Forest.

In May 2000, a meeting was held with several state and federal agencies, as well as other interested groups, to discuss developing common criteria to help identify linkages of highest importance (Ruediger, 2000). They recommended factors to consider when identifying wildlife habitat linkages; 1) consider all scales, 2) landforms and topography are important, mountain passes, river bottoms and major ridges are often natural movement corridors, 3) vegetation is important, many species use forested areas for cover, 4) quality of habitat is important, 5) areas with low road densities and low levels of human use are important, 6) need data and 7) maintain large intact blocks of habitat (Ruediger, 2000).

In 2001, the Wildlife Spatial Analysis Lab of the University of Montana mapped "Priority Wildlife Linkage Habitat with Roads and National Forests." In this mapping exercise, no areas on or in the vicinity of the Caribou were identified as priority areas (www.fs.fed.us/r1/wildlife/igbc/Linkage/map).

The Wasatch-Cache National Forest in Utah looked at a north-south corridor passing through the Forest. They used McNab, *et al*, (1994) to identify Province M331 "Southern Rocky Mountain Steppe" as a main north-south corridor (Williams, Forest Biologist, pers. comm.). Part of this province (M331) passes through part of the Caribou NF (in the Caribou/Webster/Preuss subsections). This same area has been mapped as part of the Greater Yellowstone Ecosystem and was included on Ruedigers "IGBC Wildlife Habitat Linkages" map.

This "mountain range" is a combination of the Caribou, Webster and Preuss subsections. It has a wide variety of habitats. On the north end in the Caribou subsection, the vegetation is dominated by shrublands and aspen/conifer, with lesser amounts of mixed conifer (lodgepole pine, Douglas-fir, subalpine fir). This section has the lowest open route density of the three (approximately 0.6 mi/mi^2). This subsection also is adjacent to the Palisades area of the Targhee NF, which then moves up into Yellowstone and Grand Teton National Parks. In the middle section more mixed conifer stands are evident, but they are present in a patchy mosaic. This subsection has been more heavily developed, including phosphate mining and past timber harvest, and has the highest open route density of the three (approximately 1.4 mi/mi^2). On the southern end in the Preuss subsection, shrublands, aspen and aspen/conifer dominate the area. It has a more open nature, and open route densities are around 1.2 mi/mi^2. The eastern edge of this subsection connects to the Salt River Range on the Bridger-Teton NF.

An interagency meeting on January 25, 2002 identified and mapped possible lynx linkages for the state of Idaho. This mapping effort focused on highways as the major factor affecting lynx movements and dispersal, especially four-lane highways. Of special concern would be the conversion of existing two-lane

highways to four-lane highways. As a result of that mapping, there were two areas on or adjacent to the Caribou NF that were mapped as linkage areas across highways. These are Highway 34 along the Tincup Highway, and Highway 34 between Manson and Georgetown. (M. Orme, Forest Biologist, pers. comm.). These are shown on the attached lynx map.

Landscape level linkages have been identified as areas that could allow movement of lynx from the Greater Yellowstone Ecosystem on the north, to adjacent Forests to the south. On the Forest, areas that were considered as most important include 1) the south end of the Bear River Range that connects to the Wasatch-Cache NF to the south; 2) the Gannett Hills area that connects to the Bridger-Teton NF to the east and 3) the McCoy Creek area that connects to the Targhee NF on the north and the Bridger-Teton NF to the east. These are shown on Map 1. Mapping of potential lynx linkage habitat identified linkages that may be used by several of the carnivores.

Migration Corridors

Studies of elk and mule deer that use the Diamond and Stump Creek areas in the summer have found that the South Fork of Fall Creek (on the Targhee NF) is an important migration corridor for animals moving between summer and winter range (Brown, 1981; Thomas, 2000; and Thomas, 1987). Thomas (2000) identified Fall Creek as critical autumn and spring habitat.

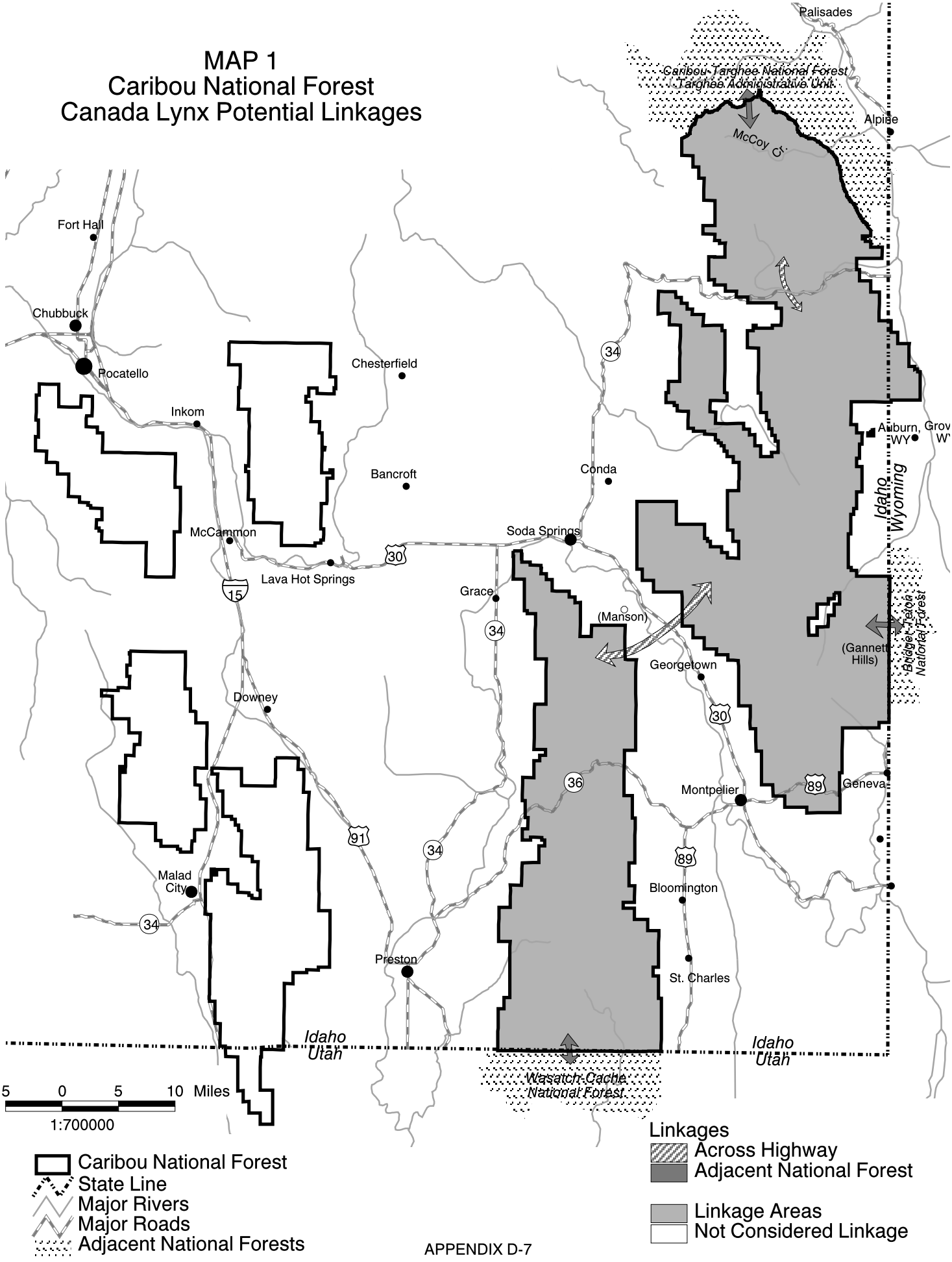
A map of migration corridors in Brown (1981) indicates that elk in his study moved from Fall Creek, down along Iowa Creek, and into the head of Tincup Creek and into Trail Creek. Another group of elk used the area to the west of Caribou Mountain and moved into the head of Tincup Creek. Other areas are used for seasonal migration corridors, such as movement of mule deer from the Aspen Range east to winter range on Soda Springs Hills (BLM and private).

Analysis of Effects

Connectivity or linkages on lands managed by the Caribou NF will be maintained due to several factors:

1) The Plan directs management towards upland and riparian vegetation towards proper functioning condition. This will provide a diversity of seral stages of all major vegetation types.
2) Several, larger, existing security areas (areas over 250 acres over one-half mile from an open motorized route) are maintained in the summer and winter through recommended wilderness or non-motorized prescriptions (Mt. Naomi, Caribou City, Bear Creek, Toponce and Meade Peak).
3) Open motorized route densities set an upper limit to the amount of new roads or motorized trails that could be developed, and identifies areas where reductions of existing open road and motorized trail densities are needed.
4) The Plan emphasizes maintenance or improvement of unique or highly used habitats, such as aspen and riparian.
5) The Plan includes wildlife goals, an objective and standard for land adjustments, and a Transportation goal that address connectivity (either directly or indirectly).
6) Any highway reconstruction across the Forest would go through site-specific environmental analyses and concerns over affects on wildlife movements would be addressed and/or mitigated. Conversion of two-lane to four-lane highways has been identified as a major concern during mapping of potential lynx linkages.

MAP 1
Caribou National Forest
Canada Lynx Potential Linkages



The following table compares criteria that may affect suitability of an area for use by some species. Off-route travel and high, open motorized route densities may affect species that are sensitive to human disturbance.

Table 2. Factors Affecting Suitability for Linkage Habitat.

Linkages	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Percent of Forest open to off-route travel *	33% (2)	38% (2)	38% (2)	0% (1)	3% (1)	0% (1)	2% (1)	2% (1)
OMRD**								
Caribou	0.6	0.6	0.6	0.6	0.5	0.2	0.6	0.6
Webster/Diamond	1.4	1.4	1.4	1.3	1.4	0.4	1.3	1.4
Pruess	1.2 (2)	1.2 (2)	1.2 (2)	1.2 (2)	1.1 (2)	1.0 (1)	1.2 (2)	1.2 (2)
Acres in 1.3 and 3.1, where natural processes dominate ***	9,302 (4)	9,302 (4)	0 (5)	88,207 (2)	94,477 (2)	200,000 (1)	57,019 (3)	87,140 (2)
Movement towards PFC****	7 yrs (1)	60 yrs (2)	14 yrs (1)	60 yrs (2)	100 yrs (3)	Na (3)	45 yrs (2)	60 yrs (2)
Overall ranking	**4**	**5**	**2**	**3**	**3**	**1**	**3**	**2**

* In Alternatives 1-3, almost the entire middle subsection (Webster/Diamond) is open to off-route travel. In Alternatives 5-7 an area of the middle subsection would still be open to off-route travel.

** These numbers were calculated on boundaries drawn for big game analysis and were not drawn based on subsection lines, but they give the overall picture for the same overall area.

*** These acres are approximate but give a picture for the Caribou/Webster/Preuss ranges

**** "1"= fastest rate; "3" is slowest

None of the alternatives propose habitat type conversions; vegetation treatments will change seral status over the short-term, but over the long-term, vegetation will move towards proper functioning condition. This will maintain habitats in a condition that will allow continued use for dispersal and movement. The vegetation on the Caribou NF is naturally patchy (See next section in this Process Paper) and fragmentation from vegetation treatments is not expected to be an issue. Species using the area have adapted to naturally fragmented habitats. All of the alternatives would maintain potential for linkage habitat, with Alternative 6 ranked the highest, followed by Alternative 3 and Alternative 7R.

The major affects on animal movements are at lower elevations. The river valleys are fairly highly developed and include highways, towns, croplands, subdivisions, railroads etc. All of these developments may limit use of these lower areas for corridors.

Major drainages and ridges on the Forest have a much lower level of development. There are a few developed recreation sites and developed mines, where there is concentrated human activity, but over most of the Forest human activity is dispersed along road and trail corridors.

Maintenance of an area for use as a corridor does not require major limitations on land uses in the area. As outlined in the rationale for why connectivity would be maintained, human uses are a consideration, but do not limit suitability as corridors. Vegetation management, recreational use and access will continue across the Forest as outlined in the Plan.

References cited in above section:

American Wildlands. 2000. Corridors of Life: Weaving a web of wildlife habitat in the Northern Rockies. Brochure.

Ruediger, B. 2000. Report to the Interagency Grizzly Bear Working Group on Wildlife Habitat Linkages. USDA Forest Service, Region One, Missoula, MT. August 30, 2000.

Ruediger, B., J. Gore, J. Claar and M. Maj. 2000. IGBC Wildlife Habitat Linkage in the Northern Rockies. Map, draft #1.

Samson, F. n.d. Interim direction: Corridors. USDA Forest Service, Region one, Missoula, MT. P 10 - 14.

Samson, F., *et al*, 1996. Terrestrial Protocols: Connectivity. USDA Forest Service, Region One, Missoula MT. P. 51- 57.

Samson, F.B., *et al*, 1997. Terrestrial Protocols for Coarse Filter Analysis, Species-at-risk, Viability, Connectivity, and Modeling/monitoring. USFS, Region 1, Missoula, MT.

Patch Size Analysis

Vegetation types are very patchy on the Caribou NF, with vegetation maps revealing a mosaic of small patches across the Forest. Map 2 shows forested and non-forested cover types on the Caribou. To get an overall picture of what patch sizes actually are, a patch size analysis was done. Six relatively undisturbed watersheds were selected across the Forest. These watersheds are Toponce Creek in the Portneuf Range, Weston Creek in the Malad and Oxford area, St. Charles Canyon in the Bear River Range, and Horse Creek/Stump Creek, Rock Creek/Pine Creek and Preuss Creek in the Webster/Preuss Range, shown also on Map 2.

Five broad vegetation types were selected and average patch sizes were calculated for each of the six watersheds. This was done through the use of GIS and vegetation maps for each of the watersheds and patch size maps and associated data for each are found in the project record.

Table 3. Average Patch Sizes for Various Vegetation Types.

Watershed Name	Average Patch Size (acres)				
	Sagebrush	Aspen	Douglas-fir	Mixed conifer	Lodgepole pine
Horse/Stump	94	23	28	16	44
Preuss	229	35	26	20	20
Rock/Pine	294	56	48	8	na
Weston	95	18	43	na	na
St. Charles	56	29	27	27	22
Toponce	12	55	10	14	na

This analysis shows that average patch sizes are generally small. Some of the largest patches are in the sagebrush vegetation types.

To assess what patch sizes would look like if forested, and non-forested vegetation was lumped, the analysis was re-run. The following table shows average size, and a range of patch sizes for each of the six watersheds. Non-forested vegetation includes sagebrush, aspen/maple, grass/shrub, juniper, mahogany, maple and mountain brush. Forested vegetation includes both aspen and conifer types.

MAP 2
Caribou National Forest
Forested/Nonforested Vegetation
Watersheds (HUC6) Used for Patch Size Analysis

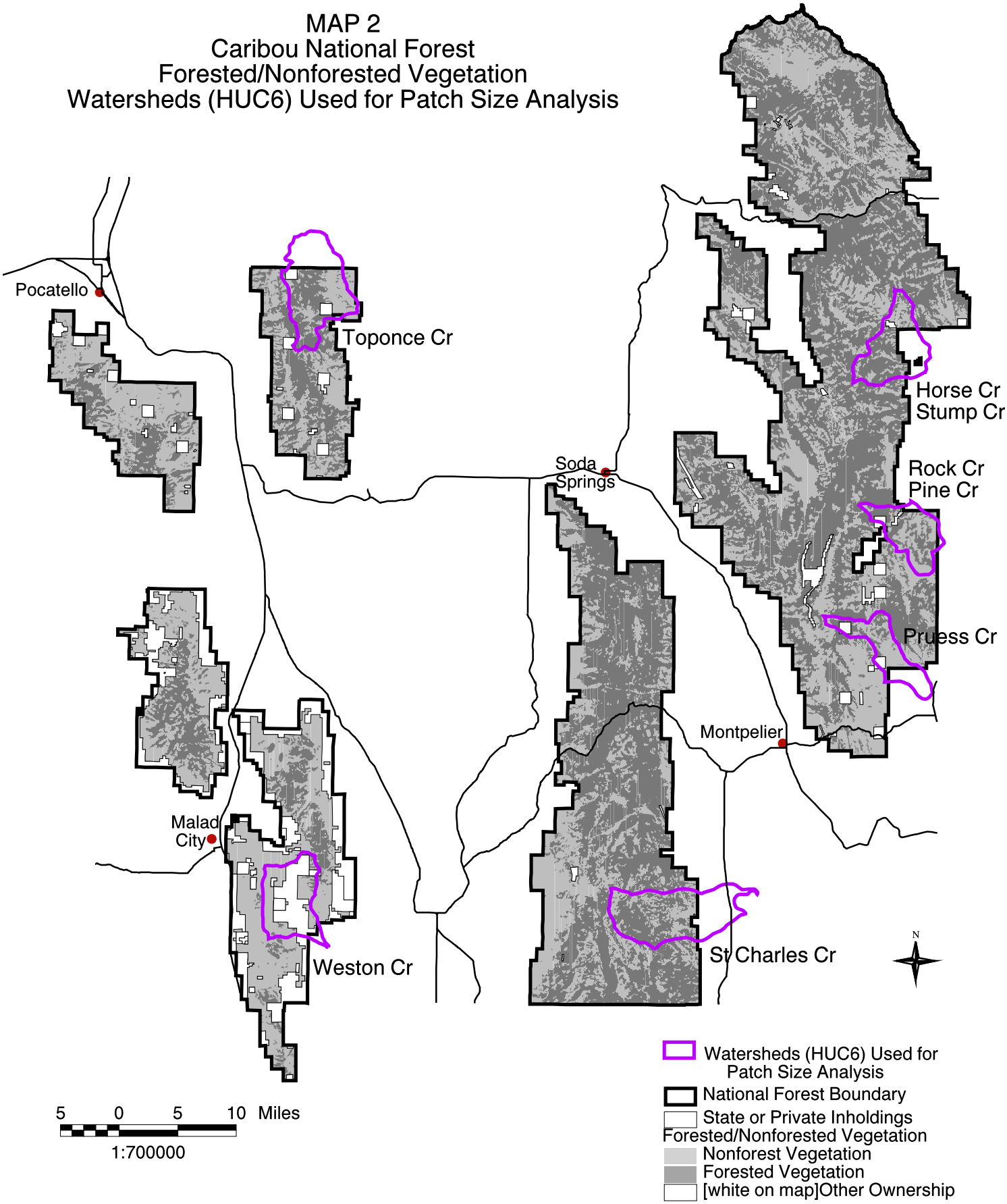


Table 4. Average and Range of Patch Sizes for Forested and Non-forested Vegetation.

Watershed Name	Non-forested Vegetation		Forested Vegetation	
	Average Patch Size (Acres)	Range (Acres)	Average Patch Size (Acres)	Range (Acres)
Horse/Stump	101	0-2,264	199	0-6,803
Preuss	229	0-4,644	83	0-1,228
Rockpine	420	0-5,899	204	0-1,498
St. Charles	80	0-3,161	256	0-9,898
Toponce	150	0-4,910	348	0-8,249
Weston	825	0-5,382	29	0-280

As expected, patch sizes are larger when vegetation is lumped into forested and non-forested, but they are still relatively small. The Plan includes a guideline under landbird management that recommends leaving contiguous patches of sagebrush 320 acres or larger, where possible. As the first table shows, this may not be possible in some cases because of the naturally small patch sizes. However, this guideline was left in because some area-sensitive birds need larger areas to successfully breed (Paige and Ritter, 1999).

The Plan also includes a guideline in the Vegetation section to manage mature and old growth forested vegetation in blocks of 200 acres or larger (200 acres used to tie to goshawk nest areas, goshawks are the MIS for mature/old forest). Again, this may not be possible in all cases, but was left in because a minimum patch size is required for many species using forested habitats.

Because of the naturally small patch size on the Caribou NF, it is expected that the vegetation treatments would not increase fragmentation or affect species using these habitats. Species using these Forests are adapted to naturally small, patchy habitats. The major areas of fragmentation on the Forest are a result of historic and current mineral development (approximately 7 percent of the Forest, mostly in the Webster subsection.

References cited for the above section:

Paige, C. and S. A. Ritter. 1999. Birds in a Sagebrush Sea: Managing Sagebrush Habitats for Bird Communities. Partners in Flight Western Working Group, Boise, ID.

Non-Forested Vegetation

Vegetation is very patchy on the Caribou NF. Since most of the sagebrush habitats are at lower elevations on the Forest (and off-Forest), and mix in with other types as elevation increases, they naturally are more broken on the Forest. To get an idea of patch sizes in sagebrush stands, six relatively undisturbed watersheds were selected from across the Forest. The average sizes in these six watersheds range from twelve acres up to 294 acres.

Currently, the overstory is denser with more than 40 percent of the area with canopy cover in greater than 15 percent. The amount of bare soil and soil loss has increased over the historical range of variation. It is desired that there would be around 30-50 percent with a canopy cover of greater than 15 percent. To move toward this goal, vegetation treatments are proposed.

There are 365,200 acres of sagebrush on the Caribou NF (and around 63,300 acres of planted grasses). Assuming that proposed treatments are evenly distributed across the Forest, and that treatments treat sagebrush and mountain brush in the proportion that they are present (90 percent sagebrush, 10 percent mountain brush) this table shows acres treated by type, forest-wide.

Table 5. Non-forested Vegetation Treatments by Alternative.

Non-forested Vegetation	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Total acres treated	130,000	77,500	100,000	77,500	70,800	60,000	79,750	40,000
Acres sagebrush treated	117,000	69,750	90,000	69,750	63,720	54,000	71,775	36,000

Assuming that 50 percent of the sagebrush is currently in the greater than 15 percent canopy cover class, at the end of ten years, sagebrush canopy cover classes would be distributed as shown:

Table 6. Non-forested Vegetation at the End of Ten Years.

	EC*	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Percent Sagebrush in Less than 15% cc	50	65	52	57	52	50	47	52	43
Percent Sagebrush in Greater than 15% cc	50	35	48	43	48	50	53	48	57

* EC = existing condition

Based on the levels of treatments proposed in Alternatives 6 and 7R, sagebrush habitats would move further from DFCs. Increased canopy cover of sagebrush results in a decrease in understory species diversity and/or abundance. Species using denser sagebrush stands would be favored. Alternative 5 would maintain the current distribution of sagebrush canopy cover classes, and the rest of the alternatives would move towards PFC.

As mentioned above, based on the levels of treatments, Alternative 7R would move further from PFC. However, Alternative 7R differs from the rest of the alternatives in that wildfire acres that burn are in addition to planned acres treated. In the other alternatives, acres proposed for treatment would be reduced as wildfire "treats" acres. Based on this difference, the affected acres are expected to be higher than what is proposed for treatment in Alternative 7R. From 1970-2000, about 1,210 acres burned each year (See Table 3.16 in EIS). Assuming half is non-forested vegetation (approximate coverage on Forest), and 605 acres burned each year, there would be an additional 6,050 acres treated over the ten-year planning period. This would be about 42,050 acres treated, but still below what is needed to move towards PFC. Actual number of acres that would be affected are unknown.

The Forest Plan includes guidelines to maintain contiguous areas of sagebrush habitats in 320-acre patches or larger, where possible, to support area-sensitive species; to implement practices that stabilize or increase native grass and forbs cover in sagebrush habitats with 5-25 percent canopy cover; and to manage habitats to conceal nests through the first incubation period.

Noxious Weeds

Over time, many non-native plants have become established on the Forest. This may affect wildlife habitat in several ways. First, as native plant species are replaced, this may affect foraging habitat, nesting habitat and cover. Changes in small mammal densities could then affect use of the area by predators. When noxious weeds have replaced native species, they may affect functioning of riparian habitats, influencing those wildlife species using these areas. In addition, it may alter the natural processes (fire, water infiltration, etc.) of the plant community, affecting ways that wildlife use the plant community.

Dominant weed species on the Forest include musk thistle, Canada thistle and leafy spurge.
Musk thistle is thought to be unpalatable to wildlife. Even at low densities it results in loss of production of native species since the rosette can grow greater than three feet in diameter. Birds are known to use thistle seed. Canada thistle may be a minor component in the diet of mule deer, and there are more than 130 species, including pathogens, birds and over 80 insects known to feed on Canada thistle. Goldfinches are known to feed on thistle seeds, but it is not known how many seeds remain viable after being consumed (Fire Effects Information System). Leafy spurge is rated poor for palatability (for antelope, mule deer and elk), and is rated fair to poor for providing cover (big game, small mammals, game birds). All of these noxious weed species displace native plant species, reducing forage, cover and altering the plant communities and processes in the plant communities. These changes then affect the ways in which wildlife use them.

Noxious weeds are spread through various means, including vehicles, recreational use, livestock, wildlife and vegetation treatments. They are more likely to become established in areas where there has been disturbance and bare soil is exposed.

Table 7. Potential Factors in Weed Spread. (See EIS for more information.)

Noxious Weeds	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
% Forest open to Off-route travel	33%	38%	38%	0	3%	0	3%	3%
% Change in cattle AUM's	-7%	-7%	-6%	-24% to -31%	-30% to -38%	-65% to -66%	-19% to -26%	-17% to -24%
% Change in sheep AUM's	-7%	-5%	-6%	-7%	-7%	-59%	-5%	-4%
Potential Acres of non-forested Treatments	130,000	77,500	100,000	77,500	70,800	60,000	79,750	40,000

Forested Vegetation

Existing Condition

Forested vegetation is distributed across the Forest as displayed on Map 1. Based on GIS vegetation data, forested vegetation is distributed as shown in the following table. This data shows recent (within twenty years) harvest or wildfire, which are shown as early seral. There is an old growth layer, which shows in this table as old growth. Everything else is shown as mid-seral.

Table 8. Existing Seral Classes for Forested Vegetation.

Forest Type	Early Seral	Mid-Seral	Old Growth
Aspen	3,951 (3%)	140,109 (91%)	10,362 (6%)
Douglas-fir	2,132 (1%)	106,962 (77%)	30,417 (22%)
Conifer with seral aspen	1,205 (1%)	97,262 (89%)	10,336 (10%)
Lodgepole pine	12,919 (20%)	46,687 (71%)	6,345 (9%)
Mixed conifer	1,563 (2%)	56,878 (79%)	13,997 (19%)

Because of habitat associations of the wildlife species to be analyzed, the above habitat type groups were grouped further, into three categories. The first is aspen. The second is low-elevation conifer, which includes Douglas-fir types. The last category is high-elevation conifer, which includes the cooler and moister habitat types (mixed conifer with lodgepole pine, Englemann spruce and subalpine fir).

The VDDT model uses different age classes from what are found in the GIS vegetation layer. Forest vegetation specialists used existing stand data to determine how the GIS categories would be split to fit the VDDT model categories, which are grass/forb, seedling/sapling, immature, mature and old. The existing condition for mature and old forests and forest type groupings is shown in the table below.

Table 9. Existing Percent Mature/Old Forest (from VDDT Analysis).

Forest Type	Mature/Old
Aspen	57%
Low-elevation mixed conifer (Douglas-fir)	80%
High-elevation mixed conifer (lodgepole, spruce/fir)	70-80%

Treatments

The VDDT model incorporated acres and type of treatments (mechanical and fire), as well as what forest type the treatments would occur in. For a discussion of the model and assumptions used see the VDDT section.

Table 10. Percent Mature and Old Forest at the end of Ten Years, by Alternative.

Alt	Forest Types Treated	Aspen % Mature and old	Doug-Fir and Limber pine Low-elevation, % Mature and old	Mixed Conifer and Lodgepole Pine High-elevation, % Mature and old
1	All	68%	85%	79%
2	Mixed conifer, aspen/Douglas-fir, aspen	73%	85%	76%
3	Douglas-fir, lodgepole pine and mixed conifer	73%	83%	74%
4	Mixed conifer, aspen/Douglas-fir and aspen	72%	83%	77%
5	Mixed conifer, aspen/Douglas-fir and aspen	73%	85%	79%
6	Mixed conifer, aspen/Douglas-fir and aspen	74%	85%	80%
7	Mixed conifer, aspen/Douglas-fir and aspen	76%	85%	79%
7R	Mixed conifer, aspen/Douglas-fir and aspen	64%	82%	81%

The VDDT model was run to estimate percent mature and old at the end of 100 years. This information was used to determine how the alternative was moving towards desired future conditions.

Table 11. Percent Mature and Old Forest at the End of 100 Years, by Alternative.

Alt	Forest Types Treated	Aspen % Mature and old	Doug-fir and Limber pine Low-elevation, % Mature and old	Mixed Conifer and Lodgepole pine High-elevation, % Mature and old
1	All	85%	67%	71%
2	Mixed conifer, aspen/Douglas-fir, aspen	82%	61%	67%
3	Douglas-fir, lodgepole pine and mixed conifer	82%	61%	62%
4	Mixed conifer, aspen/Douglas-fir and aspen	53%	54%	66%
5	Mixed conifer, aspen/Douglas-fir and aspen	71%	76%	76%
6	Mixed conifer, aspen/Douglas-fir and aspen	84%	78%	78%
7	Mixed conifer, aspen/Douglas-fir and aspen	76%	60%	69%
7R	Mixed conifer, aspen/Douglas-fir and aspen	55%	61%	76%

Desired future conditions (DFC) have been established in Alternative 7R as 30-40 percent mature/old conifer and 20-30 percent mature/old aspen.

This information was used to assess habitat changes for species associated with forests. For more information, see analyses for individual species.

Snags and Cavity Nesters

General Ecology

Snags are distributed singly, by death of individual trees, or in clusters, by weather, fire, insect or disease. Continuous Forest Inventory (CFI) plots on the Forest found a range of 0 to 38.3 snags per acre across the Forest. Currently, pine beetle populations are at endemic levels across the Forest. In the early to mid-1980s there were epidemic levels of mountain pine beetle; in the early to mid-1990s there were localized epidemics of Douglas-fir beetle and in the mid-1990s SAF complex (complex of borers, drought and disease) was present at higher levels. Past timber harvest has generally focused on these areas, but only about 20-30 percent of the harvest has been of dead or dying trees (Padian, Forester, pers. comm.). Because of the current stand ages and structures, the potential for insect epidemics is considered high.

Many wildlife species depend on dead trees for nesting, roosting, denning, foraging, resting or shelter. Woodpeckers and nuthatches, known as primary cavity nesters, have the ability to excavate cavities in snags where they nest and roost. Because woodpeckers usually excavate a new nest cavity each year, old nest cavities are available for many secondary cavity nesters. Secondary cavity users, which include many species of birds and mammals, cannot excavate a cavity, but use existing ones for nesting, denning or shelter (such as boreal owl, flammulated owl and marten); some use broken-top snags (great-gray owl).

Seven species of woodpeckers are expected to be present on the Caribou NF (Stephens and Sturts, 1998). The following table shows the relative abundance by general forest habitat (Hejl, *et al*, 1995).

Table 12. Woodpecker Species on the Caribou NF.

Species	Mixed conifer*	Lodgepole pine	Spruce-fir	Aspen
Lewis' woodpecker	-	-	-	R
Red-naped sapsucker	U	R	C	C
Williamson's sapsucker	U	U	U	U
Downy woodpecker	R	-	C	C
Hairy woodpecker	C	U	C	C
Three-toed woodpecker	R	U	U	U
Northern flicker	C	C	C	C

* Mixed conifer is dominated by Douglas-fir

* A = abundant, C = common, R = rare, U = uncommon, and - = no information

Primary cavity nesting species excavate nest cavities in snags. Live trees may also provide nest sites, depending on the presence of infection or injury that would allow the birds to excavate nest cavities. Two of these primary cavity nesters require larger snags (12 inches or more) and provide larger nesting cavities that are important for several other species of animals.

Several Forests, including the Targhee NF, have used the concept of biological potential to measure cavity nester habitat, as outlined by Thomas (1979). This involved an assessment of the primary cavity nesters present (woodpeckers), primary forest types used by each, number of cavities used per year, the

size of territories, etc. All of this information was summarized, and the number of snags and live trees per acre were estimated that would meet varying levels of biological potential for cavity nesters.

The following tables were developed during the Targhee NF Forest Plan revision, as analyzed in Process Paper D of the Targhee NF Forest Plan Revision. Species and overall snag requirement levels differ slightly from the Targhee NF, as one species they analyzed (black-backed woodpecker) is not found on the Caribou NF. In addition, cottonwood has been dropped from the tables because of its very low level of occurrence on the Forest.

Table 13. Major Forest Types Used by Woodpeckers on the Caribou NF.

Major Forest Types Used (of types found on the Caribou NF)	Aspen	Mixed conifer and Douglas-fir and spruce/fir	Lodgepole pine
Lewis' Woodpecker	X	X	
Red-naped sapsucker	X	X	X
Williamson's sapsucker	X	X	X
Downy woodpecker	X	X	X
Hairy woodpecker	X	X	X
Three-toed woodpecker	X	X	X
Northern flicker	X	X	X

Table 14. Woodpecker Habitat Requirements.

	Snag DBH (inches)	Snag Height (feet)	No. of Cavities /Year	Territory Size (Acres)*	No. of Snags Per Acre for 100% Biological Potential*
Lewis woodpecker	12-27"	5-170'	1	0-15 (15)	.48-1.01 (1.01)
Red-naped sapsucker	9-47"	15+'	1	5.1-12 (10)	1.5 (1.5)
Williamson's sapsucker	12-37"	15+'	1	10-12 (10)	.33-1.5 (1.5)
Downy woodpecker	6-14"	6-50'	2	5-50 (10)	.16-5 (3)
Hairy woodpecker	9-29"	15+'	3	6-25 (25)	.6-1.92 (1.8)
Three-toed woodpecker	7-19"	15+'	3	35-200 (75)	.06-.6 (.59)
Northern flicker	10-51"	6+'	1	8-500 (40)	.38-.48 (.38)

* No. in ( ) indicates territory sizes and number of snags used for analysis purposes on the Targhee NF.

Table 15. Snag Requirements to Achieve 100% Biological Potential for Each Woodpecker Species per 100 Acres.

Species	Aspen	Douglas-fir, spruce/fir	Lodgepole pine
Lewis' woodpecker	101	101	na
Red-naped sapsucker	150	150	150
Williamson's sapsucker	na	150	150
Downy woodpecker	300	300	300
Hairy woodpecker	180	180	180
Three-toed woodpecker	59	59	59
Northern flicker	38	38	38
Total hard snags per 100 acres	828	978	877

Table 16. Snag Requirements for Maintaining Various Percentages of Biological Potential for Woodpecker Populations (Snags per 100 Acres).*

Percent BP	Aspen	Douglas-fir and spruce/fir	Lodgepole pine
100%	828	978	877
80%	662	782	702
60%	497	587	526
40%	331	391	351
20%	166	196	175

*For mixed stands, average the numbers for the dominant cover types (for mixed conifer, percentages would be 927, 742, 556, 371 and 185).

Bull, *et al*, (1997) reviewed snag densities. She discussed Thomas (1979) and some of the problems associated with the models that he used; did not include snags for foraging, newer research suggests larger home ranges for some species (one of which was analyzed in this analysis); the relationship between snags and cavity nesters may not be linear; and did not take into account some of the secondary cavity nesters that use features like loose bark. Because of these factors, they felt that snag densities should be adjusted upward.

They found only three studies in the interior Columbia River Basin that calculated both density of snags and woodpeckers in managed and unmanaged landscapes. One was done on ponderosa pine (not found on the Caribou NF), one was done on pileated woodpeckers in Oregon (not found on the Caribou NF) and the last was on the Payette NF. Evans and Martens (1995) recommended densities of snags for retention on the Payette NF based on their ecological value, encompassing soil health, seedling regeneration, moisture retention, nutrient recycling and wildlife use. Their recommendations are shown in Table 17.

Table 17. Snag Recommendations from Evans and Martens (1995) for Payette National Forest.

Forest Type	Number of Snags/Acre	Total Snags Per Acre Over 10 inches dbh
Spruce/fir	5.0	9.5
Mixed conifer <35% canopy closure	0.5	2.5
Mixed conifer >35% canopy closure	2.5	9.0
Lodgepole pine <35% canopy closure	3.5	4.5
Lodgepole pine >35% canopy closure	6.0	7.7

Existing Condition on the Caribou

Information from 197 Continuous Forest Inventory (CFI) plots from 1993 was used to calculate the existing snag levels and the number of snags/acre/year created through tree mortality. Because the Forest Plan has direction for snags over 12 inches dbh (diameter at breast height), and 12 inches or larger are needed to maintain habitat for all seven woodpeckers, information on snags in the 11- to 12.9-inch dbh and higher categories were used.

Table 18. Continuous Forest Inventory (CFI) Plots.

Forest Types	Number of Plots
Douglas-fir dominated	19
Lodgepole pine dominated	3
Subalpine fir – spruce/fir	22
Lodgepole pine/aspen	7
Mixed conifer 1 (SAF, DF, aspen)	69
Douglas-fir/aspen	42
Aspen dominated	35
Total	197

DOUGLAS-FIR

Of the CFI plots that were dominated by Douglas-fir, only six out of nineteen plots had any snags greater than 12 inches dbh. The range of snags was from 0/acre to 12.7/acre over 12 inches dbh. When averaged over the nineteen plots, there were an average of 1.9 snags per acre over 12 inches dbh. This equates to roughly 20 percent biological potential.

LODGEPOLE PINE

Of the CFI plots that were dominated by lodgepole pine (including LPP/SAF and LP/ASP), six out of ten plots had snags greater than 12 inches dbh. There was a range from 0 snags/acre up to 29.6 snags/acre over 12 inches dbh. When averaged over the ten plots, there were an average of 6.8 snags per acre over 12 inches dbh. Based on this information, the existing biological potential is around 78 percent. This was compared to the Payette NF recommendations. Since information on canopy closures is not available for the Caribou NF, the two categories from the Payette NF were averaged into one category, with their modified recommendation being 6.0 snags/acre greater than 10 inches dbh. The existing condition for the Caribou NF is above this recommendation, with 6.8 snags/acre greater than12 inches dbh.

SUBALPINE FIR/SPRUCE

Of the CFI plots that were dominated by subalpine fir/spruce, fifteen out of twenty-two plots had snags greater than 12 inches dbh. The range of snags was from 0 snags/acre up to 38.8 snags/acre greater than 12 inches dbh. When averaged over the twenty-two plots, there were an average of 8.2 snags per acre over 12 inches dbh. Based on this information, the existing biological potential is around 84 percent. The Payette NF recommendations are for 5.0 snags/acre over 10 inches dbh; the Caribou NF is well over this.

ASPEN

Of the CFI plots that were dominated by aspen, only two out of thirty-five had any snags greater than 12 inches (less than 10 percent BP). Snags/acre over 12 inches ranged from 0 to 20.1. There are nine plots with snags between 8 to10 inches, with an average of six snags/acre. This would provide about 72 percent BP for the smaller woodpeckers, while the two largest (Lewis and Williamsons) would still be less than 10 percent BP.

DOUGLAS-FIR/ASPEN

There were forty-two plots with a mix of Douglas-fir and aspen, with an average of 2.4 snags/acre greater than 12 inches dbh. The number of snags/acre over 12 inches ranged from 0 to 20.1. Using an average of the snag requirements for aspen and Douglas-fir and spruce/fir, the existing biological potential is around 27 percent.

MIXED CONIFER

Sixty-nine plots were mixed, with subalpine fir, Douglas-fir and aspen, with an average of 4.2 snags/acre. The number of snags/acre over 12 inches ranged from 0 to 38.3. Using an average of the snag requirements for aspen and Douglas-fir and spruce/fir, existing biological potential is about 47 percent.

Table 19. Percent of forested acres by cover type on the Caribou NF.

Cover Type	Percent of Total Forested Acres
Douglas-fir	23%
Lodgepole pine	10%
Mixed conifer	11%
Subalpine fir/spruce	1%
Aspen	50%
Aspen/conifer	5%

Table 20. Biological Potential for Woodpeckers over the Forest.

Cover Type	Percent of Total Forested Acres	B.P. from CFI Plots	Snag Management Level
Douglas-fir	23%	20%	5%
Lodgepole pine	10%	78%	8%
Mixed conifer	11%	47%	5%
Subalpine fir/spruce	1%	84%	1%
Aspen	50%	10% (72%*)	5% (36%*)
Aspen/conifer	5%	27%	1%
Total	100%	na	25% (56%*)

* Based on 10 inches+ dbh snags, rather than 12 inches.

Table 21. Existing Snag Levels by Watershed.

Watershed No.	Watershed Name	No. CFI plots	Average. Snags/Acre >12” dbh
1	Geneva	5	.9
2	Montpelier	6	4.1
3	Trail Canyon	10	1.5
4	Weston	3	0
5	Malad	4	4.2
6	Crow Creek	6	2.9
7	Stump Creek	14	6.3
8	Tincup Creek	12	4.0
9	Jacknife	6	5.8
10	McCoy Creek	11	11.3
11	Bear Lake	8	.3

Watershed No.	Watershed Name	No. CFI plots	Average. Snags/Acre >12" dbh
12	Bear Lake Outlet	27	2.6
13	Grace	11	1.6
14	Grays Lake	4	11.6
15	Cub River	2	4.1
16	Blackfoot River	30	2.9
17	Upper Portneuf East	11	2.4
18	Upper Portneuf West	3	5.9
19	Marsh Creek	4	3.2
20	Lower Portneuf	0	na
21	Rattlesnake	4	.2
22	Rock Creek	0	na
23	Buist	0	na
25	S. Fk. Rock Creek	0	na
26	Logan River	8	2.8

Effects of the Alternatives

EFFECTS COMMON TO ALL ALTERNATIVES

On the Caribou NF, in Douglas-fir types, natural mortality rates produced about .7 snags/acre/year. Information from Oregon (Cline, *et al*, 1980) suggests that longevity for most Douglas-fir snags in that area is around fifty years. The fall rate cited by Forbs, 1994 (in Evans and Marten, 1995) is 13 percent for Douglas-fir. Generally, biological potential would be high for forty years after a stand-replacing fire. It would then take around eighty years for the new stand to reach 7-8 inches at dbh, during which time the biological potential would be very low. Douglas-fir forests may fluctuate greatly over time in their biological potential for woodpeckers.

On the Caribou NF, in the lodgepole pine forest types, natural mortality produced about 1 snag/acre/year (from CFI plot data). A study of snag longevity following a fire in Montana (Lyon, 1977) found that lodgepole snags greater than 8 inches dbh fell at an annual rate of 2 percent for the first two years, then averaged an annual rate of 8.6 percent for the next thirteen years. However, rates were higher in the smaller diameter classes. In addition, these rates would be expected to be higher than what would occur on the Caribou NF under existing conditions. Snag loss would be expected to be higher in fire-killed stands, because there are no live trees to reduce wind velocities (Lyon, 1977). Studies on the west coast found fall rates for lodgepole pine snags to be about 52 percent (in Evans and Marten, 1995).

Generally, biological potential would be high for twenty years after a stand-replacing fire. It would then take sixty to seventy years for the new stand to reach seven to eight inches dbh, during which time the biological potential would be very low. Lodgepole pine forests may fluctuate greatly over time in their biological potential for woodpeckers. On the Caribou NF in the subalpine fir/spruce forest types, natural mortality produced about 2.4 snags/acre/year. In aspen stands surveyed, natural mortality produced only about .3 snags/acre/year.

Not all natural disturbances are stand replacing. Natural disturbances that do not result in stand replacement would tend to create fewer snags, but live replacement trees would exist and depending on mortality rates, these live trees would become snags over time.

EFFECTS WHICH VARY BETWEEN ALTERNATIVES

Using projected timber harvest levels for the first decade, and Plan prescription direction for cavity nesting habitat, predicted changes in biological potential were calculated. Since harvest areas have not been identified as part of the alternatives, this discussion will not be site-specific.

Table 22. Comparison of Forest Harvest and Treatment by Alternative.

Alternative	Forested Acres Harvested (% of Forested Acres)	Emphasis on Even-aged Management	Total Forested Acres Treated (% of Forested Acres)	% Forested Acres Treated but Not Harvested
1	16,800 (3%)	High	16,800 (3%)	0
2	16,700 (3%)	Moderate	34,100 (6%)	3
3	21,900 (4%)	High	41,800 (7%)	3
4	7,100 (1%)	Low	57,000 (10%)	9
5	6,500 (1%)	Low	25,700 (4%)	3
6	4,950 (<1%)	Low	25,700 (4%)	3
7	7,000 (1%)	Moderate	34,100 (6%)	5
7R	14,000 (2%)	Moderate	49,000 (8%)	6

All alternatives rate high on insect hazard ratings and mod-high to high for wildfire risk (See Table 2.39 in EIS). Since there was very little difference between the alternatives in this respect, these factors were not included in the analysis.

Because the forest acres harvested would all have the same Forest Plan direction for snag management, the main difference between the alternatives is the emphasis on even-aged management. This may or may not be an issue, as the Plan direction for snags/100 acres is calculated over the prescription area, not a sale area. If snag densities are low in that prescription area, and snags are left in even-aged harvest units, they may be susceptible to windthrow and firewood harvest and would have a shorter lifespan. However, where there are adequate snags in the prescription area, snags may not be left in harvest units.

Acres treated but not harvested would maintain existing snags, but also create new ones as well, through prescribed burning and damage during mechanical treatments. Alternative 1 would not affect any acres, but Alternatives 2, 3, 5, and 6 would affect about 3 percent of the forested acres. Alternatives 7 and 7R would maintain or increase snags on 5-6 percent of the forested acres, while Alternative 4 would affect 9 percent of the forested acres.

Snag Management Levels for Alternative 7R

Levels of biological potential were assigned to prescription areas. These guidelines do not apply within 300 feet from an open road. Firewood harvest is expected to occur in these areas.

In Prescription Areas where timber harvest or vegetation treatments are allowed and products may be removed, guidelines for maintaining cavity-nesting habitat were assigned. In prescription areas such as recommended wilderness, where no product removal would occur, no guideline was established. It is assumed that the existing condition for cavity nesting habitat capability in these areas represents what can be expected during the next decade (100 percent BP). In management prescriptions where concentrated human use occurs, snags are usually removed due to safety concerns; in these areas the BP is zero.

Table 23. Prescription Areas on the Caribou NF.

Prescription	Acres	% Biological Potential Assigned
1.3	38,800	Natural levels
2.1.1 – 2.1.5	38,700	Natural levels
2.2, 2.5	7,100	Natural levels
2.7.1, 2.7.2	219,400	Natural levels
2.8.3	63,700	Greater than 80 percent
3.1	41,200	Natural levels
3.2	165,500	Greater than 60 percent
3.3	65,200	Greater than 60 percent
4.1, 4.2, 4.3	5,000	Not assigned (0)
5.2	160,900	Greater than 40 percent
6.2*	226,900	Greater than 40 percent
8.1, 8.1u, 8.2.2	9,800	Not assigned (0)

* While this prescription is rangeland vegetation management, the vegetation does include some forested stands.

Table 24. Snag Management Levels Across the Forest.

Biological Potential	Acres at BP Level (% of Total Acres)	Snag Management Level*
Natural levels (100%)	345,200 acres (33%)	33%
Not assigned (0%)	14,800 acres (1%)	0%
Greater than 40% BP	387,800 acres (37%)	15%
Greater than 60% BP	230,700 acres (22%)	13%
Greater than 80% BP	63,700 acres (6%)	5%
Total		**66%**

* Snag management level = percent Biological Potential times percent of total acres (from Thomas, 1979)

Firewood Harvest

There is no Forest-wide direction for firewood harvest. Districts identify areas (may be exclusive or broad areas). A map is compiled and distributed with firewood permits. Generally, there are few restrictions on wood gathered. In areas open to off-route travel, snags are more vulnerable to harvest, while areas within 300 feet of open roads are available in restricted travel areas.

The following table evaluates the risk of losing snags to firewood harvesting. Because such a small part of the Forest is within 300 feet of a road, the risk is fairly low.

Table 25. Risk Factors for Snag Habitat.

Snags	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
% Forest open to off-route travel	33%	38%	38%	0	3%	0	2%	3%
% Forest within 300 feet of open roads*	4%	4%	4%	4%	4%	3%	4%	4%
Overall risk from firewood cutting	Mod	Mod	Mod	Low	Low	Low	Low	Low

* This overestimates vulnerability of snags to harvest, all road miles were used, and not split out by vegetation type that they access, and about ½ of the Forest is rangeland types.

CONCLUSION

Management direction in the Plan would allow a snag management level of 66 percent over the Forest. This should be adequate to maintain viability of woodpecker and other cavity nesting species, based on Figure 41 in Thomas, 1979.

While Bull, *et al*, (1997) identified concerns with Thomas' model in that the existing condition exceeds the recommendations from the Payette NF, which were referenced by Bull, *et al*. Forest Plan direction viability for woodpeckers and secondary cavity nesters is expected to be maintained.

Table 26. Biological Potential for Woodpeckers.

Forest Type	Recommended Snags/Acre Over 10 inches dbh*	Existing Condition Snags/Acre Over 10 inches dbh**
Spruce/fir	9.5	12.1
Mixed conifer	5.75	7.6
Lodgepole pine	6.1	11.0

* From Evans and Martens (1995): where they used canopy cover classes, these were averaged into one

** From Caribou CFI plot data (1993).

References cited in above section:

Bull, E.L., C.G. Parks, and T.R. Torgersen. 1997. Trees and Logs Important to Wildlife in the Interior Columbia River Basin. USDA Forest Service, Pacific Northwest Research Station, PNW-GTR-391. La Grande, Oregon.

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Downed, Woody Debris

Logs and other woody debris, such as stumps, root wads, bark, and piles of limbs, occur on the floor of most forest ecosystems. These features provide diversity in the environment and are of varying significance as habitat for terrestrial wildlife (Thomas, 1979).

Logs can provide areas for foraging or provide cover. Insect-eating, fungus-eating, wood-eating and predaceous animals find food sources in and around logs. Besides cover, logs provide structure where animals can find stable temperatures and moisture for denning, feeding and food storage. Logs may also serve as places for sunning, courtship displays and for lookout posts. Small mammals also use logs as runways, and are often used under the snow as well. The size, distribution and orientation of logs are more important to wildlife than tonnage or volume (in Bull, *et al*, 1997). Slash piles remaining after harvest can benefit some wildlife like rodents, hares, and rabbits.

Wisdom, *et al*, (2000) reviewed the abundance of downed woody materials in different forest types in the Interior Columbia River Basin. They found that in low elevation, old forest, (dry Douglas-fir on Caribou NF), one issue was the decline in shrub and herb understories in response to increased density of small trees and **downed wood**, litter and duff. In broad-elevation, old forests (which I think applies to a lot of the Caribou NF), one issue they identified is the decline of late-seral forest attributes, including large downed logs. Wildlife species that use mosaics of forests were also noted as using downed logs as a special habitat feature.

The Draft Forest Plan included a guideline requiring an average of twenty-one logs per acre to be retained on at least 60 percent of the treatment acres. Since this direction was not specific to forest vegetation type, if was felt that this may not be sustainable over the Forest.

The USFS Intermountain Region (Region 4) Old Growth definition (Hamilton, *et al*, 1993) includes numbers of downed dead trees by forest type. The information from this analysis was used, because it was an attempt to define old growth and components from an ecological perspective. This was done using the best information available, and involved Forest Service personnel, university professors, state wildlife officials and privately employed professionals. They estimated that in **spruce/fir**, there are an average of five pieces/acre, 8 feet in length, and 20 inches in diameter. **Lodgepole** had an average of fifty pieces/acre, 8 feet long and 11 inches in diameter. For **aspen** they estimated ten pieces/acre, 10 feet in length and 8 inches in diameter. **Douglas-fir** had none.

Table 27. Downed, Woody Debris, by Forest Type, Based on R4 Old Growth Definition.

Forest Type	Downed Woody
Spruce/fir	Five pieces/acre, 8 feet in length, 20 inches in diameter
Douglas-fir	None
Aspen	Fifty pieces/acre, 8 feet in length, 11 inches in diameter
Lodgepole pine	Ten pieces/acre, 10 feet in length, 8 inches in diameter

Based on this information, the guideline for the Final Plan was modified to leave an average of eleven logs per acre over 60 percent of the area in decomposition classes 1, 2, and 3. Active management will be focused on conifer stands, with some aspen as a component. This number of downed dead trees meets the old growth criteria for spruce/fir, Douglas-fir and lodgepole pine forest types. Logs should be eleven inches in diameter and eight feet in length. This is measured as an average over the prescription area, and

logs might not be evenly distributed. Because this guideline is based on the best available information on levels of downed logs that would occur in old forests, meeting this guideline should provide sufficient downed logs to provide downed woody components used by many species.

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Wisdom, M.J., *et al.* 2000. Source Habitats for Terrestrial Vertebrates of Focus in the Interior Columbia Basin: Broad-scale trends and management implications. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. General Technical Report PNW-GTR-485. 156 pp.

Roads And Motorized Trails

General Effects on Wildlife

Wisdom, *et al*, (2000) did an extensive review of the effects of roads on wildlife, based on available literature and research. These effects include: snag and downed log reduction; habitat loss and fragmentation; edge effects; over-hunting, over-trapping, poaching and collection; harassment or disturbance; collisions; movement barriers or facilitators; displacement or avoidance; and chronic negative interactions with humans. They also reviewed what wildlife species may be affected by each of the effects. The following table summarizes these direct and indirect effects, and what species on the Caribou may be affected, and where these effects might occur.

Table 28. Road Effects on Wildlife.

Road-associated Factor	Species Potentially Affected	Where Effect May Occur
Snag and downed log reduction	Flammulated owl, boreal owl, great gray owl, three-toed woodpecker, wolverine, lynx	Forested habitats across the Forest.
Habitat loss and fragmentation	All species potentially affected by habitat loss	Habitat loss across all ownerships. Private lands and maybe wider, high-speed roads and highways on Forest for fragmentation.
Over-hunting, over-trapping, poaching, collection, recreational shooting	Wolverine, lynx, wolf, big game, marten, small mammals	Across all ownerships

Road-associated Factor	Species Potentially Affected	Where Effect May Occur
Harassment or disturbance	Wolverine, lynx, sage grouse, peregrine falcon, bald eagle, northern goshawk	Across all ownerships
Collisions	Wolves, amphibians, big game, birds feeding along roads,	High-speed roads or highways, or roads adjacent to amphibian and reptile breeding habitat
Movement barriers or facilitators	Noxious weeds, small mammals	Across all ownerships, along roads and trails
Displacement or avoidance	Wolves, elk, bald eagles	Across all ownerships
Chronic negative interactions with humans	Wolves upland bird leks	Across all ownerships
Erosion and sedimentation of adjacent streams	Amphibians	Across all ownerships

SNAG AND DOWNED LOG REDUCTION

Firewood gathering can contribute to a loss of snags and downed logs. Woodcutters often take larger-diameter snags, which are the same ones that are beneficial to the most wildlife species (the larger the snag, the more species can use it; larger species need larger snags).

HABITAT LOSS AND FRAGMENTATION

Road construction and associated road maintenance can convert large areas of habitat to non-habitat (Wisdom, et al, 2000). Because roads affect more area than the actual road surface, they can reduce available habitat well beyond the road itself.

TRAVEL BARRIERS

Habitat loss can result from the travel barriers caused by roads. For example, some researchers have found that some rodent species are reluctant to cross even the narrowest gravel roads (in USFS, 2000). This behavior can result in substantial habitat amounts of suitable habitat being unavailable to these species. In addition, habitat loss can fragment populations into smaller subpopulations through the loss of habitat connectivity, causing demography fluctuations, inbreeding, loss of genetic variability, and local population extinctions.

TRAVEL FACILITATION

The construction of roads introduces new edge habitat, and consequently, invasive species of plants, birds and animals can be introduced into environments where they previously did not occur. Ground disturbance associated with roads and with other activities enabled by roads provides additional opportunity for establishment or expansion of non-native invasive plant populations.

HUMAN DISTURBANCES

Roads facilitate human activities that disturb habitats and displace animals or cause them to avoid habitats that would otherwise be suitable. Other effects of human disturbances include loss of large trees, snags, poaching, recreational shooting, etc (For more information, see USFS, 2000).

Disturbance may cause behavioral and/or physiological responses to wildlife. These have been summarized in Joslin and Youmans (1999). Behavioral responses are influenced by the type of activity,

distance away, direction of movement, speed, predictability, frequency and magnitude) and location (above versus below, in the open versus screened by topography or vegetation). The most detrimental disturbances are those that are unanticipated. In circumstances where motorized use in predictable and localized (confined to routes), wildlife response to people afoot or skiing may be more pronounced than it is to motorized vehicles.

Behavioral responses range from avoidance, habituation and attraction. These responses may be of short duration (temporary displacement) or long-term, such as abandonment of preferred foraging areas.

Several species of birds have been found to be sensitive to disturbance. For example, harlequin ducks are sensitive while on breeding territories. Breeding territories are low-gradient streams with streamside shrub cover. Historically, many of these streams have had roads or trails constructed adjacent to them. These roads provide access to hikers, fishermen and floaters, all of which may cause displacement or abandonment of territories.

Thomas (2000) monitored movements of radio-collared elk from the Tex Creek winter range. Almost half of the elk marked in the study summered in the largely non-motorized area between Bald Mountain and Tincup Creek. He did an analysis and concluded that, "by far, the greatest concentration of elk is in the area least accessible to motorized vehicles."

Rowland, *et al*, (2000) monitored radio-collared elk over a three-year period in northeast Oregon. They found that selection ratios increased with increasing distance from open roads, and varied between seasons, but not among years or individuals. The elk consistently selected areas away from open roads in both spring and summer, confirming that roads have an influence on summer habitat selection. They did conclude that the effect of the densities was greatly influenced by the spatial patterns of the roads. Elk were able to use areas with relatively high road densities if there were still areas available that were away from roads.

Elk response to roads varies, by season and according to the size and location of the road, traffic volume and cover availability. Some of these responses are summarized in Frederick, 1991 and Joslin and Youmans, 1999. Elk may become habituated to some level of traffic; they may be less disturbed by fast-moving vehicles on a paved highway than by slow moving, infrequent traffic on lower-standard roads. Elk appear to associate a stopping vehicle with human harassment, particularly hunting, and are most disturbed by people in out-of-vehicle activity. In a number of studies, avoidance of roads by elk varied between seasons in response to hunting access and pressure. Unhunted animals may show greater tolerance to human activity. Elk can use areas in close proximity to large amounts of human activity, if it is a non-harassing type of activity.

COLLISIONS

High-speed highways and surfaced roads have the greatest potential for collisions with wildlife. Birds foraging along right-of-ways fly up and are killed. Great gray owls, that move to lower elevations and more open country in the winter, forage low over open meadows and have been documented in collisions with vehicles.

Many studies have documented the large number of amphibians and reptiles that may be killed on roadways, but only a few studies have determined the impact of this mortality at the population level (Maxell and Hokit, 1999). The degree of impacts is related to proximity of the road to breeding or other seasonal habitats and migration movements.

MOTORIZED TRAILS

Most of these road-associated factors also apply to motorized trails. Motorized trails contribute to habitat loss; provide access for hunting, trapping, poaching and collection; provide movement corridors for weeds; cause harassment or disturbance; cause displacement or avoidance; increase potential for negative interactions with humans and increase erosion and sedimentation of streams. Snag and downed log reduction and collisions are not expected to be factors associated with motorized trails.

During the revision of the Targhee NF Forest Plan, there were interactions with Dr. Jack Lyon from the Intermountain Forest and Research Experiment Station. He felt that elk would respond to motorized use on trails the same as on roads. There are no scientifically controlled studies on the effects of motorized use on trails. However, because of all the road-associated factors that are still associated with motorized trails, they have been incorporated into an open motorized route density for this analysis.

CROSS-COUNTRY TRAVEL

As explained above, this type of use is unpredictable and irregular and may cause the largest amount of disturbance or displacement. It also results in loss of habitat due to loss of vegetative cover and forage, direct mortality of small mammals, reptiles, amphibians and birds through loss of adults or nests.

Conditions on the Caribou

There are different ways to measure road and motorized trails. One is the use of open motorized route densities. This measure looks at the miles of open motorized routes over a given area. They may be calculated using watersheds, elk herd ranges, management prescription areas, or other logical boundaries. OMRDs were calculated using a couple of different analysis areas. Larger analysis areas are more effective for looking at wide-ranging species such as elk, mule deer or wolverine. (See Map 3: Existing Open Motorized Route Densities by Mountain Range Block for locations.)

Table 29. Existing OMRDs (mi/mi^2) Calculated by Mountain Range "Blocks."

Mountain Range Block	OMRD Miles/square mile	Mountain Range Block	OMRD Miles/square mile
Caribou	0.6	Bear North	1.8
Diamond	1.4	Elkhorn	1.2
Portneuf	0.9	Bear South	1.4
Bannock	1.4	Malad North	1.1
Preuss	1.2	Malad South	1.1

OMRDs were also calculated by watershed. These watersheds were a combination of 5th and 6th HUC's (hydrologic unit codes). The Westside District stayed the same as shown above and Montpelier and Soda Springs watershed values are shown below. (See Map 4: Existing Open Motorized Route Densities by 5th and 6th Code Watersheds.)

Table 30. Existing OMRDs (mi/mi^2) for Soda Springs and Montpelier Watersheds.

Watershed	OMRD Miles/square mile	Watershed	OMRD Miles/square mile
Eightmile	1.8	Slug Creek	1.8
Emigration	2.0	Rasmussen	1.4
Cub River	1.4	Diamond Creek	1.8
Bloomington	1.2	Stump Creek	1.1
Logan River	1.2	Tincup	0.7
Crow Creek	1.2	Trail Creek	0.5
Georgetown	1.8	McCoy Creek	0.7

Wisdom, *et al*, (2000) mapped road densities across the Interior Columbia River Basin. They used categories of very low (0-0.1 mi/mi^2), low (0.1 – 0.7 mi/mi^2), moderate (0.7 – 1.7 mi/mi^2) and high (Greater than 1.7 mi/mi^2). The Portneuf and Bannock Ranges and the Webster/Preuss Range are located in the Snake Headwaters Ecological Reporting Units. They mapped the north end of the Webster/Preuss range as low (Less than 0.7 mi/mi^2) and the rest of the units as moderate (0.7 – 1.7 mi/mi^2).

They went on to map habitat abundance and road densities for terrestrial carnivores, including grizzly bear, gray wolf, wolverine and lynx. The north end of the Webster/Preuss range rated out high for relative habitat abundance and low road densities for all four of these species. They stated that managers interested in conserving the few large blocks of remaining habitats that are relatively secure from human disturbances for terrestrial carnivores would want to focus on maintenance and improvement of the seven areas that they identified (which Area 1 includes the north end of the Webster/Preuss range). These areas could be effective "building blocks" from which an overall network of habitat and human activity strategies could be devised to ensure a high probability of well-distributed, persistent populations of all four species in the basin.

OPEN MOTORIZED ROUTE DENSITIES (OMRD)

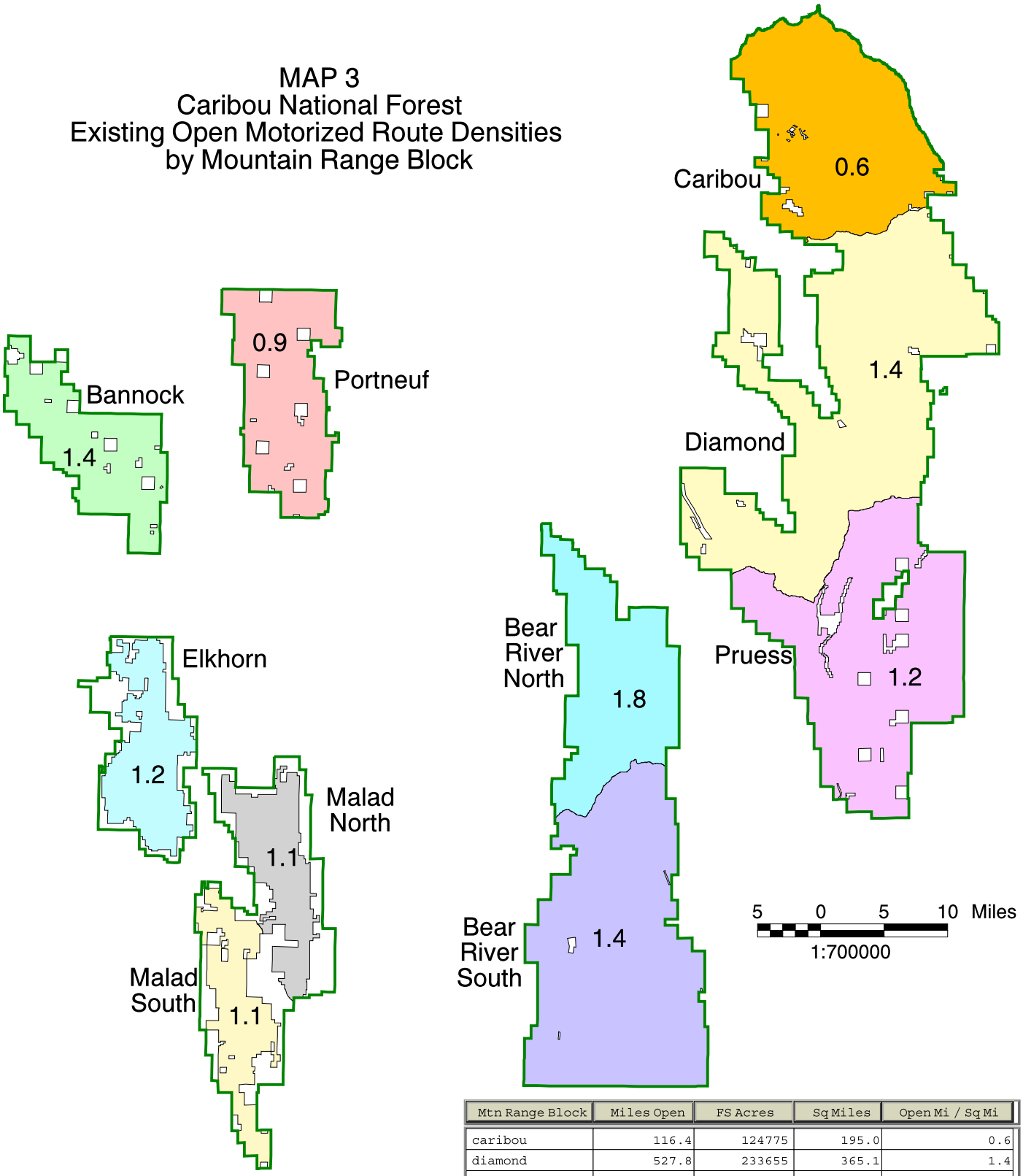
General

The decision was made that to be consistent with the Targhee NF Forest Plan, open motorized route densities would be determined by prescription areas. To establish the densities to be used for direction, available literature was reviewed.

Most of the research and studies done on open motorized route or road densities have been done for elk. The presence and motorized use of roads is the major impact on summer elk habitat effectiveness (Christensen, *et al*, 1993). For areas intended to benefit summer habitat and retain high use, habitat effectiveness should be greater than 70 percent or more. This equates to roughly an open motorized route density of 0.7 mi/mi^2. For areas where big game is one of the primary resource considerations, habitat effectiveness should be 50 percent or greater. This equates roughly to an open motorized route density of 1.9 mi/mi^2.

Because the available literature on open road densities is largely based on elk, these numbers were used roughly to also address the needs of other species as well. There are many species that avoid areas of human activity or are affected by roads, as shown above. As mentioned above, areas where elk habitat was to be maintained, open road densities should be less that .7 mi/mi^2. For this analysis, this was rounded up to 1.0 mi/mi^2. For areas that were to benefit elk, open road densities should be less that 1.9 mi/mi^2. This was rounded up to 2.0 mi/mi^2.

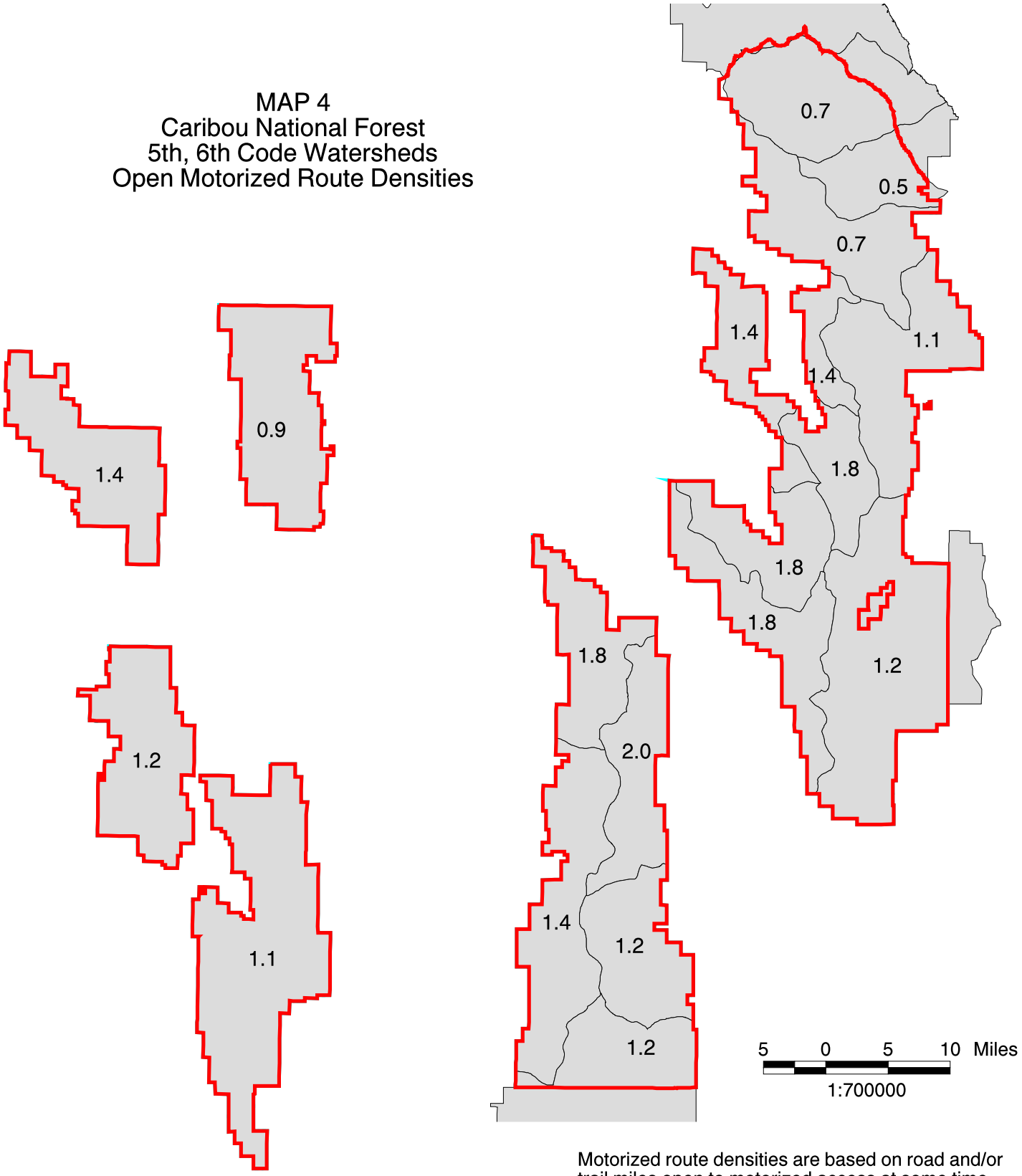
MAP 3
Caribou National Forest
Existing Open Motorized Route Densities by Mountain Range Block



Mtn Range Block	Miles Open	FS Acres	Sq Miles	Open Mi / Sq Mi
caribou	116.4	124775	195.0	0.6
diamond	527.8	233655	365.1	1.4
portneuf	103.4	71706	112.0	0.9
bannock	131.5	61134	95.5	1.4
pruess	300.9	154796	241.9	1.2
bearn	250.9	87104	136.1	1.8
elkhorn	88.2	47691	74.5	1.2
bears	374.0	176307	275.5	1.4
maladn	69.9	41177	64.3	1.1
malads	68.2	40542	63.3	1.1

Road density figures are in miles of motorized roads and trails per square mile of FS land. Private land was excluded from area calculations, as were smaller isolated National Forest parcels. Mile figures are roads/trails open to motorized use at some time during the year. Roads/trails across private land were excluded from calculations.

MAP 4
Caribou National Forest
5th, 6th Code Watersheds
Open Motorized Route Densities



Motorized route densities are based on road and/or trail miles open to motorized access at some time during the year. Values were calculated from roads and trails only on Natl Forest ground and only that portion of the watershed on the Caribou.

Effects of the Alternatives

Alternatives 1, 2 and 3 leave road densities at current levels, and allow for the potential to increase motorized trails. Currently there are approximately 2,033 miles of roads and motorized trails.

Maximum open route densities have been set by prescription area in Alternatives 4 – 7 and 7R. There are some prescription areas that may see an increase in motorized routes in the future, but currently few new roads or trails are being built. Assumptions used were that there would be no net increase in roads (use of temporary roads for access to harvest areas), but there was an increase in motorized trails, based on what has happened over the last ten years.

Based on current information, there are several prescription polygons that are exceeding set open route densities. To meet these, miles of existing open roads and motorized trails would need to be closed, either yearlong or seasonally.

Table 31. Miles or Routes to be Closed to Meet OMRD Standards.

Alternative	Year-long Closures	Seasonal Closures
Alternative 4	157 miles (8%)	0
Alternative 5	177 miles (9%)	30 miles
Alternative 6	735 miles (36%)	0
Alternative 7	129 miles (6%)	13 miles
Alternative 7R	62 miles (4%)	0

The Forest received numerous public comments on road and trail restrictions when the Draft EIS/Plan was released. Although open motorized route densities affect many species, elk were viewed as the reason for implementation of restrictions. In many areas of the Forest, elk numbers are at or above state population objectives.

Because of these concerns, the decision was made that in Alternative 7R access would be fairly close to the existing situation, except that most of the Forest would be closed to cross-country motorized use. The Final Plan includes OMRD standards for each specific prescription area, ranging from 0 mi/mi^2, 0.5 mi/mi^2, 1.0 mi/mi^2, 1.5 mi/mi^2 and 2.0 mi/mi^2. These were based largely on existing condition, but also included reductions in specific areas due to wildlife concerns. The largest reductions are in the south end of the Bear River range, where there were concerns for mule deer and connectivity to the Wasatch-Cache National Forest to the south.

The effects of this are shown in the table below, based on the mountain range units displayed at the beginning of this section.

Table 32. Alt 7R OMRDs (mi/mi^2) Calculated by Mountain Range "Blocks."

Mountain Range Block	OMRD Miles/square mile	Mountain Range Block	OMRD Miles/square mile
Caribou	0.6	Bear North	1.7
Diamond	1.4	Elkhorn	1.2
Portneuf	0.9	Bear South	1.3
Bannock	1.3	Malad North	1.1
Preuss	1.2	Malad South	1.1

Changes in open motorized route densities would be in the Bannock Range and in the Bear River Range. This would be a reduction of 62.3 miles of open routes over the Forest, or less than 4 percent of the current routes. Year-round and seasonal restrictions would be implemented.

For more information on effects on individual species, see the viability section.

References cited in above section:

Frederick, G.P. Effects of Forest Roads on Grizzly Bears, Elk and Gray Wolves: A Literature Review. USDA, Forest Service, Kootnai National Forest, Libby, MT.

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Thomas, T. 2000. Elk Radio Telemetry Study Tex Creek Wildlife Management Area, January 1998 to December 2000. Idaho Department Fish and Game, Idaho Falls ID. 61 pp.

USFS. 1999. Roads Analysis: Informing Decisions About Managing the National Forest Transportation System. USDA Forest Service, Washington Office, FS-643.

Wisdom, M.J., *et al.* 2000. Source Habitats for Terrestrial Vertebrates of Focus in the Interior Columbia Basin: Broad-scale trends and management implications. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. General Technical Report PNW-GTR-485. 156 pp.

Management Indicator Species

Existing Forest Plan Direction

Management Indicator Species (MIS) were selected during the last Forest Planning process (1985). Regional direction stated that "wildlife, fish and plant species (or groups of species) shall be selected to assure the maintenance of viable populations," and "the number selected should be the minimum necessary to indicate the effects of management and to achieve wildlife and fish goals and objectives."

MIS were chosen because of general, wide public interest, or because the species has habitat requirements similar to other species for which it can serve as a biological barometer for the well being of specific habitats. Threatened and endangered species were automatically included as MIS. Species selected in 1985, and their associated habitat types are shown below.

Table 33. MIS in 1985 Caribou Forest Plan.

MIS SPECIES	ASSOCIATED HABITAT TYPES
Bald eagle	Snags, riparian by rivers and lakes
Mule deer and elk	Early forest succession, mountain brush, sage-grass
Goshawk	Old growth conifer
Hairy woodpecker	Snags, old or decadent conifer and aspen
Yellow-bellied (red-naped sapsucker)	Aspen and riparian
Sage grouse	Sage-grass

In the 1985 Forest Plan, there is one objective for MIS: Habitat diversity will be maintained and improved to support minimum viable populations of selected management indicator species (p. III-9).

Standards and guidelines specific to MIS: Consider the habitat requirements of MIS for all resource development projects (p. III-32). Guidelines outlined in "Guidelines for Maintenance of Sage Grouse Habitats" (Braun, *et al*, 1977) will be used as a basis to develop site-specific recommendations for any proposed sagebrush treatments on lands identified as containing sage grouse on the Forest (p. III-33). The Forest will work closely with the IDFG to identify important fish and wildlife habitats, and to develop procedures to maintain or improve them (p. III-33).

Current Situation And Need For Change

In general, inventory of MIS has been limited to TES species (bald eagles and goshawks) and hunted species (elk, mule deer and sage grouse). For the other species, basic and baseline data has never been collected. The lack of emphasis on inventory, analysis and monitoring is a direct result of budget and work priorities set by the Forest.

Many of the existing MIS are not effective as MIS, because they do not meet the criteria for selection as MIS (described in next section). Bald eagles are not widespread across the Forest. Mule deer and elk are habitat generalists, migratory and don't show direct responses to changes in habitats on NFS lands. Hairy

woodpeckers are forest generalists, using a wide variety of forest types and habitat components (live and dead trees) and are difficult to monitor and get any kind of population trend information.

Indicators should be chosen for specific habitats identified as being at risk through the Caribou Properly Functioning Condition process or the Interior Columbia Basin analysis, or where there is a high level of management activity, or where there is critical habitat for TES. Other habitats can be grouped under broad headings and monitored less intensively.

Process Used for Caribou Revision

REGION ONE AND REGION FOUR TERRESTRIAL PROTOCOLS

In 1997, the Region One/Four Terrestrial Protocols were approved. In Appendix D of that document, the key steps to identifying MIS are to select an indicator:

(1) of environmental/ecological conditions including native ecological processes;
(2) affected by management activities on NFS lands; and that is
(3) a native or restricted range species;
(4) a keystone species or habitat specialist;
(5) found on most or all of the administrative units in the planning area;
(6) a year-long resident of the planning units and vicinity;
(7) relatively easy to monitor for population levels and habitats;
(8) feasible to monitor populations and habitat conditions at similar scales; and for which
(9) baseline data (population trends and/or habitat conditions) is already in place.

An indicators response to environmental change is one based on an indicator's sensitivity, specificity and predictive value. A good indicator will be sensitive to the underlying condition of interest and will be specific to the condition of interest. Sensitivity and specificity, along with the ability to measure the response of the population being studied determine the indicators predictive value.

Table 34. Suggested MIS in R1/4 Terrestrial Protocols.

HABITATS POTENTIALLY INFLUENCED BY MANAGEMENT	MIS REFLECTING STAND AND/OR PATCH REQUIREMENTS
Single-story old growth	Flammulated owl
Fire-killed stands	Black-backed woodpecker*
Aspen	Red-naped sapsucker
Riparian shrub	Beaver
Sage	Sage grouse or Brewer's sparrow
Shortgrass prairie*	Prairie dog*
Mixed grass prairie*	Sharp-tailed grouse
Tallgrass prairie*	Greater prairie chicken*
Mountain mahogany	Mountain mahogany

• *Not found in the analysis area*

Caribou Proper Functioning Condition Assessment

Proper functioning condition (PFC) assessments were done at the Regional scale (1997) and at the Forest level (1999). This process was used to identify systems at risk of not being in proper functioning condition (resilient to perturbations to structure, composition, and processes of their biological or physical processes.

Table 35. Habitats and Degree of Departure from PFC.

Vegetation Type	Intermountain Region Degree of Departure	Caribou NF Degree of Departure	Rationale from Caribou PFC Analysis
Limber Pine	Moderate	Low	Balanced range of structures, size and age classes
Spruce/fir	High	**High**	Increased mature and old age classes, endemic insect and disease, non-lethal fire regimes are out of historic intervals
Aspen	High	**High**	Mostly old age aspen, conifers replacing aspen, fire regime outside historical range
Lodgepole pine	Moderate	Low	Structurally imbalanced, high seed-sap, very low pole. Extent has changed little and resilient after fire
Douglas-fir	Moderate	Moderate	Decrease in non-lethal fires has increased understory in stands, increased subalpine fir and allowed DF to become established in aspen, mountain brush and sagebrush
Maple	Not assessed	Moderate	Expanding into sagebrush and mountain brush communities, affects hydrologic conditions
Pinyon-juniper	**High**	**High**	Expanding into sagebrush, mountain brush and riparian areas. Affects hydrologic conditions
Mountain mahogany	Moderate	Moderate	Within historic range, but older plants with little regeneration.
Mountain brush	Low	Moderate	Lack of multiple vegetation layers and structural diversity, mostly older age classes
Tall forb	**High**	**High**	Species composition is out of balance, increased bare ground, soil loss
Sagebrush	High	Moderate	Structural stages out of balance, increase in bare soil and soil loss.
Riparian areas	**High**	**High**	Of assessed streams, only 30% in PFC, 60% FAR and 10% non-functioning

Idaho Partners in Flight

Idaho Partners in Flight prioritized habitats by looking at the number of birds that use a habitat as primary breeding habitat; and the numbers of high priority birds that use the habitats. They also considered the loss of habitat in quantity and quality, including the amount of habitat within the state and the amount that

is in management status that provides moderate to good protection from degradation. Based on these criteria, they identified their priorities as **riparian, non-riverine wetlands, sagebrush shrublands** and **ponderosa pine** (not found on the Caribou NF).

Interior Columbia Basin

Analysis for the Interior Columbia Basin study (Wisdom, *et al*, 2000) found that source habitats for most species declined strongly from historical to current conditions. Strongest declines were for species dependent on low-elevation, old forest habitats (ponderosa pine not found on the Caribou), for species depending on combinations of **rangelands or early-seral forests** and for species dependent on **native grassland and open-canopy sagebrush habitats**.

Widespread but less severe declines also occurred for most species dependent **on old forest habitats present in various elevational zones**; for species dependent on **early seral forests**; for species dependent on **native herbland, shrubland and woodland habitats**; and for species dependent on **native sagebrush habitats**.

Summary of habitats at risk (from all sources)

- Spruce/fir
- Aspen
- Pinyon-juniper (no pinyon on Caribou)
- Tall forb
- Riparian
- Non-riverine wetland
- Sagebrush shrublands (including open-canopy habitats)
- Grasslands
- Early seral forests
- Old forests at various elevations

Selection Of MIS For The Caribou Revision

HABITATS AT RISK

Of the habitats identified as being at risk, several will not have wildlife management indicator species identified for monitoring. Monitoring of vegetation structure, composition and distribution would be more effective for these habitats, as explained below:

1) **Non-riverine wetlands** are a minor component on the Forest. Elk Valley Marsh is the largest example and is being proposed as a Wild and Scenic River under the Recreation River category. Management direction specific to 2.5 should be adequate to address this habitat.

2) **Juniper**. This type is found on roughly 2 percent of the Forest. Juniper has increased beyond its historic range on the Forest (CNF 1999). This type is not at high risk and species associated with

this type are not at risk based on habitat considerations. Spotted towhees are associated with this type but are very secretive by nature and would be difficult to monitor. They do have distinctive vocalizations, but that would just give presence/absence information. There are other species associated with this type, but generally they are not strongly associated with this type, and are migratory, non-residents whose populations would not reflect changes in habitats. Any monitoring in this type should be of distribution and structure of the stands (agrees with R1/4 Terrestrial Protocols).

3) The **tall forbs** type has been identified as being at high risk. However, these sites have been highly modified by historic sheep grazing and it is unknown how many sites are actually in functioning condition. Other analyses have identified the pocket gopher and several bird species as being associated with this type. The birds are migratory, not strongly associated with this vegetation type and would not reflect changes in habitat (if there is any left). The pocket gopher would be easier to monitor but is found in a wide variety of types. These habitats should be monitored for vegetative species composition to see how well they fit historic species composition.

4) **Riparian**. The Draft Revised Plan identified beaver as the MIS for riparian habitats. However, after review it was decided that it would not be possible to determine population trends and be able to relate them to forest management. Amphibians were then considered as MIS; west-wide population declines have been attributed to many factors. Again, any changes in trends on the Forest, may not be tied directly to changes in forest management. Lastly, breeding bird complexes were considered as MIS. In general, breeding birds do not make good MIS because many of them are migratory, and they are exposed to many other factors that can affect populations. We considered monitoring the number of species of breeding birds and relate to changes in shrub riparian vegetation. However, this does not meet the intent of MIS and population trends of individual species could not be determined at this level. It was decided that riparian shrub vegetation would be monitored.

5) **Early seral forest structure** . Snowshoe hares are affected by management activities, and are yearlong residents. However, they are expected to be at such low densities that it would be impossible to determine population trends. Birds were also reviewed for use as MIS. Hutto (1995) identified about eighteen species that use variously cut forests, with Williamson's sapsucker as the one that best illustrates patterns of use in managed forests. This species is migratory, and is fairly shy and wary, making them harder to survey with any degree of accuracy. Recommend monitoring changes in amount of early seral forest rather than a particular wildlife species.

6) **Aspen**. The red-naped sapsucker is currently an MIS for the Caribou and was identified as a MIS in Region 1 and 4 Terrestrial Protocol. However, this is a widespread species and changes in abundance would be very difficult to correlate to changes in aspen habitats on the Forest. Recommend monitoring changes in aspen rather than a particular wildlife species.

PROPOSED CARIBOU MIS

Generally MIS are used to determine how changes in habitat would affect other species associated with those habitats. In some cases, it may be more appropriate to use species/habitat relationships to infer population trend. Some of the reasons that this may be done are:

1) the species is relatively common, and risk of extirpation is low;
2) habitat is known to be a primary factor influencing populations; and
3) valid studies are available that relate the species to habitat.

These criteria do not apply to riparian breeding bird complexes, red-naped sapsucker and snowshoe hare and other species that were considered to replace them. This was discussed in the previous section. For this reason, they have been dropped and habitat monitoring will be done in its place.

Table 36. Habitats At Risk and Suggested MIS.

HABITAT	SPECIES	RATIONALE
Grassland and open canopy sagebrush	Columbian sharp-tailed grouse	Only one of the SAR that is a yearlong resident that also has monitoring data. It is also a sensitive species.
Sagebrush	Sage grouse	Currently a MIS for the Caribou and was identified as a MIS in Region 1 and 4 Terrestrial Protocol. Some monitoring data exists.
Mature and Old Forest structure	Goshawk	Currently this is a sensitive species and some monitoring data exists. Goshawks use a variety of forest types and structural stages within their foraging areas.

* Finch 1989; Sanders and Edge, 1998; and Bradford, *et al*, 1998

The Columbian sharp-tailed grouse and goshawk are discussed as TES in that section of this process paper. Sage grouse are discussed in more depth, including documentation of habitat relationships in the MIS Viability section.

Selected Species, How They Meet Criteria And Monitoring

COLUMBIAN SHARP-TAILED GROUSE

This species is associated with grassland, and open canopy sagebrush. Both native and cultivated range and grasslands are used for nesting. In rangelands, most research indicates that this species shows a preference for nesting sites with shrubs. When available, sagebrush is the preferred nesting habitat, but other commonly used shrubs include snowberry, serviceberry, antelope bitterbrush and other mountain shrubs (Ulliman, 1995).

While there are numerous leks documented adjacent to the Forest, none are on National Forest system lands. Sagebrush and grassland habitats on the Forest may provide nesting, brood-rearing, and winter habitat. IDFG has been monitoring leks at irregular intervals for the last couple of decades. While population fluctuations are likely, due to habitat and climatic changes, long-term trends would reflect changes in habitat conditions.

While leks (where populations are most easily monitored) are not on Forest, changes in populations could reflect changes in habitat conditions on the Forest. Where trend data is available, a decline of 20 percent in the number of male grouse for three years would initiate a further analysis, done in cooperation with IDFG.

SAGE GROUSE

General Ecology

Sage grouse depend primarily on sagebrush habitat for much of the year, although meadows and mesic sites are seasonally important habitat components (Connelly, *et al*, 1988). Sage grouse prefer sagebrush

habitats year round, however other shrubs within the sagebrush community may be used (Braun, *et al*, 1977). During the winter months sage grouse rely almost exclusively on sagebrush with a relatively dense canopy for food and cover. Sagebrush provides nesting habitat in the spring; other shrubs in the community may be used but nest success is reduced. Sage grouse have higher nesting success in sagebrush communities with a dense canopy and tall grasses that result in lower predation rates (DeLong, *et al*, 1995).

Sage grouse are dependent on sagebrush for food from all to spring. During spring, the diet shits to forbs. Forbs and insects are a fundamental part of the diet of sage grouse chicks. During the early part of a chick's life insects (beetles and ants) predominate the diet. After this time, forbs become the most important food. In addition, forbs provide essential nutrients for pre-laying sage grouse hens, which may ultimately affect their reproductive success. Sage grouse hens consume fewer forbs and more shrubs as forbs begin to dry out.

Currently, there are several leks within four to five miles of the Forest boundary. While generally, the leks are not on the Forest, the Forest may be used by sage grouse for nesting, brood-rearing or winter habitat. Approximately 56 percent of the sagebrush on the Forest is within ten miles of known sage grouse leks.

For more information on sage grouse, see the sage grouse section of the Viability Analysis.

Use as MIS

This species is associated with sagebrush steppe. Current sage grouse management guidelines (Connelly, *et al*, 2000) identify breeding habitat as having sagebrush canopy cover of 15-25 percent, with perennial grasses and forbs in the understory.

While there is one lek documented on the Forest, there are many within several miles of the Forest Boundary. Sagebrush habitats within twenty kilometers of active leks may provide nesting, brood-rearing, and winter habitat for sage grouse. IDFG has been monitoring leks at irregular intervals for the last couple of decades. While population fluctuations are likely, due to habitat and climatic changes, long-term trends would reflect changes in habitat conditions.

Habitat management guidelines have recently been updated (Connelly, *et al*, 2000). These guidelines (nesting, brood-rearing and winter habitat) would be incorporated at the site-specific level where appropriate. While leks (where populations are most easily monitored) are not on Forest, changes in populations could reflect changes in habitat conditions on the Forest. A decline of 10 percent or more in the number of male grouse would initiate a further analysis in cooperation with IDFG.

NORTHERN GOSHAWK

Nest territories have been found over several areas of the Forest generally associated with mature to old aspen and coniferous forest. Known nesting territories are relatively easily monitored on a yearly basis to determine if active nesting is occurring. Though population fluctuations are likely due to climate, availability of prey, and other factors, long-term data should reflect habitat suitability.

Monitoring on a three-year rotation basis would document the number of active territories. Monitoring would occur on an annual basis in site-specific areas where mitigation measures are employed. A decline in active status of 20 percent of the known territories in a three-year period would constitute a concern requiring management action.

Consistency With Adjacent Forests

The Targhee NF Forest Plan depends mostly on TES for MIS. They use Bald eagle, trumpeter swan, spotted frog, common loon and harlequin duck for riparian MIS, elk, wolves and grizzly bears; three-toed woodpeckers for primary cavity nesters; forest owls, forest furbearers, northern goshawk and red squirrel for forest habitats and peregrine falcon for cliff habitats.

In the case of riparian MIS, the beaver meets the criteria for selection better than those of the Targhee NF. They are year-round residents, strongly associated with shrubby riparian, well distributed across the forest, and are relatively easy to monitor for presence/absence (dams and lodges). Species selected by the Targhee NF are not well represented on the Caribou NF. There are only two known bald eagle nesting areas, and scattered winter habitat (low levels of use). Swans, loons and harlequin ducks are not present on the Caribou.

Big game species do not meet the criteria for selection of MIS. While they are widespread, they use a variety of habitats and their populations depend on many variables (such as hunting). There is no way to make a direct correlation between changes in habitat and changes in populations. While the Caribou NF does not propose big game as MIS, they will be considered as a species of special interest.

There are several forest-associated species that were considered but not selected. The three-toed woodpecker has been documented on the Caribou, but no nesting has been documented (although suspected). We have no baseline data, they are not easy to monitor, populations fluctuate based on insect (prey) activity, all of which decrease their suitability as MIS. The forest owls (boreal, flammulated and great gray) are documented as being present across the Forest, but again, nest locations are not known. These species are more difficult to monitor (nocturnal, breeding season in early spring when accessibility is often limited) and overall forest suitability would be predicted based on goshawk monitoring. Old growth and snag requirements in the Revised Forest Plan would provide those habitat components.

The Wasatch-Cache NF is also revising their Forest Plan. They are considering several breeding birds as MIS (Brewer's sparrow and vesper sparrow for sagebrush, warbling vireo for sapling aspen, McGillivary's warbler for riparian shrub and ruby-crowned kinglet for spruce/fir). They recognize the problems associated with the use of breeding birds, but feel that they are already collecting data on these species, and will continue to gather data, so will try to make these work. In addition, they have goshawk for aspen/mixed conifer and snowshoe hare for pole/sapling conifer. The Caribou NF dropped the snowshoe hare because they are believed to be at such low densities that population trends would be very difficult to determine. Goshawks are MIS for both Forests.

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Terrestrial Wildlife Species Viability

Introduction

National Forest Management Act (NFMA) regulations require National Forests to provide habitat in order "to maintain viable populations of existing native and desired non-native vertebrate species in the planning area." It goes on to define a viable population as "one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed throughout the planning area." The regulations (36CFR219.19) also direct that "habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning unit."

A Risk Assessment includes review of risks to species habitat or populations, a ranking of the level of that risk and an overall Risk Rating, based on the results of the risks associated with those activities occurring on Forest Service lands. Three levels of risk have been used: low, medium and high.

Low risk – there is a high likelihood that the populations would meet population viability criteria. Effects to individuals range from temporary displacement, short-term modification of habitat.

Moderate risk – there is an intermediate likelihood that populations would stabilize. Effects on individuals range from reduced productivity, displacement from important seasonal habitats that are limited in distribution.

High risk – it is highly unlikely that species populations would be maintained. Effects on individuals range from direct or indirect mortality of adults or young, elimination of habitat for a known population that has limited distribution, significant fragmentation of habitat where species dispersal is eliminated or significantly reduced.

To address the criteria that a species or habitat is "well-distributed" throughout the Planning area, geographic distribution of the species and its habitats need to be considered. The interpretation of "well-distributed" must be based on species' natural history and historical distribution, and the potential of the habitat, and recognition that habitat and population distribution are likely to be dynamic over time.

The regulations also direct management "to provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple use objectives. Forest planning shall provide for diversity of plant and animal communities and tree species consistent with the overall multiple-use objectives of the planning area."

Ecological sustainability means maintaining the composition, structure and processes of an ecological system. Species diversity and productivity can be preserved by maintenance of these, as well[1]. Composition refers to the biodiversity of an ecological system. Structure refers to the biological and physical attributes of sites and landscapes. Ecological processes include photosynthesis, nutrient cycling, energy flow, water movement, disturbance and succession.

Strategies that influence environmental use are often broad in scale and not focused on individual species. A community or broad-scale approach to the conservation of biological diversity is the coarse-filter approach. The process includes:

(1) delineating the planning area;
(2) comparing existing distribution of communities to pre-settlement patterns;
(3) describing changes in disturbance regimes;
(4) developing conservation measures to address community conditions and habitats for associated species; and
(5) comparing future community distribution after implementation.

This approach suggests that viable populations will be maintained when the communities in question are functioning within range of variability, including processes and structure.

The coarse-filter approach contrasts with the fine-filter approach of conserving individual species. The majority of strategies are developed for individual species are set up either because the species is endangered or because it is a game species.

General Process

An interregional process (FS Regions 1 and 4) was initially identified by the Forest Service to assess viability for species (R1/4 Terrestrial Protocols 1997). More recently, a national "White Paper on Managing Viable Populations" was prepared and evaluated through peer review and is currently being updated to incorporate new information and issues raised during the review (UDSA 2001). The White Paper viability process, involves several steps. The process used to address species viability includes the following steps:

1) Description of the ecological context;
2) Identification of species-at-risk and collection of information;
3) Description of key conservation elements for those species;
4) Development of Forest Plan alternatives;

[1] Committee of Scientists Report

5) Risk Assessment and Analysis of effects on viability of the Forest Plan alternatives; and
6) Monitoring.

A more recent paper (Andelman, *et al*, 2001) outlined nine general recommendations for conducting viability assessments. These nine recommendations have been incorporated as appropriate or possible. They also included four general recommendations for biologists at the Planning level, which have been incorporated into the following analysis:

- Adopt a systematic and consistent approach to identifying species-at-risk.
- Use broad-scale and quantified analyses where possible.
- Use structured, credible and repeatable approaches for eliciting, interpreting and using expert opinion.
- Make uncertainty and its implications explicit.

Description of the Ecological Context

INTERIOR COLUMBIA RIVER BASIN ASSESSMENT

When possible, approaches to species viability for broadly distributed species should incorporate any large-scale assessments available. Bioregional assessments are typically large-scale assessments that consider landscape patterns within similar biophysical boundaries. Bioregional assessments transcend land ownership patterns, and allow us to address issues of context relative to biophysical attributes that occur on Forest Service administered lands. They describe historic conditions, current status, and future trends of ecological, social and/or economic conditions and their relationship to the sustainability of the land base. They typically include both the causal processes and the resulting patterns, emphasizing the interactions among disturbance processes in creating patterns and the expected variability in them.

The northern part of the Forest is included in the Interior Columbia Basin assessment, and findings from that analysis have been incorporated. The southern part of the Forest has recently been analyzed in the Utah-Wyoming Rocky Mountain Assessment, by Noss for the Nature Conservancy. This report is briefly summarized in the Species Richness/Hot Spots section of this Process Paper.

For this analysis, Upper Columbia River Basin and Interior Columbia River Basin information was used. Information on pre-settlement conditions, current conditions, ecological integrity, habitat outcomes for species-at-risk, source habitats, and hot spot analysis was incorporated into different areas of the following analysis.

Ecological integrity was evaluated in ICBEMP (1996), where data was available. Forest integrity ratings for the Caribou NF was high for the Caribou/Diamond/Webster Unit, Rangeland integrity was low for the Westside units and Aquatic integrity was rated moderate for all of the Forest analyzed in CRB.

Dry forest potential vegetation types analyzed in UCRB that are found on the Caribou NF include the dry Douglas-fir types without ponderosa pine. Changes in structure and composition that have been identified include an increase in young tree stands, decrease in older, standing dead and downed trees, an increase in shade-tolerant species, and changes from open park-like stands to dense overstocked stands with multiple canopy layers. These changes are largely a result of timber harvest, livestock grazing (fuels reduction) and fire suppression. These changes make these types more vulnerable to insects and disease,

greater risk of severe fires and decreased diversity. These forest types are generally more accessible due to lower elevations and are generally more heavily roaded, increasing the potential for disturbance and displacement. They are also generally adjacent to the Forest boundary and may be affected by adjacent subdivisions. These types are also vulnerable to noxious weeds.

The **cold forest potential vegetation types** analyzed in UCRB that are found on the Caribou NF include spruce-fir, with or without aspen and lodgepole pine. Changes in structure and composition are less noticeable in these forest types because of longer fire intervals and fewer human-caused disturbances. These types have seen a general shift to dominance by shade tolerant species or a mixture of shade-tolerant and intolerant species. These changes result in higher fuel loads and increasing potential for lethal, stand-replacing fires. Much of the areas that have been harvested is highly susceptible to tree mortality from fire, insects, disease and stress.

The **dry shrub potential vegetation types** analyzed in UCRB that are found on the Caribou NF include antelope bitterbrush, basin big sage steppe and Wyoming big sage. The **cool shrub potential vegetation types** found on the Caribou include mountain big sage and mountain shrub types. These groups have a high departure from historical conditions due to agriculture, improper grazing, and changes in fire regimes. As a result, lower productivity, higher probability of severe events, and lower similarity to diversity (due to an increase in exotics and noxious weeds) is expected. Woodlands have also increased on cool shrublands and upland grasses and forbs have decreased.

UCRB identified three potential vegetation groups associated with **riparian** areas: woodlands, dominated by cottonwood, aspen and Douglas-fir); riparian shrub (dominated by alder and willow); and riparian herb (including sedges, forbs and grasses). Because of the long, linear nature and interspersion of types all of these types were lumped into one group, which corresponds to the riparian group above. Changes in riparian areas include increased fragmentation due agriculture, dams, urban development, decrease in the large tree component, increase in juniper woodlands, and exotic grasses and forbs. To a lesser extent, disturbances associated with recreational uses, urban development and mining have contributed to the decline in function of riparian areas.

Many **wetlands** on private lands have been greatly modified. Most of the remaining high quality wetlands in UCRB area are on public lands, primarily in alpine or subalpine environments or on other lands managed as National Wildlife Refuges. These types correspond to the non-riverine wetland group listed above.

Southeast Idaho wetlands were identified and classified by Jankovsky-Jones (1997). Class I sites represent high quality examples of plant communities and often provide habitat for high concentrations of state rare plant or animal species. There were none identified on the Caribou. Class II sites have good to excellent assemblages of common plant community types or the occurrence of a rare community type. Elk Valley Marsh was identified as a Class II site even though the area has been impacted by past grazing. Improved grazing management could enhance ecosystem function at this site. Other sites on the Forest that were identified as Reference or Habitat Sites include Crow Creek/Julies Fence, Horse Creek, Preuss Creek headwaters, Stump Creek Exclosure, Swan Lake and The Ponds. Application of Best Management Practices to these sites would provide for maintenance of habitat functions.

IDAHO BIRD CONSERVATION PLAN

Idaho Partners in Flight prioritized their habitats by looking at the number of birds that use a habitat as primary breeding habitat; and the numbers of high priority birds that use the habitats. They also considered the loss of habitat in quantity and quality, including the amount of habitat within the state and

the amount that is in management status that provides moderate to good protection from degradation. Based on these criteria, they identified their priorities as riparian, non-riverine wetlands, sagebrush shrublands and ponderosa pine.

Past impacts to riparian areas have resulted from channelization/diversion, (mostly at lower elevations), widespread removal of beaver, fire suppression, livestock grazing, recreational development, agriculture (off-Forest), road locations and past mining (IPIF, 2000). IPIF identified past activities that have affected sagebrush habitats as livestock grazing, sagebrush eradication to produce forage, seeding of non-native species, invasion by non-natives, conversion to agricultural and urban development, and recreation (hunting and increased use of off-road vehicles).

CARIBOU PROPER FUNCTIONING CONDITION ASSESSMENT

Proper functioning condition (PFC) assessments were done at the Regional scale (1997) and at the Forest level (1999). This process was used to identify systems at risk of not being in proper functioning condition (resilient to perturbations to structure, composition, and their biological or physical processes).

Table 37. Habitats and Degree of Departure from PFC.

Vegetation Type	Intermountain Region Degree of Departure	Caribou NF Degree of Departure	Rationale
Limber Pine	Moderate	Low	Balanced range of structures, size and age classes
Spruce/fir	High	**High**	Increased mature and old age classes, endemic insect and disease, non-lethal fire regimes are out of historic intervals
Aspen	High	**High**	Mostly old age aspen, conifers replacing aspen, fire regime outside historical range
Lodgepole pine	Moderate	Low	Structurally imbalanced, high seed-sap, very low pole. Extent has changed little and resilient after fire
Douglas-fir	Moderate	Moderate	Decrease in non-lethal fires has increased understory in stands, increased subalpine fir and allowed DF to become established in aspen, mountain brush and sagebrush
Maple	Not assessed	Moderate	Expanding into sagebrush and mountain brush communities, affects hydrologic conditions
Pinyon-juniper	High	**High**	Expanding into sagebrush, mountain brush and riparian areas. Affects hydrologic conditions
Mountain mahogany	Moderate	Moderate	Within historic range, but older plants with little regeneration.
Mountain brush	Low	Moderate	Lack of multiple vegetation layers and structural diversity, mostly older age classes
Tall forb	**High**	**High**	Species composition is out of balance, increased bare ground, soil loss
Sagebrush	High	Moderate	Structural stages out of balance, increase in bare soil and soil loss.
Riparian areas	**High**	**High**	Of assessed streams, only 30% in PFC, 60% FAR and 10% non-functioning

All of these analyses collected information on the amount and distribution of major vegetation types and their successional stages; amount and distribution of aquatic, wetland and riparian habitats; the type, intensity and frequency of major disturbance processes that shape ecosystems; and the condition of soil, water and air resources. Historical conditions of these elements were compared to current conditions to address sustainability.

Identification of Species-at-risk

The list of species-at-risk was compiled from several different sources. First, the existing threatened, endangered and sensitive species were incorporated. Next, the Conservation Data Center (CDC) lists were reviewed to incorporate Species of Special Concern (SSC). Then species from the Interior Columbia Basin (ICB) study and bird species from the Idaho Bird Conservation Plan (IPIF, 2000) were reviewed and incorporated as appropriate. Finally, the list of species of concern from the USFWS (9/00) was reviewed and incorporated as appropriate. Information from the CDC, regional specialists, the "Idaho Atlas of Wildlife" (Groves, *et al*, 1997) and "Idaho Bird Distribution" (Stephens and Sturts, 1998) was used to determine those species that may be present on the Caribou National Forest or vicinity.

The CDC only tracks their "Idaho Species of Special Concern" (SSC). This information is found on their website (www2.state.id.us/fishgame/ngconcrn). These species are ranked as Priority (A), Peripheral (B) and Undetermined Status (C). Information for any other species that are not tracked by CDC was taken from the "Idaho Atlas of Wildlife." Where state rank is shown: S1 = critically imperiled, S2 = imperiled, S3 = rare or uncommon, S4 = not rare, apparently secure and S5 = widespread, abundant and secure.

Appendix D of the ICB study (Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin, 1996) lists species with current outcomes of 4 or 5. These are species using patchy or poorly distributed habitats with a concern of extirpation or viability loss. This list was then reviewed against the "Idaho Atlas of Wildlife" to determine which species were likely to be present in southeast Idaho.

The Idaho Partners if Flight released their "Bird Conservation Plan" in January 2000. In it they identify high priority breeding bird species in Idaho. Factors used to identify vulnerability (high priority) include relative density, population trend, threats to breeding habitats, relative abundance, size of breeding range, size of non-breeding range and threats to species in non-breeding habitats. The species that were determined to be high priority breeding birds in Idaho are listed in Appendix 2 of that document and are incorporated here as appropriate. Primary breeding habitats are incorporated for these species.

Finally, the USFWS has identified species for which they have a concern about population status and long-term viability (9/1/2000). These species have been incorporated as appropriate.

The draft list was reviewed by Idaho herpetology and vertebrate specialists. Charles Peterson, Dept of Biological Sciences, Idaho State University, reviewed the amphibians and reptile section. Charles Harris, Principal Wildlife Research Biologist for IDFG Nongame and Endangered Wildlife Program (CDC) reviewed the rest of the list. His comments were also incorporated.

Existing information was collected on this Species-at-risk list (see Selection of SAR Process Paper). This included distribution, trends (where available), and habitat associations. Habitat amount, distribution and trend information was incorporated from existing vegetation data for the Forest, Proper Functioning Condition Analysis (1999) and Interior Columbia River Basin analysis. Information on habitat

specialization (generalist versus specialist) was gathered from Wisdom, *et al*, (2000), Hutto and Young (1999) and R4's Species-at-risk spreadsheet (McCarthy, 2001). Limiting factors/risk factors have been identified in some of these same documents. Information on significant long-term population declines or increases, based on Breeding Bird Surveys, has been incorporated where available (Saab and Rich, 1997).

AMPHIBIANS/REPTILES

▶*Northern leopard frog*

Historically common, and still numerous in some areas, but declining overall. Generally associated with heavily vegetated marshes, ponds, and streams and strongly associated with beaver ponds (Peterson, pers. comm.). N Am distribution is from Canada, south to Kentucky and New Mexico. In Idaho, they are found throughout much of the southern part of the state, following the Snake River Plain, and in the northern Panhandle. On the Caribou NF, they are currently only known in the Toponce Creek drainage. Ranked G5/S3. (Information taken from http://www.imnh.isu.edu/digitalatlas/ida_ecology). They are ranked as having a moderate degree of habitat specialization (McCarthy, 2000)

▶*Western (boreal) toad*

Generally widely distributed in Idaho, but identified as a species of concern for the Caribou based on survey results. Historically they were present in several areas of the Forest, now can only be found in the Tin Cup drainage. Peterson feels that this is the number one herpetological species of concern for the Caribou NF. Chytrid fungus has been identified as a potential factor contributing to their decline. Genetics have shown that this toad population is more similar to Utah and Colorado toads than to Yellowstone, Montana and northern Idaho toads. They are largely terrestrial but can generally be found within a fair proximity to water. Eggs are laid in water and larvae (tadpoles) are restricted to these habitats until metamorphosis. Ranked G4/S4. (Information taken from http://www.imnh.isu.edu/digitalatlas/ida_ecology). McCarthy ranks this species as having a low degree of habitat specialization.

▶*Common garter snake*

According to Peterson, this species used to be common, now common in "hotspots". Often associated with leopard frogs, as they are a common prey species. Usually found in habitats associated with water, such as streams, rivers and ponds. Idaho distribution is generally statewide. Ranked G5/S5. (Information taken from http://www.imnh.isu.edu/digitalatlas/ida_ecology). McCarthy ranks this species as having a moderate degree of habitat specialization.

MAMMALS

▶*Gray wolf*

T&E, experimental, non-essential. Scattered unconfirmed but probable reports over the years. Expected to increase as wolves disperse from Yellowstone. See TES Process Paper for more information.

▶*Lynx*

T&E. There are historical trapping records from several locations, including Webster Range (Georgetown), and Bear River range. There are ongoing detection surveys in the Webster Range. Harris reports that CDC has thirty-five records for lynx on the Caribou-Targhee NF. See TES Process Paper for more information.

▶*Spotted bat*
Now listed as sensitive species and ICB. According to Groves, *et al*, (1997) this species has only been found in southwest Idaho. Harris reports mist-netting a spotted bat on the Middle Fork of the Salmon River (August 1998), which greatly expands its known range in Idaho, but still not close to southeast Idaho. Has not been found in surveys on the Caribou, but is a difficult species to survey. A map showing locations shows that they have been found in south central Montana and down into western Wyoming. There is also one record from a city in Utah. The Caribou is between those points, and southwest Idaho, so the Caribou is within the species distribution. However, distribution is patchy and limited geomorphically, by roosting habitats. See TES Process Paper for more information.

▶*Western big-eared (Townsends) bat*
Forest Service sensitive species. This species has been found on the forest. See TES Process Paper for more information.

▶*Wolverine*
Now listed as a sensitive. Not listed as present in se Idaho by Groves, *et al*, (1997) but there are reported observations from the Bear River range, Portneuf range and south end of Preuss range (1992, 1993). See TES Process Paper for more information.

▶*Silver-haired bat*
Occurs in southeast Idaho, considered S4 by CDC. Has been found on surveys on the Forest. Forages on small to medium-sized insects over small water bodies in conifer forest. Roosts singly or in small groups in tree foliage, cavities, under loose bark or sometimes in buildings. Occurs throughout US and most of southern Canada. Distribution in Idaho is not well known, but is thought to be statewide in coniferous forests. Ranked G5/S4. McCarthy ranks this species as having a low degree of habitat specialization. Wisdom et al (2000) put this species in family group 2, which are species using broad-elevation old-forest. Species in this group use late-seral multi- and single-layered stages of the montane community as source habitat. Juxtaposition of early and late-seral stages is needed to meet all aspects of life functions for this species, which is identified as a "contrast species."

▶*Western small-footed myotis*
Occurs in southeast Idaho, considered S4 by CDC. USFWS identified concerns for this species. Found on surveys on the Forest. Range in from southwestern Canada through western US into Mexico. Distribution in Idaho is poorly known, but believed to be fairly widespread across the southern part of the state. Ranked G5/S3. In summer it roosts in rock crevices, under boulders, beneath loose bark and in structures in arid habitats. Known to winter in lava-tube caves in southern Idaho. McCarthy ranks this species as having a moderate degree of habitat specialization. Wisdom, *et al*, (2000) put this species in family group 7, which are species using a complex pattern of forest, woodlands and sagebrush cover types.

▶*Long-legged myotis*
Distribution maps show that this species is found statewide, where suitable habitat exists, typically in montane coniferous forest and riparian habitats. This species has been found on the Forest. This is the most common bat in the western US, but distribution in Idaho is poorly known. Summer roosts include buildings, rock crevices and under bark. Ranked G5/S3. McCarthy ranks this species as having a low degree of habitat specialization. Wisdom, *et al*, (2000) put this species in family group 7, which are species using a complex pattern of forest, woodlands and sagebrush cover types.

▶*Long-eared myotis*
Widespread from central BC south to Baja California. Distribution in Idaho is poorly known but information suggests that it is found statewide, where suitable habitat exists. Generally a forest-dwelling

bat that forages over water or among trees. An Idaho study found roosts always located near water. Roost in buildings, hollow trees, mines, caves and fissures. Has been found on surveys on Forest. Ranked G5/S3. McCarthy ranks this species as having a low degree of habitat specialization. Wisdom, *et al*, (2000) put this species in family group 7, which are species using a complex pattern of forest, woodlands and sagebrush cover types.

►*Pallid bat*

Ranges from British Columbia south to central Mexico. Distribution in Idaho includes southeast Idaho and area of Caribou NF where they are found in rocky, river canyons and cliffs near water. Usually forms in clusters in roosts in rock crevices or buildings, less often in caves, hollow trees or mines. Catches prey on ground after aerial searches. Ranked G5/S1. McCarthy ranks this species as having a low degree of habitat specialization. Wisdom, *et al*, (2000) put this species in family group 7, which are species using a complex pattern of forest, woodlands and sagebrush cover types.

►*Northern flying squirrel*

Occurs on the Forest. Prefers coniferous and mixed forests. Optimal conditions are cool, moist mature forest with abundant standing and downed logs. Distributed from Alaska east through Canada and south in Rockies, Great Lakes region and Appalachians. Distributed across Idaho in suitable habitats. Ranked G5/S4. McCarthy ranks this species as having a moderate degree of habitat specialization. Wisdom, *et al*, (2000) put this species in family group 2, which are species using broad-elevation old-forest. Species in this group use late-seral multi- and single-layered stages of the montane community as source habitat. They are also dependent on snags for nesting/foraging, use large hollow trees and used downed logs for foraging on prey species.

►*Pygmy rabbit*

USFWS has identified concerns for this species. Potentially occurs on the west side of the Forest in dense sagebrush stands. Harris reports 2 records for the Caribou NF vicinity, both from the 1930's; one in Trail Creek on the north end of the Bannock range and one from Pocatello Creek to the east of Pocatello (well off-Forest). Current distribution on west side of Forest is uncertain. Associated with sagebrush habitats with dense canopy cover and deep soils. Range from Great Basin north to southwest Montana. In Idaho, distribution is in the southern part of the state in sagebrush habitats. Ranked G5/S3. This species will be discussed individually.

►*Marten*

Documented as occurring in the extreme north end of the Caribou NF (between Palisades and Grays Lake). Ranges throughout Canada and Alaska, and south through Rockies, Sierra Nevada, northern Great lakes and northern New England. In Idaho, range is generally northern, with small areas extending down into southeastern Idaho. Usually found in dense coniferous forest, in Idaho greatest use is in older stands of spruce-fir. Ranked G4/S4. This species will be discussed individually.

►*Uinta chipmunk*

Distributional records are disjunct, but range extends from southwest Montana south to northern Arizona and from western Colorado into eastern California. Has been found in the Bear River range in southeast Idaho. Found in coniferous forests, often near logs and brush in open areas, and at edges of forests. Ranked G5/S1. McCarthy ranks this species as having a moderate degree of habitat specialization.

BIRDS

►*Trumpeter swan*

Now listed as sensitive. Found around Grays Lake, Bear River. See TES Process Paper for more information.

►*Cinnamon teal*
Breeds from southwest Canada, eastern Montana, Great Plains and Midwest, south to Mexico and breeds in across Idaho. Occupies ponds, lakes and streams at middle to lower elevations. Feeds on aquatic plants in shallow water areas, with small amounts of animal food. Nests on ground, near marsh. Ranked G5/S5. (Groves, *et al*, 1997) McCarthy ranks this species as having a high degree of habitat specialization.

►*Redhead*
Widespread distribution across Canada and south to Southwest and Midwest, found across Idaho in suitable habitats. Breeds in southeast Idaho. In Idaho, prefers marshy ponds, lakes and potholes, except in winter when it uses deep waters. Feeds on leaves, and stems of aquatic plants and smaller amounts of invertebrates. Ranked G5/S5. (Groves, *et al*, 1997). McCarthy ranks this species as having a high degree of habitat specialization.

►*Bald eagle*
T&E. One nest site near Thayne, Wyoming. Other possible nest sites off-Forest (Bear River valley, Grays Lake). They are also known to winter in several areas of the Forest (Tincup, Diamond Creek, Narrow/Lane Creek, and Crow Creek). See TES Process Paper for more information.

►*Peregrine falcon*
Has been delisted, now considered sensitive species. There are peregrine falcons in the vicinity of the Forest, around Grays Lake and Swan Valley, to the north. There are historic nesting cliffs on the Forest, and indications of recent nesting activity in the Grays range (1996, 97). See TES Process Paper for more information.

►*Sharp-shinned hawk*
Breeds from Alaska, across Canada and south to South America. Breeds in southeast Idaho. Found in forests and open woodlands, but primarily coniferous forest in more northern portions of its range. Nests in trees. Will occupy urban areas with abundant prey. Eats small birds, taking prey from perch or mid-air. Individuals occasionally killed by larger raptors, species has suffered from pesticide contamination. Ranked G5/S5. (Groves, *et al*, 1997). McCarthy ranks this species as having a low degree of habitat specialization.

►*Northern goshawk*
Now listed as sensitive. Nesting documented in Bear River range, Bannock Range, Preuss Range, Grays Range, Portneuf Range. See TES Process Paper for more information.

►*Swainson's hawk*
Breeds across Canada, and south to Mexico, including southeast Idaho. Uses more open types, tall trees used for perches, nest sites. In Idaho, prefers to nest in trees or shrubs near riparian zones adjacent to agricultural fields. During breeding season preys primarily on small mammals. A 1985 survey in southern Idaho indicated that they were still a widespread common nester in state. Ranked G4/S4. (Groves, *et al*, 1997). McCarthy ranks this species as having a moderate degree of habitat specialization.

►*Ferruginous hawk*
Breeds across western US, including se Idaho. Uses flat or rolling landscapes in sagebrush and other arid shrublands, dry open prairie grasslands and badlands. Optimal habitat is extensive ungrazed or lightly grazed sites with broad views. Prefers to nest in tree or on rimrock or cliff ledge. Preys mostly on small mammals. Previously suffered population declines due to persecution, loss of native prairie habitats, reduced prey availability due to elimination of prairie dog and ground squirrel colonies. Overall stable to

increasing population trends since 1980. (Paige and Ritter, 1999). McCarthy ranks this species as having a high degree of habitat specialization. Wisdom, *et al*, (2000) put this species in family group 10, which are species that use various shrublands, herblands and woodlands.

►*Golden eagle*

Breeds from Alaska, east to Labrador and south to Mexico, including southeast Idaho. BBS shows a 6 percent population increase in ten-year period. In Idaho, prefers open and semi-open areas in both deserts and mountains. Builds stick nests on cliff or in trees. Jackrabbits are preferred prey in s ID. Positive correlation between breeding success and jackrabbit numbers. Ranked G5/S5. (Groves, *et al*, 1997). McCarthy ranks this species as having a low degree of habitat specialization.

►*Prairie falcon*

Breeds from southeast British Columbia across to central Canada and south to Baja, California and northern Mexico, including southeast Idaho. In Idaho, breeds in open habitats, including shrub steppe and dry mountain habitat, with availability of cliff nesting sites and a prey base of small mammals being important factors. Feeds on small mammals, lizards and birds. Nests on cliff, sometimes in old corvid or raptor nest. BBS data show population declines but small sample size makes reliability of trends low. In Idaho the species showed a negative response to moderate grazing in big sagebrush/bluebunch wheatgrass. Should benefit from protection of cliff nesting sites and maintaining grassland and shrubland habitats for other species of birds. Ranked G4/S5. (Paige and Ritter, 1999). McCarthy ranks this species as having a low degree of habitat specialization.

►*Columbian sharp-tailed grouse*

Now listed as sensitive species. See TES Process Paper for more information.

►*Ruffed grouse*

Breeds from central Alaska, across Canada south along Pacific coast, Rocky Mountains and Atlantic coast, including southeast Idaho. In southeast Idaho study, associated with early seral aspen year-round. Young eat insects and spiders; adults eat nuts, flowers, buds, and leaves of aspen, willow and rose. Predators include great-horned owls and northern goshawks. Shallow snow cover or icy crusts may reduce winter survival by limiting access to subnivean (below snow) habitats. Cold wet weather in May/June may cause high losses among broods. Ranked G5/S5. (Groves, *et al*, 1997). McCarthy ranks this species as having a moderate degree of habitat specialization. A study in Montana (Hutto and Young, 1999) found that they were detected with the highest probability in aspen and other riparian cover types. They also suggest that livestock grazing and effects on understory vegetation, may affect suitability for display/breeding sites.

►*Sage grouse*

Identified as a MIS. Breeds in southeast Idaho. For more information see the MIS process Paper.

►*Whooping crane*

T&E. Now listed as experimental, non-essential. Harris reports that as there are only one or two birds left in Idaho, they should not receive emphasis. See TES Process Paper for more information.

►*Sandhill crane*

Breeds from Alaska, across Canada, south to Nevada, Colorado, and southeastern US. Breeds in southeast Idaho. Found in open grasslands, marshes, marshy edges of lakes, ponds and rivers. Feeds on roots, tubers, seeds earthworms, insects etc. Usually builds nest on ground surrounded by water, or in undisturbed location. Often feeds and rests in fields and agricultural lands. Highest reported density is Grays Lake – 200 pairs/10,000 ha. Ranked G5/S5. (Groves, *et al*, 1997).

▶*Killdeer*
Breeds from Alaska east to Newfoundland, and south to Baja, Gulf coast and Florida, including southeast Idaho. BBS shows a 4percent decrease in twenty-six years and 10 percent decrease in ten years. Found in fields, meadows, pastures etc, foraging on small invertebrates. Nests in small depression on ground in a variety of habitats from unconcealed locations near human habitation to gravelly, camouflaged areas. In Idaho study, were more abundant in grazed than ungrazed riparian habitat. Ranked G5/S5. (Groves, *et al*, 1997). McCarthy ranks this species as having a high degree of habitat specialization.

▶*Black-necked stilt*
Breeds from southern Oregon across to southern Colorado and Kansas, to Gulf coast and down through central America to southern Chile. Includes southern Idaho. Found in shallow water with soft, muddy bottom. May be at margins of ponds, lakes, and reservoirs. Feed mostly on invertebrates. Nest in small colonies. Ranked G5/S4. (Groves, *et al*, 1997). McCarthy ranks this species as having a high degree of habitat specialization.

▶*American avocet*
Breeds from southern Canada, south to California, Mexico, and to Texas. Includes southern Idaho. Found in lowland marshes, mudflats, ponds etc. Eat a variety of aquatic insects and larvae as well as seeds. Nest in depressions on ground, or on gravel, mud, or vegetation. Nests in loose colonies. Ranked G5/S5. (Groves, *et al*, 1997). McCarthy ranks this species as having a high degree of habitat specialization.

▶*Long-billed curlew*
Breeds from southwest Canada, south to California, Colorado, and Texas, including Idaho. It breeds in shortgrass prairies, grazed mixed grass prairies and short open sagebrush. Prefer open areas with a wide view. Nest in open scrape, often near a rock, or other object. Nest predators include magpies, gulls, raptors and medium-sized mammals. Adults forage on insects and other invertebrates as well as amphibians and eggs and nestlings of other birds. Populations declined due to uncontrolled hunting through early 1900s. Arctic populations have recovered, but pesticide poisoning and agricultural conversion in central and western states has not allowed same recovery. Generally respond favorably to grazing before the onset of nesting. During the breeding season nests and nestlings may be vulnerable to trampling. Curlews may respond favorably to burning that created openings of short grass. BBS shows a 5 percent increase in twenty-six year period. Documented in Grays/Wooley Range area. Ranked G5/S3. (Paige and Ritter, 1999).

▶*Flammulated owl*
Now listed as sensitive. Found in surveys in the Bannock Range, Bear River range, Smoky Canyon area. For more information see TES Process Paper.

▶*Boreal owl*
Now listed as sensitive. High elevation mixed conifer breeding habitats. Surveys have documented them in Cold Spring (Bear Camp Gulch), Danish Flat, Mill Creek (Bear River Range) and Johnson Creek (Aspen range). See TES Process Paper for more information.

▶*Great gray owl*
Now listed as sensitive. Documented as present in southeast Idaho. Found in surveys in Bannock Range. Aspen Range, Bear River Range, Grays Range and Palisades. See TES Process Paper for more information.

▶*Short-eared owl*
Breeds from northern Alaska across to Labrador, and south to California, Colorado, parts of Midwest and Virginia. Also across southern Idaho. Open prairie, meadows and open shrublands. Strongly associated with ungrazed and undisturbed native grasslands and wetlands that support dense small mammal populations. Voles are primary prey. Nest in a depression on ground on dry site, mostly in short grasses. Because they are irruptive and nomadic, trend data is scarce. Ranked G5/S5. (Paige and Ritter, 1999). McCarthy ranks this species as having a moderate degree of habitat specialization. Wisdom, *et al*, (2000) put this species in family group 10, which are species that use various shrublands, herblands and woodlands.

▶*Western burrowing owl*
Breeds in southwest Canada, south through western US, southern Florida, central Mexico to much of South America, including southern Idaho. They burrow/nest in grasslands, open sagebrush shrublands and agricultural lands (not in mountain meadows). Uses abandoned small mammal burrows (esp. prairie dog and ground squirrel). The presence of abandoned small mammal burrows in grazed, level areas is of primary importance. Badgers are the primary predator. Burrowing owls are opportunistic predators. Small mammal control and agricultural conversion have affected nesting and foraging habitat in many parts of its range. Predators, pesticides, shooting and vehicle collisions take a toll of birds as well. BBS does not adequately sample burrowing owls, but estimates for the west as a whole show an increase from 1968 to 1995. Ranked G4/S3. (Paige and Ritter, 1997). McCarthy ranks this species as having a high degree of habitat specialization. Wisdom, *et al*, (2000) put this species in family group 10, which are species that use various shrublands, herblands and woodlands.

▶*Northern pygmy owl*
Breeds from British Columbia, south through western US, Mexico and Central America. Found across Idaho in suitable habitats. Present on the Forest. Found in dense forests or open woodlands, forages in forest openings. Glides/dives from elevated perch to capture prey (mice and insects). Uses abandoned or natural cavity in snag for nesting (secondary cavity nester). Tend to be solitary. Ranked G5/S4. (Groves, *et al*, 1997). McCarthy ranks this species as having a low degree of habitat specialization.

▶*Black-chinned hummingbird*
Breeds from southwest British Columbia, through Pacific Northwest, down Rocky Mountains, south to New Mexico. Found across Idaho in suitable habitats. Found in semi-arid habitat near water, canyons, slopes, brush, riparian and open woodlands. Nest in woody vegetation, forage on nectar and insects in air. Ranked G5/S5. (Groves, *et al*, 1997). McCarthy ranks this species as having a low degree of habitat specialization. Wisdom, *et al*, (2000) put this species in family group 6, which are species using montane and lower montane forests, riparian and upland woodlands, mountain brush, mountain mahogany and riparian shrublands. Special habitat features include nectar-producing flowers.

▶*Calliope hummingbird*
Breeds in mountains from British Columbia and Alberta, south along Pacific range and Rocky Mountains. Found across all of Idaho in suitable habitats. Found in mountain meadows, canyons and streams, in open montane forest, and in willow and alder thickets. BBS shows a 13 percent decrease in ten-year period. Nest in woody vegetation, forages on nectar (paintbrush, penstomen, columbine, gilia and elephantshead), insects and spiders. Ranked G5/S5. (Groves, *et al*, 1997). McCarthy ranks this species as having a low degree of habitat specialization. Studies in Montana (Hutto and Young, 1999) found that males rely on shrubs in early successional patches and open riparian areas and use tall shrubs as perch and display areas. Females nest primarily in riparian streamside vegetation and road and forest edges.

▶*Rufous hummingbird*
Breeds from southern Alaska, southwestern Canada, south and west of Cascades to California and southern Idaho. Distributed across all of Idaho in suitable habitats. Found in coniferous forests. A study in north central Idaho found these hummingbirds more common in clearcut areas than in fragmented or continuous stands of coniferous forest. Nests in woody vegetation, feeds on nectar, insects and sap. Ranked G5/S5. (Groves, *et al*, 1997). McCarthy ranks this species as having a low degree of habitat specialization. Wisdom, *et al*, (2000) put this species in family group 6, which are species using montane and lower montane forests, riparian and upland woodlands, mountain brush, mountain mahogany and riparian shrublands. Special habitat features include nectar-producing flowers.

▶*Three-toed woodpecker*
Now listed as sensitive. Documented in Bear River Range and north end of Soda Springs RD, also in Manning Creek area. See TES Process Paper for more information.

▶*Lewis' woodpecker*
Breeds from southwestern Canada, across Rocky Mountains and Great Plain states. In Idaho found across the state in patchy areas. Found in southeast Idaho in Caribou County. Found in open forests and woodlands, and riparian woodlands. Primarily uses cavities excavated by other species. Feeds mainly on insects (ants, flies, grasshoppers). Ranked G4/S4. Wisdom, *et al*, (2000) put this species in family group 1, which is low-elevation, old forest species.

▶*Red-naped sapsucker*
Selected as MIS. Found across southeast Idaho. BBS shows a 12 percent increase in 26-year period. See MIS Process Paper for more information.

▶*Williamson's sapsucker*
Breeds from BC south along western states. In Idaho distribution is largely central and southeaster. Low elevation mixed conifer breeding habitats. Found in montane coniferous forests, especially fir and lodgepole pine. Nest in cavity in standing snag or hollow tree. Sometime returns to same tree, but not same cavity. Eats sap, cambium, insects. Ranked G5/S4. (Groves, *et al*, 1997). McCarthy ranks this species as having a moderate degree of habitat specialization. Wisdom et al (2000) put this species in family group 2, which are species using broad-elevation old-forest. Species in this group use late-seral multi- and single-layered stages of the montane community as source habitat.

▶*Olive-sided flycatcher*
Breeds from Alaska and Canada south across western states, part of Midwest and middle Atlantic states. Found across Idaho in suitable habitats. Found in forests and woodlands (especially burned areas with standing dead trees). An Idaho study found species responds positively in numbers to single-tree logging. BBS shows a 3 percent decrease in twenty-six years and 4 percent decrease in a ten-year period. Ranked G4/S5. (Groves, *et al*, 1997). McCarthy ranks this species as having a moderate degree of habitat specialization. Wisdom, *et al*, (2000) put this species in family group 2, which are species using broad-elevation old-forest. Species in this group use late-seral multi- and single-layered stages of the montane community as source habitat.

▶*Willow flycatcher*
Breeds from BC across to Minnesota, and south across western states. Found across Idaho. Found in thickets, scrubby and brushy areas, open second growth and open woodlands. BBS shows a 3 percent decrease over a twenty-six year period and 4 percent decrease in ten-year period. Nests in shrubs or deciduous trees, forage on foliage or in air. Ranked G5/S4. (Groves, *et al*, 1977). McCarthy ranks this

species as having a high degree of habitat specialization. Studies in Montana (Hutto and Young, 1999) found this species strictly tied to riparian areas with adjacent shrub cover.

▶*Hammond's flycatcher*

Breeds from Alaska and south through western states. Found across Idaho in suitable habitats. Found in coniferous forests and woodlands. In Idaho/Mt study, found to be old growth associates, in DF/Ponderosa pine. Builds nests in trees, hunts insects from perch. Ranked G5/S5. Groves, *et al*, 1997. McCarthy ranks this species as having a moderate degree of habitat specialization. Wisdom, *et al*, (2000) put this species in family group 2, which are species using broad-elevation old-forest. Species in this group use late-seral multi- and single-layered stages of the montane community as source habitat.

▶*Gray flycatcher*

Breeds from central Oregon across Rocky Mountain states. In Idaho, distribution is limited to the southern part of the state. Found in arid woodlands and brushy areas. An Idaho study found species more abundant in old growth juniper stands than in burned or clearcut areas. BBS shows a 13 percent increase in ten years. Nest is shrub or tree, hunts from perch. Ranked G5/S2. (Groves, *et al*, 1997). McCarthy ranks this species as having a high degree of habitat specialization.

▶*Dusky flycatcher*

Breeds from Canada south across western U.S. Distribution across Idaho in suitable habitats. Found in brushy habitat, thickets, open coniferous forest, mountain scrub and aspen groves. Idaho/Mt study found the species associated with rotation aged Douglas-fir stands. Nests in shrub or tree, hunts from perch or forages on foliage. Ranked G5/S5. (Groves, *et al*, 1997). McCarthy ranks this species as having a low degree of habitat specialization.

▶*Western scrub jay*

Resident from southwestern Washington, through southwestern U.S. (also southern Florida). Documented as occurring in extreme south central Idaho. Breeding habitats are pinyon/juniper and brush. Found in scrub (oak, pinyon, juniper), brush, chaparral and pine/oak. Nests in trees and shrubs. Forages on nuts, grains, fruits, insects, eggs, rodents and reptiles. Caches nuts. Ranked G5/S2. (Groves, *et al*, 1997). McCarthy ranks this species as having a moderate degree of habitat specialization.

▶*Pinyon jay*

Resident from central Oregon, to South Dakota, and south through Rocky Mountain states. In Idaho, distribution is limited to the southeastern part of the state. Found in pinyon/juniper woodlands, less frequently in pine. Documented south of Pocatello and around Malad City. Nests in juniper or pine. Breeds in loose, scattered colonies. Eat and cache pine seeds, berries, seeds, grains or insects. Ranked G5/S2. Groves, *et al*, 1997). McCarthy ranks this species as having a high degree of habitat specialization.

▶*Brown creeper*

Breeds across Alaska and Canada, south to Texas and portion of Midwest and eastern U.S. In Idaho, distribution is statewide in suitable habitats. Found in forests, woodlands and swamps. Northern Idaho study indicated species was more abundant in continuous old growth than in fragmented or selectively harvested stands. Hutto and Young (1999) also found this species fairly tightly restricted to old growth forest. Usually nests under bark on tree trunk. Forages on bark for insects/invertebrates. Ranked G5/S5. (Groves, *et al*, 1997). Wisdom, *et al*, (2000) put this species in family group 2, which are species using broad-elevation old-forest. Species in this group use late-seral multi- and single-layered stages of the montane community as source habitat.

▶*Rock wren*
Breeds from British Columbia, across western states and east to Texas. Found in arid or semi-arid habitat in shrubby areas in rocky canyons and cliffs, on rock slides and bouldery slopes. Feeds on insects and spiders. Nests in cavity under or near rocks. Ranked G5/S5. (Groves, *et al*, 1997). Hutto and Young (1999) found this species was detected in open sagebrush, grasslands, and post-fire habitats with rock outcrops or boulder-strewn slopes. High degree of habitat specialization.

▶*American dipper*
Resident from Alaska, western Canada, south in mountains to California, and South Dakota. Distributed across Idaho (except in the southwest portion) in suitable habitat Found up to treeline along montane streams, especially along swift-flowing water. Nests along swift-flowing streams, on rock in streams, on cliff faces, or behind falls. Walks, swims and dives while foraging. Ranked G5/S5. McCarthy ranks this species as having a high degree of habitat specialization.

▶*Sage thrasher*
Breeds from southern British Columbia, southeast to Wyoming, south to Texas. In Idaho distribution is limited to southern half of the state. Found in sagebrush steppe. Idaho study found big sagebrush used for nesting were taller than average, had greater foliar density, and most often faced easterly. Another study in southwest Idaho concluded distribution was influenced by both local vegetation cover and landscape features, such as patch size. Uses sage for nesting and security cover. Positively associated with shrub cover, bare ground and horizontal habitat diversity. Negatively associated with grass cover. Prey includes Mormon crickets, grasshoppers and other insects. BBS surveys have a low sample size, but population trends appear to be more or less stable across the west. Ranked G5/S5. (Groves, *et al*, 1997 and Paige and Ritter, 1999). Wisdom, *et al*, (2000) put this species into family group 11, which are species using sagebrush types (big sagebrush, low sagebrush and mountain big sagebrush). This species also uses upland woodlands.

▶*Loggerhead shrike*
Breeds across part of Canada, south to Great Basin, across Gulf coast and southern Florida. In Idaho, distribution is across the southern part of the state. Found in open country with scattered trees and shrubs and occasionally in open juniper woodlands. Open country with low vegetation for foraging (insects, small birds, rodents) and shrubs and trees for nesting and roosting. A study in se Idaho found nests in sagebrush, bitterbrush, and greasewood. An Idaho study found that shrikes directly lowered nesting success of sage and Brewer's sparrows and sage thrashers. BBS shows a 3 percent decrease in twenty-six year period. Ranked G4/S3. (Groves, *et al*, 1997 and Paige and Ritter, 1999). McCarthy ranks this species as having a low degree of habitat specialization. Wisdom, *et al*, (2000) put this species into family group 11, which are species using sagebrush types (big sagebrush, low sagebrush and mountain big sagebrush). This species also uses upland woodlands.

▶*Plumbeous vireo* (formerly solitary vireo)
Breeds across part of Canada, south to California and across to Texas. Also portions of Midwest and east. In Idaho, distribution is state-wide in suitable habitat. Found in mixed woodlands, humid montane forests, pine/oak, oak forests, and pinyon/juniper. Montana/Idaho study found they favored rotation-aged Douglas-fir stands over old growth. Nests in trees. Forages among foliage and branches. Ranked G5/S5. (Groves, *et al*, 1997). McCarthy ranks this species as having a low degree of habitat specialization.

▶*Virginia's warbler*
Breeds in Great Basin, in Idaho, distribution is limited to south-central/east Idaho. Breeds in deciduous woodlands on steep mountain slopes. Also found along mountain streams in sagebrush, or in cottonwood and willow. In Idaho, species is most closely associated with pinyon/juniper woodlands and nearby

riparian areas. Documented in Bannock Range. Nests concealed on ground. Forages on ground in thick brush. Ranked G5/S2. (Groves, *et al*, 1997). McCarthy ranks this species as having a moderate degree of habitat specialization.

▶*Yellow warbler*

Breeds from Alaska across Canada and south to Panama. Found across Idaho in suitable habitats. Found in open scrub, second growth woodlands, thickets, farmlands. Idaho studies have found this species to be a riparian habitat generalist. BBS shows a 2 percent decrease in ten-year period. Nests in shrubs. Most food taken from foliage. Ranked G5/S5. (Groves, *et al*, 1997). Hutto and Young (1999) list this species as being a riparian obligate, most common in riparian with well-developed shrub layers and large deciduous trees.

▶*Black-throated gray warbler*

Breeds from southwest British Columbia, through western states .In Idaho, distribution is limited to scattered areas in southern third of the state. Found in dry, open forests and woodlands, and in brushlands. In Idaho, this species is associated with juniper stands. Nests in coniferous and deciduous trees, forages in leaves, feeding on insects. Ranked G5/S3. (Groves, *et al*, 1997). McCarthy ranks this species as having a moderate degree of habitat specialization.

▶*MacGillivray's warbler*

Breeds from southeast Alaska and western Canada, south through western states. In Idaho, distribution is state-wide in suitable habitat. Riparian breeding habitats. Riparian habitat specialist, preferring dry, tall willow areas with grasses and forbs. Nests low in thick shrubs, foraging close to ground in dense vegetation. Ranked G5/S5. (Groves, *et al*, 1997). Hutto and Young (1999) found that this species was commonly found in open forest patches with dense shrub cover, although nest success is unknown.

▶*Western tanager*

Breeds from southeastern Alaska, through western Canada, and south through western U.S. Breeds mostly in coniferous and mixed mountain woodlands. Idaho/Montana study indicated that this species favored old growth over rotation-aged stands in Douglas-fir/ponderosa pine habitats. Nests on branches in conifer. Feeds on insects and fruits. Ranked G5/S5. (Groves, *et al*, 1997). Hutto and Young (1999) found this species was found over a wide range of coniferous forest types and were widespread and considered them habitat generalists. McCarthy ranks this species as having a low degree of habitat specialization.

▶*Grasshopper sparrow*

Breeds from eastern Washington east across U.S. to Maine, south to California, Texas and southeast U.S. In Idaho, distribution is mostly state-wide, except for northernmost part. Found in prairies, open grasslands, fields and savannas. Eats insects, grain and seeds. Builds nest on ground. Ranked G4/S3. Groves, *et al*, 1997). Hutto and Young (1999) found these species almost exclusively in grasslands. McCarthy ranks this species as having a high degree of habitat specialization.

▶*Brewer's Sparrow*

Breeds across portions of western Canada and south through western U.S. In Idaho, distribution is in the southern part of the state. Usually found in association with sagebrush. They prefer large, living sagebrush for nesting. A recent study in southwest Idaho concluded that their distribution was influenced by both local vegetation cover and landscape level features (patch size). Positively associated with shrub cover, bare ground and horizontal habitat diversity. Negatively associated with grass cover. Occassional cowbird hosts. Forages mostly on sagebrush leaves but also weevils, aphids and other insects, as well as seeds of grasses and forbs. Historically may have been the most abundant bird in the Intermountain west. BBS shows a 1 percent decrease in twenty-six year period and 4 percent decrease in ten-year period.

Ranked G4/S5. (Groves, *et al*, 1997 and Paige and Ritter, 1999). Wisdom, *et al*, (2000) put this species into family group 11, which are species using sagebrush types (big sagebrush, low sagebrush and mountain big sagebrush).

►*Lark sparrow*

Breeds from western Oregon, across upper Midwest, south to southwest and southeast U.S. In Idaho, distribution is in southern 2/3 of the state. Found in open situations with scattered bushes and trees such as prairies, forest edges, shrublands, cultivated areas, fields with brushy borders and savannas. Uses margins, varying structure, nests on ground or low in shrub. Nests in depression on ground or in shrubs or rock crevices. Feeds on seeds and insects. BBS shows a 3 percent decrease in twenty-six years. Ranked G5/S5. (Groves, *et al*, 1997 and Paige and Ritter, 1999).

►*Sage sparrow*

Breeds through northwest US and south through Great Basin/Rockies. In Idaho, distribution is through southern half of the state. Found in sagebrush, saltbrush brushlands, and chaparral. One Idaho study found nesting occurred where sagebrush coverage was sparse but clumped. A recent southwest Idaho study concluded that they were influenced by local vegetation cover and patch size. Use high sagebrush cover for nesting, large (250-acre +) patch size, and areas of low disturbance. Positively associated with shrub cover, bare ground and horizontal habitat diversity. Negatively associated with grass cover. Ranked G5/S4. (Groves, *et al*, 1997 and Paige and Ritter, 1999). Wisdom, *et al*, (2000) put this species into family group 11, which are species using sagebrush types (big sagebrush, low sagebrush and mountain big sagebrush).

►*Red-winged blackbird*

BBS shows a 1.5 percent decrease over twenty-six years, and 2.3 percent decrease over ten years. Breeds across U.S. and Canada, year-round resident in southern Idaho. Nest in grasses, reeds/cattails and shrubs.

►*Brewers blackbird*

Breeds across western and northern states and into Canada. Found across Idaho, year-round in western part, summers in eastern Idaho. Nest on ground, shrub, reed/cattails, deciduous shrubs and conifers. BBS shows a 1.3 percent decrease over twenty-six years, and 4.3 percent decrease over ten years.

►*Western meadowlark*

Breeds from British Columbia and south through western and midwestern states. Found in grasslands, shrubsteppe, cultivated fields and pastures. A study in southwest Idaho determined that landscape level features did not influence distribution of meadowlarks. Nest on ground. Forage on insects predominately, with lesser amounts of grains and seeds. BBS shows a 1 percent decrease in twenty-six year period and 4 percent decrease in ten-year period. Ranked G5/S5. (Groves, *et al*, 1997).

►*Lesser goldfinch*

Resident from Washington, through Pacific northwest. Mainly migratory in Rocky Mountain region. Rare breeder in Idaho, documented south of the Bannock Range. Found in partly open situations with scattered trees, and edges, where water is available. Nests in dense foliage in tree or shrub. Diet dominated by seeds, but also insects in summer. Ranked G5/S1. (Groves, *et al*, 1997). McCarthy ranks this species as having a moderate degree of habitat specialization.

Partners in Flight (Pashley, D.N., *et al*, 2000) has developed a “watch list” from individual state Bird Conservation Plans. These birds are not listed under ESA, but may warrant conservation attention. Some are common, but undergoing steep population declines, others are rare but increasing. Some are both rare and declining. None of the species considered here fall into their “extremely high priority”. Species put

into the "moderately high" category that we are analyzing here are trumpeter swan (sensitive), flammulated owl (sensitive), rufous hummingbird, Lewis' woodpecker, and Virginia's warbler. Species put into the "moderate" category that we are analyzing here are sage grouse (MIS), long-billed curlew, sage sparrow, short-eared owl, and Brewer's sparrow.

Saab and Rich (1997) analyzed Breeding Bird Survey data and identified species of high concern to management in the Interior Columbia River Basin. These include Lewis' woodpecker, olive-sided flycatcher, willow flycatcher, loggerhead shrike, Virginia's warbler, lark sparrow, Brewer's sparrow, sage sparrow and western meadowlark.

Environmental Condition Outcomes

Environmental conditions are the combination of physical and biological factors that allow a species to utilize habitat. Well-distributed habitat indicates that habitat is not eroded at the edges of the range, and does not contain significant gaps that would prevent demographic and genetic interchange throughout the population, across multiple generations. In general, geographic range refers to the recent historical range (last 100 to 200 years) of the species. However, if substantial range contraction or fragmentation has occurred, not as a result of national forest management, the potential future (50-100 years) range may be used as a reference point. The following information follows the same process as that used in the Interior Columbia Basin broad-scale assessment (1996).

The second column shows habitat outcomes identified, by species, during the Columbia River Basin broad-scale assessment. The first number represents distribution of habitats historically (H), while the second number represents the current (C) distribution of habitats. The number relates to a habitat outcome, which are described below. Species outcomes were determined by expert panels, and numbers here have been rounded to the nearest whole number to give a picture of trends (Quigley, *et al*, 1996).

Outcome 1. Suitable environments are broadly distributed and of high abundance across the range of the species. The combination of distribution and abundance of environmental conditions provide opportunity for continuous or nearly continuous intraspecific interactions for the species.

Outcome 2. Suitable environments are either broadly distributed or of high abundance across the range of the species, but there are temporary gaps where suitable environments are absent or only present in low abundance. However, the disjunct areas of suitable environments are typically large enough and close enough to permit dispersal and interaction among subpopulations across the species range.

Outcome 3. Suitable environments are frequently distributed as patches or they exist at low abundance, or both. Gaps, where suitable environments are either absent or present in low abundance, are large enough that some subpopulations are isolated, limiting opportunity for interaction. There is opportunity for subpopulations in most of the species range to interact as a metapopulation, but some subpopulations are so disjunct or of such low density that they are essentially isolated from other populations. For species for which this is not the historical condition, reduction in overall species range from historical conditions may have resulted from this isolation.

Outcome 4. Suitable environments are highly isolated or they exist at very low abundance, or both. While some subpopulations associated with these environments may be self-sustaining, there is limited or no opportunity for population interaction. There has likely been a reduction in overall species range from historical conditions, except for some rare, local endemics that may have

persisted in this condition since the historical period. For species for which this is not the historical condition, reduction in overall species range from historical conditions may have resulted from this isolation.

Outcome 5. Suitable environments are highly isolated and exist at very low abundance, with little or no possibility of population interactions, resulting in strong potential for local or regional extirpation, and little likelihood of recolonization.

Additional analyses in the Interior Columbia Basin Analysis (Wisdom, *et al*, 2000) calculated changes in source habitats for many of the same species. A habitat trend category for those species analyzed is shown below in the third column (from Vol. 1, pg 44). Trend categories were identified where –2 was a decrease of more than 60 percent; -1 was a decrease between 20 percent and 60 percent; 0 was a decrease or increase of less than 20 percent and 1 was an increase of 20 percent and 60 percent.

Table 38. Habitat Outcomes and Changes in Source Habitats (from Wisdom, et al)

Species-At-Risk	Habitat Outcome	Change in Source Habitat
Northern leopard frog	H3/C5	na
Western toad	H2/C3	na
Common garter snake	H2/C3	na
Black-chinned hummingbird	H3/C3	0
Calliope hummingbird	na	na
Rufous hummingbird	H2/C3	-1
Willow flycatcher	H3/C3	na
Dusky flycatcher	na	na
American dipper	na	na
Yellow warbler	H2/C3	na
MacGillivray's warbler	na	na
Lesser goldfinch	na	na
Trumpeter swan	na	na
Harlequin duck	H3/C5	na
Peregrine falcon	na	na
Cinnamon teal	na	na
Redhead	H3/C3	na
Sandhill crane	H3/C3	na
Killdeer	na	na
Black-necked stilt	na	na
American avocet	H3/C3	na
Sage thrasher	H1/C2	-1
Pygmy rabbit	H4/C4	-1
Sage sparrow	H1/C2	-1
Brewer's sparrow	H1/C2	-1
Swainson's hawk	H2/C2	na
Loggerhead shrike	H2/C2	0
Burrowing owl	H1/C3	-1
Meadowlark	H1/C1	-1
Short-eared owl	na	-1
Pallid bat	na	-1
Lark sparrow	H1/C3	-1
Western small-footed myotis	H2/C3	-1
Spotted bat	H4/C4	na
Col. Sharp-tailed grouse	H1/C5	-1

Species-At-Risk	Habitat Outcome	Change in Source Habitat
Sage grouse	H2/C3	-1
Ferruginous hawk	H2/C3	-1
Gray flycatcher	na	na
Black-throated gray warbler	na	na
Plumbeous vireo	na	na
Western scrub jay	na	na
Pinyon jay	na	na
Virginia's warbler	na	na
Ruffed grouse	na	na
Sharp-shinned hawk	na	na
Northern pygmy owl	H1/C2	na
Silver-haired bat	H2/C3	-1
Lewis' woodpecker	H3/C4	0 (resident)
Williamsons' sapsucker	H2/C3	-1
Long-legged bat	H2/C4	0
Brown creeper	na	-1
Western tanager	na	na
Long-eared bat	H2/C4	na
Olive-sided flycatcher	H1/C3	0
Hammond's flycatcher	H2/C3	-1
N. flying squirrel	H2/C3	-1
marten	H2/C4	-1
Uinta chipmunk	na	na
Western Big-eared bat	na	na
Wolverine	H4/C5	0
Boreal owl	H3/C4	-2
Flammulated owl	H2/C4	-1
Great gray owl	H3/C4	0
Northern goshawk	H2/C3	-1
Three-toed woodpecker	H3/C3	1
Golden eagle	na	na
Prairie falcon	na	na
Rock wren	na	na

Based on a combination of outcomes and trends in habitats, there are a few species-at-risk that will be discussed individually, rather than in habitat associations. Besides the species that are already listed and analyzed as threatened, endangered, R4 Sensitive Species, and management indicator species, these are the leopard frog, pygmy rabbit, and marten. In addition, while the western (boreal) toad had a current outcome of 3, it has been raised as a concern on the Caribou NF. There is only one known breeding location that has been found on the Caribou NF. In addition, these toads appear to be genetically more similar to those from Colorado, than those in Yellowstone.

Coarse-Filter Analysis

Development of Species Groups

It is infeasible to consider all species-at-risk in detail in the planning process. Consequently, a process to identify subsets of species to focus conservation measures and analysis are needed. All threatened, endangered, sensitive and management indicator species will be discussed individually (fine-filter

analysis). Most of the other species-at-risk are discussed at the coarse-filter level. These species are all secure globally (ranked G4 or G5 by the CDC) and viability of the species is not an issue at the planning level. However, there were three that appeared to need more specific analysis based on habitat outcomes from ICB (2000). These species will be discussed individually (northern leopard frog, pygmy rabbit and marten) in the fine-filter analysis.

Because site-specific population information is lacking for most species, analysis based on inventories and projections of the amount and distribution of suitable habitat will be used for the coarse-filter species viability evaluation (SVE). This method assumes 1) attributes of suitable habitat are well known, 2) that amount, condition or quality of habitat reflects fitness of the species and 3) habitat is limiting so that changes in amount of suitable habitat are correlated with changes in population status (Viability White Paper, 1/26/01).

Evaluations relying solely on habitat have shortcomings: actual populations are not considered. In addition, the habitat (vegetation) information is broad-scale and has not been field-checked for accuracy. But this evaluation method is useful to demonstrate broadly if a species status is likely to decline, improve or remain unchanged. Because the species analyzed here are not at high risk (based on previous analysis above), this method is appropriate for these species.

The process used here groups species by breeding habitat association. Some species use several habitat types but have been grouped into habitats considered to be primary breeding habitat. Information used to determine primary breeding habitats was taken from several sources, including Idaho Bird Conservation Plan (IPIF, 2000), Paige and Ritter (2000), Wisdom, *et al*, (2000) and Groves, *et al*, (1997).

Table 39. Species-At-Risk and Habitat Associations.

Habitat	Species-At-Risk
Riparian	Lesser goldfinch, Western toad, common garter snake, black-chinned hummingbird, calliope hummingbird, rufous hummingbird, willow flycatcher, dusky flycatcher, American dipper, yellow warbler, MacGillivray's warbler
Non-riverine wetland	Cinnamon teal, redhead, sandhill crane, killdeer, black-necked stilt, American avocet, red-winged blackbird and Brewers blackbird
Sagebrush (closed canopy)	Sage thrasher, sage sparrow, Brewer's sparrow
Sagebrush (open canopy)	Swainson's hawk, loggerhead shrike, burrowing owl, meadowlark, short-eared owl
Sagebrush	Lark sparrow, Western small-footed myotis, pallid bat
Juniper/mountain mahogany	Ferruginous hawk, gray flycatcher, black-throated gray warbler, plumbeous vireo, western scrub jay, pinyon jay, Virginia's warbler
Aspen	Ruffed grouse
Low-elevation mixed conifer	Sharp-shinned hawk, northern pygmy owl, silver-haired bat, Lewis' woodpecker, Williamsons' sapsucker, long-legged bat, brown creeper, western tanager, long-eared bat
High-elevation mixed conifer	Olive-sided flycatcher, Hammond's flycatcher, northern flying squirrel, Uinta chipmunk
Cliff/rock outcrops/ talus	Golden eagle, prairie falcon, rock wren

DEVELOPMENT OF CONSERVATION APPROACHES

Many of the SARs have been identified as such due to habitat associations (i.e., Partners in Flight, ICRB). Conservation approaches for these species needs to focus on key conditions that caused these species to

be at risk; thus we focus on habitat based conservation measures. Ecosystem based approaches make a significant contribution to ecological conditions needed to sustain species viability.

Existing conservation strategies, Idaho Bird Conservation Plan and others may be a source for conservation approaches. While some of these may not be specific to subspecies found in Idaho, habitat conservation approaches may still be appropriate. Specific conservation strategies used include Idaho Partners in Flight Bird Conservation Plan (2000), Conservation Strategy for southeastern Idaho Wetlands (Jankovsky-Jones, 1997), HCAS for the Northern Goshawk (Patla. *et al*, 1995), HCAS for the Townsend's big-eared bat (Idaho State Conservation Effort, 1995), HCAS for Forest Carnivores in Idaho (IDFG, *et al*, 1995) and "Status, Ecology and Conservation of the Southwestern Willow Flycatcher" (Finch and Stoleson, 2000). These approaches may then serve as basis for Forest Plan standards or guidelines, or go into management area direction. Or they may be used simply to evaluate the effects of the alternatives in the EIS.

Development of conservation approaches may be aided by both broad management practices that provide for overall ecosystem composition and function, and more specific management practices directed at the needs of individual species. A separate approach is not needed for each individual species, but for groups where feasible. Managing habitat for proper functioning condition (PFC) where possible, including restoring natural disturbance regimes or emulating these ecosystem processes with management activities, will improve conditions for the conservation of neotropical migratory birds (Saab and Rich, 1997).

Riparian habitats

Overall goals for riparian habitats include: 1) no additional loss of habitat, 2) maintain and restore dynamic riparian ecosystems, using natural or artificial disturbances to achieve this, and 3) restore lost or degraded riparian habitats (IPIF, 2000). In addition, they identified habitat objectives of: 1) maintain the existing distribution and extent of each riparian system; and 2) by 2025, restore at least 10 percent of the historical extent of each riparian system within each ecoregion subsystem.

Non-riverine wetlands

The overall objective for non-riverine wetlands is a net increase in the number of acres of wetlands in Idaho (IPIF, 2000).

Sagebrush/grasslands

IPIF identified the greatest threats to these habitats is from the invasion of non-native species, loss of shrub cover due to wildfire, and changes due to livestock grazing. The overall goals for sagebrush/grassland habitats is to 1) maintain and restore dynamic ecosystems, 2) no net loss of sagebrush habitats, 3) restoration of fragmented and degraded habitats where condition and distribution close to historical patterns and 4) linkage of existing and restored sagebrush habitats (IPIF, 2000). Strategies identified for the ICB study include 1) identify and conserve large remaining areas of shrub-steppe vegetation, where integrity is relatively high, 2) restore native grass and forb understories to historic levels where the potential exists, and retard the spread of nonnative vegetation, 3) reduce/eliminate soil compaction and erosion, 3) restore microbiotic crusts where potential exists, 4) restore vegetation around springs, seeps, streams, meadows and other riparian areas, and 5) minimize the adverse impacts of human disturbance (Wisdom. *et al.* 2000).

Juniper/mountain mahogany

UCRB (Quigley, *et al*, 1996) identify changes that have resulted in expansion of juniper woodlands, including extensive livestock grazing, fire exclusion and maybe climate changes. Exotic species are also an issue in this type. Conservation measures for these types would be to bring them into proper functioning condition (species distribution, structure and species composition).

Low elevation mixed conifer

Strategies that have been identified include 1) where cottonwood/willow stands occur, maintain old forests, 2) retain all large diameter snags (cottonwood and Douglas-fir), and 3) reduce exposure to pesticides during nesting (Wisdom, *et al*, 2000).

High elevation mixed conifer

Strategies that have been identified include 1) increase the amounts of early seral forests, focusing on early-seral conditions that result from fire (olive-sided flycatcher), and 2) maintain existing late-seral forests and encourage development of habitat components (snags, downed woody debris, abundance of fungi and lichen) in mid-seral forests (northern flying squirrel) (Wisdom, *et al*, 2000).

Cliff/rock outcrops/talus

These sites and species using them are most affected by human activities or disturbances during nesting. Identification of areas where conflicts are occurring, and addressing those sites is the best conservation approach.

Bats

Strategies identified in ICB (2000) to address these forest-dwelling (i.e., long-eared and long-legged) species include 1) Manage for retention and recruitment of large-diameter snags in all forest cover types and structural stages, 2) protect all roosts and reduce human disturbance near roosts, 3) maintain and improve the conditions of riparian and wetland vegetation for bat foraging areas, 4) alleviate impacts of pesticides on bat populations, and 5) work with other agencies to search for hibernacula and protect those sites.

Strategies identified for shrubland associated species (pallid and western small-footed) include 1) maintain and improve the condition of native shrublands to provide foraging areas, 2) reduce human disturbance near known roosts, 3) alleviate impacts of pesticides, and 4) work with other agencies to search for hibernacula and protect those sites.

Incorporation Of Conservation Measures Into Alternatives And Effects Of The Alternatives On Habitats And Populations

Effects analysis should incorporate an evaluation of ecological sustainability, both over the short- and long-term. An uncertainty assessment includes acknowledging that there are unpredictable natural processes that may come into play. Other important sources of uncertainty stem from incomplete knowledge of species population status and habitat relations, incomplete vegetation data, unforeseen changes that may occur on private lands and many other factors not directly related to habitat.

For the species analyzed here, use of available broad-scale assessments is appropriate. These can be used, with information gathered during the planning process, to determine the historical, current and predicted future distribution of habitats.

RIPARIAN AND NON-RIVERINE WETLAND

The biggest impact to these habitats in the past has been from livestock grazing, beaver removal, recreational and road development, and fire suppression (See Chapter 3 of FEIS). The effects of these activities have been to alter vegetative composition and structure and to create disturbance during nesting.

Habitat components and features necessary for the identified species-at-risk include; shrubby vegetation for nesting and foraging for avian SAR; and shrub or forb streamside vegetation for stream shading (temperature regulation), insect habitat (foraging habitat) and cover from predators; and water quality for reproduction (amphibian species).

There are goals, objectives, standards and guidelines for Prescription 2.8.3 (Aquatic influence zone) that address the maintenance and restoration of riparian habitats (water quality, streamside vegetation), and human uses allowed in riparian areas. This direction addresses and incorporates the conservation approaches identified above for riparian and non-riverine wetland habitats.

There is also a Forest Plan objective to develop a plan in cooperation with IDFG to identify watersheds where beaver would benefit, and habitat conditions are suitable for beaver reintroduction. This objective would also benefit species like the northern leopard frog and common garter snake over the long-term, as they have been identified as being associated with beaver ponds.

All of the Action Alternatives incorporate some form of riparian utilization standards but vary in how long it would take to reach proper functioning condition.

Table 40. Riparian ranking for the alternatives (1 = best).

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Riparian Ranking	7	6	8	2	3	1	4	5

Alternatives 4-7 and 7R all move riparian and non-riverine wetlands toward proper functioning condition at a faster rate than Alternatives 1-3 (see Hydrology effects section). As a result, species distribution across the Forest is expected to improve in the Planning period, under Alternatives 4-7 and 7R. Alternatives 1-3 should maintain the current distribution.

The following Risk Assessment is based on risk factors identified by Finch and Stoleson (2000). There are a few unknowns such as parasites, disease, environmental toxins, and migratory and winter habitats for the migratory species that are not addressed.

Table 41. Risk Assessment for Riparian Habitats.

Risk Assessment	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Movement out of PFC	Mod	Mod	Mod	Low	Low	Low	Low	Low
Cowbird parasitism*	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod
Recreation* *	Mod	Mod	Mod	Low	Low	Low	Low	Low

* The potential for cowbird parasitism stays the same because the presence of livestock on and adjacent to the Forest is similar in all alternatives.

** Recreation effects are a result of off-route travel, location of roads and trails (Forest plan guidance about location of future roads and trails, common to all alternatives).

Elk Valley Marsh, a large, high-elevation marsh (non-riverine wetland). It is a complex mix of water sedge, clustered field sedge, baltic rush, booth willow/beaked sedge community types. The adjacent terrestrial vegetation is silver sage and mountain big sagebrush. Elk Valley is being impacted by livestock grazing (Jankovsky-Jones, 1997). The marsh has a muskeg-like quality that has historically made it inaccessible to livestock. However, drought in the last few years has caused drying, and part of the area is now grazed, causing changes in plant species composition.

Elk Valley March is included in Prescription 2.5(b), which is for Wild and Scenic Eligible Recreation Rivers. This prescription includes a standard that says livestock grazing shall be phased out on an opportunity basis. Until that time, livestock forage utilization will be limited to levels allowed in the Forest-wide riparian direction.

SAGEBRUSH/GRASSLANDS

The biggest impact to these habitats in the past has been from livestock grazing, non-natives, and fire suppression. The effects of these activities have been to alter vegetative composition and structure.

The Forest Plan includes goals, objectives, standards and guidelines for shrublands in the Vegetation section, and the Grouse part of the Wildlife section. Generally, the conservation approaches outlined above are addressed through the incorporation of this Forest Plan guidance. The rate at which shrublands move into proper functioning condition varies by alternative, as does off-route travel and resultant effects from disturbance.

There are 365,200 acres of sagebrush on the Caribou. Assuming that proposed treatments are evenly distributed across the Forest, and that treatments treat sagebrush and mountain brush in the proportion that they are present (90 percent sagebrush, 10 percent mountain brush) this table shows acres treated by type, forest-wide.

Table 42. Acres of Non-forested Vegetation Treated Under the Alternatives.

Non-forested vegetation	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Total acres treated	130,000	77,500	100,000	77,500	70,800	60,000	79,750	40,000
Acres sagebrush	117,000	69,750	90,000	69,750	63,720	54,000	71,775	36,000

Table 43. Percent of Sagebrush in Canopy Cover Classes at the End of Ten Years.

Sagebrush at 10 years	EC*	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
% Sagebrush <15%cc	50	65	52	57	52	50	47	52	43
% Sagebrush >15%cc	50	35	48	43	48	50	53	48	57

* EC = Existing condition

Over the short-term (ten-year period), species using more open stands of sagebrush would be favored by Alternatives 1-4 and 7. Alternative 5 maintains the current structure and Alternative 6 would decrease habitat for species using more open stands. Alternatives 6 and 7R would favor species associated with denser stands of sagebrush.

Recommendations for sagebrush-associated species suggest that habitat patches need to be at least 320 acres to be effective for species requiring “interior” habitats (Paige and Ritter 2000). Vegetation is very patchy on the Caribou NF. Since most of the sagebrush habitats are at lower elevations on the Forest (and off-Forest) and mix in with other types as elevation increases, they naturally are more broken on the Forest. To get an idea of patch sizes in sagebrush stands, six relatively undisturbed watersheds were selected from across the Forest. The average sizes of sagebrush patches in these six watersheds range from 35 acres up to 294 acres. However, these averages are misleading. There are a few areas on the Forest that have more extensive coverage of sagebrush, with only small inclusions of other types. These areas are found around the Preuss Range and Westside Ranger District units. The Forest Plan contains a

guideline that outlines maintenance of sagebrush patches greater than 320 acres, where appropriate. This will insure that habitat patches are large enough to provide habitat for area-dependent species where it is possible.

The Plan also included guidelines to focus treatments in areas where sagebrush canopy cover is greater than 25 percent; these areas start to lose value as sage grouse nesting habitat as canopy cover increases over 25 percent. Additional guidelines are for use of practices that stabilize or increase native grass and forbs in sagebrush habitats with 5-25 percent canopy cover; and to manage herbaceous cover to conceal nests through the first incubation period.

Implementation of upland forage utilization standards on browse and herbaceous vegetation will improve habitat quality most in Alternatives 3-7 and 7R. Alternatives 1 and 2 would maintain current conditions. Where habitats lie in a big game winter range prescription (17 percent of the Forest), more residual vegetation would be retained after livestock grazing.

Table 44. Risk Factors to Sagebrush Habitats and Associated Species.

Risk Factors for Sagebrush	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Degree of departure from PFC based on treatments*	Low	Mod	Low	Mod	Mod	High	Mod	High
Upland utilization ranking[1]	3	2	1	1	1	1	1	1
% forest open to off-route travel	33%	38%	38%	0	3%	0	2%	2%
Overall ranking	**5**	**6**	**1**	**2**	**2**	**7**	**2**	**7**

*Based on how long it would take alternatives to reach PFC, see Vegetation section.
1 Ranking is based on "1" as best and "7" as worst.

These alternatives were ranked based on listed criteria. Alternative 3 has the lowest degree of departure from PFC and one of the best upland utilization standards. This alternative would provide for increased distribution of sagebrush as a result of treatments, as areas currently occupied by juniper and mountain mahogany are returned to sagebrush cover.

Alternatives 1, 4, 5 and 7 all rank next. These alternatives all have improved upland utilization standards, and understory grass and forb composition and structure should improve. This should improve security for nesting and foraging birds. Alternative 2, which has a low departure from PFC, has the lowest upland utilization ranking and there is expected to be no improvement in understory grass and forb composition and structure.

Alternative 6 and Alternative 7R rates last because of the high departure from proper functioning condition in sagebrush habitats. Over the long-term, Alternatives 6 and 7R move habitats further from PFC (30-50 percent of watershed with sagebrush in greater than 15 percent canopy cover class). This puts these habitats at risk from loss of understory diversity and wildfire, due to denser canopies. One feature that has been incorporated into Alternative 7R to address the departure from PFC is that wildfire acres burned are not included in the proposed treatment acres. This is different from the rest of the alternatives; the other alternatives include wildfire acres into the proposed treatment acres.

Risk assessment

Factors identified as risks for sagebrush-associated species include changes in sagebrush structural class distribution, livestock grazing utilization and residual cover; off-route travel and potential for nest destruction or disturbance to adults; connectivity of habitats for species with low dispersal potential; the size of patches for area-dependent species; loss of grass and forb understory; degradation of adjacent

riparian areas; and the potential for effects as a result of the use of pesticides (Paige and Ritter, 1999). Another risk factor identified was fragmentation (land conversion to annual grasses or croplands, mining and development). Development and land conversion are not issues on the Forest, and the potential for habitat loss due to mining is the same for all alternatives.

Table 45. Risk Assessment for Sagebrush-associated Species.

Risk Assessment	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Departure from PFC	Low	Low	Low	Low	Low	Mod	Low	Mod
Livestock utilization and gr/fb understory	Mod	Low	Low	Low	Low	Low	Low	Low
Off-route travel	Mod	Mod	Mod	Low	Low	Low	Low	Low
Connectivity/size*	Low	Low	Low	Low	Low	Low	Low	Low
Pesticides**	Low	Low	Low	Low	Low	Low	Low	Low
Overall risk	**Low**	**Low**	**Low**	**Low**	**Low**	**Low**	**Low**	**Low**

* Forest Plan guideline incorporates patch size criteria, common to all alternatives.

** Common to all alternatives, very little use of insecticides on Forest.

All alternatives are a low risk for sagebrush-associated species over the long-term. Viability of associated species will be maintained through maintenance of vegetation structure and composition, size of treatments of livestock utilization levels.

JUNIPER/MOUNTAIN MAHOGANY

Since these habitats have expanded beyond their historic range, treatments will be focused on returning some of these sites to their historic structure (sagebrush) and distribution. A Forest-wide objective is to create or maintain diversity in vegetation structure, composition, and patterns to meet proper functioning condition indicators.

Juniper and mountain mahogany are minor vegetation types on the Forest (1 percent and 2 percent, respectively). Rangeland vegetation treatments (sagebrush and mountain brush) may treat some of these types where they are adjacent to larger treatment areas. Number of acres treated for these types depends on location of other treatments and is a site-specific evaluation. However, incorporation of Forest-wide direction should move these types toward PFC (from current toward historic distribution) in all alternatives.

Species-at-risk associated with this type may see a decrease in available habitat, depending on where specific treatments are implemented. However, these habitat types have increased outside of their historical distribution. Any treatments proposed in these types would focus on areas where these species have moved outside of their historical (Forest Plan Vegetation guideline). Risk for species associated with these habitats is low.

ASPEN

Aspen has been identified as at high departure from historic conditions due to succession and heavy grazing. Most stands are older, with little successful regeneration. All of the alternatives address this concern, but to varying degrees. The effects of the harvest and fire treatments at the end of the decade, are shown in the table below (see Process Paper in the Appendix for more information).

Table 46. Percent Mature/Old Aspen at End of 10 and 100 years.

End of 10 years	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Mature/Old	57%	56%	56%	56%	55%	56%	56%	49%
End of 100 years								
Mature/Old	85%	82%	82%	53%	71%	84%	76%	59%

Table 47. Risk Factors for Aspen Habitats and Associated Species (1= best).

Risk Factors for Aspen	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Age structure at end of decade – ranking[1]	2	2	2	2	2	2	2	1
Success of aspen regen*	3	2	1	1	1	1	1	1
Distribution across planning area **	3	2	1	1	2	2	2	1
Overall ranking	**4**	**3**	**1**	**1**	**2**	**2**	**2**	**1**

1 Ranking is based on "1" as best.

* Based on upland browse and herbaceous utilization. It is assumed that less utilization will increase success of aspen regeneration.

** Based on assumption that as conifer stands are treated and age structure is improved, aspen clones will sucker and expand into adjacent areas, increasing amount of aspen habitats available over the long-term.

Overall ranking of the alternatives looked at all three factors. Alternatives 3, 4 and 7R ranked highest due to the expected distribution of age classes, improved success of regeneration due to improved upland utilization standards and an expected increase in distribution across the planning unit.

Alternatives 5, 6 and 7 rank next due to the expected distribution of age classes, improved success of regeneration due to improved upland utilization standards and an expected increase in distribution across the planning unit. Alternatives 1-3 rank lowest due to a combination of changes in distribution/age classes and decreased success of regeneration.

Risk Assessment.

Alternatives 3-7 and 7R have a low risk associated with them. Aspen should increase across the planning area and improve habitat conditions for associated species over the long-term. Alternatives 1and 2 would have a moderate risk associated with them, and species associated with aspen would continue to see a decline in suitable habitats.

FORESTED VEGETATION

Assessments for many species (fine-scale analysis) show an estimated age class distribution of forested habitats at the end of ten years. This type of assessment may overestimate amount of habitat, because not all acres of a particular age class have the same fine-scale attributes, like snags and downed, woody debris. This type of analysis is useful because it displays the relative differences between alternatives and trends in habitats through time. This process is used here, as well as an evaluation of expected stands structures in relation to PFC, at the end of 100 years. It is assumed that while the treatments will decrease suitable habitat for some species over the short-term, that managing towards PFC will be better in the long-term.

Table 48. Percent Mature/Old at End of 100 Years.

At 100 years, Meets or Does Not Meet PFC/DFC	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Aspen	85	82	82	53	71	84	76	59
Low-elevation mixed conifer	67	61	61	54	76	78	60	61
High-elevation mixed conifer	71	67	62	66	76	78	69	76

LOW-ELEVATION MIXED CONIFER FOREST

Snag retention is a key for conservation in these types. This has been addressed through Forest-wide objectives, standards and guidelines and is common to all alternatives.

Table 49. Percent Mature/Old Low Elevation Mixed Conifer Forest.

End of 10 years	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Mature/Old	85%	85%	83%	83%	85%	85%	85%	82%
End of 100 years								
Mature/Old	67%	61%	61%	54%	76%	78%	60%	61%

Over the short-term, Alternatives 3, 4 and 7R improve age class distribution the most. None of the alternatives is close to DFC, which is 30-40 percent mature/old for conifers.

Over the long term, Alternative 4 moves closest to DFC. Alternatives 1, 2, 3, 7 and 7R move toward DFC. Alternatives 5 and 6 are furthest from DFC and pose the greatest risk to low-elevation mixed conifer-associated species.

HIGH-ELEVATION MIXED CONIFER FOREST

The two main conservation strategies identified are addressed through vegetation treatments (which vary by alternative) that affect forest structure, and through Forest-wide objectives, standards and guidelines, which address stand components, such as snags and downed logs and size of mature/old blocks.

Table 50. Percent Mature/Old High Elevation Mixed Conifer Forest.

End of 10 years	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Mature/Old	79%	76%	74%	77%	79%	80%	79%	81%
End of 100 years								
Mature/Old	71%	67%	62%	66%	76%	78%	69%	76%

Over the short-term and long-term, Alternative 3 moves closer to PFC than the rest of the alternatives, followed closely by Alternatives 2, and 4. It is expected that species associated with these forest types would benefit most from implementation of one of these alternatives. Alternatives 1, 5, 6, 7 and 7R stay furthest from PFC or DFC.

Species associated with mature and old high-elevation mixed conifer forest would find more habitat than was predicted to occur under historical conditions, under all alternatives. Habitat would be available until such time as wildfire, or insect or disease epidemics regenerate stands.

BATS

All of the identified conservation approaches listed above have been addressed through Forest-wide goals, objectives, standards and guidelines except the use of pesticides and loss of snags to firewood cutters.

Table 51. Risk Assessment for Bat Species.

Risk Assessment	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Disturbance at roosts, hibernacula*	Low	Low	Low	Low	Low	Low	Low	Low
Pesticides*	Low	Low	Low	Low	Low	Low	Low	Low
Shrubland foraging habitat in relation to PFC	Low	Mod	Low	Mod	Mod	High	Mod	High
Loss of snags	Mod	Mod	Mod	Low	Low	Low	Low	Low
Riparian foraging habitat in relation to PFC	Mod	Mod	Mod	Low	Low	Low	Low	Low
Overall risk	**Low**	**Mod**	**Low**	**Low**	**Low**	**Low**	**Low**	**Low**

* Low due to Forest Plan direction and low levels of use of pesticides.

The overall risk for bats is low for most alternatives, except Alternative 2. Risk is highest for bats associated with shrubland habitats. However, bats would be using these habitats for foraging, and nocturnal, flying insect populations may not be as affected by increases in sagebrush canopy cover. It is expected that insect populations would be adequate to provide foraging habitat for these bats.

CLIFFS/ROCK OUTCROPS/TALUS

These habitats will not be affected by any of the proposed actions and there is no risk associated with implementation of any of the alternatives.

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Fine Filter Analysis

Threatened, and Endangered Species

CANADA LYNX

(The following information is summarized from USFWS, 2000)

Habitat and Population Overview

In the contiguous US, the distribution of lynx is associated with southern boreal forest, comprising of subalpine, coniferous forest in the west. Lynx are most likely to persist in areas that receive deep snow, for which the lynx is highly adapted. Lynx in the contiguous US are part of a larger metapopulation whose core is located in the northern boreal forest of central Canada. At the southern margins of their distribution, habitat becomes naturally fragmented into patches of varying size as it transitions into other forest types. Some of these patches serve as sources, while others may function as sinks, where lynx mortality is greater than recruitment.

Lynx use large woody debris, such as downed logs and windfalls for denning sites with security and thermal cover for kittens. The age of the stand does not seem as important as the amount of downed woody debris available.

The size of the lynx home range varies by the animal's gender, abundance of prey, season and density of lynx populations. Preliminary research supports the theory that lynx home ranges at the southern extent of their distribution are generally larger compared to those in the north.

Lynx are highly specialized predators whose primary prey are snowshoe hares. Snowshoe hares use forests with dense understories that provide forage, cover to escape from predators and protection during extreme weather. Snowshoe hare provide the high quality prey necessary to support high-density lynx populations. Relative densities of snowshoe hares at southern latitudes are generally lower than those in the north.

ICB (Wisdom, *et al*, 2000) put lynx into the habitat generalist family, because they use subalpine forests, lower montane forests and riparian woodlands as source habitats. Downed logs are a special habitat feature because they serve as potential resting and denning sites.

Lynx were not abundant but were distributed throughout northern Idaho in the early 1940s. Anecdotal reports compiled by Lewis and Wenger (1998) indicated the occurrence of lynx in atypical habitats. Based on the time frames when collected, these records likely were dispersing transient individuals. Historic and current presence of resident lynx cannot be determined, nor is information on population trends available with current information.

Lewis and Wenger (1998) collected information on lynx sightings and records in Idaho. They found several records from the Caribou Forest; Skinner Canyon, Georgetown Canyon, Tincup Creek, Home Canyon, Trail Canyon area and Big Rattlesnake Canyon (Bear River, Preuss, and Caribou ranges). Most of these records have been on the east side of the Forest.

To date, no lynx hair samples have been identified in the on-going lynx hair snare grid survey on the Caribou NF (two years have been completed). To the north, on the Targhee NF, no lynx hair samples have been found either on four survey grids.

No critical habitat has been designated for the lynx.

Habitat Evaluation—Draft Lynx Analysis Unit Map

The lynx was listed as threatened in March 2000. In the Final Rule, the USFWS concluded that the factor threatening the continuous U.S. Distinct Population Segment is the inadequacy of existing regulatory mechanisms. The Lynx Conservation Assessment and Strategy (2nd edition) was released in August 2000. This document outlines risk factors and conservation measures to conserve lynx. It also provides objectives, standards and guidelines.

The LCAS (2000) identified southeastern Idaho as part of the Northern Rocky Mountain geographic area. As it is mapped, habitat on the Caribou NF connects to the Wasatch-Cache NF to the south (Figure 1 from LCAS).

The conservation measures are written at two levels. The programmatic plans provide broad direction for management activities. Direction is substantive and procedural. At the project level, Lynx Analysis Units (LAUs) are used to evaluate and monitor effects of land management on lynx habitat. Programmatic planning may entail consideration of all the LAUs within a given sub-basin or mountain range.

Draft LAUs were mapped for the Caribou NF (6/6/2000). There were eighteen LAUs identified, four of which are on the Westside Ranger District and have little to no primary or secondary habitat. Primary habitat included all mixed conifer 1 and mixed conifer 2 on the Caribou NF vegetation layer (subalpine fir

and Engelmann spruce intermixed with other species). Secondary habitat was all lodgepole pine, Douglas-fir, aspen and aspen/conifer on the vegetation layer. Areas dominated by dry Douglas-fir, and shrublands were not mapped as primary or secondary habitat.

Of the eighteen mapped Draft LAUs, thirteen had less than 10 percent primary habitat, and the other five had less than 20 percent primary habitat.

McKelvey and McDaniel (2001) studied snowshoe hare densities on the Island Park area of the Targhee NF in what they considered the best snowshoe hare habitat. They found low densities compared to other areas that have resident lynx populations. Based on this, and the fact that snowshoe hares is more limiting on the Caribou NF, densities of primary prey for lynx are expected to be very low on the Caribou NF.

The LCAS includes a guideline to determine where high total road densities (greater than 2 mi/mi^2) coincide with lynx habitat. When OMRDs were determined by draft LAU, all draft LAUs were less than 2 mi/mi^2. The following tables refer to the Draft LAUs which were dropped before Alternative 7R was developed (See following section).

Table 52. OMRD's in Draft Caribou LAUs.

OMRD	0-0.5 mi/mi^2	0.6-1.0 mi/mi^2	1.1– 1.5 mi/mi^2	1.6-2.0 mi/mi^2
Number of draft LAUs in OMRD category	1	3	9	5

Table 53. Comparison of Alternatives Based on Risk Factors When Caribou Had Draft LAUs.

Risk Factors for Lynx	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
Acres of winter non-motorized	2,500	2,500	2,500	1,600	53,500	40,400	3,600
Maximum open route density (mi/mi^2)	None	None	None	2	2	2	2
% of Forest open to off-route travel	33%	38%	38%	0	3%	0	2%
Maintenance of corridors* in Caribou/Webster/Preuss	4	4	4	2	2	1	3
Overall ranking from forest age distribution	**2**	**2**	**1**	**1**	**2**	**2**	**2**

* See corridor evaluation.

Table 54. Ranking of Alternatives Based on Former Risk Factors.

Lynx Ranking	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
Acres of winter non-motorized	4	4	4	5	1	2	3
Maximum open route density (mi/mi^2)	2	2	2	1	1	1	1
% of Forest open to off-route travel	3	3	3	1	2	1	2
Maintenance of corridors* in Caribou/Webster/Preuss	4	4	4	2	2	1	3
Overall ranking from forest age distribution	2	2	1	1	2	2	2
Overall Ranking	**1**	**3**	**3**	**2**	**1**	**1**	**2**

* See corridor evaluation.

Table 55. Risk Assessment for Lynx Based on Former Risk Factors.

Risk Assessment	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7
Acres of winter non-motorized	Mod	Mod	Mod	Mod	Low	Low	Mod
Maximum open route density (mi/mi^2)	Mod	Mod	Mod	Low	Low	Low	Low
% of Forest open to off-route travel	Mod	Mod	Mod	Low	Low	Low	Low
Maintenance of corridors* in Caribou/Webster/Preuss	Mod	Mod	Mod	Low	Low	Low	Mod
Forest age distribution	Mod	Mod	Low	Low	Mod	Mod	Mod
Overall risk	**Mod**	**Mod**	**Mod**	**Mod**	**Low**	**Low**	**Mod**

* See corridor evaluation at end of the Wildlife section of this Appendix.

Habitat Evaluation—Final Lynx Analysis Unit Maps

A meeting was held on 9/5/2001 with the USFWS, Salmon-Challis, Bridger-Teton, and Caribou-Targhee National Forests, and BLM from Montana and Idaho. It was jointly decided by Caribou-Targhee and Fish and Wildlife Service personnel that primary vegetation types (lynx habitat) on the Caribou NF were too patchy and disjunct to provide suitable lynx habitat. A patch size analysis done for the Caribou NF found that in the watersheds reviewed, the average patch sizes for mixed conifer stands ranged from 14 to 27 acres, and 20 to 44 acres for lodgepole pine. At that meeting, it was agreed that the Caribou portion of the Caribou-Targhee National Forest would be dropped as suitable lynx habitat, and no lynx analysis units would be delineated on the Caribou NF. As a result of this meeting, Montpelier and Soda Springs Ranger Districts were identified as potential linkage habitat. The Westside Ranger District, including the Curlew National Grasslands would not be considered linkage habitat.

The Final Lynx Analysis Unit (LAU) map was amended by the Caribou-Targhee National Forest on September 18, 2001 to reflect these changes. The USFWS agreed (letter dated 2/5/02) that the final mapping met the habitat mapping requirements of the Lynx Conservation Assessment and Strategy (LCAS). The eastside districts (Montpelier and Soda Springs) will address LCAS conservation measures regarding lynx connectivity, movement, and dispersal.

A later interagency meeting on January 25, 2002 identified and mapped possible lynx linkages for the state of Idaho. This mapping effort focused on highways as the major factor affecting lynx movements and dispersal, especially four-lane highways. Of special concern would be the conversion of existing two-lane, to four-lane highways. As a result of that mapping, there were two areas on or adjacent to the Caribou NF that were mapped as linkage areas across highways. These are: Highway 34 along the Tincup Highway and Highway 34 between Manson and Georgetown. (M. Orme, Forest Biologist, pers. comm.). These are shown on Map 1: Canada Lynx Potential Linkages.

Landscape level linkages have been identified as areas that could allow movement of lynx from the Greater Yellowstone Ecosystem on the north, to adjacent Forests to the south. On the Forest, areas that were considered as most important include 1) the south end of the Bear River Range that connects to the Wasatch-Cache NF to the south; 2) the Gannett Hills area that connects to the Bridger-Teton NF to the east and 3) the McCoy Creek area that connects to the Targhee NF on the north and the Bridger-Teton NF to the east. These are shown on Map 1: Canada Lynx Potential Linkages.

The Targhee NF has mapped Lynx Analysis Units adjacent to the Caribou NF. The Palisades country has cooler, moister habitats and the amount of primary habitat increases greatly over what is found to the south.

The Bridger-Teton NF has mapped LAUs adjacent to the Caribou NF, as well. They used information from two radio-collared lynx to help determine suitable habitat, as well as used recommendations of the lynx Biology team to include slopes over 40 percent as suitable. According to Timm Kaminski (Forest Biologist, pers. comm.), their LAUs have around 45 to 80 percent primary habitat. This contrasts with the Caribou NF, where all eighteen previously mapped LAUs had less than 20 percent primary habitat.

The Wasatch-Cache NF had previously mapped Draft LAUs in the Bear River Range adjacent to the Caribou NF. However, LAUs are in the process of being remapped on three Forests in Utah, and the Bear River Range may not have LAUs, due to the low amount of primary habitat (R. Williams, Forest Biologist, pers. comm.). They have identified the Logan Canyon Highway 89 as a potential barrier to lynx movements along the Bear River Range.

Risk Factors

The LCAS identifies range-wide risk factors to lynx movement; these include highways, railroads and utility corridors; land ownership patterns and ski areas and large resorts. Other large-scale risk factors associated with movements include dispersal across shrub-steppe habitats and habitat degradation by non-native invasive plant species. Risk factors affecting movement specific to the Northern Rockies include highways and associated developments and private land development. There are no ski areas or large resorts on Montpelier or Soda Springs Ranger Districts, so this risk factor does not apply to the Caribou NF.

Analysis of Conservation Measures and How They Were Addressed

For the Caribou Forest Plan Revision, standards and guidelines were used from the LCAS (Ruediger, *et al*, 2000), and the Ecology and Conservation of Lynx in the United States (Ruggiero, *et al*, 1999) as the basis for the analysis.

The following table lists the programmatic and project level objectives, standards and guidelines for lynx movements and dispersal from the LCAS. These conservation measures were developed to address the risk factors that were outlined in the previous section.

Table 56. Lynx Conservation Measures and How They Are Addressed in the Caribou NF Revised Forest Plan.

Conservation Measures to Address Movement and Dispersal	Analysis
Programmatic Planning Objective	
Maintain, and where necessary and feasible, restore habitat connectivity across forested landscapes.	Habitat connectivity is defined as vegetation in sufficient quantity and arrangement to allow for the movement of lynx. The Caribou is a natural mix of vegetation types, with about half forest and half rangeland vegetation. Patch sizes are very small, less than forty acres for all vegetation types except sagebrush (which are larger). Vegetation treatments will follow natural patterns, will be designed to move towards desired future conditions and native vegetation will become reestablished after treatments. There may be a short-term loss of cover following treatment, but over the long-term, connectivity will be maintained. As previously documented in the Project Description of this BA, forest vegetation treatment will affect less than 9 percent of the total forested vegetation, and 8 percent of the non-forested vegetation.

Conservation Measures to Address Movement and Dispersal	Analysis
	During winter lynx were observed traveling through silviculturally thinned stands with 420-640 trees/ha (170-259 trees/acre) (Koehler, 1990 as reported in Aubry, *et al*, 1999). From these observations, Koehler and Brittell (1990 as reported in Aubrey, *et al*, 1999) speculated that lynx avoid open areas where security cover is lacking but that 420-640 trees/ha (170-259 trees/acre) could provide adequate travel cover; during snow free periods, shrub habitat may also be used for travel by lynx. Our knowledge of lynx dispersal indicates that the vegetation treatments proposed in the Revised Plan would not be barriers to lynx movement through the Caribou NF.
Programmatic Planning Standards	
Identify key linkage areas that may be important in providing landscape connectivity within and between geographic areas, across all ownerships.	Potential landscape level linkages have been identified as areas that could allow movement of lynx from the Greater Yellowstone Ecosystem on the north, to adjacent Forests to the south. On the Forest, areas that were considered as most important include 1) the south end of the Bear River Range that connects to the Wasatch-Cache NF to the south; 2) the Gannett Hills area that connects to the Bridger-Teton NF to the east and 3) the McCoy Creek area that connects to the Targhee NF on the north and the Bridger-Teton NF to the east. Currently there are no four-lane highways crossing Montpelier or Soda Springs Ranger Districts. There are two sections of two-lane highway on or adjacent to the Caribou that were mapped as areas that could be of concern as potential linkage areas. These are Highway 34 along the Tincup Highway, and Highway 34 between Manson and Georgetown. There is little evidence that roads represent a significant disturbance or mortality factor for lynx (Aubry, *et al*, 1999). Studies documented that four of five lynx that dispersed in Montana, Washington, and Minnesota crossed two- or four-lane highways and major rivers (Aubrey, *et al*, 1999). Although we know little about the indirect effects of roads or trails on lynx, none of the eighty-nine lynx studied with radio telemetry in Washington, Montana, Wyoming, the southern Canadian Rockies, Minnesota, or Nova Scotia were killed in vehicle collisions (Aubry, *et al*, 1999). From analysis of sequential telemetry locations for lynx in Washington, McKelvey, *et al*, (1999) concluded that selection or avoidance of roads could not be inferred. Mowat, *et al*, (1999) reported similar observations concerning roads in northern boreal forest; lynx appeared to tolerate

Conservation Measures to Address Movement and Dispersal	Analysis
	moderate levels of snowmobile traffic, readily crossed highways, and established home ranges in proximity to roads. Several studies of lynx in the taiga have been conducted in areas of relatively dense rural human populations and agricultural development, suggesting that lynx can tolerate moderate levels of human disturbance (Aubrey, *et al*, 1999). The Caribou Forest Plan Revision does not change any existing highway conditions, nor affect the potential key linkage areas in any way that would prevent lynx movements.
Develop and implement a plan to protect key linkage areas on federal lands from activities that would create barriers to movement. Barriers could result from an accumulation of incremental projects, as opposed to any one project.	Vegetation treatments are to help move conditions toward proper functioning condition, providing suitable movement and dispersal areas over the long-term. Upland and riparian livestock utilization levels will improve habitat for small mammals, improving foraging habitat for dispersing lynx. In addition, a couple of security areas were made non-motorized yearlong (Bear Creek and Meade Peak). None of the proposed activities would create a barrier to movement.
Evaluate the potential importance of shrub-steppe habitats in providing landscape connectivity between blocks of lynx habitat. Livestock grazing within shrub-steppe habitats in such areas should be managed to maintain or achieve mid seral or higher condition, to maximize cover and prey availability. Such areas that are currently in late seral conditions should not be degraded.	Sagebrush habitats will be managed to move towards the desired future condition of having 50 percent in canopy cover greater than15 percent. As treatments occur on about 8 percent of the non-forested vegetation, there would be short-term changes in cover and changes in prey species composition, abundance and distribution. However, over the long-term, sagebrush habitats will be maintained across the Forest, and associated-species should benefit. Foraging habitat for dispersing lynx will be maintained over the long-term. Upland livestock forage utilization levels would maintain upland vegetation health and vigor. There would be no major changes in plant species composition and seral conditions as a result of livestock grazing.
Programmatic Planning Guidelines	
Where feasible, maintain or enhance native plant communities and patterns, and habitat for potential lynx prey, within identified linkage areas. Pursue opportunities for cooperative management with other landowners.	Most vegetation treatments and the forage utilization standards are all planned to maintain or enhance native plant communities. Landscape patterns would not be affected, as vegetation is already very patchy on the Caribou NF. Management direction that provides for suitable habitat for maintaining linkages for lynx on the Forest is located in the following places in the Revised Forest Plan: ♦ Vegetation Desired Future Conditions ♦ Vegetation, Goals 1-6 ♦ Vegetation, Standard 2

Conservation Measures to Address Movement and Dispersal	Analysis
	♦ Wildlife, Goals 2 and 6 ♦ Lands, Objective 1 ♦ Lands and Land Exchanges, Standard 1
Highways	
Programmatic Planning Objective	
Ensure that connectivity is maintained across highway rights-of-ways.	The Revised Forest Plan has an objective to "Identify land adjustments and right-of-ways to improve management, public access, and/or wildlife connectivity annually."
Programmatic Planning Standards	
Federal land management agencies will work cooperatively with the Federal Highway Administration and State Departments of Transportation to address the following within lynx geographic areas: a) identify land corridors necessary to maintain connectivity of lynx habitat and b) map the location of "key linkage areas" where highway crossings may be needed to provide habitat connectivity and reduce mortality of lynx.	A meeting on January 25, 2002 mapped lynx linkages for the state of Idaho. This mapping effort focused on highways as the major factor affecting lynx movements and dispersal. Of special concern would be the conversion of existing two-lane, to four-lane highways. Currently there are no four-lane highways crossing Montpelier or Soda Springs Ranger Districts. As a result of that mapping, there were two areas on or adjacent to the Caribou NF that were mapped as linkage areas across two-lane highways. These are Highway 34 along the Tincup Highway, and Highway 34 between Manson and Georgetown. (M. Orme, Forest Biologist, pers. comm.). There is little evidence that roads represent a significant disturbance or mortality factor for lynx (Aubry, *et al*, 1999). Studies documented that four of five lynx that dispersed in Montana, Washington, and Minnesota crossed two- or four-lane highways and major rivers (Aubrey, *et al*, 1999). Although we know little about the indirect effects of roads or trails on lynx, none of the eighty-nine lynx studied with radio telemetry in Washington, Montana, Wyoming, the southern Canadian Rockies, Minnesota, or Nova Scotia were killed in vehicle collisions (Aubry, *et al*, 1999). From analysis of sequential telemetry locations for lynx in Washington, McKelvey, *et al*, (1999) concluded that selection or avoidance of roads could not be inferred. Mowat, *et al*, (1999) reported similar observations concerning roads in northern boreal forest; lynx appeared to tolerate moderate levels of snowmobile traffic, readily crossed highways, and established home ranges in proximity to roads. Several studies of lynx in the taiga have been conducted in areas of relatively dense rural human populations and agricultural development, suggesting that lynx can tolerate moderate levels of human disturbance (Aubrey, *et al*, 1999). The Caribou Forest Plan Revision does not change any existing highway conditions, nor affect the potential key linkage areas in any way that would

Conservation Measures to Address Movement and Dispersal	Analysis
	prevent lynx movements. Any highway realignments or upgrades on the Forest would go through an Environmental Analysis. Needs for special wildlife crossings would be identified at that time.
Programmatic Planning Guidelines	
Evaluate whether land ownership and management practices are compatible with maintaining lynx highway crossings in key linkage areas. On public lands, management practices will be compatible with providing habitat connectivity. On private lands, agencies will strive to work with landowners to develop conservation easements, exchanges or other solutions.	All of the Tincup Highway linkage area is managed by the Caribou-Targhee NF. Vegetation is very patchy in this area, with only small amounts of suitable habitat within a mile of the highway. All proposed management activities in Alt 7R would be compatible with providing habitat connectivity. The section of Highway 34 between Manson and Georgetown is largely private land, with smaller amounts of state land. According to the Adjacency Analysis (Rine, 2001), Bear Lake County is in the process of revising its land use plan and ordinances, due to the counties rapid development. Lands managed by Department of State Lands are dedicated to timber harvest or grazing. Crossing this linkage involves crossing more than seven miles of open country, with agricultural lands, livestock grazing, subdivision, the Bear River, a railroad, as well as the Highway.
Project Planning Standards	
Identify, map and prioritize site-specific locations, using topographic and vegetation features, to determine where highway crossings are needed to reduce impacts on lynx.	As previously stated above, there are two two-lane highways that exist. Current studies as cited above indicate that these highways are currently not barriers to lynx movement. Any highway realignments or upgrades on the Forest would go thru an Environmental Analysis. Needs for special wildlife crossings would be identified at that time.
Within the range of lynx, complete a Biological Assessment for all proposed highway projects on federal lands. A land management agency biologist will review and coordinate with highway departments on development of the Biological Assessment.	This is already done as standard operating procedure. No additional direction is needed.
Project Planning Guidelines	
Dirt and gravel roads traversing lynx habitat should not be paved or otherwise upgraded in a manner that is likely to lead to significant increases in traffic. When such upgrades are proposed, a thorough analysis should be conducted on the potential direct and indirect effects to lynx and lynx habitat.	Current studies as cited above indicate that dirt and gravel roads are not barriers to lynx movement. In the Facilities-Transportation System section of the Revised Plan, Goal 2 states, "The Forest transportation system will be developed and maintained at the minimum level necessary to effectively and efficiently manage natural resources, provide user access, protect capital investments, provide for user health and safety, and protect the environment." It is standard operating procedure to conduct an analysis anytime a road is upgraded.
Land Ownership	
Programmatic planning objective	
Retain lands in key linkage areas in public ownership.	The Revised Forest Plan has the following Objective in the Lands section: "Identify land adjustments and

Conservation Measures to Address Movement and Dispersal	Analysis
	rights-of-ways to improve management, public access, and/or wildlife connectivity annually." The following Standard is in the Lands and Land Exchanges section: "Priority shall be given to acquiring lands having special importance or unique characteristics such as riparian areas, historic sites, habitat for federally listed species, recreation sites, etc."
Programmatic planning standards	
Identify key linkage areas by management jurisdictions in management plans and prescriptions.	Potential linkage areas were mapped as previously discussed in this BA, and are shown on the map. The management direction contained in the Revised Plan (Forest-wide Goals, Objectives, Standards and Guidelines, and Management Prescriptions) provide suitable habitat for the movement of lynx.
Programmatic planning guidelines	
In land adjustment programs, identify key linkage areas. Work towards unified management direction via habitat conservation plans, conservation easements or agreements and land acquisition	Potential linkage areas were mapped as previously discussed in this BA, and are shown on the map. The Revised Forest Plan has the following Objective in the Lands section: "Identify land adjustments and rights-of-ways to improve management, public access, and/or wildlife connectivity annually." The following Standard is in the Lands and Land Exchange section: "Priority shall be given to acquiring lands having special importance or unique characteristics such as riparian areas, historic sites, habitat for federally listed species, recreation sites, etc."
Project Planning Standards	
Develop and implement specific management prescriptions to protect/enhance key linkage areas	See Programmatic planning Standards above.
Evaluate proposed land exchanges, land sales and special use permits for effects on key linkage areas.	Potential linkage areas were mapped as previously discussed in this BA, and are shown on the map. The Revised Forest Plan has the following Objective in the Lands section: "Identify land adjustments and rights-of-ways to improve management, public access, and/or wildlife connectivity annually." The following Standard is in the Lands and Land Exchange section: "Priority shall be given to acquiring lands having special importance or unique characteristics such as riparian areas, historic sites, habitat for federally listed species, recreation sites, etc."
Other Large-scale Factors	
Fragmentation and Degradation of Refugia	The LACS describes refugia as large areas of high-quality habitat. There are no LAUs mapped on the Caribou NF based on the low quality of habitat, and there are no refugia on the Caribou NF.
Lynx Movement and Dispersal Across Shrub-steppe Habitats	Sagebrush habitats will be managed to move towards the desired future condition of having 50 percent in canopy cover greater than 15 percent. As treatments occur on about 7 percent of the non-forested

Conservation Measures to Address Movement and Dispersal	Analysis
	vegetation, there would be short-term changes in cover and changes in prey species composition, abundance and distribution. However, over the long-term, sagebrush habitats will be maintained across the Forest, and associated-species should benefit. Foraging habitat for dispersing lynx will be maintained over the long-term. Upland livestock forage utilization levels would maintain upland vegetation health and vigor. There would be no major changes in plant species composition and seral conditions as a result of livestock grazing.
Non-invasive Plant Species	Forest Plan direction seeks to prevent the establishment of new populations, control the spread of existing infestations, provide information to the public and cooperate with other agencies and landowners. This is consistent with the LCAS. No additional direction is needed.

Determination of Effects

Implementation of this alternative may effect, but is not likely to adversely affect lynx or lynx habitat. The rationale for this is based on inclusion of standards and guidelines into the Revised Forest Plan that address identified risk factors for lynx movement and dispersal. The Caribou NF will continue to provide potential linkage habitat for lynx moving across the Northern Rocky Mountain lynx geographic area.

In addition, the vegetation treatments proposed will move aspen, conifer and sagebrush types towards desired future conditions. This will improve understory conditions for prey species and maintain its potential for lynx dispersal over the long-term. Implementation of upland and riparian livestock grazing utilization standards will improve understory vegetation conditions, improving foraging habitat and cover for dispersing lynx. The Revised Forest Plan includes management direction that provides habitat for maintaining linkages for lynx on the Forest and has an objective to complete hair snare surveys on Montpelier and Soda Springs Ranger Districts. Additional site-specific level analysis will consider and analyze effects on lynx movements and dispersal when specific projects are proposed.

Cumulative Effects

Most suitable habitat is southern Idaho is located on higher elevation forested lands, often publicly managed lands. All public land managers will incorporate guidance from the LCAS. Impacts and risk factors for lynx movement and dispersal that could occur on private lands have been incorporated into the discussion of direct and indirect effects. The list of reasonably foreseeable future actions was reviewed for those that would affect the risk factors identified for lynx movement and dispersal, on adjacent private lands. These have already been incorporated into the above table.

References cited in above section:

Lewis, L. and C.R. Wenger. 1998. Idaho's Canada Lynx: Pieces of the Puzzle. Idaho Bureau of Land Management Technical Bulletin No. 98-11, October 1998.

Ruediger, B., J. Claar, S. Gniadek, B. Holt, L. Lewis, S. Mighton, B. Naney, G. Patton, T. Rinaldi, J. Trick, A. Vandehey, F. Wahl, N. Warren, D. Wenger and A. Williamson. 2000. Canada Lynx Conservation Assessment and Strategy. USDA Forest Service, USDI Fish and Wildlife Service, USDI

Bureau of Land Management, and USDI National Park Service. Forest Service Publication #R1-00-53, Missoula, MT. 142 pp.

U.S. Fish and Wildlife Service. 2000. Final Rule, Determination of Threatened Status for the Contiguous U.S. Distinct Population Segment of the Canada Lynx. March, 24, 2000. p. 16052 – 16086.

Wisdom, M.J., *et al*, 2000. Source Habitats for Terrestrial Vertebrates of Focus in the Interior Columbia Basin: Broad-scale trends and management implications. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. General Technical Report PNW-GTR-485. 156 pp.

ROCKY MOUNTAIN WOLF

(Most of the following information is summarized from USFWS, 1994).

Population Overview

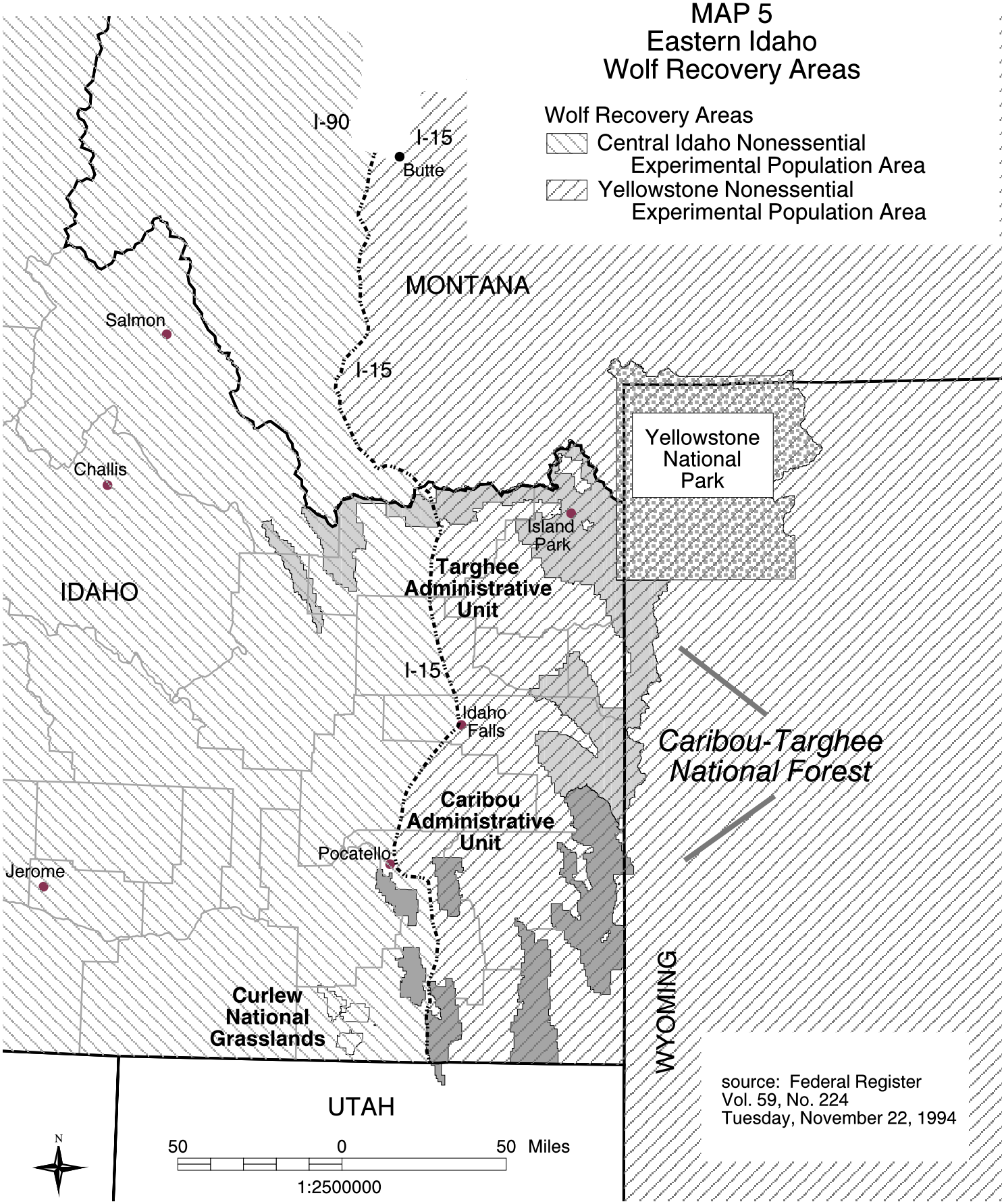
The gray wolf was listed as endangered in 1978. For fifty years prior to 1986, no detection of wolf reproduction was found in the Rocky Mountain portion of the United States. Then in 1986, a wolf den was discovered near the Canadian border near Glacier National Park. A revised recovery plan was approved by the USFWS in 1987. It identified a recovered wolf population as being at least ten breeding pairs of wolves, for three consecutive years, in each of three recovery areas (northwestern Montana, central Idaho and Yellowstone). This has recently been modified to mean thirty breeding pairs, about evenly distributed between the three recovery areas (Ed Bangs, Wolf Recovery Project Leader, USFWS, pers. comm.). In 1994, the USFWS signed the decision to reintroduce wolves into Yellowstone and central Idaho as nonessential experimental populations (USFWS, 1994).

The division between the central Idaho and Yellowstone populations is U.S. Interstate I-15. As a result, the Caribou National Forest is split between the two recovery areas. See Map 5: Eastern Idaho Wolf Recovery Areas. By the end of 1999, at least 118 wolves were present in the GYA. Reproduction was confirmed in eleven of sixteen packs, but pup survival was low. In central Idaho, reproduction was confirmed in twelve packs, with generally high pup survival. However, when factoring in pack and pup survival at the end of the year, the number of packs/breeding pairs is somewhat lower:

Table 57. Number of Breeding Pairs in the Central Idaho and Yellowstone Recovery Areas.

Recovery Area	1995	1996	1997	1998	1999	2000	2001
Yellowstone	2	4	9	6	8	13	13
Central Idaho	-	3	6	10	10	9	14

In July of 2000, the USFWS began the yearlong process to reclassify, de-list wolves over much of the United States. The Western population would be reclassified from endangered to threatened. The non-essential, experimental status of wolves in Yellowstone and central Idaho would remain (USFWS, 2000). No critical habitat has been designated for the wolf.


MAP 5
Eastern Idaho
Wolf Recovery Areas
Wolf Recovery Areas
Central Idaho Nonessential Experimental Population Area
Yellowstone Nonessential Experimental Population Area
I-90
I-15
Butte
MONTANA
Salmon
I-15
Challis
Yellowstone National Park
Island Park
Targhee Administrative Unit
IDAHO
I-15
Idaho Falls
Caribou-Targhee National Forest
Caribou Administrative Unit
Pocatello
Jerome
Curlew National Grasslands
WYOMING
UTAH
N
50
0
50 Miles
1:2500000
source: Federal Register
Vol. 59, No. 224
Tuesday, November 22, 1994

Wolf Biology and Ecology

The basic social unit in wolf populations is the pack. A pack consists of two to thirty wolves (average of ten), which have strong social bonds to each other. Breeding within the pack usually occurs only between the top-ranking alpha male and female. Wolves breed in Yellowstone any time from late January to late February. Pregnant wolves dig dens a few weeks before birth of pups. They are usually burrows in the ground, but they will also use hollow logs, rock caves or abandoned beaver lodges. Some den sites are used traditionally, and there may be several den sites within their territory that are used in different years. By the time pups are six to ten weeks of age (late May to early July), they will move to a first rendezvous site. This is usually within one to six miles of the natal den and often consists of open meadows and adjacent forest with surface water close by. A succession of rendezvous sites is used through fall.

Wolves die from a variety of causes: malnutrition, disease, debilitating injuries, interpack strife and human exploitation or control. The USFWS's Annual Reports show mortalities for each recovery area.

Table 58. Known Mortalities and Causes (from USFWS Annual Wolf Reports).

Recovery Area	Natural Causes	Human-caused	Unknown	Total
Yellowstone 1999	21	10	1	32
Central Idaho 1999	6	11	8	25
Yellowstone 2000	6	9	5	20
Central Idaho 2000	1	17	5	23
Yellowstone 2001	3	13	0	16
Central Idaho 2001	1	10	5	16

In general, wolves depend upon ungulates for food year round. In northwestern Montana since the mid-1980s, about 63 percent of kills were deer, 30 percent were elk and 7 percent were moose; in Yellowstone elk made up 89 percent of kills made during winters over a three-year period; near Salmon, elk made up an estimated 90 percent of the wolf kills (Draft Idaho Wolf Conservation Management Plan, 2000). On an average, wolves eat nine pounds of meat per day during the winter. The frequency of kills by a wolf pack varies tremendously, depending on many factors, including pack size, diversity, density, and vulnerability of prey, snow conditions, and degree of utilization of carcasses.

Use on Forest

Sightings of suspected wolves have been reported across the east side of the Forest over the last twenty years. These have all been of lone, individual animals. All of these sightings were in the vicinity of Montpelier and Soda Springs Ranger Districts. One of these animals was taken in a control action (Nove, 2000) as a result of livestock depredations. At this time, there are no breeding pairs or packs of wolves on the Caribou NF.

Effect of Open Road Densities on Wolves

Originally, wolves lived in every habitat in North America that supported large mammals, their main prey. When wolves were persecuted the only populations left were those in inaccessible and heavily forested areas. Early research showed that in Wisconsin, Michigan and Minnesota, wolf populations generally inhabited only areas with road densities less than .23 km^2 (.4 mi/mi^2), because higher road densities allowed human access, which led to illegal, accidental, or incidental wolf deaths (USFWS, 1994).

Given legal protection, wolves have adapted to human developments. Current land management in national forests places restrictions on human use in important ungulate seasonal ranges (winter range,

calving areas). These restrictions occur at the same time and in habitats similar to those that would be used by denning wolves.

The relationship between roads, wolf survival and wolf habitat use is more complicated than road density alone. Terrain, topography, cover, traffic, road distribution and the ability, opportunity and desire of people to kill wolves affect wolf vulnerability. Wolf packs have survived in some areas of high road densities, but most wolf mortality has been associated with road access. Illegally killed wolves continue to be a problem in both recovery areas. While it is unlikely that road density guidelines are needed to support wolf recovery, they do benefit big game, which are important as prey.

Threats or Risks to Wolves

In the Final Rule (Federal Register, Vol. 59. Number 224) it says, "There are no conflicts with current management actions of the Forest Service". Potential threats were listed as hunting, trapping, animal damage control activities and high-speed roads and highways. The Final Rule outlines how wolves depredating on livestock will be managed and this has been incorporated into the Forest Plan. Risks identified by Witmer, *et al*, (1998) include risks due to increased accessibility of humans; trapping, shooting and predator control activities; and activities that decrease prey (big game) populations.

Several measures of access are shown below, reflecting vulnerability to hunters and trappers. OMRDs for the Caribou/Webster/Preuss range is shown, as that is where the majority of the sightings have been reported and is the major linkage from the Greater Yellowstone Ecosystem to the north.

Comparison of Alternatives

Table 59. Ranking of Alternatives Based on Risk Factors from Final Rule.

Wolf Rankings (1=best)	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
% Forest open to off-route travel	2	2	2	1	1	1	1	1
Ranking of OMRD For Caribou/Diamond/Preuss	4	4	4	3	2	1	3	4
Ranking based on acres where natural processes dominate	3	3	4	2	2	1	3	2
Ranking on winter big game distribution*	3	2	2	1	1	2	1	1
Ranking based on AUM's	2	2	2	1	1	1	1	1
Overall ranking	**3**	**3**	**3**	**2**	**1**	**1**	**2**	**2**

* Assumption that winter ranges in Rx 2.7 will be in better condition and receive more use from wintering big game

Table 60. Risk Assessment Based on Risk Factors.

Risk Assessment	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Maximum open route density (mi/mi^2)	Mod	Mod	Mod	Low	Low	Low	Low	Low
% of Forest open to off-route travel	Mod	Mod	Mod	Low	Low	Low	Low	Low
Maintenance of corridors* in Caribou/Webster/Preuss	Mod	Mod	Mod	Low	Low	Low	Mod	Mod
Livestock AUM's on forest and potential for predation	Mod	Mod	Mod	Low	Low	Low	Low	Low
Overall Risk	**Mod**	**Mod**	**Mod**	**Low**	**Low**	**Low**	**Low**	**Low**

Determination of Effects

Risks identified by Witmer, *et al*, (1998) include risks due to increased accessibility of humans; trapping, shooting and predator control activities; and activities that decrease prey (big game) populations.

Table 61. Risk Assessment Based on Factors Identified in the Final Rule and Witmer, *et al*, (1998).

Risk Assessment	Alt 7R, the Preferred Alternative
Travel Management and accessibility to humans.	Motorized use would be restricted to designated routes year-round over 98 percent of the Forest. OMRDs would be maintained at just below current levels once travel planning is updated and implemented. Risk of shooting or trapping would not increase over current conditions, based on OMRDs as outlined in the project description section.
Prey availability	Alt7R would improve suitability of habitat for mule deer and elk and no decrease in abundance or major changes in distribution are expected as a result of implementation of this alternative. Winter ranges are managed through upland livestock forage utilization levels, winter travel management and vegetation treatments. All of these activities will benefit big game and maintain a prey base for wolves.
Predator management	Predator control activities are done by Wildlife Services under existing regulations. Implementation of any of the alternatives would not affect predator control activities.
Highway mortality	Highways across the Forest are all two-lane and generally lower speed highways (due to grade, alignment, visibility etc) than those found in the valleys. Any highway reconstruction, re-alignment or improvement that crosses federal lands would be assessed in a site-specific analysis and mitigation would be incorporated as needed.
Overall Risk	**Low**

The Final Rule states: "Management of wolves in the experimental population would not cause major changes to existing private or public land use restrictions after six breeding pairs are established in the recovery area". Before six wolf pairs are established, temporary restrictions on human access near active den sites may be required between April 1 and June 30." Since there are well over six breeding pairs established in both of the recovery areas, protection around den sites is not required.

A Standard has been incorporated into the Forest Plan that addresses restriction of human disturbances around den sites and rendezvous sites, if the number of breeding pairs drops below six in either of the recovery areas.

Alternative 7R is not likely to jeopardize the continued existence of the species or result in destruction or adverse modification of proposed critical habitat (no critical habitat has been identified). Wolf populations have met recovery goals for breeding pairs for the last two years in both the Central Idaho and Yellowstone Recovery Areas. The Caribou may contribute to the conservation of this species by providing habitat for wolves dispersing from either the Central Idaho or Yellowstone Recovery Areas.

Cumulative Effects

Wolves are wide-ranging species and the potential for conflicts with humans and livestock is higher on private lands where livestock is concentrated in smaller areas. All of these potential problems are dealt with on a site-specific basis, by Wildlife Services. As wolves move into more open areas, with more access, they also become more vulnerable to shooting. The potential for highway mortality, due to more traffic at higher speeds would increase at lower elevations off the Forest. In addition, there are several areas where subdivisions are increasing adjacent to the Forest. The potential for conflicts due to depredations on pets etc will increase.

In 2001, in the Yellowstone Recovery Area, there were thirteen documented human-caused mortalities, or 6 percent of the total population. In the Central Idaho Recovery Area there were ten documented human-caused mortalities, or 4 percent of the population (USFWS, 2002). In spite of the human-caused mortalities, populations are continuing to increase.

References cited for above section:

Idaho Legislative Wolf Oversight Committee. 2000. Draft Idaho Wolf Conservation Management Plan. April 2000. Boise, ID.

US Fish and Wildlife Service. 1994. The Reintroduction of Gray Wolves to Yellowstone National Park and Central Idaho, Final Environmental Impact Statement. USFWS, Helena, MT.

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US Fish and Wildlife Service. 2000. News Release. Gray Wolves Rebound; US Fish and Wildlife Service Proposes to Reclassify, Delist Wolves in much of the United States. July 11, 2000.

US Fish and Wildlife Service. 2000. Gray Wolf Recovery Status Reports, Week of 12/8 – 12/15/2000.

US Fish and Wildlife Service. 2000. Rocky Mountain wolf Recovery 1999 Annual Report. USFWS, Nez Perce Tribe, National Park Service and USDA Wildlife Services.

US Fish and Wildlife Service, Nez Perce Tribe, National Park Service, and USDA Wildlife Services. 2002. Rocky Mountain Wolf Recovery 2001 Annual Report. T. Meier, ed. USFWS, Ecological Services, 100 N. Park, Suite 320, Helena, MT. 43 pp.

Witmer, G.W., S.K. Martin and R.D. Sayler. 1998. Forest Carnivore Conservation in the Interior Columbia River Basin: Issues and Environmental Correlates. USDA Forest Service, Pacific Northwest Research Station, General Technical Report PNW-GTR-420. Portland, OR. 15 p.

WHOOPING CRANE

Habitat and Population Overview

Whooping crane breeding grounds consist of marshes, sloughs, prairie potholes, and lake margins with abundant emergent vegetation in isolated, undisturbed areas. They also forage in upland areas.

During the 1970s the USFWS tried to establish a flock of whooping cranes at Grays Lake National Wildlife Refuge by “cross-fostering”, allowing sandhill cranes to hatch and raise young whooping cranes, but to date, the whooping cranes have shown no evidence of pairing or breeding. The “cross-fostering” program was terminated in 1989, because the birds were not pairing, and mortality was too high to establish a self-sustaining population. In 1997, the USFWS designated the Rocky Mountain population of whooping cranes as an experimental, nonessential population (USFWS, 1997).

Numbers of whooping cranes have declined over the years and the probability of whooping crane occupancy on the Forest is very low. In 1992, twelve whooping cranes returned to the Refuge. By the spring of 1995, only four returned, and only one of which remained there for the summer. By 1997,

numbers in the Rocky Mountain population had dropped to three non-breeding birds. One bird was sited in July 2000 on private lands between Soda Springs and Blackfoot Reservoir.

There may be one whooping crane left, but it was not seen in the spring of 2001 in the San Luis Valley, and it is not known if it is still alive. If it is alive, it is expected to stopover once in Idaho in the spring and not at all in the fall (T. Stehn, Whooping Crane coordinator, USFWS). Whooping cranes will be removed from consultation lists and project impacts will not need to be addressed for whooping cranes, once this happens (T. Stehn, Whooping Crane coordinator, USFWS, 4/17/02).

Habitat Evaluation

Reported sightings of whooping cranes on the Forest will be verified. Whooping cranes have periodically been observed on the Forest in the past (Stump and Slug Creek areas). If observations continue over a period of time or nesting territories are established, consultation with USFWS will be initiated. Until a pair of whooping cranes has been observed to use a Forest habitat for at least two consecutive years or has established a nesting territory on the Forest, they are not considered Forest residents.

Determination of Effects

None of the alternatives are likely to jeopardize the continued existence of the species or result in destruction or adverse modification of proposed critical habitat (no critical habitat has been identified). There are no risks to whooping cranes based on the low potential for use on the Forest.

Cumulative Effects

None.

References for the above section:

Stehn, T. 2002. E-mail correspondence dated 4/17/02, titled Idaho Whooping Crane Status.

US Fish and Wildlife Service. 1997. Final Rule to Designate the Whooping Cranes of the Rocky Mountains as Experimental Nonessential. Federal Register, July 21, 1997, Volume 62, Number 139, pages 38832-38838.

BALD EAGLE

Habitat Overview

During the breeding season, bald eagles eat mainly fish. They also forage on waterfowl, shorebirds, upland birds and small mammals. Eagles are very opportunistic predators, especially during the winter. The will eat whatever is available, including fish, waterfowl, small mammals and carrion.

Nesting habitat on or adjacent to the Caribou NF is associated with rivers, lakes and reservoirs. Nests are commonly found in large trees, mainly conifers and cottonwoods. Because eagles need large trees to support their large, heavy nests, they are often found in multi-storied, late successional stands with open canopies.

Wintering bald eagles tend to congregate near bodies of open water and roost communally. Major rivers and large lakes constitute the majority of winter habitats used, although temporary presence of high quality foods may entice eagles to areas far removed from aquatic zones (Greater Yellowstone Bald Eagle Working Group 1996). Considerations in the winter include the abundance of food usually associated with open water, availability and distribution of foraging perches and availability of secure night roost sites and the potential for human disturbance around all three habitat components.

Population Overview

The Caribou National Forest is part of the Pacific Recovery Region. The Pacific States Bald Eagle Recovery Plan was developed in 1986 (USFWS, 1986). Due to accomplishments of achieving recovery goals, the USFWS reclassified the bald eagle from endangered status to threatened status in the lower 48 States, in 1995 (USFWS, 1995).

The USFWS continues to move forward with plans to de-list the bald eagle and they are now working on addressing post de-listing population monitoring and continued protection of habitat once the population is delisted. There is no projected date for a decision at this time (Jane Jewett, USFWS, pers. comm.). If they are delisted, monitoring will continue, management plans will be followed, and birds themselves would continue to be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. If the bald eagle is delisted, USFWS will work with state wildlife agencies to monitor status of the species for a minimum of 5 years. If it becomes evident that protection is needed, the Service will relist the species.

The Caribou National Forest is within three bald eagle management zones, as identified in the Recovery Plan; Caribou/Green River in the southern part of the Forest, the Greater Yellowstone in the northeast part, and Great Basin on the northwestern part of the Forest. The Recovery Plan established habitat and population goals for these zones. The habitat management goals are considered the minimum number of territories needed to provide secure habitat for the recovered population (pg 30). These goals include all land ownerships.

Bald Eagle Populations in Management Zones

No territories have been documented in the Idaho portions of the Caribou/Green River and Great Basin Zones during the last several years (IDFG 1993 to 1999). Monitoring information from the Idaho portion of the Greater Yellowstone is shown below. One of these nests (Grays Range) is found on Caribou National Forest lands.

Table 62. Idaho Portion of the Greater Yellowstone Zone.

YEAR	# OCCUPIED	# SUCCESSFUL	# OF YOUNG
2000	51	31	45
1999	45	20	31
1998	43	26	32
1997	40	27	47
1996	43	29	43
1995	40	22	37
1994	38	30	44
1993	35	18	24

The 1999 Idaho Bald Eagle Nesting Report (Beals and Melquist, 1999) found that although the number of occupied territories in Idaho continues to increase, several statewide monitoring categories indicate slight downward trends (occupancy, and success and productivity). Both of these categories showed upward trends in 2000 (Beals and Melquist, 2001).

Bald Eagle Populations on and Adjacent to the Caribou NF

In 2000, bald eagles on the Caribou-Targhee NF and adjacent lands had their third highest productivity year since 1981. Twenty-five out of forty-five young produced in southeast Idaho and adjacent Wyoming were from Caribou-Targhee NF nest territories (USFS, 2001).

There are two nesting territories on or adjacent to the Caribou National Forest. One is located near Thayne, Wyoming. Much of the following information was taken from the Bald Eagle Nest Area Management Plan (Brassfield, 1998). The Nest Management Plan has been approved by the USFWS and includes land management recommendations for different zones.

The Thayne territory has been occupied since 1977 and includes at least three nest sites, two of which are on Forest lands. Nesting in the territory was documented during 1977, 1980-84, and 1991-98. The nesting pair produced one or two fledglings in 1991-97. In 1994 the nest was occupied, but the pair failed to produce fledglings. Surveys in 1999 and 2000 observed eagles in the area, but no nesting was documented. The territory is considered occupied but inactive for those two years (S. Patla, Wildlife Biologist, Wyoming Game and Fish, pers. comm.).

Access to the nests is by foot only and the nearest bridge to cross the Salt River is privately owned and one-half mile from the nest, so the nests are relatively secluded from human activity. Wyoming Game and Fish has been trying to gain access to the general area for eleven years (Rine, 2001). The riverbanks and valley bottom are mostly privately owned, and the eagles spend much of their time on or above private lands. In 1994, the male bald eagle of the nesting pair was shot, and no young were fledged. Shooting is known to be a frequent cause of bald eagle mortality throughout the west (USFWS, 1986). Urban development along the riparian areas of the Salt River may also be affecting the productivity of the eagles.

In the summer various types of boats are used to float the Salt River for recreational purposes. The nests on Forest lands are part of the Stump Creek cattle allotment. Grazing by cattle in the nesting zone is light due to the steep terrain. There has been one large timber sale in the area, roughly four miles north of the nests, in the late 1960s or early 1970s. Several small sales were sold in the vicinity prior to 1980. Currently, most human activities in the area occur during the fall big game hunting seasons.

The other nest territory on or adjacent to the Caribou is found on Grays Range. The Grays Range nesting area is mostly off-forest, but one nest tree may be located on the Forest. The Grays Range nest was observed in 1996 and 1997, but first shows up in the 1998 Idaho Bald Eagle Nesting Report. In that year, they were successful in raising one young. In 1999 they were successful in raising three young and two young in 2000 (Beals and Melquist, 2001). An objective has been added to prepare a nest management plan for the Grays Range Nest territory, and any other new territories that may become established. These Plans will include management direction by zone (nest, primary use area and home range), as described in the Forest Plan.

Table 63. Bald Eagle Nesting Territories on the Caribou NF.

Territory Name	Nest Site Occurs On Forest	Portion Of Territory On Forest	Number Of Years Occupied
Thayne[1]	2 of 3	Yes	16 years since 1977
Grays Lake	1 of 2	Yes	1996 - 1999

1 Information taken from the Nest Management Plan and updated from Susan Patla, Wyoming Game and Fish.

In addition to the two nest territories, there are others that have been reported in the vicinity of the Caribou. One nest was confirmed at Blackfoot Reservoir for one year, and one nest at Alexander Reservoir in 1999. Efforts to relocate the nest in 2000 were unsuccessful (Carl Anderson, IDFG, pers. comm.). In addition, there were reports of nests around Thatcher (1998) and Sulphur Canyon (1995).

Both of these reports were followed up on, but no nesting could be confirmed (Carl Anderson, IDFG, pers. comm.).

Four areas of known bald eagle winter use have been surveyed once yearly since 1986. These areas are Tincup (nine eagles over fifteen years), Diamond Creek (two eagles in twelve years), Narrows/Lane Creek (eight eagles in thirteen years) and Crow Creek (sixteen eagles in fifteen years).

Risks Identified for Bald Eagles

Risks to eagles involve exposure to lead poisoning, secondary poisoning from insect and predator control programs, collision and electrocutions associated with power transmission, and loss of perching, foraging and roosting opportunities due to human disturbance or activities (GYBEWG, 1996)

Overview of Effects

(This overview is summarized from the Greater Yellowstone Bald Eagle Working Group, 1996.)

Poisoning/Contaminants

Wildlife Services carries out control activities within existing regulations. In addition, the Plan includes a Guideline about predator management activity within nest zones and primary use areas. The Plan also incorporates a Guideline about the use of herbicides and pesticides within the Home Range zone.

Collision/electrocution

The Plan includes a Standard in nest zones and primary use areas to reduce the potential for effects from powerlines.

Human activity

Although direct impacts occur, frequencies are unexpectedly low because eagles are modifying their activities to avoid direct impacts and are less sensitive that anticipated. Bald eagles clearly respond to the proximity of humans by modifying activity and movements to avoid encounters.

Responses of eagles to human activities may vary from ephemeral, temporal and spatial avoidance of activity to total reproductive failure and abandonment of breeding areas. Relationships of human activity and eagle responses are highly complex, difficult to quantify and often individual for site-specific. Responses vary depending on type of activity, intensity, duration, timing, predictability and location of human activity. The ways in which these variables interact depend on age, gender, physiological condition, sensitivity, residency, and mated status of affected eagles. Prey base, season, weather, geographic area, topography and vegetation in the vicinity of the activity also influence eagle responses.

In a study along the Snake River in Wyoming, fewer eagles flushed when human activity was over 200 meters (656 feet) but most did when human activity was within 150 meters (492 feet). Some pairs primary use areas were on the most heavily impacted sections of the river. However, they shifted their activity patterns to very early morning and evening, to periods when their presence would be least obvious to humans.

In a study along the Snake River in Idaho, only 6 percent of the encounters between recreating humans and bald eagles resulted in a flush response, but eagles chose perches insulated from recreational activity by vegetation or distance. These eagles are excluded from prime foraging at these times, but used these areas heavily when recreational activities were absent.

Some eagles are more tolerant of human activity than others. Mean distance at which resident eagles flushed from human activity was greater when relative exposure to human activity was less. Thus, eagles in the vicinity of continuously inhabited areas of high human density may become habituated to human presence and tolerant of certain human activities more than those using more isolated locations. Whether individual eagles become more tolerant of human activity over time, or if areas subjected to excessive human activity are occupied by more tolerant eagles is unknown.

Both known nest locations on or adjacent to the Caribou are in areas that are fairly inaccessible to the general public. They are both within one to two miles of main roads. The site near Thayne is within two miles of Highway 89, which receives heavy traffic. The highway near the Grays Range nest site receives much less traffic. There may some activities on adjacent private lands, but would probably be at fairly low levels. Current levels of human activity do not appear to be affecting use of these nest territories, especially the Grays Range site. The Thayne site has been occupied but inactive, but no clear reason has been identified for this.

Vehicular traffic traveling along prescribed routes or within strict spatial limits and at relatively predictable frequencies is least disturbing to bald eagles. Snowmachines and all terrain vehicles are more disturbing, due to random, unpredictable movements, loud noise and visibility of operators.

All four monitored winter use areas are located adjacent to main access routes. Other roost sites will also probably be adjacent to main roads, since road locations often follow major riparian corridors. There is the potential for disturbance, but if the traffic stays on the road, they may become habituated to it and not be displaced.

Determination of Effects

Identified risk factors are summarized and the potential for effects is shown in the following table.

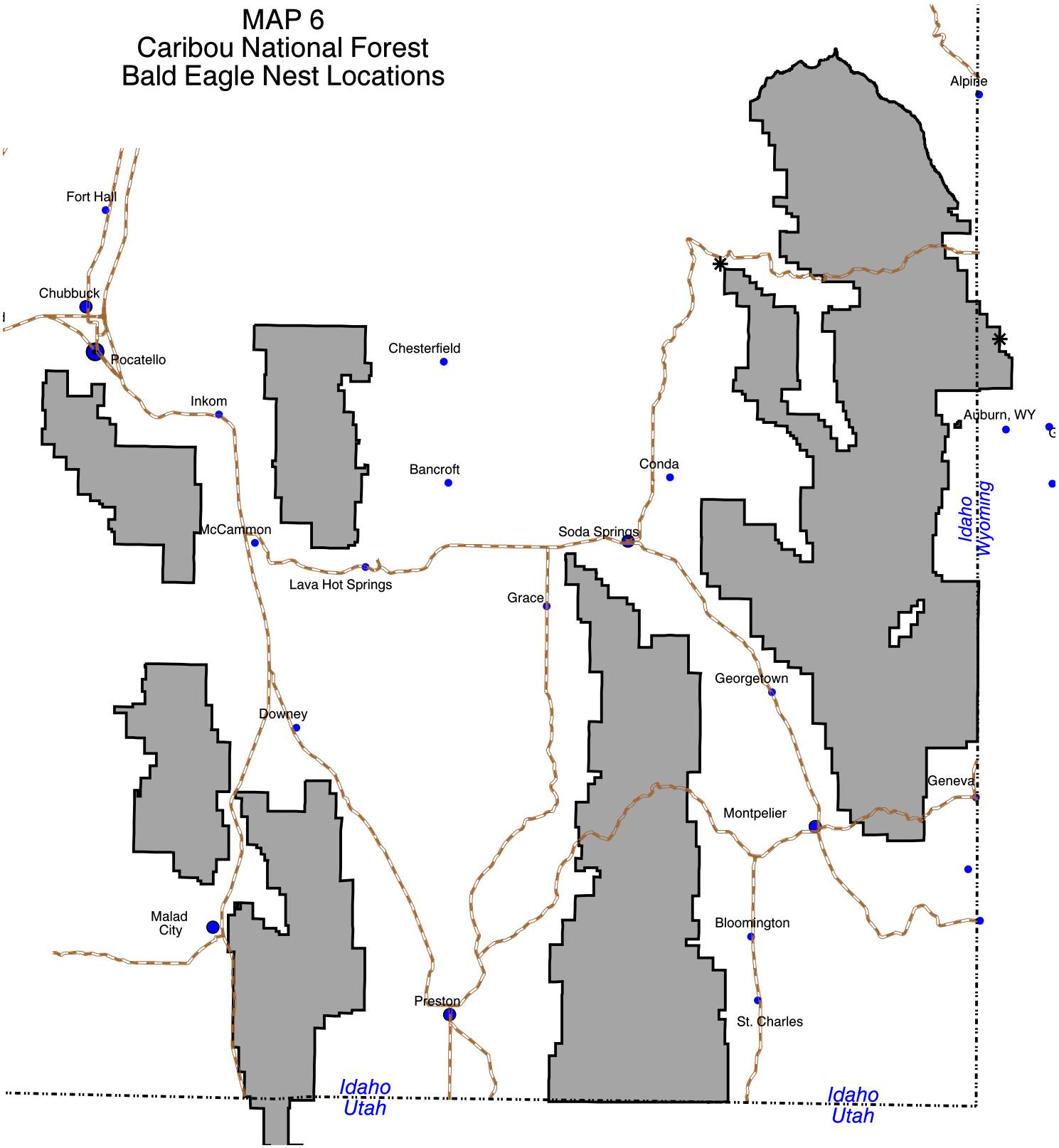
Table 64. Risk Assessment for Bald Eagles.

Risk Assessment	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Poisoning/contaminants	Low	Low	Low	Low	Low	Low	Low	Low
Collision/electrocution	Low	Low	Low	Low	Low	Low	Low	Low
Human activities around nest*	Low	Low	Low	Low	Low	Low	Low	Low
Habitat alteration around nest stands*	Low	Low	Low	Low	Low	Low	Low	Low
Overall risk	**Low**	**Low**	**Low**	**Low**	**Low**	**Low**	**Low**	**Low**

* All low due to Forest-wide Plan direction and implementation of Nest Management Plans

All of the alternatives “may affect, but are not likely to adversely affect” bald eagles or habitat. Bald eagle goals, objectives, standards and guidelines are presented in the Forest-wide Plan direction. These apply to all existing territories and any new territories that become established. In addition, an objective has been added to the Plan that requires the development of a Nest Management Plan for the Grays Range nest site, and any new nest site that may become established in the future.

MAP 6
Caribou National Forest
Bald Eagle Nest Locations



Bald Eagle Nest Locations
State Line
Major Roads
Caribou National Forest

5 0 5 10 Miles
1:700000

Cumulative Effects

The Adjacency Analysis (Rine, 2001) identifies that Wyoming Game and Fish has been trying to get access into the Thayne area. If access to the nest area around Thayne, Wyoming is gained in the future, the Forest Plan guidance and direction in the Nest Management Plan should be adequate to address the potential for disturbance to nesting birds.

Most of the suitable habitat for bald eagles is found off-Forest along the major river corridors and around lakes and reservoirs. The risk factors identified above also relate to bald eagle habitat off-Forest. Currently bald eagle numbers are increasing and current management appears to be compatible with bald eagle use.

References cited in above section:

Beals, J. and W. Melquist. 2001. Idaho Bald Eagle Nesting Repor for 2000. Idaho Department of Fish and Game, Nongame and Endangered Wildlife Program, Boise, Idaho.

Beals, J. and W. Melquist. 1999. Idaho Bald Eagle Nesting Report. Idaho Department of Fish and Game, Nongame and Endangered Wildlife Program, Boise, Idaho.

Beals, J. and W. Melquist. 1998. Idaho Bald Eagle Nesting Report. Idaho Department of Fish and Game, Nongame and Endangered Wildlife Program, Boise, Idaho. October 1998.

Brassfield, R. 1998. Bald Eagle Nest Area Management Plan, for the Soda Springs Ranger District, Caribou National Forest, Lincoln County, Wyoming.

Rine, B. 2001. Caribou Adjacency Analysis. Prepared for the Caribou National Forest, March 2001.

U.S. Fish and Wildlife Service. 1986. Pacific Bald Eagle Recovery Plan. U.S. Fish and Wildlife Service, Portland, Oregon. 163 p.

U.S. Fish and Wildlife Service. 1995. Endangered and Threatened Species; Bald Eagle Reclassification, Final Rule. Federal Register, Volume 60, number 133, pp 36000-36010.

U.S. Fish and Wildlife Service. 1999. News release, Proposal to Remove Bald Eagles from the Endangered Species List. July 2, 1999, Portland, OR.

USFS. 2001. Caribou-Targhee National Forest Plan Monitoring and Evaluation Report 2000-2001. USDA Forest Service, Caribou-Targhee National Forest, Supervisors Office, Idaho Falls, ID.

YELLOW-BILLED CUCKOO

The following information is taken from the Petition Finding (USFWS 2001).

Population Overview

The yellow-billed cuckoo was petitioned for listing in 1998, and in 2000 the USFWS concluded that the petition presented information to indicate that listing may be warranted.

In Idaho, the yellow-billed cuckoo was considered a rare and local summer resident. In Northern and Central Idaho, there have been only four records of yellow-billed cuckoo over the last century. The most

recent record for this area comes from the South Fork of the Snake River in 1992. Saab (1998) found them in five of her fifty-seven survey patches on the South Fork Snake River. In southwestern Idaho, the yellow-billed cuckoo has been considered a rare, sometimes erratic visitor and breeder in the Snake River valley. The breeding population in Idaho is likely limited to a few breeding pairs.

Biology and Ecology

Western yellow-billed cuckoos breed in large blocks or riparian habitats, especially woodlands with cottonwoods and willows. Dense understory foliage appears to be an important factor in nest site selection, while cottonwood trees are an important foraging habitat in areas where they have been studied in California. Western yellow-billed cuckoos appear to require large blocks of riparian habitat for nesting.

This species is strongly associated with relatively large expansive stands of mature cottonwood-willow forests. They appear to be dependent on a combination of a dense willow understory for nesting, a cottonwood overstory for foraging and large patches of habitat in excess of twenty hectares (about fifty acres). The species will occupy a variety of marginal habitats, particularly at the edge of their range, but is not known to use non-native vegetation in the majority of its range.

Habitat Evaluation

The National Wetlands Inventory (1980) only identified about fifty acres of deciduous forest riparian areas, with no differentiation between aspen or cottonwood. Conversations with District personnel confirmed that cottonwood/willow riparian habitat types are very limited on the Forest. If they do occur in small places, they are well below the fifty-acre minimum patch size to be considered suitable habitat.

Determination of Effects

No effect. Because of the lack of suitable habitat for this species on the Caribou NF, implementation of any of the alternatives will have no affect on yellow-billed cuckoos or critical habitat.

Sensitive Species

SUMMARY

This analysis serves as the Biological Evaluation for Sensitive Species. An overview of habitat associations and trends, as well as species distribution, population trends and expected changes as a result of the alternatives is shown. The analysis includes a risk assessment for each species, with risk factors used to determine the risk of each alternative. A summary of determinations for all sensitive species is given in the following Table 65, below.

The boreal owl is rated at moderate risk due to the departure of suitable habitat from PFC over the long-term. As explained in the following section, stand conditions will favor this species over the short term, as mature and old forest stands provide suitable nesting and foraging habitat.

The sage grouse and pygmy rabbit are both rated at moderate risk due to the departure of sagebrush habitats from PFC. Again, sagebrush stand conditions will favor these species over the short term, as more closed stands provide nesting and winter habitat for sage grouse, and year-round habitat for pygmy rabbits.

Wolverines are rated at moderate risk due to a couple of factors. These include lack of large, remote areas and the potential for disturbance during denning. See the following analysis for more information.

Table 65. Determinations and Risk Assessment for Sensitive Species, MIS and SAR (Alternative 7R).

SPECIES	DETERMINATION*	RISK ASSESSMENT
Peregrine falcon	MIIH	Low
Boreal owl	MIIH	Moderate
Flammulated owl	MIIH	Low
Great Gray Owl	MIIH	Low
Trumpeter swan	MIIH	Low
Harlequin duck	MIIH	Low
Three-toed woodpecker	MIIH	Low
Columbian sharp-tailed grouse	MIIH	Low
Northern goshawk	MIIH	Low
Spotted bat	MIIH	Low
Spotted frog	NI	NA
Townsends big-eared bat	MIIH	Low
Wolverine	MIIH	Moderate
Sage grouse (MIS)	-	Moderate
Northern leopard frog	-	Low
Boreal toad	-	Low
Pygmy rabbit	-	Moderate
Marten	-	Low

MIIH May impact individuals or habitat, but will not likely contribute to a trend towards federal listing or loss of viability to the population or species.
NI No impact.
* Determinations are only made for sensitive species

PEREGRINE FALCON

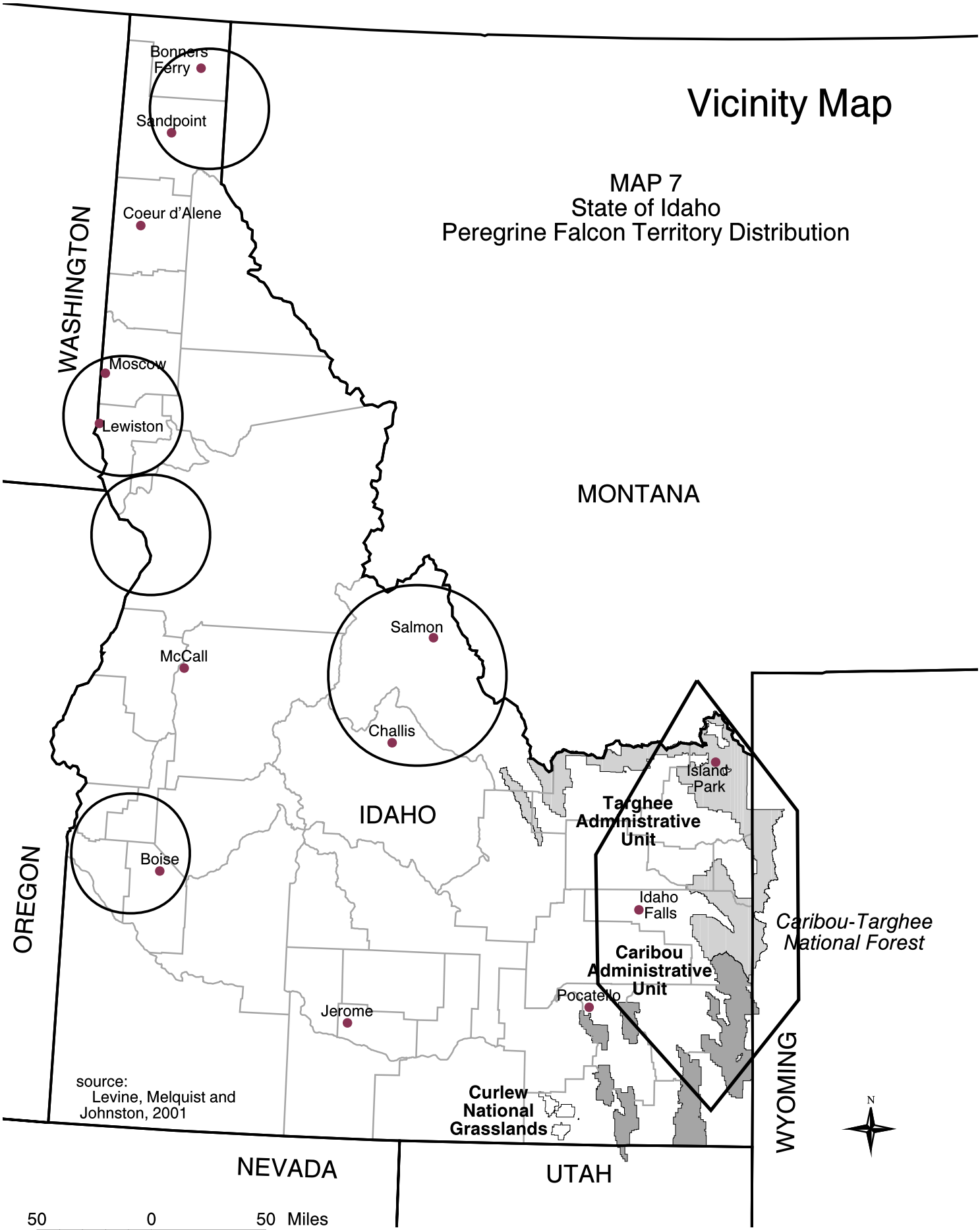
American Peregrine Falcon Recovery Plan and Recovery Status

The peregrine falcon occurs throughout most of North America as three races or subspecies. The subspecies or race *Falco peregrinus anatum* appears throughout the western United States from Mexico to the arctic tundra. It was this subspecies that underwent the most dramatic decline from the 1950s to 1970s (USFWS 1977, 1984).

The Forest is within the American Peregrine Falcon Recovery Plan area, the Rocky Mountain/Southwest Population. In 1991 there were 363 known pairs within the Recovery Area. By 1994 there were 559 breeding pairs in the Rocky Mountain/Southwest Population, exceeding the recovery goal. Other objectives for recovery included an average production of 1.25 young per pair and an eggshell thickness objective.

By 1999, there were at least 1,650 peregrine breeding pairs in the United States and Canada, well above the recovery goal of 631 pairs. At this time the peregrine falcon was removed from the Endangered Species list (USFWS, 1999). The Service decided to monitor the peregine falcon for thirteen years with surveys occurring once every three years, allowing for five surveys, to provide data that will reflect the status of at least two generations of peregrines. If it becomes evident during this period that the bird again needs the Act's protection, the Service will re-list the species.

In Idaho, the number of occupied territories has fluctuated from year to year, but is generally increasing (Levine, *et al*, 2001). Distribution of territories across Idaho are shown on Map 7.


Vicinity Map
MAP 7
State of Idaho
Peregrine Falcon Territory Distribution
Bonners Ferry
Sandpoint
Coeur d'Alene
WASHINGTON
Moscow
Lewiston
MONTANA
Salmon
McCall
Challis
IDAHO
Boise
OREGON
Island Park
Targhee Administrative Unit
Idaho Falls
Caribou-Targhee National Forest
Caribou Administrative Unit
Pocatello
Jerome
Curlew National Grasslands
WYOMING
NEVADA
UTAH
N
source:
Levine, Melquist and Johnston, 2001
50 0 50 Miles
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MAP 8
Caribou National Forest
Historic, Potential, and Current
Peregrine Falcon Habitat

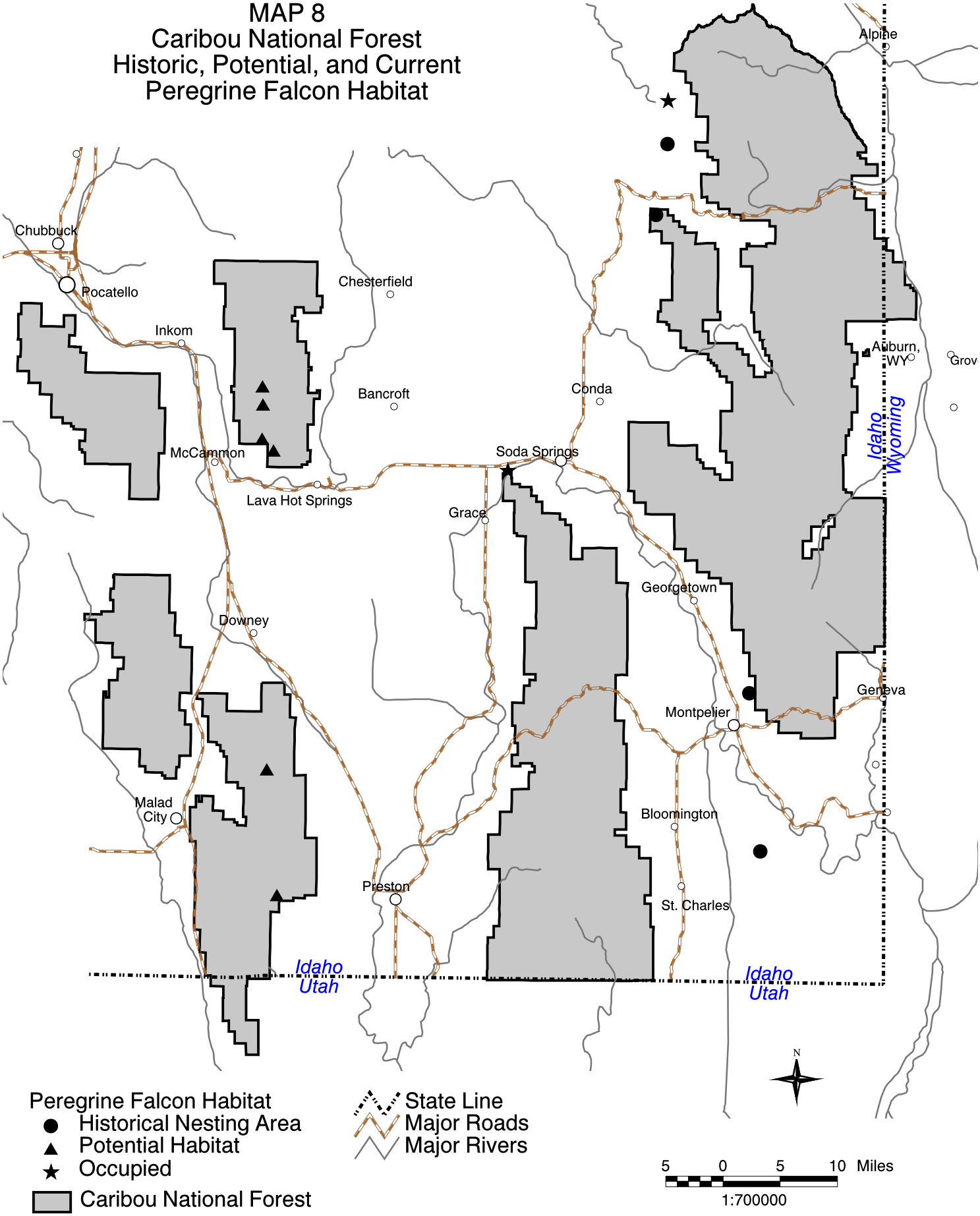


Table 66. Peregrine Falcon Occupied Territories in Idaho (Levine, *et al*, 2001).

Year	Number Occupied Territories	Year	Number Occupied Territories
1990	16	1996	19
1991	18	1997	21
1992	25	1998	30
1993	30	1999	22
1994	20	2000	36
1995	16		

The following table shows the number of new territories, and number of young fledged at five-year intervals from 1990 to 2000.

Table 67. Peregrine Falcon Productivity in Idaho.

	1990	1995	2000
New territories	6	1	2
Number of young fledged	16	16	36

Peregrine Falcon Occurrence on the Forest and Adjacent Lands

Historic peregrine nesting cliffs were found at Grays Range, Joe's Gap. Potential cliffs include Harkness Canyon, Robbers Roost, West Bob Smith and Big Canyon drainages in the Portneuf Range. Sightings have been reported along the south end of the Portneuf Range, Oxford Range, around Joe's Gap and the vicinity of Grays Lake NWR.

An evaluation of potential habitat was done in 1991. IDFG Region 5 (which includes the Caribou) was described as follows:

> "This area has limited potential nesting habitat but what is available appears excellent. Over 40 percent of all known historical nest sites in Idaho are within this region. Much of the habitat is on the Caribou and Sawtooth National Forests, BLM or private lands. The only release site within this region is at Gray's Lake, which was occupied by a pair during 1991. There are significant populations developing in Yellowstone to the northeast and in northern Utah, to the south. It is feasible that recruitment from these populations could pioneer unoccupied habitat in this region."

Areas on the Forest were surveyed in 1991 by IDFG and include Swan Lake/Oxford Ridge, Weston Canyon and Grays Ridge. No peregrines were observed at that time (Levine, *et al*, 1991). In 1992 surveys include Joe's Gap, Grays Ridge, and Weston Canyon. No peregrines were observed at that time. The Grays Lake tower, on the Wildlife Refuge, has been occupied almost yearly, except for 1999.

In 1996 a new nest site was found on the Forest, Grays Lake South (Grays Range). Nest was on a cliff and produced one young. In 1997 this site produced two young. In 1998 the site was unoccupied. In 1999, the site was occupied but produced no young. In 2000 one young was produced (Levine, *et al*, 2001).

In 1999 another nest site was found near the Forest close to Soda Springs on BLM lands. One young was produced but not successfully fledged (Levine et al, 1999). In 2000, three young were produced (Levine et al, 2001).

Historical, potential and currently occupied nesting cliffs are shown on Map 8.

Habitat Overview

Peregrine falcons occupy a wide range of habitats, typically found in open country near rivers, marshes, lakes and coasts. They capture prey by striking from above with their talons after a high-speed dive. Foraging habitat includes wetlands and riparian habitats, meadows and parklands, croplands such as hayfields and orchards, gorges and mountain valleys and lakes which support good populations of small to medium terrestrial birds, shorebirds and waterfowl.

Cliffs are preferred nesting sites, although reintroduced birds now regularly nest on man-made structures such as towers and high-rise buildings. Peregrines may travel more than eighteen miles from the nest site to hunt for food, however a ten-mile radius around the nest is an average hunting area, with 80 percent of foraging occurring within a mile of the nest.

Peregrine falcons do not breed until two years of age. Paired peregrine falcons arrive at their eyries around mid-March. Eggs re la id directly on the cliff substrate starting in early to mid-April. Clutches can range from one to six eggs, average of three to four. Both adults may incubate though the female performs most of this duty and the male performs most of the foraging. Fledging occurs from mid-June to mid-July, about forty-two days after hatching. Juvenile birds stay in the area several weeks after hatching. Little is known about post breeding habitat.

Overview of Effects

Much of the following information has been summarized from USFWS, 1994. Peregrine falcons numbers declined sharply in North America following WWII. Research implicated organochlorine pesticides, which caused eggshell thinning. Other contaminants may also affect peregrines, but appear to be relatively minor in comparison, and are not well documented. Use of DDT was restricted in Canada in 1970 and in the United States in 1972. Consequently, reproductive rates improved and numbers began to increase.

Other known negative factors, such as illegal shooting and collisions with wires, fences, cars, and buildings, are much less significant to the western birds, at the population level. On an individual, nest-site basis, human-caused disturbance or habitat alterations close to an active peregrine falcon nest can be a problem. Breeding season closure of rock-climbing cliffs in close proximity to nests has shown to prevent adverse effects. Powerlines may cause mortality; but rates appear to be low as many birds nest successfully near powerlines. Land use practices adjacent to nesting cliffs that do not result in extensive habitat changes or excessive disturbance sometimes appear to have little adverse effect on nesting success. Generally, the recent apparent increase in the number of pairs of peregrine falcons in the west provides evidence that significant adverse factors affecting the western subspecies are being alleviated or have been reduced.

Determination of Effects

The Plan includes a Guideline to survey for the presence of sensitive species in suitable habitats within a project area prior to or during project development. If nest sites are found, Forest Plan direction for peregrine falcons would be implemented.

The Forest Plan contains guidance to limit human activities and herbicide and pesticide use around peregrine falcon nests during the nesting period. Proposed management activities would do little if anything to affect nesting habitat, which consists typically of cliffs. Based on this Plan direction, there is a low risk to birds/young during the breeding season.

All alternatives could indirectly affect this species as a result in changes in habitat for small birds, which are prey for peregrines. Improved riparian conditions would improve habitat for birds and foraging conditions should improve.

Table 68. Ranking of Alternatives Based on Predicted Improvements in Riparian Habitats (1=best).

Foraging Habitat	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Improved riparian habitat	2	2	2	1	1	1	1	1

Due to the low number of peregrines currently using the Forest (one pair), the habitat changes and prey abundance changes would be insignificant and effects immeasurable. There is no risk associated with any of the proposed activities in any of the alternatives.

As discussed above, there are historical but currently unoccupied nesting cliffs, as well as other potentially suitable nesting cliffs on the Forest. As numbers of peregrines increase in Idaho, some of these cliffs may become occupied. The Caribou has the potential to contribute to further increases in peregrine falcon populations in southeastern Idaho.

Cumulative Effects

Much of the suitable foraging habitat for this species is found at lower elevations, over meadows, river bottoms and openings, where prey is available. Activities on or adjacent to cliff nesting sites have the greatest potential for disturbance, whether on public or private lands. Numbers of peregrines have risen to the point where they have been de-listed, and habitat (both nesting and foraging) is assumed to be adequate.

References cited for above section:

Levine, E., J.J. Johnston, E. Atkinson and M. Parker. 1991. Idaho Peregrine Falcon Survey, Nest Monitoring and Release Program – 1991. Idaho Department of Fish and Game, Boise, ID.

Levine, E., W. Melquist and J. Johnston. 1999. Idaho Peregrine Falcon Survey and Nest Monitoring, 1999 Annual Summary. IDFG, Boise, ID.

Levine, E., W. Melquist and J. Johnston. 2001. Idaho Peregrine Falcon Survey and Nest Monitoring, 2000 Annual Summary. IDFG, Boise, ID.

U.S. Fish and Wildlife Service. 1994. Addendum to the Pacific Coast and Rocky Mountain/Southwest American Peregrine Falcon Recovery Plans. Portland, OR. 40 pp.

BOREAL OWL

(The general habitat information is summarized from Hayward and Verner, 1994).

Habitat and Population Overview

This owl is a secondary cavity nester, relying on cavities that would be built by hairy woodpeckers, northern flickers and sapsuckers, in this part of its range. The distribution of this species is tied to the distribution of boreal forest, and at the southern end of their range, distribution of habitat is very patchy (See copy of Map 2 from Hayward and Verner). On the Caribou NF, they have mapped most of the Bannock Range, part of the southern end of the Bear River Range, and a small part of the Preuss Range as habitat.

A review of the literature suggests that preferred habitat for the boreal owl on the Caribou would be mature to old growth Douglas-fir, mixed conifer, spruce-fir and aspen forests. In Idaho, nesting occurs in mid-April to late May.

Mature forests are needed for nesting because the owls require large nesting cavities (three-inch diameter opening and twelve- to fifteen-inch diameter tree). Nesting habitat structure consists of forests with a relatively high density of large trees, open understory and multi-layered canopy.

Boreal owls prey primarily on small mammals. Red-backed voles make up the largest proportion of their diet. They are, however, opportunistic and also eat insects, birds, pocket gophers, and shrews. Boreal owls are closely associated with high elevation spruce-fir forests due to their dependence on this forest type for foraging year-round.

In the Intermountain Region, the boreal owl may occur as island populations (USFS, 1991). Hayward and Verner (1994) state that in the southern part of their distribution, breeding populations occur as islands of habitat linked through long-distance dispersal through areas without breeding habitat. This is shown on the map mentioned previously.

Population trend data is not available for this species. Before 1979, boreal owls were not thought to occur south of Canada (Hayward and Verner, 1994). By 1987, after beginning surveys, they were found in high elevation conifer forests south to New Mexico. Wisdom, *et al*, (2000) predict that population trends are declining due to changes in habitat across the Interior Columbia Basin. Boreal owls exhibit low density and low rates of population growth. Summer home ranges average about 2,900 acres, and winter home ranges average about 3,600 acres. The largest size nest stands recorded in the literature are thirty acres.

The boreal owl is considered to be a year-round resident on the Caribou NF. All of the Caribou NF is mapped as suitable habitat in Groves, *et al*, (1997) and Stephens and Sturts (1998) show all of southeast Idaho as suspected breeding habitat. Surveys have been done in a few areas of the forest. Boreal owls have been detected in McPherson Canyon 10/93 and Smoky Canyon 5/99. These observations are from the east side of the Forest, where forested cover is more continuous. The CDC reports four observation records from the vicinity of the Forest. See Map 9 for a map showing forested vegetation and known boreal owl locations.

Habitat Evaluation

ICB (Wisdom, *et al*, 2000) put boreal owls in Family 2, which are species using broad-elevation old forest. They use late-seral multi- and single layered stages of the montane community. Important habitat components include snags for nesting and downed logs for foraging for prey species. Late-seral source habitats used by the boreal owl may be negatively affected by increased fragmentation.

Conservation strategies for species in this group include (1) disturbance processes that create/maintain these habitats considered when determined where habitats are to be maintained. In Upper Snake and Snake Headwaters ERU's it may be necessary to identify mid-seral forests in lower montane communities that could be brought to late-seral condition; (2) maintain all large diameter (21 inches dbh) snags and trees, preferably in clumps, and provide opportunities for snag recruitment; (3) maintenance of old forest attributes, like coarse woody debris; (4) increase connectivity; (5) minimize or avoid road construction in late-seral forests; and (5) evaluate wildfire and prescribed fire policies (Wisdom, *et al*, 2000).

Comparison of Alternatives

Vegetation types are very patchy on the Caribou NF, with vegetation maps revealing a mosaic of small patches across the Forest. To get an overall picture of what patch sizes actually are, a patch size analysis was done. Six relatively undisturbed watersheds were selected across the Forest.

Table 69. Average Patch Size in Acres, by Habitat Type.

Watershed	Aspen	Doug-fir	Mixed conifer	Lodgepole pine
Preuss	35	26	20	20
Weston	18	43	na	na
Toponce	55	10	14	na
Rock/Pine	56	48	8	na
St. Charles	29	27	27	22
Horse	23	28	16	44

Even when lumping the vegetation into forested and non-forested vegetation, patch sizes were relatively small. Average patch sizes in forested vegetation were between 84 and 348 acres in these six drainages.

Based on this information, in combination with analysis of vegetation patterns as displayed on maps, it is apparent that the Forest has naturally small patch sizes and fragmentation as a result of timber harvest or burning is not expected to have measurable impacts on this species.

Over the short-term, conversion to early-aged stands will decrease habitat for this species. However, mature/old aged stands are found over a greater proportion of the Forest than what occurred historically. It is assumed that those treatments that move forest types toward PFC would be more beneficial to boreal owls over the long term.

Table 70. Percent Mature and Old at the End of Ten Years, by Alternative.

Alt	Forest Types Treated	Aspen % Mature and Old	Low-elevation, % Mature and Old	High-elevation, % Mature and Old
1	All	57%	89%	79%
2	Mixed conifer, aspen/Douglas-fir, aspen	56%	85%	76%
3	Douglas-fir, lodgepole pine and mixed conifer	56%	83%	74%
4	Mixed conifer, aspen/Douglas-fir and aspen	56%	83%	77%
5	Mixed conifer, aspen/Douglas-fir and aspen	55%	85%	79%
6	Mixed conifer, aspen/Douglas-fir and aspen	56%	85%	80%
7	Mixed conifer, aspen/Douglas-fir and aspen	56%	85%	79%
7R	Mixed conifer, aspen/Douglas-fir and aspen	49%	82%	81%

The risk assessment focused on higher-elevation mixed conifer forests, since generally mesic forest is considered primary habitat.

MAP 9
Caribou National Forest
Forested and Non-forested Vegetation
Boreal, Flammulated, and Great Gray Owl Observations

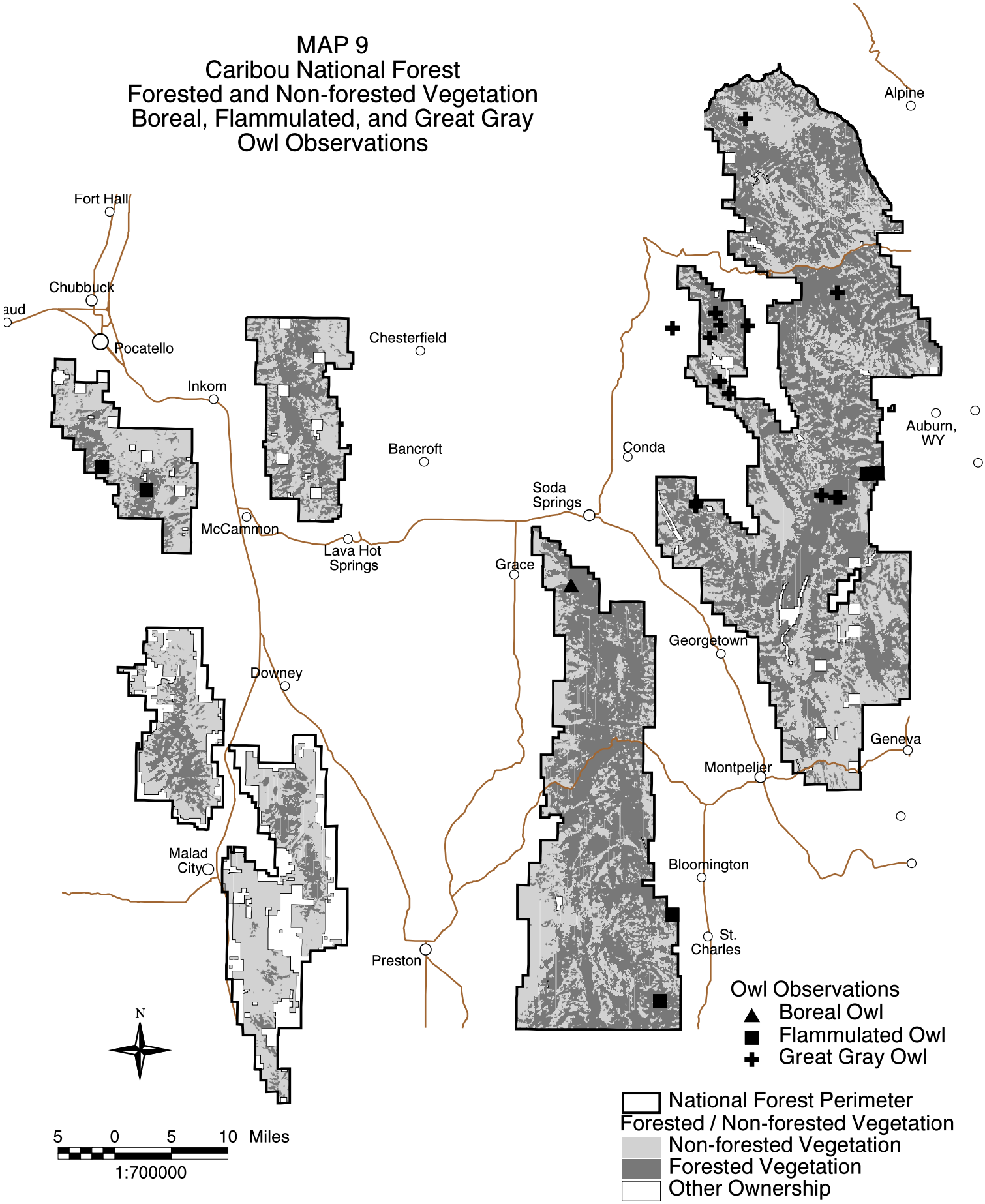


Table 71. Risk Assessment for Boreal Owls, by Alternative.

Risk Assessment	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
PFC at 10 years*	Mod	Low	Low	Low	Mod	Mod	Mod	Mod
PFC at 100 years*	Low	Low	Low	Low	Mod	Mod	Low	Mod
Loss of snags, downed woody debris	Mod	Mod	Mod	Low	Low	Low	Low	Low
Fragmentation	Low	Low	Low	Low	Low	Low	Low	Low
Overall risk	**Mod**	**Low**	**Low**	**Low**	**Mod**	**Mod**	**Low**	**Mod**

* Emphasis on high-elevation mixed conifer as primary habitat

Determination of Effects

Snag and downed woody debris retention are both addressed through forest-wide standards and guidelines (see Process Paper). Implementation of this Forest Plan guidance addresses these components and should maintain foraging and nesting habitat where overstory conditions are suitable.

The Forest Plan also includes objectives and guidelines for boreal owls. These require pre-project surveys and retention of mature forest structure around known nests, if any are found.

Alternatives 2, 3, 4 and 7 provide the lowest risk for boreal owls, based on short-term and long-term habitat provided, as well as the predicted availability of snag nesting trees. The rest of the alternatives have a moderate risk. Alternative 7R proposes to treat about 8 percent of the forested vegetation over the next ten years. While the forested stands are further from PFC, the preponderance of mature and old stands will provide nesting and foraging habitat. Populations would stay the same or increase across the planning area, until such time as a stand-replacing fire, insect or disease outbreak or other natural disturbance changed stand structures.

The Caribou NF will continue to provide areas of suitable habitat across the Forest. These areas will contribute to the dispersal and distribution of the island populations found at the southern edge of their distribution, as discussed in Hayward and Verner (1994).

Cumulative Effects

Most of the habitat for this species is found at higher-elevations, in forested habitats, which are often public lands. Since the boreal owl is considered a regional sensitive species in Regions 1 and 4, every project is reviewed for effects. Actions affecting boreal owl habitats on the Forest have been analyzed in the direct and indirect effects.

References for the above section:

Hayward, G.D. and J. Verner, tech eds. 1994. Flammulated, boreal and great gray owls in the United States: A Technical Conservation Assessment. General Technical Report RM-253. Ft. Collons, CO. USDA, Forest Service, Rocky Mountain Forest and Range Experiment Station. 215 p.

Stephens, D.A. and S.H. Sturts. 1998. Idaho Bird Distribution. Idaho Museum of Natural History, Special Publication Number 13. Second edition.

US Forest Service. 1991. Threatened, Endangered and Sensitive Species of the Intermountain Region. Forest Service, Intermountain Region, Ogden, UT.

Wisdom, M.J., *et al*. 2000. Source Habitats for Terrestrial Vertebrates of Focus in the Interior Columbia Basin: Broad-scale trends and management implications. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. General Technical Report PNW-GTR-485. 156 pp.

FLAMMULATED OWL

(The general habitat information is summarized from Hayward and Verner, 1994).

Habitat and Population Overview

Flammulated owls are almost exclusively insectivorous, preying on small to medium sized moths, beetles, caterpillars and crickets. They also eat spiders, scorpions, and other arachnids (USFS, 1991). This species is thought to be migratory, but show high site-fidelity for nesting territories.

They can be found in mixed pine forests, from pine mixed with oak and pinyon at lower elevations to pine mixed with spruce and fir and higher elevations. They have also been found in aspen and second growth ponderosa pine. However, they prefer mature ponderosa pine/Douglas-fir forests and mixed conifer forests with open canopies. A distribution map (Map 1 in Hayward and Verner) shows a distribution across most of the mountainous areas of the western US. This map shows most of the Caribou NF as suitable, based on vegetation. A review of the literature suggests that preferred breeding habitat on the Caribou NF would be mature to old growth Douglas-fir, although other species may be used.

This owl is a secondary cavity nester, relying on nest cavities that would be built my hairy woodpeckers, northern flickers and sapsuckers in this part of its range. Dead trees with cavities having nest holes with a 2.7-inch entrance hole diameter are important nest site characteristics. They avoid foraging in young dense stands where hunting is difficult.

Population trend data is not available for this species. Wisdom, *et al*, (2000) predict that population trends are declining due to changes in habitat across the Interior Columbia Basin. The entire home range for a flammulated owl pair is about 30 acres (One study in Colorado found the home range to be 14 ha). Surveys in Idaho have reported densities up to 1.25 males/40 ha.

Flammulated owls are known to be present in the summer on the Caribou NF and are expected to migrate south for the winter. They have been documented at Clark Mine on Worm Creek (nest in dead aspen) 7/93, Left Fork Fish Haven Canyon 8/92 (dead in water trough), Smoky Canyon 5/99, head of East Fork Mink Creek 7/89, Porcelain pot Gulch (Bannock Range) 7/89. See Map 9 for forested vegetation and known flammulated owl occurrences.

Habitat Evaluation

ICB (Wisdom, *et a*l, 2000) put flammulated owls in Family 2, which are species using broad-elevation old forest. They use late-seral multi- and single layered stages of the montane community. Important habitat components include snags for nesting and downed logs for foraging for prey species.

Conservation strategies for species in this group include (1) disturbance processes that create/maintain these habitats considered when determined where habitats are to be maintained. In Upper Snake and Snake Headwaters ERUs it may be necessary to identify mid-seral forests in lower montane communities that could be brought to late-seral condition; (2) maintain all large diameter (21 inches dbh) snags and trees, preferably in clumps, and provide opportunities for snag recruitment; (3) maintenance of old forest attributes, like coarse woody debris; (4) increase connectivity; (5) minimize or avoid road construction in late-seral forests; and (5) evaluate wildfire and prescribed fire policies (Wisdom, *et al*, 2000).

Comparison of Alternatives

It is assumed that those treatments that move forest vegetation types toward PFC would be more beneficial to flammulated owls over the long-term. This includes both the effects of regeneration and intermediate harvests. Stand conditions after intermediate treatments may be similar to those effects from historic fire patterns (mature/old overstory, fairly open spacing, with a grass/forb/shrub understory).

Table 72. Percent Mature and Old at the end of Ten Years, by Alternative.

Alt	Forest Types Treated	Aspen % Mature and Old	Low-elevation, % Mature and Old	High-elevation, % Mature and Old
1	All	57%	85%	79%
2	Mixed conifer, aspen/Douglas-fir, aspen	56%	85%	76%
3	Douglas-fir, lodgepole pine and mixed conifer	56%	83%	74%
4	Mixed conifer, aspen/Douglas-fir and aspen	56%	83%	77%
5	Mixed conifer, aspen/Douglas-fir and aspen	55%	85%	79%
6	Mixed conifer, aspen/Douglas-fir and aspen	56%	85%	80%
7	Mixed conifer, aspen/Douglas-fir and aspen	56%	85%	79%
7R	Mixed conifer, aspen/Douglas-fir and aspen	49%	82%	81%

The risk assessment focused on aspen and lower-elevation mixed conifer forests, since generally lower-elevation forest is considered primary habitat.

Table 73. Risk Assessment for Flammulated Owls, by Alternative.

Risk Assessment	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
PFC at 10 years*	Mod	Mod	Low	Low	Mod	Mod	Mod	Low
PFC at 100 years*	Low	Low	Low	Low	Mod	Mod	Low	Low
Loss of snags, downed woody debris	Mod	Mod	Mod	Low	Low	Low	Low	Low
Overall risk	**Mod**	**Mod**	**Mod**	**Low**	**Low**	**Mod**	**Low**	**Low**

* Emphasis on aspen and low-elevation mixed conifer as primary habitat.

Determination of Effects

The Forest Plan contains objectives and guidelines that apply to the flammulated owl. These include pre-project surveys, and restrictions on timber or firewood harvest within a thirty-acre area around known nests. Snag and downed woody debris retention are both addressed through forest-wide standards and guidelines (See Process Paper). Implementation of this Forest Plan guidance addresses these components and should maintain foraging and nesting habitat where overstory conditions are suitable.

Alternatives 4, 5, 7 and 7R provide the least risk to flammulated owls and their habitat. Alternative 7R proposes to treat about 8 percent of the forested vegetation over the next ten years, with an emphasis on regenerating aspen. While total nesting habitat may decrease, over the short-term with vegetation treatments, the quality of some stands may be improved (intermediate harvest and non-lethal fire). Over the long-term, habitats closer to PFC would be most suitable. Habitat and populations would be expected to be maintained or increase across the planning area. The Caribou NF will continue to contribute to the conservation of this species by providing suitable nesting habitat in southeastern Idaho, but this is a very small part of the total breeding habitat (See map).

Cumulative Effects

Some of the habitat for flammulated owls is found at lower-elevations, and more suitable habitat is found on privately owned lands. Much of these stands have been impacted by logging, fire-exclusion, and conversion to other uses. Fire-exclusion may be having the major impact. As fire is excluded, understory vegetation and fuels build up so that when fires do occur, they often are stand-replacing rather than underburns. The increase in understory vegetation also limits suitability for foraging.

References for the above section:

Hayward, G.D. and J. Verner, tech eds. 1994. Flammulated, boreal and great gray owls in the United States: A Technical Conservation Assessment. General Technical Report RM-253. Ft. Collins, CO. USDA, Forest Service, Rocky Mountain Forest and Range Experiment Station. 215 p.

US Forest Service. 1991. Threatened, Endangered and Sensitive Species of the Intermountain Region. Forest Service, Intermountain Region, Ogden, UT.

Wisdom, M.J., *et al.* 2000. Source Habitats for Terrestrial Vertebrates of Focus in the Interior Columbia Basin: Broad-scale trends and management implications. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. General Technical Report PNW-GTR-485. 156 pp.

GREAT GRAY OWL

(The general habitat information is summarized from Hayward and Verner, 1994).

Habitat and Population Overview

Great gray owls prey primarily on voles and pocket gophers throughout the year. They use mixed coniferous and hardwood forests usually bordering small openings or meadows. They forage along edges of clearings. Semi-open areas, where small rodents are abundant, near dense coniferous forests, for roosting and nesting, are optimum for great grays. In Idaho, owls nesting near clearcuts were found to have greater proportions of pocket gophers in their diet. They hunt from a perch and capture food on the ground.

In the Intermountain Region, great grays occur primarily in the lodgepole pine/ Douglas-fir/aspen zone and in ponderosa pine. They do not build nests, but use existing platforms such as old stick nests built by northern goshawks or red-tailed hawks. They may also nest on platforms formed by dwarf mistletoe brooms, on the flat top of a broken–off tree, or on artificial platforms. In Idaho, they are found at lower elevations and agricultural areas in winter, coniferous forest is summer, most commonly near meadows or openings.

Population trend data is not available for this species. Wisdom, *et al*, (2000) predict that population trends are stable based on available habitat across the Interior Columbia Basin. The largest home range recorded for great gray owls is about 1,600 acres. Nest sites average 156 yards from the nearest opening. In an Idaho study, home range per pair was 2.6 sq. km. Predation by great horned owls was the greatest mortality factor in several studies.

The great gray owl is a year-round resident on the Caribou. They have been documented across the Forest, in the Bannock, Webster, Bear River, and Grays Ranges. See Map 9 for forested vegetation and known great gray owl locations.

Habitat Evaluation

ICB (Wisdom, *et al*, 2000) put great gray owls in Family 2, which are species using broad-elevation old forest. They use late-seral multi- and single layered stages of the montane community. Important habitat components include snags for nesting and downed logs for foraging for prey species. Juxtaposition of early and late-seral stages is needed to meet all aspects of life functions for the great gray owl, which is identified as a "contrast species."

Conservation strategies for species in this group include (1) disturbance processes that create/maintain these habitats considered when determined where habitats are to be maintained. In Upper Snake and Snake Headwaters ERU's it may be necessary to identify mid-seral forests in lower montane communities that could be brought to late-seral condition; (2) maintain all large diameter (21 inches dbh) snags and trees, preferably in clumps, and provide opportunities for snag recruitment; (3) maintenance of old forest attributes, like coarse woody debris; (4) increase connectivity; (5) minimize or avoid road construction in late-seral forests; and (5) evaluate wildfire and prescribed fire policies (Wisdom, *et al*, 2000).

Determination of Effects

The Revised Forest Plan contains objectives and guidelines that apply to the great gray owl. These include pre-project surveys, and maintenance of mature/old forest around known nests. Snag and downed woody debris retention are both addressed through forest-wide standards and guidelines (see Process Paper). Implementation of this Forest Plan guidance addresses these components and should maintain nesting habitat where overstory conditions are suitable.

It is assumed that those treatments that move forest types toward PFC would be more beneficial to great gray owl over the long term. This includes both the effects of regeneration and intermediate harvests. Stand conditions after intermediate treatments may be similar to those effects from historic fire patterns (mature/old overstory, fairly open spacing, with a grass/forb/shrub understory). Great gray owls forage in more open areas, and treatments may benefit this species by improving foraging habitat.

Table 74. Percent Mature and Old at the end of Ten Years, by Alternative.

Alt	Forest Types Treated	Aspen % Mature & Old	Low-elevation % Mature and Old	High-elevation % Mature and Old
1	All	57%	85%	79%
2	Mixed conifer, aspen/Douglas-fir, aspen	56%	85%	76%
3	Douglas-fir, lodgepole pine and mixed conifer	56%	83%	74%
4	Mixed conifer, aspen/Douglas-fir and aspen	56%	83%	77%
5	Mixed conifer, aspen/Douglas-fir and aspen	55%	85%	79%
6	Mixed conifer, aspen/Douglas-fir and aspen	56%	85%	80%
7	Mixed conifer, aspen/Douglas-fir and aspen	56%	85%	79%
7R	Mixed conifer, aspen/Douglas-fir and aspen	49%	82%	81%

The risk assessment focused on all forest types, since the great gray owl uses all types.

Table 75. Risk Assessment for Great Gray Owl, by Alternative.

Risk Assessment	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
PFC at 10 years*	Mod	Mod	Low	Low	Mod	Mod	Mod	Low
PFC at 100 years*	Low	Low	Low	Low	Mod	Mod	Low	Low
Loss of snags, downed woody debris	Mod	Mod	Mod	Low	Low	Low	Low	Low
Overall risk	**Low to Moderate**	**Low to Moderate**	**Low to Moderate**	**Low**	**Low to Moderate**	**Low to Moderate**	**Low to Moderate**	**Low**

* Emphasis on all types (aspen and conifer) as primary habitat.

** These alternatives ranked low to moderate. While ranking leads more to a moderate rank, this species often uses goshawk nests for nesting and all alternatives are rated low risk for goshawks, based on wide variety of types used, and Forest Plan S&G.

Alternatives 4 and 7R have the lowest overall risk to great gray owls, based largely on vegetation treatments. Alternative 7R proposes to treat about 8 percent of the forested vegetation over the next ten years. Other alternatives have a slightly higher risk over the long-term, as the potential for stand-replacing fires increases as the percent mature/old increases. All alternatives should maintain habitat and distribution of this species across the planning area. The Caribou NF will continue to contribute to the conservation of this species by providing suitable habitat in southeastern Idaho.

Cumulative Effects

A part of the habitat for great gray owls is found at lower-elevations, especially in the winter. Actions affecting habitat for the species are the same, but there are a few more risks at lower elevations. They forage in open areas because they need more room to maneuver. This species has been noted to forage around meadows, fields and highways and collisions with vehicles has been noted as a concern (Joslin and Youmans, 1999). None of the alternatives would increase risk to birds wintering at lower elevations.

References for the above section:

Hayward, G.D. and J. Verner, tech eds. 1994. Flammulated, boreal and great gray owls in the United States: A Technical Conservation Assessment. General Technical Report RM-253. Ft. Collins, CO. USDA, Forest Service, Rocky Mountain Forest and Range Experiment Station. 215 p.

US Forest Service. 1991. Threatened, Endangered and Sensitive Species of the Intermountain Region. Forest Service, Intermountain Region, Ogden, UT.

Wisdom, M.J., *et al.* 2000. Source Habitats for Terrestrial Vertebrates of Focus in the Interior Columbia Basin: Broad-scale trends and management implications. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. General Technical Report PNW-GTR-485. 156 pp.

Habitat and Population Overview

A conservation assessment of trumpeter swans was completed in 1995 (Shea, 1995). Much of the following information is summarized from this document.

Trumpeter swans occurring in the Greater Yellowstone Ecosystem are members of the Rocky Mountain population. Trumpeter swan nesting habitat consists of marshes, lakes, beaver ponds and oxbows and backwaters of rivers. They prefer quiet, shallow water with dense aquatic plant and invertebrate growth. Tall emergent vegetation is essential for cover for both adults and broods. In winter, trumpeter swans require ice-free rivers with available aquatic vegetation.

Trumpeter swans form pair bonds in their second or third year, but do not nest until four or five years of age. Pairs usually stay together year-round and mate for life. Nests are built in dense mounds of aquatic vegetation in late April or early May. Clutches contain two to seven eggs and hatch in June. Cygnets fledge at fourteen to seventeen weeks; family bonds are strong and the subadult siblings may stay together up to their third year, rejoining their parents after the nesting period.

From 1988 to 1992 trumpeter swans were translocated from areas to the north, into areas adjacent to the Caribou NF (Bear River, Fort Hall and Grays Lake). However, there are no reported observations of swans on the Forest.

Habitat Evaluation

Table 76. Comparison of Alternatives for Trumpeter Swans.

Trumpeter Swans	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Riparian Ranking	7	5	6	3	1	1	3	3

Determinations of Effects

The Forest Plan includes standards and guidelines for maintenance of potential habitats like Elk Valley Marsh. This direction is found in 2.5 (Wild and Scenic Eligible Recreation River) and 2.8.3 (Aquatic Influence Zone) prescriptions.

Alternatives 4-7R all move riparian and non-riverine wetlands toward proper functioning condition at a faster rate than alternatives 1-3 (See Hydrology Effects section). As a result, potential habitat across the Forest is expected to improve in the Planning period under Alternatives 4-7R. Alternatives 1-3 may maintain habitats in current conditions.

Table 77. Risk Assessment Based on Riparian Conditions.

Risk Assessment	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Movement out of PFC	Low	Low	Low	Low	Low	Low	Low	Low

All alternatives have a low risk for this species, as they have not been documented on the Forest. While Alternatives 4-7 and 7R improve riparian habitats at a faster rate, the probability of use by trumpeter swans is very low under every alternative. The Caribou NF has little potential to contribute towards the conservation of this species.

Cumulative Effects

Most of the primary habitat for this species lies at lower elevations off the Forest. This species has a high public profile, is easily observed, and of high interest. Many of the most suitable habitats are in public ownership (state and federal wildlife refuges). Management at these sites favors this species, and other waterfowl, as described in the Caribou NF Adjacency Analysis (Rine, 2001). These areas include Grays Lake National Wildlife Refuge, Bear Lake National Wildlife Refuge, and Oxford Slough Waterfowl Production Area.

References for the above section:

Rine, B.B. 2001. Caribou-Targhee National Forest – Caribou Adjacency Analysis. USFS, Caribou-Targhee National Forest, Supervisors Office, Idaho Falls, ID.

Shea, R.E. 1995. Conservation Assessment for the Rocky Mountain Population of Trumpeter Swans. 1995. USDA, Forest Service, Northern and Intermountain Regions.

HARLEQUIN DUCK

(Most of the following information was taken from Clark, *et al*, 1989)

Habitat and Population Overview

Harlequin ducks winter along both the Atlantic and Pacific coasts of the US. On the Pacific coast, they are found from the Aleutians south to central California. This western population is stable at 2-300,000 (Waterfowl, 2000). They are a small duck, with very distinctive markings. Breeding pairs form on the wintering areas and they arrive on their breeding grounds by late April and show fidelity to their nesting areas. They have been documented to nest in parts of Idaho, western Montana and northwest Wyoming.

Recent harlequin duck monitoring in northern Idaho estimated the minimum population of forty-four pairs, while in 1995 the estimate was of forty-two pairs, which is not significantly different (www2.state.id.us/fishgame/info/nongame).

Specific habitat requirements include streams with gradients of less than three degrees, greater than fifty percent streamside shrub cover and less than three loafing sites (mid-stream boulders, log jams) every thirty-three feet of stream. Harlequins will use turbulent stream sections for security and feeding activities. Harlequins feed on benthic aquatic insects, crustaceans, mollusks and fish. Females lay eggs in nests located on riverbanks or islands of mountain streams, usually under low, dense shrubs. Incubation lasts about thirty days with hatching in mid-June through late-July. The young fledge in six weeks.

Studies have repeatedly shown that harlequin ducks are very sensitive to disturbance in breeding territories. Adjacent roads, trails, fishermen, and rafting have all been shown to have effects (Joslin and Youmans, 1999).

Habitat Evaluation

Harlequins have been documented in the Palisades area to the north. In the Palisades area of the Targhee they are known to breed on several drainages on the east side of Palisades Reservoir. There is one reported sighting on McCoy Creek from 5/13/89 near the boundary between the Caribou and Targhee National Forests (Cassirer and Groves, 1990). CDC feels that it would be highly unlikely for harlequins to be found on the Caribou (C. Harris, Principal Wildlife Research Biologist for CDC, pers. comm.).

Determination of Effects

The only area that has been identified as potentially providing habitat for harlequin ducks is McCoy Creek, immediately south of Palisades. One observation has been reported on the boundary between the Caribou and Targhee National Forests, but there has been no evidence of breeding. McCoy Creek Road follows McCoy Creek fairly closely, but there are a few sections that may be suitable due to security provided by distance from the road, heavy vegetative cover, or topographic cover. The Plan includes an objective to complete surveys of McCoy Creek within two years to determine use. The Plan also includes a guideline to avoid any new developments within 300 feet of any stream with breeding activity and to do pre-project surveys for sensitive species.

Because of the types of riparian habitats they use, potential habitat is generally not affected by livestock grazing. The low gradient streams that they use, are generally rocky with abundant, shrubby streamside vegetation, both of which make the areas inaccessible to livestock. With incorporation of Forest Plan guidance outlined above, none of the alternatives will affect habitat suitability.
Because of the low potential for harlequins to be present, and the presence of Forest Plan guidelines, implementation of any of the alternatives would have a low risk to this species. The Caribou has little potential to contribute toward conservation of this species.

Cumulative Effects

Past actions (road and trail locations) may have reduced suitability of many streams in the west. Because of the nature of the breeding habitats used, these stretches have often been developed historically (roads and trails). However, there is no historical data to base any conclusions on. These habitats may only get more developed in the future, and suitable habitat on public lands may be of increased importance.

References for the above section:

Cassirer, E.F. and C.R. Groves. 1990. A Summary of Harlequin Duck Sightings in Idaho, 1989. Idaho Department Fish and Game, Natural Heritage Section, Nongame and Endangered Wildlife Bureau, Boise, ID.

Clark, T.W., A.H. Harvey, R.D. Dorn, D.L. Genter, and C. Groves, eds. 1989. Rare, sensitive and threatened species of the Greater Yellowstone Ecosystem. Northern Rockies Conservation Cooperative, Montana Natural Heritage Program, The Nature Conservancy, and Mountain West Environmental Services. P. 82-83.

Groves, C.R., B. Butterfield, A. Lippincott, B. Csuti and J.M. Scott. 1997. Atlas of Idaho's Wildlife; Integrating Gap Analysis and Natural Heritage Information. Cooperative Project of Idaho Conservation Data Center, Nature Conservancy, University of Idaho and US Geological Survey. Boise, ID.

Joslin, G. and H. Youmans, coord. 1999. Effects of Recreation on Rocky Mountain Wildlife: A Review for the Montana Committee on Effects of Recreation on Wildlife, Montana Chapter of the Wildlife Society. 307 p.

Stephens, D.A. and S.H. Sturts. 1998. Idaho Bird Distribution. Idaho Museum of Natural History, Special Publication Number 13. Second edition.

THREE-TOED WOODPECKER

Most of the following information is summarized from Clark, *et al*, (1989) and Groves, *et al*, (1997).

Habitat and Population Overview

Three-toed woodpeckers are found in northern coniferous and mixed forest types up to 9,000 feet. Their distribution is roughly the same as the distribution of spruce. They use forests of spruce, ponderosa pine, and lodgepole pine. Nests are found in spruce, pine and aspen trees, where they excavate cavities in standing trees or snags. Nests are also found in willow riparian, in high elevation aspen groves, in swamps and burned over coniferous forest.

Both live and dead trees are used for foraging substrate. They forage by scaling, which involves prying off layers of bark by probe-tapping to get at insects beneath the bark. About 75 percent of their diet is wood-boring insect larvae, mostly beetles, but they also eat moth larvae, spiders, berries and cambium. They are major predators of the spruce bark beetle, especially during epidemics.

In the northeastern United States, seventy-four acre territories are documented. In Oregon, home range size varied from 52–300 ha, depending on the quality of habitat. Three-toed woodpeckers remain on their territories year-round.

Population trend data is not available for this species. Wisdom, *et al*, (2000) predict that population trends are increasing due to changes in habitat across the Interior Columbia Basin.

Three-toed woodpeckers have been documented in the Grays Range (Gravel Creek Campground) and Webster Range (Manning Creek, 1996). Groves, *et al*, (1997) shows the Bear River range as potential habitat. Map 10 shows the distribution of forested vegetation and known sighting of this species across the Caribou NF.

Habitat Evaluation

ICB (Wisdom, *et al*, 2000) put three-toed woodpeckers in Family 2, which are species using broad-elevation old forest. They use late-seral multi- and single layered stages of the montane community. Important habitat components include snags for nesting and foraging and downed logs for foraging for prey species. Stand-replacing, large burns and other beetle-infested stands provide high concentrations of prey (wood-boring beetles and larvae). Hutto and Young (1999) found that three-toed woodpeckers were most often detected in post-fire habitats as well as spruce/fir stands, and concluded that post-fire habitats were important for this species.

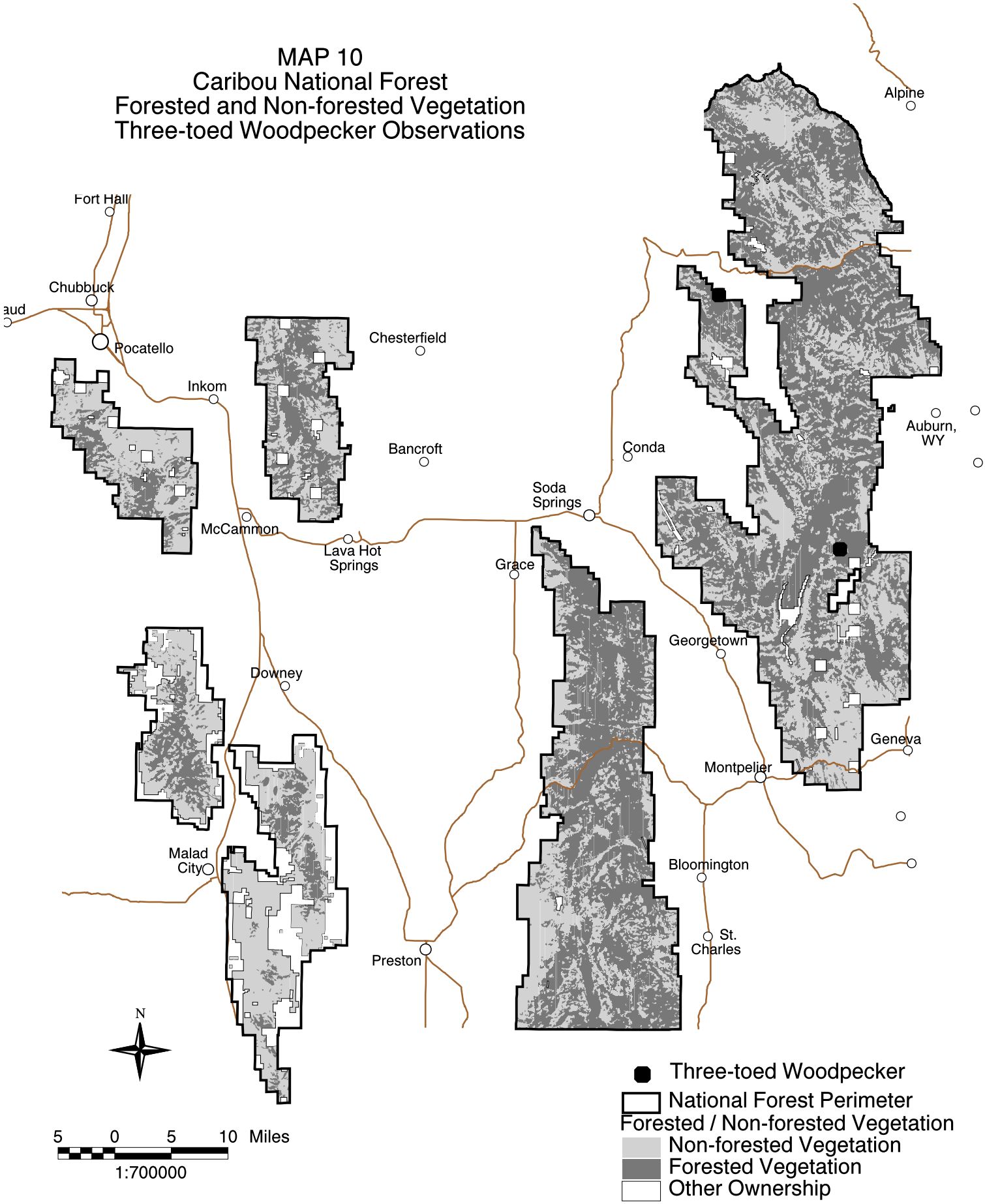
Conservation strategies for this species include stand-replacing fires as a disturbance process. Stand-replacing wildfires are of particular benefit to three-toed woodpeckers (Wisdom, *et al*, 2000).

Determination of Effects

Snag and downed woody debris retention are both addressed through forest-wide standards and guidelines (See Process Paper). Implementation of Forest Plan guidance addresses these components and should maintain foraging and nesting habitat where overstory conditions are suitable.

Because they require snags for feeding, perching, nesting and roosting, they are threatened by loss of standing dead trees, through timber harvest or firewood gathering. Fire suppression has also decreased the availability of standing dead trees. Post-fire logging may be in conflict with the needs of the species (Hutto and Young, 1999).

MAP 10
Caribou National Forest
Forested and Non-forested Vegetation
Three-toed Woodpecker Observations



Currently, pine beetle populations are at endemic levels across the Forest. In the early to mid-1980s there were epidemic levels of mountain pine beetle; in the early to mid-1990s there were localized epidemics of Douglas-fir beetle and in the mid-1990s SAF complex (complex of borers, drought and disease) was present at higher levels. Past timber harvest has generally focused on these areas, but only about 20-30 percent of the harvest has been of dead or dying trees (B. Padian, Forester, pers. comm.). Stands on the Caribou NF are now rated as being at high risk for insect epidemics, due to the stand ages.

It is assumed that those treatments that move forest types toward PFC would be more beneficial to three-toed woodpeckers over the long term. However, the current situation of high risk to insect epidemics benefits this species over the short-term, as they can take advantage of concentrated foraging habitats.

Table 78. Percent Mature and Old at the End of Ten Years, by Alternative.

Alt	Forest Types Treated	Aspen % Mature and Old	Low-elevation % Mature and Old	High-elevation % Mature and Old
1	All	57%	85%	79%
2	Mixed conifer, aspen/Douglas-fir, aspen	56%	85%	76%
3	Douglas-fir, lodgepole pine and mixed conifer	56%	83%	74%
4	Mixed conifer, aspen/Douglas-fir and aspen	56%	83%	77%
5	Mixed conifer, aspen/Douglas-fir and aspen	55%	85%	79%
6	Mixed conifer, aspen/Douglas-fir and aspen	56%	895	80%
7	Mixed conifer, aspen/Douglas-fir and aspen	56%	85%	79%
7R	Mixed conifer, aspen/Douglas-fir and aspen	49%	82%	81%

There is no Forest-wide direction for firewood harvest. Districts identify areas (may be exclusive or broad areas), and a map is compiled and distributed with firewood permits. Generally there are few restrictions on wood gathered. In areas open to off-route travel, snags are more vulnerable to harvest, while areas within 300 feet of open roads are available in restricted travel areas.

Salvage harvest is allowed on over 90 percent of the Forest as outlined in the Plan Prescription direction. There is direction in the Plan to do pre-project surveys for sensitive species prior to development.

Table 79. Risk Assessment for Three-toed Woodpeckers, by Alternative.

Risk Assessment	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Vegetation in relation to PFC*	Low	Low	Low	Low	Mod	Mod	Low	Mod
% Forest open to off-route travel, snag retention	Mod	Mod	Mod	Low	Low	Low	Low	Low
Retention of fire, insect, disease standing dead	Mod	Mod	Mod	Low	Low	Low	Low	Low
Overall risk	**Mod**	**Mod**	**Mod**	**Low**	**Low**	**Low**	**Low**	**Low**

* Based on high-elevation mixed conifer

Alternatives 4 –7 and 7R are low risk to three-toed woodpeckers over the long-term. Over the short-term all alternatives would improve habitat and abundance of this species across the planning area. Natural events, such as wildfire and insect and disease would provide a three to five year increase in foraging habitat when beetles and other insects move into dead or stressed trees. Salvage harvest could decrease the amount of foraging habitat, depending on insect populations at time of harvest. In the last planning period, only about 20-30 percent of the harvest has been of dead or dying trees. Loss of foraging habitat for this species due to salvage harvest is expected to be minimal.

Current stand ages favor endemic levels of insects across large areas. As a result, foraging habitat is spread over larger areas. In the future, epidemic levels of insects and stand-replacing fires will provide concentrated foraging habitats. The Caribou NF is expected to contribute towards the conservation of this species, based on this and incorporation of Plan direction.

Cumulative Effects

Past timber harvest on the Caribou NF has generally focused on these areas, but only about 20-30 percent of the harvest has been of dead or dying trees (B. Padian, Forester, pers. comm.). BLM and adjacent Forests have been harvesting areas of dead trees. BLM is currently working on a plan to remove Douglas-fir killed trees in the Samaria/Pleasantville Mountains (to the east of the Caribou NF). The Wasatch-Cache NF has plans to treat areas of spruce-beetle killed trees on the Bear River Range (Rine, 2001).

While concentrated areas of beetle-infestations vary in space and time, current stand ages favor endemic levels of insects across large areas. As a result, foraging habitat is spread over larger areas. In the future, epidemic levels of insects and stand-replacing fires will provide concentrated foraging habitats.

References for the above section:

Clark, T.W., A.H. Harvey, R.D. Dorn, D.L. Genter, and C. Groves, eds. 1989. Rare, sensitive and threatened species of the Greater Yellowstone Ecosystem. Northern Rockies Conservation Cooperative, Montana Natural Heritage Program, The Nature Conservancy, and Mountain West Environmental Services. P. 82-83.

Groves, C.R., B. Butterfield, A. Lippincott, B. Csuti and J.M. Scott. 1997. Atlas of Idaho's Wildlife; Integrating Gap Analysis and Natural Heritage Information. Cooperative Project of Idaho Conservation Data Center, Nature Conservancy, University of Idaho and US Geological Survey. Boise, ID.

Hutto, R.L. and J.S. Young. 1999. Habitat Relationships of Landbirds in the Northern Region, USDA Forest Service. General Technical Report RMRS-GTR-32.USDA Forest Service, Rocky Mountain Research Station. 72 p.

Rine, B. 2001. Caribou Adjacency Analysis. Prepared for the Caribou National Forest. March 2001.

Wisdom, M.J., *et al.* 2000. Source Habitats for Terrestrial Vertebrates of Focus in the Interior Columbia Basin: Broad-scale trends and management implications. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. General Technical Report PNW-GTR-485. 156 pp.

Habitat and Population Overview

Over the last decade concern has increased regarding sharp-tailed grouse populations in Idaho, the western United States, and southern Canada. They have undergone significant range-wide declines; the species now occupies less than 10 percent of its former range. The loss and/or degradation of native grassland and shrubsteppe habitats from agricultural expansion, fire, invasion of non-native annual vegetation and overgrazing by livestock are cited as contributing to this decline (Ulliman, 1989).

Idaho has the best remaining populations, with 75 percent of the remaining birds (Paige and Ritter, 1999). Populations in Idaho are currently increasing, in part due to the Conservation Reserve Program (CRP). In southeastern Idaho, the largest concentrations of sharp-tailed grouse are in Fremont, Bonneville and Oneida counties (Ulliman, 1995). Birds from the area around the Curlew National Grasslands have been used to transplant into other areas of Idaho and out-of-state.

Sharp-tailed grouse are habitat generalists and can adapt to many different habitats (Apa, 1998). Summer and brood-rearing habitat generally consists of shrub-steppe vegetation with 20-40 percent shrub cover interspersed with a high diversity of forbs and bunchgrasses, generally comprised of 60-80 percent grass/forbs cover. Summer habitat use generally consists of grasslands or habitat edges during the morning hours, moving to shrub cover during mid-day, then move back to more open vegetation types towards the evening (Ulliman, 1995).

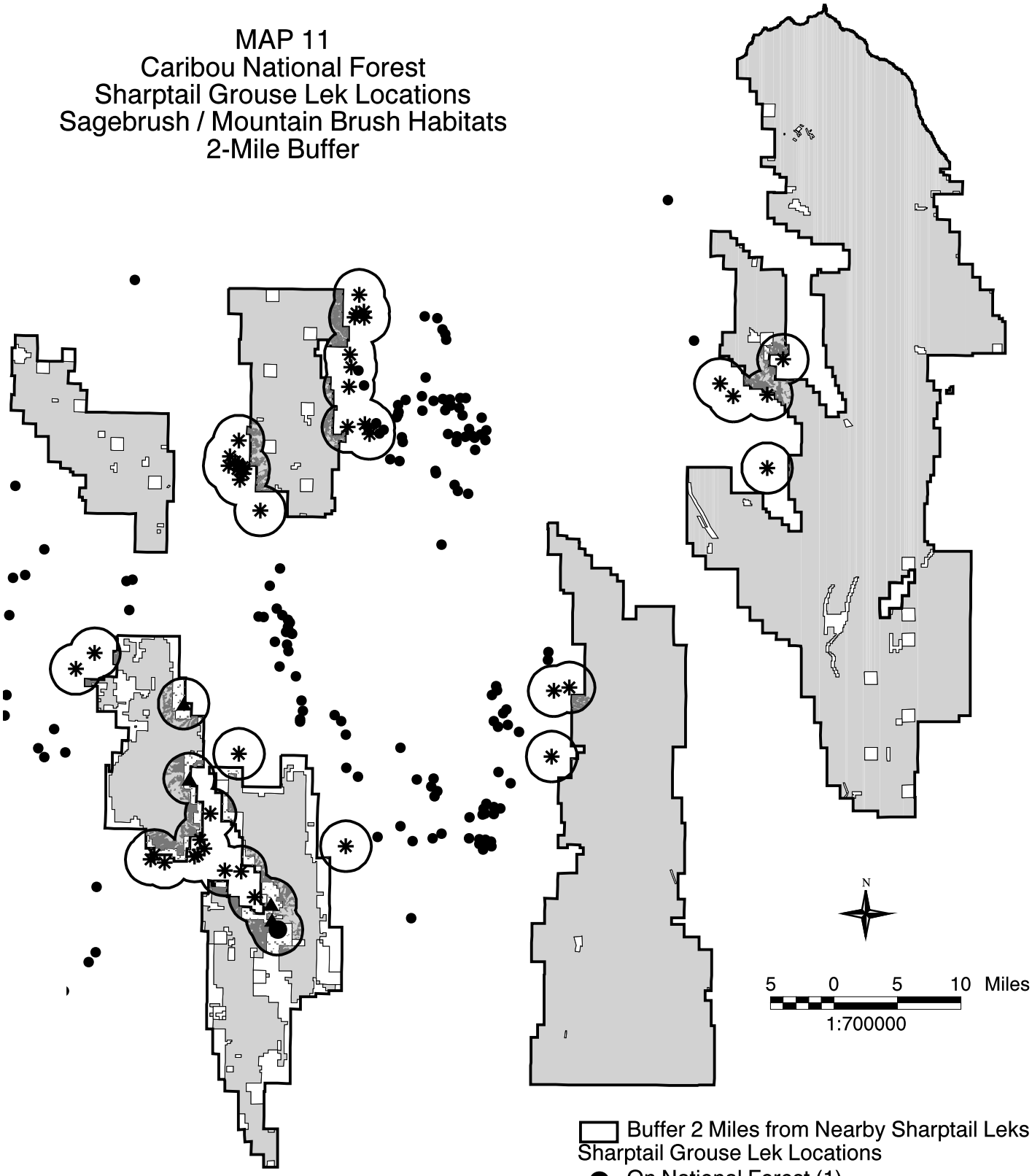
During winter, sharp-tailed grouse exhibit a close association with deciduous trees and mountain shrubs in upland and riparian areas, because they provide the only adequate food source and shelter from weather and predators. Severity of the winter influences habitats used. Unless forced by heavy snows, birds do not move out of summer/fall habitat (Ulliman, 1993).

Sharp-tailed grouse favor lek (traditional breeding grounds) locations having low, mottled or sparse vegetation with good visibility. Leks tend to be used year after year and are focal points in population surveys and monitoring. In the fall a hunting season for sharp-tailed grouse occurs in southeast and eastern Idaho. Apa (1998) found that females moved about 1,400 meters (or about one mile) from lek of capture to nest location.

The sharp-tailed grouse was petitioned for listing under the Endangered Species Act, in 1995. In October 2000, the U.S. Fish and Wildlife Service found that they were not warranted for listing. Their review showed that while smaller, isolated populations may currently be at risk, there are numerous larger populations that are relatively secure and possibly increasing.

Survey data for lek attendance on leks adjacent to the Caribou NF is very patchy. For example, in 1986, two leks were surveyed; in 1992 there were seventeen leks surveyed; and in 1998 there were seven leks monitored. There are or have been forty-nine leks known within two miles of the Forest, but none has long-term data. Because of the lack of data, it is not known how many of these are currently active. Because of the very limited data, no attempt will be made to talk about population trends in the vicinity of the Caribou NF. However, as mentioned previously, populations in southeastern Idaho are being used to transplant into other areas of Idaho and other states.

MAP 11
Caribou National Forest
Sharptail Grouse Lek Locations
Sagebrush / Mountain Brush Habitats
2-Mile Buffer



Buffer 2 Miles from Nearby Sharptail Leks

Sharptail Grouse Lek Locations
- On National Forest (1)
- On Private Inholding (4)
- Within 2 Miles of Natl Forest
- Other Nearby Leks

Vegetative Types for Sharptail Grouse Habitat
- Sagebrush/MtnBrush Habitats on Natl Forest
- Sagebrush/MtnBrush Habitats on Other Ownership
- National Forest Perimeter

Ownership
- Caribou National Forest
- Private or State Inholdings

Habitat Evaluation

Apa (1998) found that sharp-tailed grouse hens would move up to one mile from the lek to nest, and that mean winter movements from lek to winter habitat was two miles. He found that during a typical winter, movements were 2.1 miles for females and 1.2 miles for males. A two-mile area from known leks was used for this analysis (See Map 11).

There are 365,200 acres of sagebrush on the Caribou NF, of which 18,304 acres are within two miles of known lek locations (5 percent). The sagebrush habitats within two miles of the leks may provide summer habitat for sharp-tailed grouse. In addition, there are 5,492 acres of mountain brush (14 percent of total on Forest) within two miles of known leks that may provide winter habitat.

Calculation Used for Effects

Assuming that proposed treatments are evenly distributed across the Forest, and that treatments treat sagebrush and mountain brush in the proportion that they are present (90 percent sagebrush, 10 percent mountain brush) this table shows acres treated by type, forest-wide.

Table 80. Acres of Non-forested Vegetation Treated by Alternative over the Planning Period.

Non-forested Vegetation	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Total acres treated	130,000	77,500	100,000	77,500	70,800	60,000	79,750	40,000
Acres sagebrush	117,000	69,750	90,000	69,750	63,720	54,000	71,775	36,000
Acres mountain brush	13,000	7,750	10,000	7,750	7.080	6,000	7,975	4,000

Since the vegetation types are not uniformly distributed across the forest, treatment acres were calculated for the vegetation within the two-mile area around leks. Five percent of the sagebrush treatments are expected to be in this two-mile area, while 14 percent of the mountain brush acres are within this area. The following table shows acres treated within the two-mile area, by alternative.

Table 81. Predicted Acres of Non-forested Vegetation Treated, Within Two Miles of Leks.

Areas within Two Miles of Leks	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Acres sagebrush treated	5,850	3,488	4,500	3,488	3,186	2,700	3,589	1,800
Acres mountain brush treated	1,820	1,085	1,400	1,085	991	840	1,117	560

To calculate what the age/structure of these types would be expected to look like at the end of ten years, there are a couple of assumptions used. First, in the sagebrush types, 50 percent of the acres are assumed to be in greater than 15 percent canopy cover, and 50 percent of the acres are assumed to be in less than 15 percent canopy cover. Approximately 15 percent of the sagebrush that is in greater than 15% canopy cover will never move into the greater than 15 percent canopy cover, due to soils, site conditions, etc. (1,373 acres). Finally, about 5 percent of the acres in less than 15 percent canopy cover (390 acres) moves into the greater than 15 percent canopy cover each year. This means that 9,152 acres – 1,373 acres = 7,779 acres times 5 percent = 390 acres per year.

<u>Acres in less than 15 percent canopy cover</u>:

Starting acres (50 percent of 18,304 acres) + acres treated – acres moving up x 10 years

<u>Acres in greater than 15 percent canopy cover</u>:

Starting acres (50 percent of 18,304 acres) – acres treated + acres moving in x 10 years

Alternative 1
<15% cc: 9,152 ac + 5,850 – 390(10) = 11,102
>15% cc: 9,152 ac – 5,850 + 390(10) = 7,202

Alternative 2
<15% cc: 9,152 ac + 3,488 – 390(10) = 8,740
>15% cc: 9,152 ac – 3,488 + 390(10) = 9,564

Alternative 3
<15% cc: 9,152 ac + 4,500 – 390(10) = 9,752
>15% cc: 9,152 ac – 4,500 + 390(10) = 9,564

Alternative 4
<15% cc: 9,152 ac + 3,488 – 390(10) = 8,740
>15% cc: 9,152 ac – 3,488 + 390(10) = 9,564

Alternative 5
<15% cc: 9,152 ac + 3,186 – 390(10) = 8,438
>15% cc: 9,152 ac – 3,186 + 390(10) = 9,866

Alternative 6
<15% cc: 9,152 ac + 2,700 – 390(10) = 7,952
>15% cc: 9,152 ac – 2,700+ 390(10) = 10,352

Alternative 7
<15% cc: 9,152 ac + 3,589 – 390(10) = 8,841
>15% cc: 9,152 ac – 3,589 + 390(10) = 9,463

Alternative 7R
<15% cc: 9,152 ac + 1,800 – 390(10) = 7,052
>15%cc: 9,152 ac – 1,800 + 390(10) = 11,252

Table 82. Sagebrush Canopy Cover Classes within Two Miles of Leks at End of Ten Years.

	Existing Condition	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
% Sagebrush Acres in Less than 15%cc	50%	61%	48%	53%	48%	46%	43%	48%	39%
% Sagebrush Acres in Greater than 15%cc	50%	39%	52%	47%	52%	54%	57%	52%	61%

In the mountain brush types, only 175 acres forest-wide show recent disturbance (GIS), which is 3 percent early seral and 97 percent late seral. These disturbances are fairly recent, and early seral acres would not be expected to move to late seral in the ten-year planning period.

Table 83. Mountain Brush Seral Status in Acres within Two Miles of Known Leks at the End of Ten Years.

Seral Status	Existing Condition (Percent of Acres)	Existing Condition (Acres)	Alt 1 (Acres)	Alt 2 (Acres)	Alt 3 (Acres)	Alt 4 (Acres)	Alt 5 (Acres)	Alt 6 (Acres)	Alt 7 (Acres)	Alt 7R (Acres)
Early	3%	165	1,985	1,250	1,565	1,250	1,156	1,005	1,282	725
Late	97%	5,327	3,507	4,242	3,927	4,242	4,336	4,487	4,210	4,767

Table 84. Mountain Brush Seral Status (%) within Two Miles of Known Leks, at the End of Ten Years.

Seral Status	Existing Condition	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
% Early seral mtn brush	3%	36%	23%	28%	23%	21%	18%	23%	13%
% Late seral mtn brush	97%	64%	77%	72%	77%	79%	82%	77%	87%

Determination of Effects

Implementation of upland forage utilization standards on browse and herbaceous vegetation will improve habitat quality most in Alternatives 3-7 and 7R. These alternatives will benefit nesting and brood-rearing habitat by providing residual cover. Alternatives 1 and 2 would maintain current conditions. Where habitats lie in a big game winter range prescription, more residual vegetation would be retained after livestock grazing.

The Plan also includes direction for pre-project surveys, about the use of current species management guidelines when developing site-specific projects, and these site-specific projects will consider proximity to active lek locations during planning and environmental analysis.

Sagebrush treatments would be prioritized in areas with canopy closure greater than 25 percent (Plan guideline); since sharp-tailed grouse nest and raise their broods in a variety of habitats, vegetation treatments should not affect suitability for nesting.

Mountain brush treatments have the potential to affect winter habitat. The alternatives range from 64 percent to 87 percent late seral mountain brush. Alternatives 6 and 7R would retain the most late seral mountain brush habitats within the two-mile area of known leks.

Table 85. Risk Assessment for Columbian Sharp-tailed Grouse, by Alternative.

Factor	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Livestock forage utilization	Mod	Low	Low	Low	Low	Low	Low	Low
Sagebrush treatments	Low	Low	Low	Low	Low	Low	Low	Low
Mountain brush treatments	Mod	Low	Low	Low	Low	Low	Low	Low

There is a low level of risk for implementing Alternatives 2-7 and 7R. Because sharp-tailed grouse are habitat generalists, and these alternatives maintain or improve habitat conditions, sharp-tailed grouse habitat use on the Forest should remain the same or increase. Alternative 1 has higher utilization standards, leaving less cover the nesting and brood-rearing, and would leave only 64 percent of the mountain brush in late-seral condition. These factors give this alternative a moderate risk.

The Caribou NF provides only a small part to conservation of this species. Most of the habitat for this species is off-Forest, but the Caribou NF will continue to provide potential nesting, brood-rearing and winter habitat in southeastern Idaho.

Cumulative Effects

Most habitat is located on private, state or BLM lands and the Forest contributes only a portion of potential habitat. Since this species is a habitat generalist, and uses a wide variety of modified habitats, like CRP, it is doing well in southeastern Idaho. Only Alternative 1 has the potential to negatively affect use on the Forest, shifting use onto adjacent lands in other ownerships.

References for the above section:

Apa, A.D. 1998. Habitat Use and Movements of Sympatric Sage and Columbian Sharp-tailed Grouse in southeastern Idaho. PhD dissertation, University of Idaho. 199 pgs

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Ulliman, M.J, A. Sands and T. Hemker. 1998. "Conservation Plan for Colombian Sharp-tailed Grouse and its Habitat in Idaho." Draft document on file at the Headquarters Office in Idaho Falls, ID. 36 pp.

Ulliman, M.J. 1993. Winter Ecology and Habitat Selection of Columbian Sharp-tailed grouse in southeastern Idaho, Progress Report. University of Idaho, Moscow, ID.

Ulliman, M.J. 1995. Winter Habitat Ecology of Columbian Sharp-tailed Grouse in Southeastern Idaho. M.S. Thesis, University of Idaho, Moscow, ID. 123 pgs.

USFWS 2000. News Release. Columbian Sharp-tailed Grouse not Warranted for Endangered Species Act Protection. Boise, ID 10/11/2000.

NORTHERN GOSHAWK

(The following information is summarized from Reynolds, *et al*, 1992 except where noted otherwise).

Habitat and Population Overview

The northern goshawk is a forest habitat generalist that uses a variety of forest types, forest ages, structural conditions, and successional stages. It preys on small to medium-sized birds and mammals, which it captures on the ground, in trees or in the air. Forests within goshawk nesting home ranges should be an interspersed mosaic of structural stages to increase the diversity of habitat for goshawks and their many prey species. The goshawk is found across the western US, most of Canada, and into the northeastern US.

Patla (1997) studies goshawks on the Targhee NF to the north. She found nest stands in Douglas-fir, mixed conifer and lodgepole pine cover types. More than half had some degree of past timber harvest in the area. The six most important prey categories she found were snowshoe hare, Uinta ground squirrel, ruffed grouse, blue grouse, unidentified grouse sp, and red squirrel.

The USFWS received a petition to list the northern goshawk as threatened or endangered in the western United States. In 1997, they determined that the petition presented substantial information indicating that listing may be warranted. A further evaluation of the assertions made in the petition was done, and all of

the factors reviewed lead them to the conclusion that listing was not warranted. The Service found no evidence to support the contention that the goshawk was in danger of extinction, or that the species is likely to become endangered in the foreseeable future.

Population trend data is not available for this species. Wisdom, *et al*, (2000) predict that population trends are declining due to changes in habitat across the Interior Columbia Basin. The Caribou-Targhee NF Monitoring and Evaluation Report (2000-2001) summarized data from goshawk nest territory monitoring. Nest occupancy rates were down in 1998 compared to the early 1990s. Patla (2000) believes that this trend is due to a variety of factors, including possible cyclic populations, weather patterns, monitoring methods, management, etc.

Accipiter surveys were conducted in the Sulphur Canyon Area of the Aspen Range in the late 1970s. In the 20 square miles that were surveyed, twelve goshawk nest territories were found – six of which were active in 1978, and four in 1979. Of these nests, elevations ranged from 6,600 to 7,300 feet; about 71 percent were located on north, northeast and northwest slopes; and about 82 percent were located in aspen (Chase, 1984). Map 12, showing current known goshawk nest territories shows only one in the Aspen Range, however this is most likely a reflection on lack of survey information as opposed to decreases in goshawks in that area.

Nest Areas

Nest areas include one or more forest stands, several nests, and several landform characteristics. Nest areas are occupied by breeding goshawks from early March until late September, and are the focus of all movements and activities associated with nesting. The size (20-25 acres) and shape of nest areas depend on topography and the availability of patches of dense, large trees.

Nest areas are often used more than one year, and some are used intermittently for decades. Many pairs of goshawks have two to four alternate nest areas within their home range. All previously occupied nest areas may be critical for maintaining nesting populations because they contain the habitat elements that attracted the goshawks originally. Additionally, replacement nest areas are required because goshawk nest stands are subject to loss from catastrophic events and natural decline.

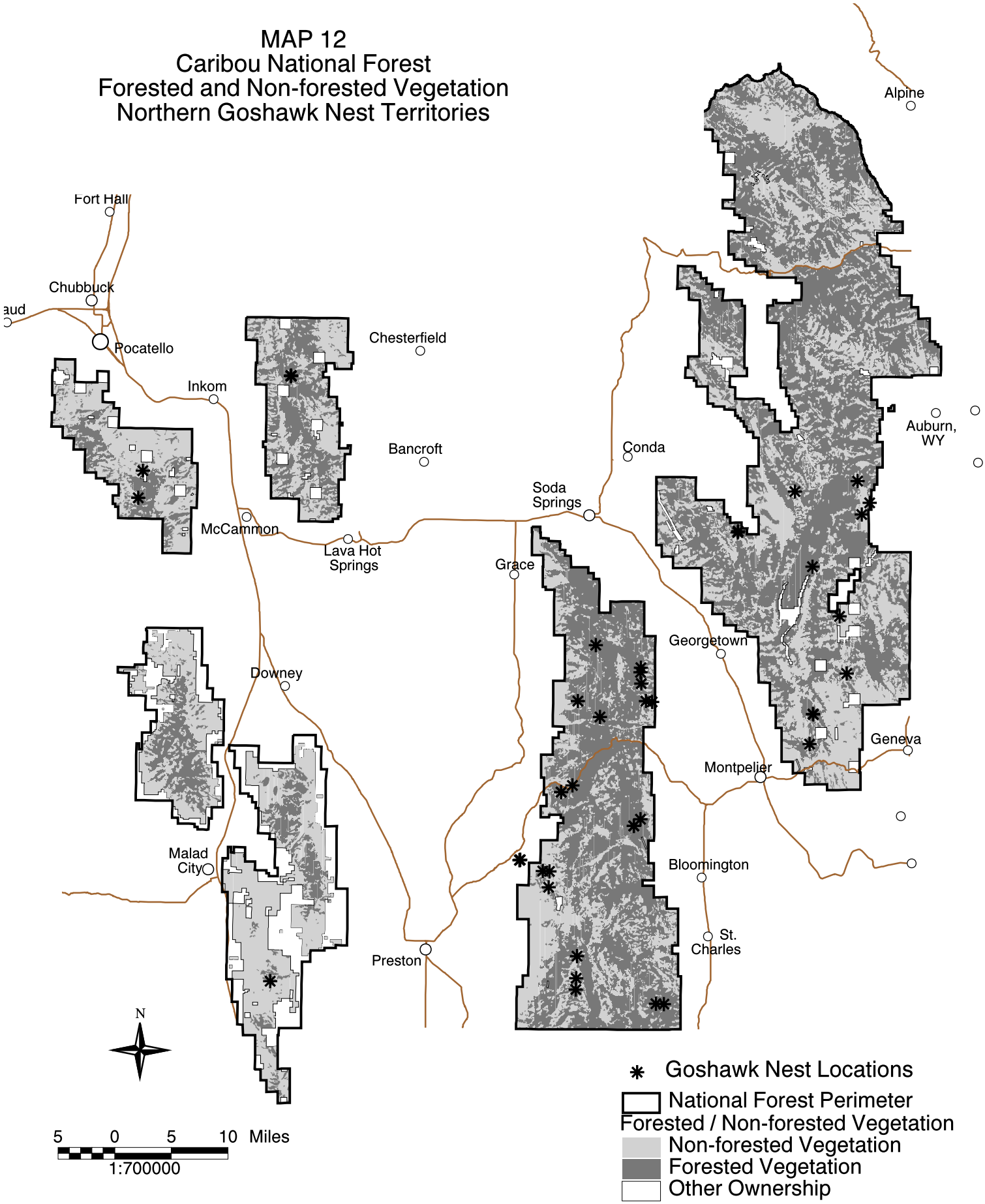
Goshawk nest stands have a relatively high tree canopy cover, a high density of large trees and are usually classified as mature or older forested stands. Studies suggest that the dense vegetation in these stands provide relatively mild and stable microclimates, as well as protection from predators.

Nest trees surveyed by Patla (1997) were largely in Douglas-fir, with minor amounts in lodgepole pine, aspen and spruce. Douglas-fir trees tend to have stout, lateral branches that provide good structural support for nests. Most of the nests were found on mid- to lower slope positions. The average size of the nest area was 80 ha. Mature conifer was the dominant cover type (but with a large range between stands), with smaller amounts of young sawtimber, seedling stands, sage/shrub, and open areas.

Post-fledging Family Area (PFA)

PFAs include the area used by the adults and young from the time the young leave the nest until they are no longer dependent on the adults for food. The PFA surrounds the nest area, and although it generally includes a variety of forest conditions, the vegetation structure resembles that found within nest stands. PFAs vary in size from 300-600 acres. PFAs provide the young hawks with cover from predators, and sufficient prey to develop hunting skills and feed themselves in the weeks before juvenile dispersal. Forests in the PFA should contain understories with a canopy cover greater than 50 percent and well-developed understories and habitat attributes critical in the life histories of goshawk prey species.

MAP 12
Caribou National Forest
Forested and Non-forested Vegetation
Northern Goshawk Nest Territories



Patla (1997) found that the PFAs (160 ha) also had a large range of mature forests present, but only two territories had PFAs with less than 40 percent mature forest cover. Patla (1997) calculated a mean fledging date of July 15, with a range of July 1 to August 3. This was based on thirty-seven successful breeding pairs from 1989 to 1994.

Foraging Area

Goshawks prey on birds and mammals in the larger body-size class available to forest dwelling hawks. Generally speaking, because larger species of vertebrates have less dense populations than smaller species, predators of large prey must hunt over large areas in order to meet their energy requirements. Goshawks foraging areas are about 5,000 to 6,000 acres.

Limited studies suggest that goshawks prefer mature forests for foraging. Additional information on the composition and structure of goshawk foraging habitat was gleaned from information on the habitat requirements of goshawk prey species. Raptor populations are often limited by prey populations, and choice of foraging habitat is somewhat restricted by prey abundance and accessibility.

The foraging area comprises the largest portion of the goshawk nesting home range and therefore typically includes a greater diversity of landforms, forest cover types and vegetation structural stages. Important habitat components include snags, downed logs, woody debris, openings, large trees, herbaceous and shrubby understories, and interspersion of vegetation structural/successional stages.

Monitoring on the Caribou-Targhee NF

Monitoring of goshawks on the Targhee NF portion of the Caribou-Targhee NF has occurred at varying levels over two decades. In 2000, only 31 percent of surveyed territories were occupied, compared to 80 percent occupancy rate in 1992. This trend may be due to a variety of factors, including naturally cyclic populations, weather, monitoring methods, habitat management, etc (Caribou-Targhee Forest Plan Monitoring and Evaluation Report, 2000-2001). In 2001, Patla found 38 percent of surveyed nest territories were occupied.

In 1999, goshawks on monitored nests produced only two young, the lowest number recorded. In 2000, nine young were produced, which is about average. In 2001, about 25 percent of the nests were successful and produced nine young (Patla, 2002).

Patla (2002) suggested that low occupancy rates in 2000 and 2001 were not a result of failed nesting attempts, but rather failure of pairs to return to known nesting areas. She found that in some years, low adult survival might be affecting occupancy rates the following season.

Use on the Caribou NF

Goshawk monitoring on the Forest has identified goshawk territories, some of these are historic and some are active. See the attached map for generalized locations of goshawk nest territories in relation to forested vegetation across the Caribou. Not all of the Forest has been inventoried or monitored for goshawks, therefore additional territories are sure to exist. There are also goshawks on adjacent lands on the Targhee NF to the north and the Bridger-Teton NF to the east. The following table shows an overview of known nest territories on the Forest.

Table 86. Known Goshawk Nest Territories on the Caribou NF (through 2001).

DISTRICT	# KNOWN TERRITORIES	YEARS ACTIVE/ YEARS MONITORED
Soda Springs	6	3/11
Montpelier	32	37/84
Malad	1	0/2
Pocatello	7	7/22

Habitat Evaluation

ICB (Wisdom, *et al*, 2000) put goshaws in Family 2, which are species using broad-elevation old forest. They use late-seral multi- and single layered stages of the montane community. Important habitat components include snags for nesting and downed logs for foraging for prey species.

An assessment of goshawk habitat in the state of Utah was done in 1999 (Graham, *et al*, 1999). They concluded that to ensure the goshawks continued existence in Utah, habitat restoration and protection of natural processes were important. Based on their mapping, the Bear River range on the Caribou NF is contiguous to an area of high value habitat in Utah.

In 1998, an analysis of vegetative composition within one mile of known goshawk nest trees was completed (S. Feltis). Of the thirty territories considered, twenty-seven were analyzed further (three had less than 10 percent outside of Forest, with no vegetation data available). Of these twenty-seven areas, major (greater than 10 percent) vegetation types found within one mile of the nest included aspen, aspen/maple, aspen/conifer, Douglas-fir, lodgepole pine, mixed conifer, mountain brush and sagebrush. The following table shows the number of territories with more than 10 percent of specific vegetation types present. It also shows the average percent of vegetative cover for each type on those territories where it is present. For example, nine of the twenty-seven territories analyzed had greater than 10 percent sagebrush cover within one mile of the nest. Of these nine territories, the average percent of sagebrush canopy cover is 22 percent. Basically, this reflects the fact that vegetation is very patchy on the Caribou NF, and goshawks are still able to find suitable nesting habitat.

Table 87. Vegetative Cover within One Mile of Known Goshawk Territories (Feltis, 1998).

Vegetation Type	Number of Territories with Greater Than 10 Percent of Vegetation Type	Average Percent Cover
Aspen	9	29%
Aspen/conifer	6	18%
Aspen/maple	17	46%
Douglas-fir	17	18%
Lodgepole pine	8	19%
Mixed conifer	5	25%
Mountain brush	11	29%
Sagebrush	9	22%

Comparison of Alternatives

Table 88. Percent Mature and Old at the End of Ten Years, by Alternative.

Alt	Forest Types Treated	Aspen % Mature and Old	Low-elevation % Mature and Old	High-elevation % Mature and Old
1	All	57%	89%	79%
2	Mixed conifer, aspen/Douglas-fir, aspen	56%	85%	76%
3	Douglas-fir, lodgepole pine and mixed conifer	56%	83%	74%
4	Mixed conifer, aspen/Douglas-fir and aspen	56%	83%	77%
5	Mixed conifer, aspen/Douglas-fir and aspen	55%	85%	79%
6	Mixed conifer, aspen/Douglas-fir and aspen	56%	85%	80%
7	Mixed conifer, aspen/Douglas-fir and aspen	56%	85%	79%
7R	Mixed conifer, aspen/Douglas-fir and aspen	49%	82%	81%

Analysis of Effects

The Revised Forest Plan includes a table that includes standards and guidelines for management around active goshawk nest territories. The following analysis incorporates the standards and guidelines from this table and other Plan direction where noted. In addition, the Plan has a guideline requiring pre-project surveys, and upland livestock utilization levels that will maintain habitat for small mammals (prey species).

Nest Areas

The Southwest Guidelines were used to develop the guidelines used for the Targhee NF Plan. They were modified somewhat based on monitoring done on the Targhee NF. Instead of having 630-acre nest sites in a goshawk nesting territory, they used one 200-acre nest area. This is a large contiguous area, which includes alternate nest sites and replacement nest sites. This modification of the Southwest Guidelines was incorporated into the Caribou Revised Forest Plan. In addition, the management season of October to March was changed from September to March. This was based on monitoring from the Targhee NF that showed most of the young had fledged by early August and were mobile by September. This will allow vegetation treatments, such as prescribed burning for aspen regeneration, to occur in the September period.

Of the forty-one known nesting territories on the Caribou NF, there is a wide range of forest cover within the 200-acre nest area. This is displayed in the table below. There are also five nest areas with over 50 percent grass/shrub types, one with over 75 percent rock, and four with over 50 percent maple. But, overall, almost 75 percent of the nest areas were found in areas with over 76 percent forested cover.

Table 89. Forested Cover within 200-acres Around Known Goshawk Territories.

Percent of Forest Cover	0-25%	26-50%	51-75%	76-100%
Number of 200-acre nest areas	3	5	3	30
Percent of total nest areas	7%	12%	7%	73%

Focusing on just those thirty nest areas that were found in areas with over 76 percent forested cover, two had less than 75 percent pole-sized or larger trees, while the other twenty-eight are dominated by pole-sized and larger trees. The guidelines in the Plan call for retaining 100 percent of the forested stands within the 200-acre nest area in mature to old stands. While thinning is allowed within this 200-acre area, it will be done to maximize diversity of the stand and will retain mature/old trees.

Post-fledging Area

On the Targhee NF the majority of all existing territories have more than 60 percent mature forest cover within the post-fledging area (Patla, 2001). This contrasts with territories on the Caribou NF, where 20 percent of the territories had less than 40 percent mature forested cover within the PFA.

The standards and guidelines in the Revised Plan call for a size class distribution of less than 20 percent seedling, sapling or pole and over 40 percent mature/old within the PFA. Under existing conditions, 20 percent of the known territories would not meet these criteria (have less than 40 percent mature/old) but management in the future would maintain these at current levels, and would not move further from the 40 percent guideline.

Foraging Area

Management in the 5,400-acre foraging area follows the Southwest guidelines and the Targhee NF. The guidelines are displayed in Table 3.5 in the Revised Plan.

Determination of Effects

Problems or threats facing the goshawk were summarized in Idaho's Habitat Conservation Assessment and Strategy for the Northern Goshawk (*Accipiter gentiles*) (Patla, *et al*, 1995). These include modification of habitat at the local and landscape scales, over-utilization, disease, predation, competition and absence of regulatory mechanisms to prevent degradation of habitat.

Patla, *et al*, (1995) also identified risk factors for goshawks. Besides the risks analyzed below, there are others. Others listed included over-utilization (commercial, recreational, scientific); disease, predation and competition; and the absence of regulatory mechanisms to prevent the decline of species or habitat. This last risk factor has been addressed in great detail in the Revised Forest Plan. The Revised Forest Plan includes objectives, standards and guidelines for goshawks. There are specific standards for the nest area, the post-fledging area and the larger foraging area. None of the alternatives has any of the former risk factors associated with them.

Table 90. Risk Assessment for Management of Goshawk Territories.

Risk Assessment	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Habitat modification around nest	Mod	Low	Low	Low	Low	Low	Low	Low
Habitat modification in PFA	Mod	Low	Low	Low	Low	Low	Low	Low
Wildfire suppression*	Mod	Low	Low	Low	Low	Low	Low	Low
Aspen out of PFC	Mod	Mod	Mod	Low	Mod	Mod	Mod	Low
Alteration of riparian habitats	Mod	Mod	Mod	Low	Low	Low	Low	Low
Overall risk	**Mod**	**Low**	**Low**	**Low**	**Low**	**Low**	**Low**	**Low**

* Based on whether the alternative allows wildfire for resource benefit.

Because of forest-wide direction for management around known goshawk nests and improvements in nesting and foraging habitats, all alternatives, except Alternaitve1, No Action, would have a low risk to goshawks. Habitats should be sufficient to maintain populations across the planning area. The Caribou NF and southeastern Idaho is only a very small portion of its total range, but with its mix of forested vegetation, can contribute towards the conservation of this species.

Cumulative Effects

It is not known to what degree some of the other risk factors may be occurring off of National Forest lands (shooting, predation etc). Habitat modification is occurring, but based on the variety of habitats used, this may not be a high risk. Proposed actions on National Forest lands should not contribute to actions on private lands to increase this risk.

References cited for above section:

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SPOTTED FROG

Habitat and Population Overview

Spotted fogs are found near permanent water such as marshy edges of ponds or lakes, algae-grown overflow pools of streams and near springs with emergent vegetation during the breeding period. They may move to mixed conifer and subalpine fir forest, grasslands, and brushlands of sage and rabbitbrush.

This species is thought to hibernate in holes near springs or other areas where water is unfrozen and constantly renewed. The spotted frog breeds from late February to early July. They may be locally abundant when congregating to breed in the spring. Eggs are deposited in ponds or quiet water in clusters.

They are considered opportunistic feeders, preying on a variety of insects, mollusks, crustaceans and arachnids. The demise of the spotted frog is believed to be a result of interspecific competition with the northern leopard frog and bullfrogs, and loss of riparian habitat.

To date, amphibian surveys on the Caribou NF have found four species of amphibians, but no spotted frogs (Burton and Peterson, 1998). According to Peterson (pers. comm.) this species is not found in southeast Idaho. A segment of the Great Basin population is found in the southwest part of the state. This population is of concern and has been identified as a "Species of Special Concern" by CDC. It is also a candidate species for federal listing. The northern population, which includes the Yellowstone population to the north of the Caribou NF, has not been identified as a concern and is also not found in the Planning area.

Determination of Effects

None of the alternatives would have any effects or any risk associated with them.

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Burton, S. and C.R. Peterson. 1998. Distribution, Relative Abundance, and Habitat Associations of Amphibians in Caribou National Forest, Idaho. Dept. Biological Sciences, Idaho State University, Pocatello, ID. 15 Sept 1998. 72 pp plus appendices.

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SPOTTED BAT

(The following information is summarized from Clark, *et al*, 1989).

Habitat and Population Overview

The spotted bat is known from the northeastern portion of the Greater Yellowstone area in Montana and Wyoming. Spotted bats use a variety of habitats including open ponderosa pine, desert scrub, pinyon-juniper, and open pasture and hay fields. They roost alone in rock crevices high up on steep cliff faces. Cracks and crevices ranging in width from .8 to 2.2 inches in limestone and sandstone cliffs are critical roosting sites. Spotted bats are rare and maybe limited by suitable roosting habitats. The food habits are

poorly known but previous studies have shown that they forage primarily on moths. Spotted bats are thought to migrate south for the winter, but information on seasonal movements and winter activity is very limited.

Groves, *et al*, (1997) indicate that extensive surveys in Idaho have only recently located this species in the southwestern part of the state. Surveys on the Caribou NF have not documented this species in the area, but it is a difficult species to detect in standard bat surveys.

Wisdom, *et al*, (2000) determined that habitat conditions across the Interior Columbia Basin had remained constant.

Habitat Evaluation

Roosting habitat for this species (rock crevices on cliffs) are fairly secure and disturbance at roosts is not expected to be an issue. Foraging habitat for this species is open, arid country and associated riparian areas. It is assumed that shrublands and riparian habitats in proper functioning condition provide the best habitat for insect populations, providing prey.

Table 91. Comparison of Alternatives, Based on Changes in Foraging Habitat.

Foraging Habitat	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Years to meet PFC in shrublands	<10	60	14	60	Static	Never	45	Never
Riparian ranking	7	5	6	3	1	1	3	3

Determination of Effects

Table 92. Risk Assessment, Based on Changes in Foraging Habitat.

Risk Assessment	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Shrublands in relation to PFC	Low	Low	Low	Low	Low	Mod	Low	Mod
Riparian ranking	Mod	Mod	Mod	Mod	Low	Low	Low	Low
Overall risk	**Low**	**Low**	**Low**	**Low**	**Low**	**Low**	**Low**	**Low**

All alternatives have a low risk for this species. Roosting habitat is secure, and foraging habitats will be maintained or improved in all alternatives. The Plan includes a guideline for pre-project surveys if suitable habitat is present. If spotted bats are found on the Caribou NF, the Revised Plan includes an objective to develop management plans for habitats where this species is found. Proposed management will maintain suitability of habitat.

Cumulative Effects

One unknown risk is the level of pesticide use in southeastern Idaho, and the effects of pesticide use on insect prey, and bats preying on these insects.

References cited in above section:

Clark, T.W., A.H. Harvey, R.D. Dorn, D.L. Genter and C. Groves. 1989. Rare, Sensitive and Threatened Species of the Greater Yellowstone Ecosystem. Northern Rockies Conservation Cooperative, Montana Natural Heritage Program, The Nature Conservancy, and Mountain West Environmental Services. 153 pp.

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WESTERN BIG-EARED BAT (TOWNSENDS)

(The following information is summarized from Clark, *et al*, 1989)

Habitat and Population Overview

Western big-eared bat is found throughout much of western North America. This species is not abundant anywhere and is uncommon to rare over much of its wide range. They are known from several locations in Yellowstone and Grand Teton National Parks to the northeast and the Craters area to the northwest. There are two known maternity roosts in Idaho at Craters of the Moon (Idaho Conservation Effort, 1995). Population trends are not well documented, but the most serious factor leading to perceived population declines is the loss and/or disturbance of suitable breeding habitat. This is a result of recreational caving and abandoned mine closures (Idaho Conservation Effort, 1995). Wisdom, *et al*, (2000) determined that habitat trends have remained constant across the Interior Columbia Basin.

This species occupies moist forests as well as arid savannah and shrub-steppe. It has been found foraging over sagebrush-grasslands, riparian areas, open pine forests, and arid scrub within the Greater Yellowstone Ecosystem. They forage well after dark and selectively forage for nocturnal moths and occasional flies and beetles.

These bats will occasionally take shelter in buildings, but do not tolerate a hot, dry roost environment for long periods. Males are solitary or occur in small groups while females form maternity colonies in suitable warmer caves. Hibernation occurs in local caves that range from 42.8–53.6 degrees F.

Cave and abandoned mine surveys have found Townsends big-eared bats present. These structures are being used for both summer roosts and winter hibernacula. Use has been documented in the Bear River range, Preuss Range, Portneuf Range and Elkhorn Mountains. Of eighteen caves and mines surveyed on the Montpelier Ranger District during the winter, eleven were found to have low numbers of western big-eared bats (Lengas, 1996). Of twelve caves and mines surveyed in the summer, five had low numbers of western big-eared bats (Lengas, 1995). No large concentrations were found in any season.

Habitat Evaluation

ICB (2000) put Townsends big-eared bat in family 7 that are species that use a complex pattern of forest, woodlands and sagebrush cover types. This species uses cliffs, mines, and buildings for day roosts and hibernacula. Suitable roosting structures often limit bat distribution and population size. Distribution of big-eared bats is closely tied to the presence of caves and cave-like structures because they roost in large colonies and require a ceiling-like substrate for hanging (Idaho State Conservation Effort, 1995). Because this species is a habitat generalist, habitat changes have not had substantial changes in extent of source habitats. The primary issue for this species is related to human impacts on special habitat features used for roosting (Wisdom, *et al*, 2000). Conservation measures for this species include: (1) protect all known roost sites; (2) reduce levels of human activities around known roosts; and (3) maintain/improve condition of foraging habitats.

Determination of Effects

Several studies have shown that this species is very sensitive to human disturbance. Summer roosts and hibernacula are particularly vulnerable to disturbance, which leads to abandonment and increased mortality. Bosworth (1994) looked at winter activity of Townsends big-eared bats in southeastern Idaho.

Both entering the hibernaculum and handling bats induced changes in normal activity patterns. Entering the hibernaculum induced premature arousal in bats near the end of a torpor bout. Lasting effects from this disturbance were not detected. However, alteration of normal behavior by human disturbance to hibernacula has been implicated in the decline of this species.

Abandoned mines, which have been closed for human safety, have been surveyed for use by bats. Where use has been documented, closures have been done with grated openings or culverts, which still allow access to bats and permit airflow.

The Revised Forest Plan includes an objective for development of management plans for known occupied sites, and guidelines for access into occupied sites, and for surveys prior to closure of abandoned mines.

Table 93. Risk Assessment for Western Big-eared Bats, by Alternative.

Risk Assessment	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Abandoned mine closure	Mod	Low	Low	Low	Low	Low	Low	Low
Recreational caving*	Mod	Low	Low	Low	Low	Low	Low	Low
Renewed mining at historic sites	Mod	Low	Low	Low	Low	Low	Low	Low
Use of pesticides	Low	Low	Low	Low	Low	Low	Low	Low
Rangeland conversion to monotypic grasses	Low	Low	Low	Low	Low	Low	Low	Low
Grazing effects on foraging habitat	Mod	Mod	Mod	Low	Low	Low	Low	Low
Overall risk	**Mod**	**Low**	**Low**	**Low**	**Low**	**Low**	**Low**	**Low**

* Access is already regulated at known cave location.

Because of Forest-wide direction incorporated into the Plan, all alternatives, except Alternative 1, No Action, would have a low risk to this species. While Alternative1 would have no Plan direction, this species is still a sensitive species and these factors will be addressed at the site-specific project level. Based on current information provided by surveys, the Caribou NF provides summer and winter habitat for small numbers of this species. No large over-winter hibernacula or maternity colonies have been found. Because of this, the Caribou NF may contribute small areas of habitat for this species.

Cumulative Effects

Because of the types of habitats used for roosting, maternity colonies and hibernacula, risks are mostly associated with disturbances at these sites. Many known sites are on lands where they are monitored (Forest Service, BLM, and other areas like INEEL) and access is restricted. Another risk that is unknown is the level of pesticides used in southeastern Idaho, and effects on insect prey and bats preying on them.

References cited in above section:

Bosworth, W.R. 1994. Characteristics of Winter Activity in *Plecotus townsendii* in southeastern Idaho. MS Thesis, Idaho State University, Pocatello, ID.

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Wisdom, M.J., *et al.* 2000. Source Habitats for Terrestrial Vertebrates of Focus in the Interior Columbia Basin: Broad-scale trends and management implications. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. General Technical Report PNW-GTR-485. 156 pp.

WOLVERINE

(The following overview was summarized from Ruggerio, *et al*, 1994)

Habitat and Population Overview

Researchers have generally agreed that wolverine habitat is probably best defined in terms of adequate year-round food supplies in large, sparsely inhabited areas, rather than in terms of topography or vegetation. Wolverine populations have generally been pushed into the least developed habitats and the perception has resulted that wolverines are high-elevation species. Home ranges are very large, with male home ranges typically larger than those of females.

Wolverines are generally described as opportunistic omnivores in summer and primarily scavengers in winter. Studies have shown the importance of large mammal carrion and the availability of large mammals underlies the distribution, survival and reproductive success of wolverines. During the snow-free periods diets are more varied and include berries, small mammals, squirrels, and insect larvae.

Wolverines breed during the summer but because of delayed implantation, don't give birth until late winter/early spring. Natal dens are excavated in snow and usually are found in areas with snow-covered tree roots, log jams, or rocks and boulders.

In 1987, the Idaho Fish and Game reviewed the status of wolverine in Idaho (Groves, 1987). In the 1960 to 1987 time period, there were only ten confirmed reports of wolverines in Idaho, none of which were in southeast Idaho. There were probable reports of wolverines (one each in Bonneville, Caribou and Bannock counties) for the Caribou NF. The lack of wolverine reports was attributed to roadless nature, and resultant lower density of people (especially biologists and trappers).

Wolverine are not commercially trapped in Idaho, but are susceptible to leg-hold trapping as non-target species (Copeland and Hudak, 1995). Trapping accounts for a high proportion of wolverine mortality, affecting even populations that are locally protected (Ruggerio, *et al*, 1994).

Ruggerio, *et al*, (1994) mapped wolverine observations from 1961 to 1982 and 1983 to 1993 across the western United States. Between these periods, numbers of sighting decreased in Washington, Oregon, California, Colorado, and Yellowstone, increased in Central Idaho, but stayed about the same in southeast Idaho.

In 1999, the distribution of wolverines in northwest United States was reviewed (Edelmann and Copeland, 1999). While the focus of the study was in west-central Idaho, the sightings map shows seven locations in southeast Idaho. While this is a first step in identifying subpopulations in the northwest, additional information on 1) reproducing subpopulations, 2) source-sink habitat patches, 3) movement corridors and 4) movement patterns between subpopulations is necessary to understanding regional population status.

From the scattered sightings it appears that a sparse wolverine population may exist, or at least travel throughout southeastern Idaho and northern Idaho. In the early 1990s motion/activated cameras at bait stations were placed in the Bear River Range, but again, were not successful in locating wolverine. In 1995, camera/bait station surveys were conducted in the Franklin Basin area of the Bear River Range (Groves, 1987). No wolverines were documented during these surveys.

After reviewing these results, it was decided to use aerial surveys during late winter (Feb-May). To identify areas to survey, a GIS query was run over the Bear River Range, based on elevation, and landtypes with rock features. This mapping exercise identified areas around Soda Peak, Sherman Peak, and then areas from Copenhagen Basin south to the Forest Boundary.

In March of 1996, aerial surveys for wolverines were done within selected lands of the Bear River Range (Bissonette, 1997). Four potential track sightings were documented at that time. Some of the higher peaks appeared to provide talus communities consistent with central Idaho denning habitat, but potential denning sites within the survey area were not extensive. While there may be adequate habitat to support wolverine denning, it would likely occur only in the absence of snowmachine disturbance. It is possible that the survey area may provide useful wolverine habitat outside of the denning period (Bissonette, 1997).

Aerial surveys were again conducted in late winter/early spring 2002. These surveys documented wolverine trails in the Bear River Range and the mountains east of Soda Springs (M. Orme, Forest Biologist, pers. comm.).

There was a confirmed wolverine sighting in Hillyard Canyon of the Bear River Range in 10/93. Another report is from Wood Canyon on the south end of the Preuss Range, in 5/92. In 1992 there was also a sighting in the Pebble Guard Station area of the Portneuf Range. See Map 13, Wolverine Observations and Wildlife Security Areas.

Female wolverines appear to be extremely sensitive to disturbance during pre-weaning, and kit-rearing periods. Recreational activities (cross-country skiing and snowmobiling) may displace wolverines from potential denning habitat or cause den abandonment (Copeland and Hudak, 1995). In an ongoing study in the Tetons, six wolverines have implanted transmitters, and two of the females appeared to be denning (M. Orme, Forest Wildlife Biologist, pers. comm.) Researchers will try to look at denning locations in relation to winter recreation.

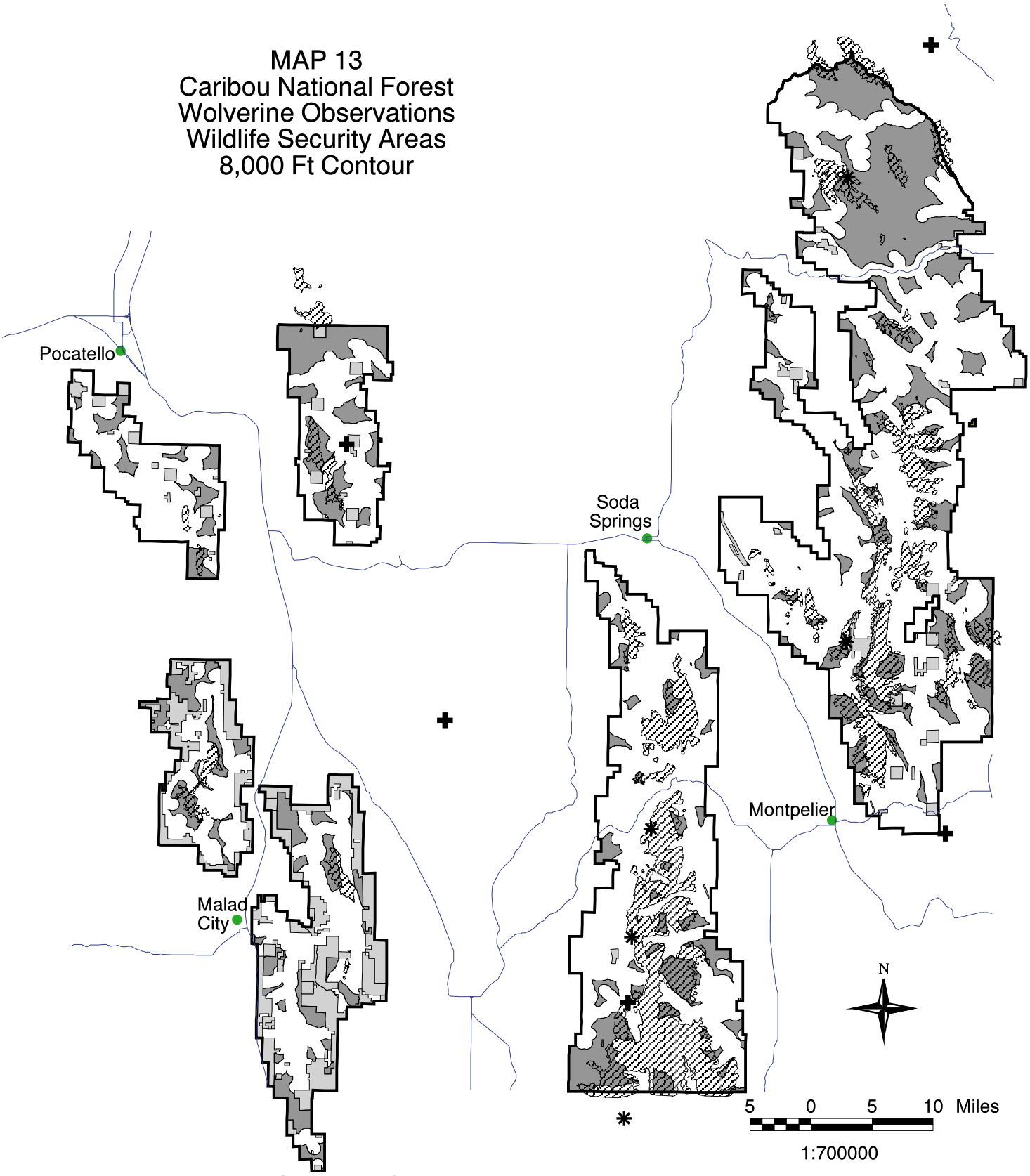
Habitat Evaluation

ICB (Wisdom, *et al*, 2000) put wolverine into the habitat generalist family, because they use subalpine forests, lower montane forests and riparian woodlands as source habitats. Downed logs are a special habitat feature because they serve as potential resting and denning sites. In addition, wolverines use talus slopes as denning sites and talus is considered a special habitat component for this species.

Strategies for the wolverine include (1) provide large areas with low road densities and minimal human disturbance; and (2) manage for wolverines in a metapopulation context, and provide adequate linkages among existing populations.

Witmer, *et al*, (1998) list three major issues for wolverines in the Interior Columbia Basin. One is maintenance of large, remote areas. If populations become too fragmented, low reproductive potential could lead to local extinctions. Coarse, woody debris and rocky habitat are important, fine-scale components for denning. Other lesser issues are prey populations (big game) and incidental trapping.

MAP 13
Caribou National Forest
Wolverine Observations
Wildlife Security Areas
8,000 Ft Contour



✚ Wolverine Previous Sightings / Signs
✱ Wolverine Observations by Aber, 2000
National Forest Perimeter
Elevation 8,000 ft +
Security Areas
Other Ownership

For security areas --
Motorized roads and trails were buffered 1/2 mile.
Private land was not excluded, nor were roads/trails on private land.

1/30/03,mm
../cnf_plan/wildlife/procpaper/wolverine_8X11.apr

From the scattered sightings it appears that a sparse wolverine population may exist, or at least travel, throughout southeastern Idaho and northern Utah. In 1995, camera/bait station surveys were conducted in the Franklin Basin area of the Bear River range (Bissonette, *et al*, 1995). No wolverines were documented during these surveys. In March of 1996, aerial surveys for wolverines were done within selected lands of the Bear River range (Bissonette, 1997). Four potential track sightings were documented at that time. Some of the higher peaks did appear to provide talus communities consistent with central Idaho denning habitat, but potential denning sites within the survey area were not extensive. While there may be adequate habitat to support wolverine denning, it would likely occur only in the absence of snowmachine disturbance. It is possible that the survey area may provide useful wolverine habitat outside of the denning period (Bissonette, 1997).

Summer security (areas over one-half mile from an open route and greater than 250 acres) is fairly limited on most of the Forest. A summary of the existing condition by mountain range block is shown in the table below.

Table 94. Summer Security Across the Caribou NF.

Mountain Range Block	Percent Security	Mountain Range Block	Percent Security
Bannock	21%	Elkhorn	27%
Bear North	9%	Malad North	27%
Bear South	19%	Malad South	19%
Caribou	58%	Portneuf	40%
Diamond	16%	Preuss	22%

Winter security is even more limited. Areas closed to winter motorized use are found in Prescription Areas 2.7.1(f), 2.7.2(f), 2.2(a), 3.1(a) and 3.2(f). This amounts to only 3 percent of the Forest.

Determination of Effects

The Revised Forest Plan includes direction for pre-project surveys for sensitive species in suitable habitat, has a guideline about restricting access around known den sites, and has an objective to do a GIS analysis to identify potential wolverine natal den sites.

Table 95. Comparison of Alternatives for Wolverine.

Wolverine	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
% Forest open to off-route travel	33%	38%	38%	0	3%	0	2%	2%
Acres closed to motorized use summer	8,400	8,400	0	28,500	52,300	33,600	24,400	95,468 (9%)
% Acres closed to motorized use in winter	3%	3%	4%	7%	8%	8%	6%	3%

Table 96. Risk Factors for Wolverine, by Alternative.

Linkages	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
% Forest open to off-route travel *	33%	38%	38%	0%	3%	0%	2%	2%
OMRD**								
Caribou	0.6	0.6	0.6	0.6	0.5	0.2	0.6	0.6
Webster/Diamond	1.4	1.4	1.4	1.3	1.4	0.4	1.3	1.4
Preuss	1.2	1.2	1.2	1.2	1.1	1.0	1.2	1.2
Acres in 1.3 and 3.1, where natural processes dominate ***	9,302	9,302	0	88,207	94,477	200,000	57,019	80,000
Overall ranking	**4**	**4**	**4**	**2**	**2**	**1**	**3**	**2**

* In Alts 1-3, almost the entire middle subsection (Webster/Diamond) is open to off-route travel. In Alts 5-7R an area of the middle subsection would still be open to off-route travel.

** These numbers were calculated on boundaries drawn for big game analysis and were not drawn based on subsection lines, but they give the overall picture for the same overall area.

*** These acres are approximate but provide a picture for the Caribou/Webster/Preuss ranges

Table 97. Risk Assessment for Wolverine, by Alternative.

Risk Assessment	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Loss of large, remote areas	Mod	Mod	Mod	Mod	Low	Low	Mod	Mod
Connectivity	Mod	Mod	Mod	Low	Low	Low	Mod	Mod
Denning habitat components	Low	Low	Low	Low	Low	Low	Low	Low
Potential for disturbance during denning	High	High	High	High	High	High	High	High
Potential for incidental trapping*	Low	Mow	Low	Low	Low	Low	Low	Low
Overall risk	**Mod**	**Mod**	**Mod**	**Low**	**Low**	**Low**	**Mod**	**Mod**

* Ranked low because this has not been a problem in Idaho.

There is suitable denning habitat on the Forest, but it is not known what affect snowmobile activity has on attempts at denning. Tracks have been seen during the denning season, but no dens have been found. While the potential for disturbance during denning is high in all alternatives (Alt 7R allows snowmobile use on 97 percent of the Forest), it is not known what affect movement of den sites has on kit survival.

Access to trappers, and resultant potential for incidental trapping as non-target species is associated with winter motorized access to trappers. In the last twenty years, there were only three known wolverines trapped and/or killed incidental to other activities in Idaho. While there are probably others that have gone unreported, they are probably not more than a few (J. Copeland, Wolverine Research Biologist, pers. comm.). Incidental trapping does not appear to be an issue in Idaho, or in this analysis area.
The Caribou NF provides habitat in southeast Idaho, and linkage to the Targhee NF to the north, and Wasatch-Cache NF and Bridger-Teton NF to the south and east.

Cumulative Effects

One of the greatest threats to wolverine is the loss of linkages to isolated populations. To move from some areas of the Forest, significant barriers must be crossed. Wide valley bottoms, with associated agricultural uses, towns and highways are inhospitable habitat. The best strategy is to work with other agencies and groups to identify key linkages for large carnivores and work on providing more hospitable

crossings. See corridor section in this paper for more information on potential linkages for large carnivores.

References cited for above section:

Bissonette, J.A. 1997. Final Report, Southeastern Idaho Wolverine Aerial Surveys – March 1996. Utah Coop Fish and Wildlife Research Unit, Utah State University, Logan, UT.

Bissonette, J.A., L.J. Christiansen and N.H. Smith. 1995. Final Report, Franklin Basin Wolverine Study. UTCFWRU 95-4:1-5.

Copeland, J. and H. Hudak. 1995. Conservation Strategies for Wolverine in Idaho. In Habitat Conservation Assessment and Strategy for Forest Carnivores in Idaho. Prepared by IDFG, Nez Perce Tribe and Sawtooth National Forest, for the Idaho Conservation Effort, IDFG, Boise, ID.

Edelmann, F. and J. Copeland. 1999. Wolverine Distribution in the Northwestern United States and a Survey in the Seven Devils Mountains of Idaho. Northwest Science, Vol. 73, No. 3, p 295-300.

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Ruggerio, L.F., K.B. Aubry, S.W. Buskirk, L.J. Lyon and W.J. Zielinski, technical editors. 1994. The Scientific Basis for Conserving Forest Carnivores: American Marten, Fisher, Lynx and Wolverine in the western United States. US Forest Service, General Technical Report, RM-254. Ft Collins, CO. Rocky Mountain Range and Experiment Station. 184 p.

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Management Indicator Species (MIS)

Two MIS have already been discussed as Sensitive Species. For information on Columbian sharp-tailed grouse and northern goshawk, see the Sensitive Species sections. Between the draft and final Plan, several proposed MIS were dropped. For rationale, see the Selection of MIS section of this Appendix. Sage grouse is the only additional MIS species discussed here.

SAGE GROUSE

Habitat Overview

Sage grouse depend primarily on sagebrush habitat for much of the year, although meadows and mesic sites are seasonally important habitat components (Connelly, *et al*, 1988). Sage grouse prefer sagebrush habitats year round, however other shrubs within the sagebrush community may be used (Braun, *et al*, 1977). During the winter months sage grouse rely almost exclusively on sagebrush with a relatively dense

canopy for food and cover. Sagebrush provides nesting habitat in the spring; other shrubs in the community may be used but nest success is reduced. Sage grouse have higher nesting success in sagebrush communities with a dense canopy and tall grasses that result in lower predation rates (DeLong, *et al*, 1995).

Sage grouse are dependent on sagebrush for food from all to spring. During spring, the diet shifts to forbs. Forbs and insects are a fundamental part of the diet of sage grouse chicks. During the early part of a chick's life insects (beetles and ants) predominate the diet. After this time, forbs become the most important food. In addition, forbs provide essential nutrients for pre-laying sage grouse hens, which may ultimately affect their reproductive success. Sage grouse hens consume fewer forbs and more shrubs as forbs begin to dry out.

Population Overview

Available data indicate that sage grouse have declined throughout their range. Long-term data from nine western states show breeding populations have declined from 17 percent to 47 percent from the long-term average (Connelly and Braun, 1997). Based on their analysis, populations in Idaho have decreased by 40 percent.

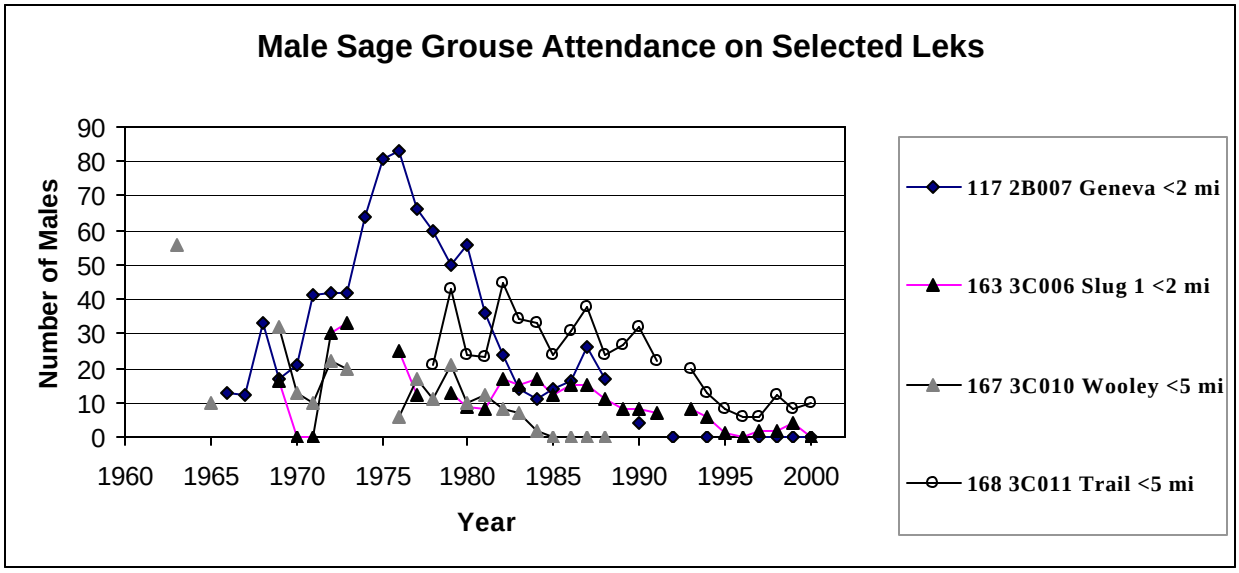
Because of the declines in sage grouse numbers in Idaho, the IDFG developed a sage grouse management plan (Idaho, 1997) and have implemented it through a Memorandum of Agreement. In 2001, a Memorandum Of Understanding (MOU) was signed between the Western Association of Fish and Wildlife Agencies, Forest Service, Bureau of Land Management, and the U.S. Fish and Wildlife Service.

The Washington population of sage grouse was petitioned for listing in 1999. In 2001, the U.S. Fish and Wildlife Service found that listing was warranted but precluded by higher priority listing actions (USFWS, 2001). There was a petition for listing the Mono County, California sage grouse population, but the U.S. Fish and Wildlife dismissed the petition. The greater sage grouse (includes birds in Idaho) was petitioned for listing in July 2002.

Only one lek has been documented on the Forest, but there are many within several miles of the Forest boundary (See Map 14). Sagebrush habitats within 20 kilometers (twelve miles) of active leks may provide nesting, brood-rearing and winter habitat for sage grouse (Connelly, *et al*, 2000). IDFG has been monitoring leks at irregular intervals for the last couple of decades, but monitoring efforts have increased over the last couple of years. While population fluctuations are likely, due to habitat and climatic changes, long-term trends may reflect changes in habitat conditions.

There are two known leks within two miles of the Forest Boundary that have long-term data, Geneva and Slug 1. In addition, there are two other larger leks within five miles that have long-term data, Wooley and Trail.

The graph suggests a declining population trend for sage grouse. However, there were only four leks reported and monitored before 1977, while in year 2000 there were fourteen leks monitored. Because of the difference in survey intensity, it is difficult to get a clear picture of overall trends. Of those fourteen leks surveyed in 2000, only three are larger (over twenty males) leks.



Factors Potentially Affecting Populations

Activities such as sagebrush treatments, hunting, wildfire, livestock grazing, fences, powerlines, and predation, along with adverse weather, are factors identified by Connelly and Braun (1997) that may have contributed to the decline of sage grouse range-wide.

Habitat Evaluation

ICB (Wisdom, *et al*, 2000) put sage grouse in family 11 with species that use big sagebrush, low sage and mountain big sagebrush. A special habitat feature for sage grouse is riparian meadows (brood-rearing habitat). Conservation measures identified in ICB include: (1) identification and conservation of remaining core areas where ecological integrity is high; (2) retard spread of non-native vegetation like cheatgrass; (3) restore native grass, forb and shrub components; (4) manage livestock grazing; (5) maintain or restore riparian vegetation; (6) minimize adverse impacts of human disturbance; and (7) focus short-term restoration of watersheds on those that are in high departure from historic conditions.

There are 365,200 acres of sagebrush on the Caribou NF, of which 203,459 acres are within ten miles of known lek locations (56 percent). The sagebrush habitats within ten miles of the leks are predicted to provide summer nesting and brood-rearing and winter habitat for sage grouse.

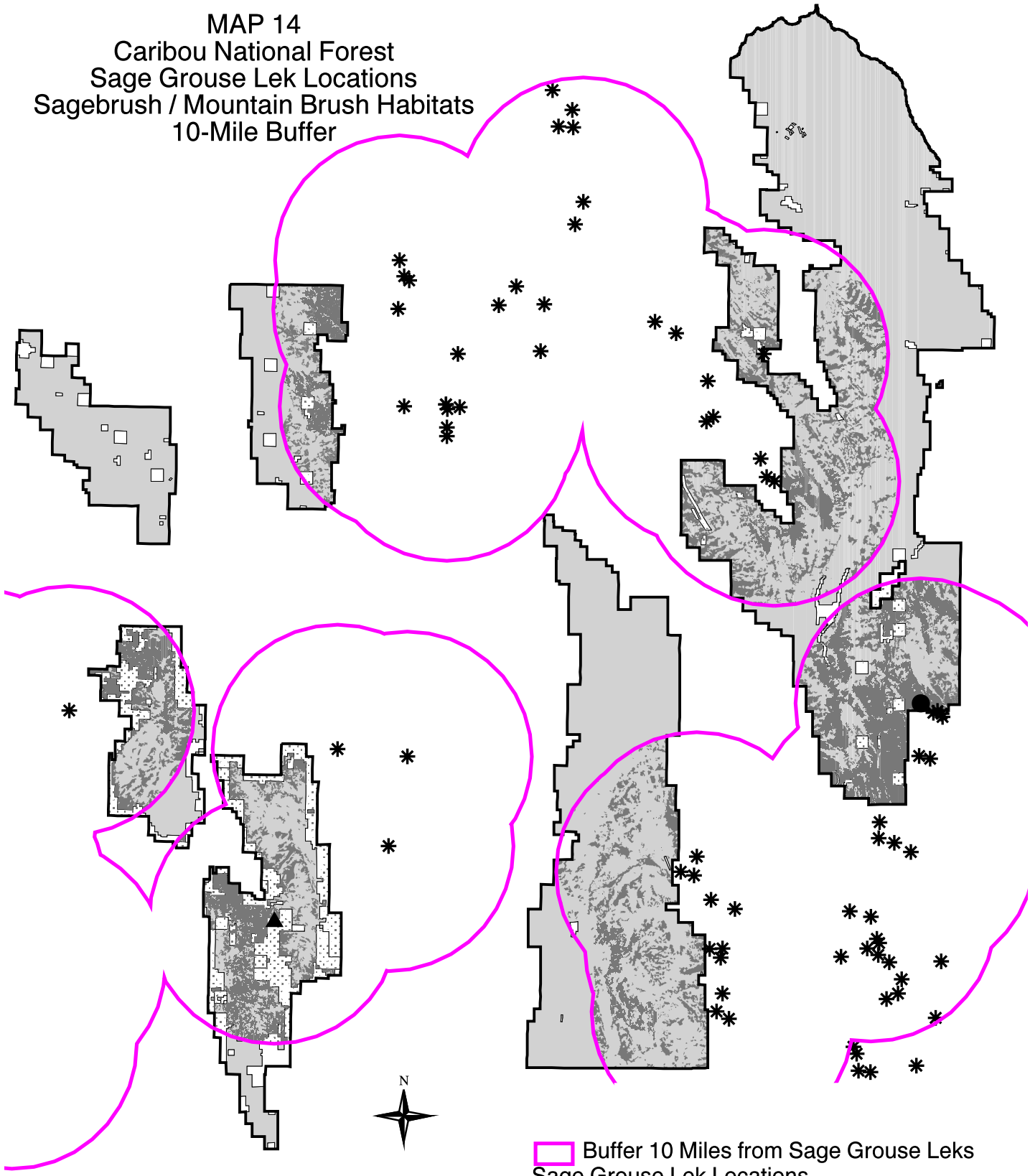
Analysis of Alternatives

Assuming that proposed treatments are evenly distributed across the Forest, and that treatments treat sagebrush and mountain brush in the proportion that they are present (90 percent sagebrush, 10 percent mountain brush), this table shows acres treated by type, forest-wide.

Table 98. Acres of Non-forested Vegetation and Sagebrush Treated, by Alternative.

Non-forested Vegetation	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Total acres treated	130,000	77,500	100,000	77,500	70,800	60,000	79,750	40,000
Acres of sagebrush treated	117,000	69,750	90,000	69,750	63,720	54,000	71,775	36,000

MAP 14
Caribou National Forest
Sage Grouse Lek Locations
Sagebrush / Mountain Brush Habitats
10-Mile Buffer



Buffer 10 Miles from Sage Grouse Leks

Sage Grouse Lek Locations

- ● On Caribou National Forest (1)
- ▲ On Private Inholding (1)
- ✱ Adjacent to the National Forest

National Forest Perimeter

Vegetative Types for Sage Grouse Habitat

- Sagebrush/MtnBrush on Natl Forest
- Sagebrush/Mtnbrush on Other Ownership

Ownership

- Caribou National Forest
- Private or State Inholdings

5 0 5 10 Miles

1:700000

Since the vegetation types are not uniformly distributed across the forest, treatment acres were calculated for the vegetation within the ten-mile area around leks. Connelly, *et al*, (2000) used three miles for non-migratory populations with non-uniformly distributed habitat and eleven miles for migratory populations. The status of migratory or non-migratory is not known for all of the areas around the Forest. As a result ten miles was used as an estimate of those sagebrush habitats that may be habitat for sage grouse. Fifty-six percent of the sagebrush acre treatments are expected to be in these areas. The following table shows acres treated within the ten-mile area of known leks, by alternative.

Table 99. Acres of Sagebrush Treated within Ten-mile Area of Known Leks, by Alternative.

Acres Within Ten Miles of Leks	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Acres sagebrush treated	65,520	39,060	50,400	39,060	35,683	30,240	40,194	20,160

To calculate what the age/structure of these types would be expected to look like at the end of ten years, several assumptions were used. First, in the sagebrush types (203,460 acres), 50 percent is in less than 15 percent canopy cover (101,730 acres), and 50 percent is in greater than 15 percent canopy cover (101,730 acres). Approximately 15 percent of the sagebrush that is in less than 15 percent canopy cover will never move into the greater than 15 percent canopy cover due to soils, site conditions, etc (15,260 acres). Finally, about 5 percent of the acres in less than 15 percent canopy cover (4,323 acres) moves into the greater than 15 percent canopy cover each year. This means that 101,730 acres minus 15,260 acres equals 86,470 acres times 5 percent equals 4,323 acres per year.

For sagebrush acres in less than 15 percent canopy cover:

Starting acres (50 percent of 203,460) + acres treated – acres moving up x 10 years

For sagebrush acres in greater than 15 percent canopy cover:

Starting acres (50 percent of 203,460) – acres treated + acres moving in x 10 years

Alternative 1

<15% cc: 101,730 acres (+) 65,520 acres (–) 4,323 acres (times) 10 = 124,020 acres
>15% cc: 101,730 acres (–) 65,520 acres (+) 4,323 acres (times) 10 = 79,440 acres

Alternative 2

<15% cc: 101,730 acres (+) 39,060 acres (–) 4,323 acres (times) 10 = 97,560 acres
>15% cc: 101,730 acres (–) 39,060 acres (+) 4,323 acres (times) 10 = 105,900 acres

Alternative 3

<15% cc: 101,730 acres (+) 50,400 acres (–) 4,323 acres (times) 10 = 108,900 acres
>15% cc: 101,730 acres (–) 50,400 acres (+) 4,323 acres (times) 10 = 94,560 acres

Alternative 4

<15% cc: 101,730 acres (+) 39,060 acres (–) 4,323 acres (times) 10 = 97,560 acres
>15% cc: 101,730 acres (–) 39,060 acres (+) 4,323 acres (times) 10 = 105,900 acres

Alternative 5

<15% cc: 101,730 acres (+) 35,683 acres (–) 4,323 acres (times) 10 = 94,183 acres
>15% cc: 101,730 acres (–) 35,683 acres (+) 4,323 acres (times) 10 = 109,277 acres

Alternative 6
<15% cc: 101,730 acres (+) 30,240 acres (–) 4,323 acres (times) 10 = 88,740 acres
>15% cc: 101,730 acres (–) 30,240 acres (+) 4,323 acres (times) 10 = 114,720 acres

Alternative 7
<15% cc: 101,730 acres (+) 40,194 acres (–) 4,323 acres (times) 10 = 98,694 acres
>15% cc: 101,730 acres (–) 40,194 acres (+) 4,323 acres (times) 10 = 104,766 acres

Alternative 7R
<15% cc: 101,730 acres (+) 20,160 acres (–) 4,323 acres (times) 10 = 78,660 acres
>15% cc: 101,730 acres (–) 20,160 acres (+) 4,323 acres (times) 10 = 124,800 acres

Comparison of Alternatives

Table 100. Percent in Sagebrush Canopy Cover Classes at the End of Ten Years.

Canopy Cover	Existing Condition	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
% Sagebrush acres <15%cc	50%	61%	48%	53%	48%	46%	43%	48%	39%
% Sagebrush acres >15%cc	50%	39%	52%	47%	52%	54%	57%	52%	61%

Habitat management guidelines have recently been updated (Connelly, *et al*, 2000). These guidelines (nesting, brood-rearing and winter habitat) would be incorporated at the site-specific level where appropriate. While most leks (where populations are most easily monitored) are not on Forest, changes in populations could reflect changes in habitat conditions on the Forest.

Implementation of upland forage utilization standards on browse and herbaceous vegetation will improve habitat quality most in Alternatives 2-7 and 7R. Alternative 1 would maintain current conditions. Where habitats lie in a big game winter range prescription, more residual vegetation would be retained after livestock grazing.

Sage grouse are habitat specialists and depend on closed canopy sagebrush. In the short-term, all alternatives, except Alternatives 1 and 3, maintain or improve habitat conditions. Sage grouse habitat use on the Forest should remain the same or increase under these alternatives. However, at some point, as canopy cover increases, understory grasses and forbs decrease, decreasing suitability of the stand. As a result, overall effects are based on short-term changes, and longer-term departure from PFC.

To focus treatments on sagebrush that has lower potential for use by nesting sage grouse, the objective for sagebrush treatments has been changed to focus on canopy cover in greater than 25 percent, rather than the 15 percent that was in the Draft Plan.

Patch sizes/treatment sizes are listed in the sage grouse guidelines. Vegetation types are very patchy on the Caribou NF, with vegetation maps revealing a mosaic of small patches across the Forest. To get an overall picture of what patch sizes actually are, a patch size analysis was done. Six relatively undisturbed watersheds were selected across the Forest. Initially, three broad vegetation types were selected and two watersheds that had a good representation of one of the three vegetation types (sagebrush, aspen and conifer).

Table 101. Average Sagebrush Patch Size (in acres) for Relatively Undisturbed Watersheds.

Watershed Name	Average Sagebrush Patch Size (acres)
Preuss	229
Weston	95
Toponce	35
Rock/Pine	294
St. Charles	56
Horse	94

Naturally, patch sizes vary widely with a few areas of the Forest being made of larger patches while the rest of the Forest is in smaller patches. The Forest Plan includes a guideline to manage for a minimum of 320-acre patches, where possible.

The potential for disturbance during nesting is greatest in areas where off-route travel is allowed. In areas where vehicles are restricted to roads and trails, the birds are able to adjust to the predictable disturbances. The table below shows the major areas of potential sage grouse habitat and how off-route travel is dealt with in each alternative.

Table 102. Potential Sage Grouse Habitat and Travel Management.

Sage Grouse Habitat Area	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Portneuf	C	C	C	C	C	C	C	C
Malad District	C	C	C	C	C	C	C	C
Bear River Range	O/C	O/C	O/C	C	C	C	C	C
Preuss Range	O	O	O	C	C	C	C	C
Aspen/Grays/Webster	O	O	O	C	C/O	C	C/O	C/O

C = Closed to cross-country motorized travel.
O = Open to cross-country motorized travel.

Table 103. Risk Assessment for Sage Grouse, by Alternative.

Risk Assessment	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Loss of mature sage, 10-years	Mod	Low	Mod	Low	Low	Low	Low	Low
Departure from PFC	Low	Mod	Low	Mod	Mod	High	Mod	High
Loss in grass/forb understory*	Mod	Low	Low	Low	Low	Mod	Low	Mod
Decline in wet sites	Mod	Mod	Mod	Low	Low	Low	Low	Low
Loss of tall sage winter habitats	Mod	Low	Mod	Low	Low	Low	Low	Low
Disturbance during nesting	Mod	Mod	Mod	Low	Low	Low	Low	Low
Overall risk	**Mod**	**Mod**	**Mod**	**Low**	**Low**	**Mod**	**Low**	**Mod**

* Based on a combination of forage utilization levels and sagebrush canopy cover.

Determinations of Effects

Implementation of Alternatives 4, 5, and 7 would have a low risk to sage grouse. Alternatives 1, 2, 3, 6 and 7R rank moderate based on a combination of the risk factors. While Alternative 7R has low risk over the short-term due to the low levels of treatments, it moves farther away from PFC and may be negative over the long-term.

The Revised Forest Plan includes direction for the use of the most current guidelines in development of site-specific projects, consideration of proximity to leks during project proposals, and potential for

disturbance during the breeding and nesting periods. In addition, there are several other guidelines for sagebrush habitat management found in the "Landbird" section.

The most suitable habitat was historically found at the lower elevations. The Revised Forest Plan direction will ensure that habitat suitability for sage grouse is maintained on the Caribou NF.

How the Revised Forest Plan Addressed the Most Current Sage Grouse Guidelines

The most current guidelines for management of sage grouse habitat are found in Connelly, *et al*, (2000). The habitat management guidelines were used, rather than the habitat restoration guidelines, as overall habitats on the Caribou NF are in suitable condition.

Table 104. Comparison of Forest Plan Direction to Guidelines in Connelly, *et al*, 2000.

CONNELLY 2000 GUIDELINES	REVISED FOREST PLAN DIRECTION
Breeding Habitat	
1. Manage to support 15-25 percent canopy cover of sagebrush, understory averaging greater than 18 cm in height, with greater than 15 percent cc of grasses and greater than 10 percent forbs	Guideline for treatments in sagebrush as been changed to prioritize treatments in canopy cover greater than 25 percent; implementation of forage utilization standards will leave more residual cover, especially on big game winter ranges; and guidelines in landbird section address understory vegetation
2. Protection of suitable habitats within buffer from lek (distance depends on seasonal use status)	Guideline for use of current guidelines in development of site-specific projects; consideration of distance to active lek locations during site-specific project planning
3. Management during drought	Upland utilization standards will still be in effect. In bad years, livestock will leave the Forest early, as they do now.
4. Suppression of wildfires in breeding habitats	Plan includes an objective to map functional and degraded sage grouse nesting and winter habitat and identify opportunities to increase the quality or quantity of habitat
5. Timing of activities	Two guidelines for management activities in relation to grouse breeding and nesting habitat
Summer-late Brood-rearing Habitat	
1. Avoid practices that reduce soil moisture effectiveness	Soils standards
2. Buffer sage grouse foraging areas (wet meadows)	Riparian buffers and riparian forage utilization standards
3. Discourage use of very toxic organophoshorus and carbamate insecticides	This is not addressed here. Done in a separate analysis with Wildlife Services
4. Maintain free water and wet meadows if developing springs.	Addressed in grazing guideline for returning water to point of origin after livestock leave unit
Winter Habitat	
1. Over the landscape, allow access to sagebrush stands with 10-30 percent canopy cover and 25-35 cm tall	Plan includes an objective to map functional and degraded sage grouse nesting and winter habitat and identify opportunities to increase the quality or quantity of habitat
2. Protect patches of sagebrush within burned areas	Not addressed here. Will be addressed at the site-specific project level.

Cumulative Effects

Only one of the known leks is located on the Forest. The majority of the land within ten miles of these leks is in other ownerships and current sagebrush management is unknown. Other risk factors like predation, hunting, powerlines and weather vary widely by area and by year.

References cited in above section:

Braun, C.L., Britt, T. and R.O. Wallestad. 1977. "Guidelines for Maintenance of Sage Grouse Habitats" Wildlife Society Bulletin 5:99-106.

Connelly, J.W. and C.E. Braun. 1997. Long-term changes in sage grouse populations in western North America. Wildlife Biology. 3: 123-128.

Connelly, J.W., M.A. Schroeder, A.R. Sands and C.E. Braun. 2000. Guidelines to manage sage grouse populations and their habitats. Wildlife Society Bulletin. 28(4): 967-985.

DeLong, A.K., Crawford, J.A. and D.C. DeLong, Jr. 1995. "Relationships between vegetational structure and predation of artificial sage grouse nests". Journal of Wildlife Management 59: 88-92.

Idaho. 1999. Idaho Sage Grouse Management Plan". Idaho Department of Fish and Game. Boise, ID.

USFWS. 2001. Notice of 12-month petition finding. Federal Register. May 7, 2001. Volume 66, Number 88.

Wisdom, M.J., *et al.* 2000. Source Habitats for Terrestrial Vertebrates of Focus in the Interior Columbia Basin: Broad-scale trends and management implications. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. General Technical Report PNW-GTR-485. 156 pp.

Other Fine-Filter Species-At-Risk

NORTHERN LEOPARD FROG

In Idaho the leopard frog lives in marshes, wet meadows from low valleys to mountain ridges (IDFG 1994). C. Peterson (pers. comm.) has found that this species is often associated with beaver ponds. They eat vertebrates as well as invertebrates and winter in the bottoms of ponds and lakes.

Within the last twenty to twenty-five years northern leopard frog populations have declined and been extirpated from large portions of the area from the western plains of Colorado, Wyoming, Montana, and Alberta westward to Oregon and Washington (Maxell, 2000). Suggested causes of declines include loss of wetlands and natural hydrologic regimes, introduction of game fish, mosquito fish and bullfrogs; application of pesticides and herbicides; and drought. While it is likely that all of these factors have played a role in the decline and extirpation of local populations, many of the declines and extirpations were apparently associated with regional mass mortality events between 1973 and 1982 because declines were observed in relatively pristine areas as well (Maxell, 2000).

In 1992, IDFG conducted a mail survey to get information on amphibian population trends in Idaho (Groves and Peterson, 1992). While there are problems associated with this survey and its results, about 78 percent of the respondents that commented on northern leopard frogs felt that populations were decreasing.

The northern leopard frog was historically found on Pocatello Ranger District, but was not observed during 1996 and 1997 surveys of Scout Mountain and Clifton Creek. They were only found in Toponce Creek area but were locally abundant (Burton and Peterson, 1998). They concluded that the Toponce Creek drainage is an important area for this species.

More recently, Burton (2001) looked at the Mink, Pebble and Toponce Creek drainages – the biggest threat in Mink and Pebble drainages was identified as successional changes in wetlands after disappearance of beaver. In Toponce Creek, beaver created 75 percent of northern leopard frog breeding ponds; of these, 25 percent of these were active and 75 percent were inactive. He concluded that restoration of breeding habitat is dependent on reestablishment of beaver in these drainages.

Habitat Evaluation

Based on the National Wetlands Inventory[2] for the Caribou NF, there are 7,150 acres of wetlands. Of these, 2,702 acres (38 percent) are categorized as shrub riparian.

Riparian habitats are mapped on the Caribou NF. This mapping identifies 4,100 acres. Currently 24 percent of riparian habitat is in proper functioning condition, 69 percent is functioning-at-risk and 7 percent of riparian is in non-functioning condition. Of the functioning-at-risk streams, about 86 percent are at moderate to high risk.

Determination of Effects

There is a Revised Forest Plan objective to develop a plan in cooperation with IDFG to identify watersheds where beaver would benefit, and habitat conditions are suitable for beaver reintroduction. This objective would also benefit species like the northern leopard frog over the long-term, as they have been identified as being associated with beaver ponds.

The Plan also includes an objective to "Repeat amphibian surveys at ten-year intervals to determine habitat and population trends. Add new surveys into unsurveyed but potential habitat."

Based on the riparian utilization standards in each of the alternatives, the following shows the relative ranking of the alternatives, with a ranking of "1" being the best. Alternatives 4-7 and 7R are the lowest risk and should improve habitats the most.

Table 105. Ranking of Alternatives Based on Riparian Habitat Conditions.

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Ranking (1= best)	7	5	6	3	1	1	3	3

Northern leopard frogs are found across the western United States, and the Caribou NF is only a small part of their range. However, improved riparian habitats and restoration of beaver could help to increase the distribution of this species across the Forest and southeast Idaho.

Cumulative Effects

More work will need to be done to identify the causes of declines of populations, both on and off the Forest. Suggested causes of declines in northern leopard frog populations in this and other areas of the country included loss of wetlands and natural hydrological regimes, introductions of game fish, mosquito fish, and bullfrogs; application of pesticides and herbicides, and drought (Maxell, 2000).

[2] USDI 1991. National Wetlands Inventory. USDI, Fish and Wildlife Service, Office of Biological Services, Portland, OR.

References cited in above section:

Burton, S.R. 2001. Amphibian Declines in Southeast Idaho: Using Modeling to Assess the Habitat Loss Hypothesis. PhD Thesis, Idaho State University, Pocatello, ID.

Burton, S. and C.R. Peterson. 1998. Distribution, Relative Abundance and Habitat Association of Amphibians in Caribou National Forest. Idaho State University, Pocatello, ID.

Groves, C.R. and C. Peterson. 1992. Distribution and Population Trends of Idaho Amphibians as Determined by Mail Questionnaire. Idaho Fish and Game, Boise, ID.

IDFG. 1994. Idaho's Amphibians and Reptiles: Description, Habitat and Ecology. IDFG, Nongame and Endangered Wildlife Program, Nongame Wildlife Leaflet No.7, Boise, ID.

Maxell, B.A. 2000. Management of Montana's Amphibians: A review of factors that may present a risk to population viability and accounts on the identification, distribution, taxonomy, habitat use, natural history and the status and conservation of individual species.

BOREAL TOAD

Boreal toads are found in a wide variety of habitats including wetlands, forests, woodlands, sagebrush, meadows and floodplains in the mountains and mountain valleys. Adults and juveniles are freeze intolerant and over winter in rodent burrows (Maxell, 2000). Breeding may take place in shallow areas of large and small lakes, beaver ponds, temporary ponds, slow-moving streams and backwater channels of rivers. Females lay strings of eggs around emergent vegetation or in loose clumps. Adults and dispersing juveniles may move up to 2.5 miles from breeding and natal sites.

Population Status

Within the last twenty-five years populations have undergone declines in Colorado, Utah, southeast Wyoming and New Mexico. Surveys in the late 1990s in the northern Rocky Mountains found that they were absent from a large number of their historic localities and only occupied a small part of the available habitat (Maxell, 2000).

Groves and Peterson (1992) did a mail questionnaire about the status of amphibian populations in Idaho. Although there are problems with this survey, half of the respondents that addressed boreal toads felt that populations were decreasing.

The boreal toad is ranked as not rare and apparently secure, both globally and statewide (CDC 2002). Boreal toads were historically found in several areas of the Forest. In recent surveys they were found only in the Tincup drainage (Burton and Peterson, 1998). These surveys in 1996 and 1997 found them in four of 185 sites surveyed, and only one breeding site was found. They concluded that the Tincup Creek drainage is an important area for this species.

Habitat Evaluation

Based on the National Wetlands Inventory[3] for the Caribou NF, there are 7,150 acres of wetlands. Of these, 2,702 acres (38 percent) are categorized as shrub riparian.

[3] USDI 1991. National Wetlands Inventory. USDI, Fish and Wildlife Service, Office of Biological Services, Portland, OR.

Riparian habitats are mapped on the Caribou. This mapping identifies 4,100 acres. Currently 24 percent of riparian habitat is in proper functioning condition, 69 percent is functioning-at-risk and 7 percent of riparian is in non-functioning condition. Of the functioning-at-risk streams, about 86 percent are at moderate to high risk.

Determination of Effects

There is a Revised Forest Plan objective to develop a plan in cooperation with IDFG to identify watersheds where beaver would benefit, and habitat conditions are suitable for beaver reintroduction. This objective would also benefit species like the boreal toad over the long-term, as beaver ponds have been identified as breeding habitat.

The Plan also includes a guideline that states, "Ensure habitats in the Tincup Creek drainage and other known toad breeding locations are managed to maintain or improve the existing population and distribution of boreal toads." The Plan also includes an objective to "Repeat amphibian surveys at ten-year intervals to determine habitat and population trends. Add new surveys into unsurveyed but potential habitat."

Based on the riparian utilization standards in each of the alternatives, the following shows the relative ranking of the alternatives, with a ranking of "1" being the best. Alternatives 4-7 and 7R are the lowest risk and should improve habitats the most.

Table 106. Ranking of Alternatives Based on Riparian Habitat Conditions.

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Ranking (1= best)	7	5	6	3	1	1	3	3

The boreal toad is distributed across the western part of the United States, and the Caribou NF provides only a small part of the habitat within their range. However, improved riparian habitats could potentially help increase distribution across the Forest and southeast Idaho.

Cumulative Effects

More work will need to be done to identify the causes of declines of populations, both on and off the Forest. There are many potential risk factors for this species. Some of these include sublethal environmental stress which leaves the toads more susceptible to diseases like red-leg or chytrid fungus; predation; livestock grazing at temporary ponds, and use of pesticides and insecticides (Maxell, 2000).

References cited in above section:

Burton, S. and C.R. Peterson. 1998. Distribution, Relative Abundance and Habitat Association of Amphibians in Caribou National Forest. Idaho State University, Pocatello, ID.

Groves, C.R. and C. Peterson. 1992. Distribution and Population Trends of Idaho Amphibians as Determined by Mail Questionnaire. Idaho Fish and Game, Boise, ID.

Maxell, B.A. 2000. Management of Montana's Amphibians: A review of factors that may present a risk to population viability and accounts on the identification, distribution, taxonomy, habitat use, natural history and the status and conservation of individual species.

Pygmy rabbits are associated with greater sagebrush densities; stands in deep soils, with a tall, dense structure and a high percent of woody cover. Sagebrush is the primary food, but grasses and forbs are eaten in mid- to late-summer (Green and Flinders, 1980).

Pygmy rabbits are moderately widespread or widespread with spotty distribution. They are found across the western states. They are ranked as apparently secure (S4) in Nevada; vulnerable (S3) in Idaho and California; and imperiled (S2) in Oregon, Montana, Wyoming, and Utah (www.natureserve.org).

Habitat Evaluation

ICB (Wisdom, *et al*, 2000) put pygmy rabbits in family 11 with species that use big sagebrush, low sage and mountain big sagebrush. Pygmy rabbits use dense stands of tall sagebrush, with a high amount of woody cover, in areas with deep soils. Sagebrush is the primary food, but grasses and forbs are eaten in mid- to late-summer.

Documented historic records for pygmy rabbits are from near Pocatello, Ft Hall and Downey, all at lower elevations, below the Forest (CDC). There are no known occurrences on the Forest. Pygmy rabbits have been included with cottontails in Idaho's hunting seasons. There is currently a proposal to ban hunting for pygmy rabbits because of the lack of data and concerns that populations may be declining.

There are 365,200 acres of sagebrush on the Caribou NF, and the assumption is made in this analysis that it is all potential habitat. Assuming that proposed treatments are evenly distributed across the Forest, and that treatments treat sagebrush and mountain brush in the proportion that they are present (90 percent sagebrush, 10 percent mountain brush) this table shows acres treated by type, forest-wide.

Determination of Effects

Table 107. Acres of Non-forested Vegetation and Sagebrush Treated, by Alternative.

Non-forested Vegetation	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Total acres treated	130,000	77,500	100,000	77,500	70,800	60,000	79,750	40,000
Acres of sagebrush treated	117,000	69,750	90,000	69,750	63,720	54,000	71,775	36,000

Table 108. Distribution of Sagebrush Canopy Cover Classes at the end of Ten Years.

Canopy Cover Classes	Existing Condition	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
% Sagebrush acres <15%cc	50%	65%	52%	57%	52%	50%	47%	52%	43%
% Sagebrush acres >15%cc	50%	35%	48%	43%	48%	50%	53%	48%	57%

Recommendations for sagebrush-associated species suggest that habitat patches need to be at least 320 acres to be effective for species requiring "interior" habitats[4]. Fragmentation of sagebrush shrublands may result in the loss of habitat for a couple of decades, or until canopy cover moves up into the denser category. Large treatments would result in a decrease in habitat connectivity, acting as barriers to movement or increasing vulnerability to predation due to a lack of cover.

[4] Paige and Ritter

Vegetation is very patchy on the Caribou NF. Since most of the sagebrush habitats are at lower elevations on the Forest (and off-Forest), and mix in with other types as elevation increases, they naturally are more broken on the Forest. To get an idea of patch sizes in sagebrush stands, six relatively undisturbed watersheds were selected from across the Forest. The average sizes in these six watersheds range from 35 acres up to 294 acres.

Table 109. Average Sagebrush Patch Size (in acres) for Relatively Undisturbed Watersheds.

Watershed Name	Average Sagebrush Patch Size (acres)
Preuss	229
Weston	95
Toponce	35
Rock/Pine	294
St. Charles	56
Horse	94

The Forest Plan has a guideline that looks at a patch size minimum of 320 acres, where possible. In addition, because of the unknown status of pygmy rabbits on the Forest, an objective has been added to work with IDFG to resurvey historic locations to see if they are present, or habitat is still suitable.

Table 110. Risk Assessment for Pygmy Rabbits, by Alternative.

Risk Assessment	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Loss of mature sage, 10-years	Mod	Low	Mod	Low	Low	Low	Low	Low
Departure from PFC	Low	Mod	Low	Mod	Mod	High	Mod	High
Loss in grass/forb understory	Mod	Low	Low	Low	Low	Low	Low	Low
Overall risk	**Mod**	**Low**	**Mod**	**Low**	**Low**	**Mod**	**Low**	**Mod**

Alternatives 2, 4, 5 and 7 all have a low risk for pygmy rabbits, while the rest of the alternatives rate moderate. Alternative 7R has a low risk over the short-term due to the low level of treatments. But over the long-term, risk goes up as sagebrush habitats move further from proper functioning condition. All alternative should maintain habitat suitability over the planning period over the next ten years, but the most suitable habitat for this species was historically found at lower elevations.

Cumulative Effects

The historic records of pygmy rabbits in the vicinity of the Forest were mostly from off-Forest locations. It is unknown what the status of habitats or animals is currently. To address the status of habitats, an objective has been added to the Plan to work with IDFG to resurvey historic locations to see if they are still present, or if habitat is still suitable.

References cited in above section:

Green, J.S. and J. T. Flinders. 1980. Habitat and Dietary Relationships of the Pygmy Rabbit. Journal of Range Management. Vol 33, No. 2, p. 136-142.

Wisdom, M.J., *et al.* 2000. Source Habitats for Terrestrial Vertebrates of Focus in the Interior Columbia Basin: Broad-scale trends and management implications. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. General Technical Report PNW-GTR-485. 156 pp.

Marten distribution is closely associated with late-successional coniferous forest. Voles are the most important food item across their range. They prefer mature, moist forests with high structural diversity in the understory (foraging habitat and winter thermal cover). They are vulnerable to predators (raptors and owls) and need cover for protection from predation.

The main part of their distribution comprises the boreal and taiga zones of Canada and Alaska. South of this area, the distribution becomes more dispersed, following mountain ranges southward. The southern limit of marten distribution coincides roughly with that of conifer tree species (Ruggerio, *et al*, 1994).

In the winters of 1994 and 1995, the Forest, in cooperation with the IDFG, released pine marten back into the Bear River Range to supplement the remaining resident populations that had been trapped to very low numbers from the 1940s through the 1960s. During the winters of 1995 and 1996 camera/bait stations recorded the presence of martens. These surveys stations were in Green Canyon, Franklin Basin, and Egan Basin. They recorded snowshoe hare, bobcat, deer mice, northern flying squirrels, magpies, golden eagles and tree squirrels, as well as pine marten.

Relatively small home ranges and tolerance of home range overlap suggests that marten may be capable of persisting in fragmented landscapes (Witmer, *et al*, 1998). However, they will not travel far from overhead cover, and thus direct links between habitats are essential.

Habitat Evaluation

ICB (Wisdom, *et al*, 2000) put pine martens in Family 2, which are species using broad-elevation old forest. They use late-seral multi- and single layered stages of the montane community. Important habitat components include snags for nesting and downed logs for foraging for prey species. Late-seral source habitats used by the marten may be negatively affected by increased fragmentation.

Conservation strategies for species in this group include: (1) disturbance processes that create/maintain these habitats considered when determined where habitats are to be maintained. In Upper Snake and Snake Headwaters ERU's it may be necessary to identify mid-seral forests in lower montane communities that could be brought to late-seral condition; (2) maintain all large diameter (21 inches dbh) snags and trees, preferably in clumps, and provide opportunities for snag recruitment; (3) maintenance of old forest attributes, like coarse woody debris; (4) increase connectivity; (5) minimize or avoid road construction in late-seral forests; and (5) evaluate wildfire and prescribed fire policies (Wisdom, *et al*, 2000).

Comparison of Alternatives

Table 111. Average Patch Size in Acres, by Habitat Type.

Watershed	Aspen (Acres)	Doug-fir (Acres)	Mixed conifer (Acres)	Lodgepole pine (Acres)
Preuss	35	26	20	20
Weston	18	43	na	na
Toponce	55	10	14	na
Rock/Pine	56	48	8	na
St. Charles	29	27	27	22
Horse	23	28	16	44

Even when lumping the vegetation into forested and non-forested vegetation, patch sizes were relatively small. Average patch sizes in forested vegetation were between 84 and 348 acres in these six drainages.

Based on this information, in combination with analysis of vegetation patterns as displayed on maps, it is apparent that the Forest has naturally small patch sizes and fragmentation as a result of timber harvest or burning is not expected to have measurable impacts on this species.

Table 112. Percent Mature and Old at the end of Ten Years, by Alternative.

Alt	Forest Types Treated	Aspen % Mature and Old	Low-elevation % Mature and Old	High-elevation % Mature and Old
1	All	57%	85%	79%
2	Mixed conifer, aspen/Douglas-fir, aspen	56%	85%	76%
3	Douglas-fir, lodgepole pine and mixed conifer	56%	83%	74%
4	Mixed conifer, aspen/Douglas-fir and aspen	56%	83%	77%
5	Mixed conifer, aspen/Douglas-fir and aspen	55%	85%	79%
6	Mixed conifer, aspen/Douglas-fir and aspen	56%	85%	80%
7	Mixed conifer, aspen/Douglas-fir and aspen	56%	85%	79%
7R	Mixed conifer, aspen/Douglas-fir and aspen	49%	82%	81%

The risk assessment focused on higher-elevation mixed conifer forests, since generally mesic forest is considered primary habitat.

Table 113. Risk Assessment for Pine Marten, by Alternative.

Risk Assessment	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Decrease on high-elevation Old forest	Low	Mod	Low	Low	Low	Low	Low	Low
Departure from PFC	Mod	Low	Low	Low	Mod	Mod	Low	Mod
Loss of snags, downed woody debris	Mod	Mod	Mod	Low	Low	Low	Low	Low
Fragmentation	Low	Low	Low	Low	Low	Low	Low	Low
Overall Ranking	**Mod**	**Mod**	**Low**	**Low**	**L-M**	**L-M**	**Low**	**L-M**

* Emphasis on high-elevation mixed conifer as primary habitat

Alternatives 3, 4 and 7 provide the lowest risk for boreal owls, based on short-term and long-term habitat provided, as well as that predicted availability of snag nesting trees. Alternatives 1, 2, 5, 6 and 7R have a moderate risk to pine marten and habitat. While the forested stands are further from PFC, the preponderance of mature and old stands will provide habitat. Populations would be expected by remain at current levels until such time as stand-replacing fires, insect or disease epidemics or other natural events replace mature/old stands with young stands.

Cumulative Effects

Most of the suitable habitat for this species is found at higher elevations, in forested lands, which are often federally managed lands. Increased emphasis on managing for forested species and forest carnivores should benefit this species over the long-term.

References cited in above section:

Ruggerio, L.F., K.B. Aubry, S.W. Buskirk, L.J. Lyon and W.J. Zielinski, technical editors. 1994. The Scientific Basis for Conserving Forest Carnivores: American Marten, Fisher, Lynx and Wolverine in the western United States. US Forest Service, General Technical Report, RM-254. Ft Collins, CO. Rocky Mountain Range and Experiment Station. 184 p.

Witmer, G.W., S.K. Martin and R.D. Sayler. 1998. Forest Carnivore Conservation in the Interior Columbia River Basin: Issues and Environmental Correlates. USDA Forest Service, Pacific Northwest Research Station, General Technical Report PNW-GTR-420. Portland, OR. 15 p.

Wisdom, M.J., *et al.* 2000. Source Habitats for Terrestrial Vertebrates of Focus in the Interior Columbia Basin: Broad-scale trends and management implications. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. General Technical Report PNW-GTR-485. 156 pp.

Landbirds

Idaho has 243 species of birds that breed in the state (IPIF, 2000). Breeding bird survey routes in Idaho have found 114 species on more than fourteen routes, from 1966 to 2000. Of these 114 species, 46 percent of species had positive population trends; 18 percent had significant negative trends (mostly wetland-associated species) and 9 percent had significantly positive trends (www.mbr-pwrc.usgs.gov).

The USFS has developed a Landbird Strategic Plan (USFS, 2000). The overall goal is to maintain long-term sustainability of habitat for landbirds. This Plan includes goals to incorporate landbirds at all levels of the organization; incorporate knowledge about landbirds into land management decisions; consistency with state Partners in Flight Conservation Plans; incorporation of landbirds into Forest Plans; and prioritization of habitat improvement efforts in priority habitats.
More recent developments in migratory bird conservation provide a framework for promoting bird conservation. These include:

1) Executive Order 13186 (January, 2001). Defines responsibilities for federal agencies to protect migratory birds.

2) Memorandum of Understanding (January, 2001). Between the USFS and USFWS, providing for enhanced cooperation on behalf of migratory birds and their habitats.

3) Expansion of *Taking Wing* (February, 2001). Deputy areas for State and Private Forestry, research and Development, and the Office of International Programs joined the National Forest System in advancing the Taking Wing program, and expanding it to include all water birds.

The needs of landbirds have been incorporated into the Forest Planning process in several areas:

1) Identification of species-at-risk used the Partners in Flight "Idaho Bird Conservation Plan" (2000) to identify species of concern for the physiographic areas present in the Planning Area. See the Viability section of this document for more information.

2) These species-at-risk were grouped into habitat associations based on primary breeding habitats used. Habitat conservation measures were developed for priority habitats (riparian, non-riverine wetlands and sagebrush) and these were incorporated into the Forest Plan.

3) Individual species of landbirds (threatened, endangered and sensitive species) have guidelines to manage habitats and mitigate effects of projects.

4) Cavity nesters are addressed through Forest Plan snag guidelines.

5) Priority habitats from the PIF "Bird Conservation Plan" were incorporated into the analysis and Plan

INCORPORATION INTO THE REVISED FOREST PLAN

Idaho PIF identified priority habitats for migratory landbirds. These include riparian habitat, non-riverine wetlands, sagebrush habitats and dry Ponderosa pine/Douglas-fir/Grand fir (which are not found on the Caribou NF). Habitat management goals, and desired future conditions have been included in the Forest Plan.

Riparian habitat

Riparian goals, objectives, standards and guidelines have been incorporated into the Plan in both Forest-wide direction and direction specific to 2.8.3 (Aquatic Influence Zone). This includes direction for shrub riparian vegetation. Direction from PIF and how it has been incorporated is shown in the Conservation Measures section of this paper.

Non-riverine wetland

Elk Valley, which is the major non-riverine wetland found on the Forest, has been given a Wild and Scenic River designation. The alternatives vary as to whether livestock grazing is allowed in this area. Alternatives 1, 2, 3, and 4 allow grazing, while no grazing is allowed in Alternatives 5 and 6. In alternative 7 and 7R, the Grazing Protocol will allow grazing if vegetative and soil conditions allow it. Direction from PIF and how it has been incorporated is shown in the Conservation Measures section of this paper.

Sagebrush habitats

Direction for management of sagebrush habitats if found in the Properly Functioning Condition section, Vegetation section and Wildlife section. This was developed from PIF and Paige and Ritter (1999). This direction how it has been incorporated is shown in the Conservation Measures section of this paper.

Overall

The Revised Forest Plan includes an objective to establish population and habitat trend plots in riparian, non-riverine, and sagebrush habitats.

Effects Analysis

Activities associated with the alternatives have the potential for unintentional take of nests or nestlings. Spring prescribed burning, off-route vehicle use, mining, timber harvest, concentrated recreational use and livestock grazing all can affect birds during the nesting season.

Forested vegetation treatments may affect understory and overstory nesting species. Prescribed burning may affect ground and shrub nesting species. Livestock grazing may affect ground, shrub and riparian

nesting species. Off-route vehicle use may impact ground-associated species. Mining and concentrated recreational use does not vary by alternative and is not displayed below.

Table 114. Risk Factors for Nesting Landbirds, by Alternative.

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
Forested acres treated	16,800	34,100	41,800	57,000	25,700	25,700	34,100	49,000
% of forested acres treated	3%	6%	7%	10%	4%	4%	6%	8%
Non-forested vegetation treated	130,000	77,500	100,000	77,500	70,800	60,000	79,750	40,000
% of non-forested vegetation treated	28%	16%	21%	16%	15%	13%	17%	8%
Potential Cattle AUM decrease*	7%	7%	6%	24-31%	30-38%	65-66%	19-26%	17-24%
% Forest open to cross-country motorized travel*	33%	38%	38%	0%	3%	0%	2%	2%
Overall risk	**Mod**	**Mod**	**Mod**	**Low**	**Low**	**Low**	**Low**	**Low**

* Assumption that less cattle and less cross-country travel means less trampling of nests.

Alternatives 1, 2, and 3 have a moderate risk to breeding landbirds, due to higher percent of non-forested acres treated, more cattle compared to the other alternatives, and more of the forest is open to cross-country travel. Alternatives 4 and 7R have a low risk.

The Caribou NF will contribute towards the conservation of landbirds in southeastern Idaho. Many of the sagebrush-associated birds were historically found at lower elevations where sagebrush was more extensive and not broken into smaller patches. Planned management of sagebrush habitats on the Forest will maintain habitats in a suitable condition for these species, although it is generally in smaller patches than habitats that they used historically.

Most of the non-riverine wetland habitats are found at lower-elevations off-forest and the Forest contributes little habitat for associated species. Riparian habitats are found across the Forest and the Caribou will contribute to improving riparian habitats of various types and at a range of elevations, providing habitat for associated wildlife species.

References cited in above section:

IPIF. 2000. Idaho Bird Conservation Plan. S. Ritter, PIF Coordinator, Hamilton, MT.

Paige, C. and S.A. Ritter. 1999. Birds in a Sagebrush Sea: Managing Sagebrush Habitats for Bird Communities. Partners in Flight Western Working Group, Boise, ID.

USFS. 2000. Landbird Strategic Plan. Prepared in cooperation with Partners in Flight. FS-648. Washington D.C.

Overall Viability Assessment

Based on the risk assessments presented in this section, we have determined that Alternative 7R will maintain habitat able to support viable populations of existing native and desired non-native vertebrate species in the planning area. We have determined that the Plan is sufficient to provide well distributed habitat for reproductive individuals.

Big Game

Selection Of Areas To Be Analyzed

The Caribou NF includes parts of nine different State Game Management Units. These are shown on the following table and on Map 15.

Table 115. State Game Management Units on the Caribou NF.

GMU No.	GMU Location
66	Bear Creek
66a	Caribou
70	Bannock Range
71	Portneuf Range
73	Malad
75	Bear River Range North
76	Diamond Creek
77	Bear River Range Southwest
78	Bear River Range Southeast

Several meetings were held with IDFG Biologists to identify areas of concern on the Caribou. Most of the Forest is providing habitat to help meet big game population objectives. There were four areas identified where special concerns for big game exist. These four areas identified and specific concerns for each of these areas are discussed below.

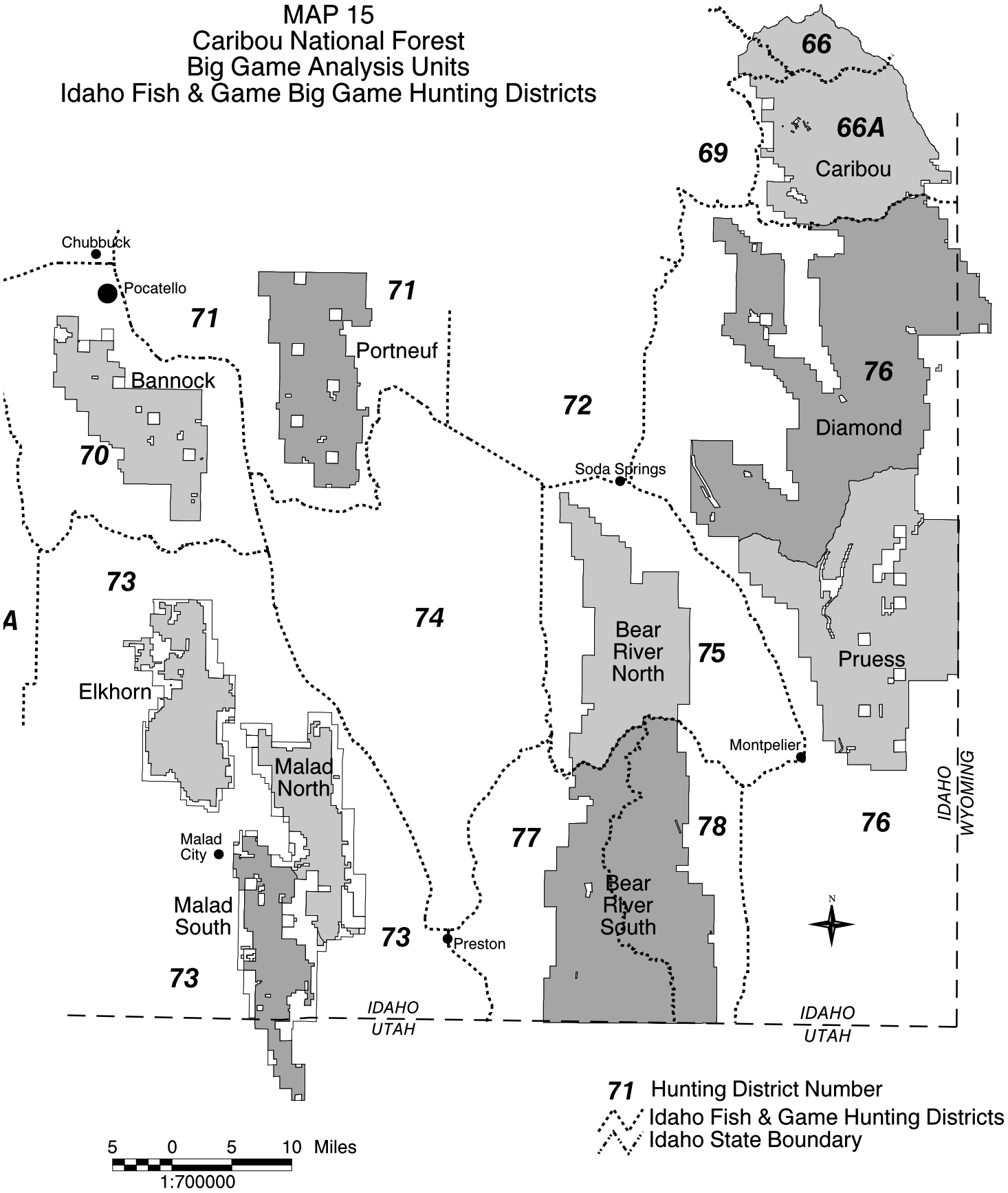
ELK

Smoky Canyon/Diamond Creek north. This area is part of Zones 66a and 76 and is managed for trophy bull elk hunting. To maintain this opportunity, summer and fall habitat concerns need to be addressed.

Table 116. Elk Population Objectives and Current Status for the Diamond Creek Zone.

Zone	Units	Adult Bull: 100 cows objective	Current Adult Bull: 100 cows	Total Bull: 100 cows objective	Current Total Bull: 100 cows	Population Objectives	Current Population
Diamond Creek	66a, 76	18-24	19 (2002 estimate)	30-35	35 (2002 estimate)	2,100	3,690 (2002 estimate)

MAP 15
Caribou National Forest
Big Game Analysis Units
Idaho Fish & Game Big Game Hunting Districts



MULE DEER

The southwestern part of the Malad Range is in Unit 73. It provides important mule deer winter range, especially on the western side. Population numbers have remained at or below State Plan objectives over several years. To improve habitat in this area we need to look at winter, summer and fall seasons.

Table 117. Mule Deer Objectives and Current Status for Unit 73 (Malad).

Trend Areas	Minimum *	1995	1996	1997	1998	1999	2000	2001	2002
Elkhorn	1,200	761	908	929	787	958	980	1387	794
Malad Face	1,200	760	962	701	947	942	885	1622	761

* Minimum antlerless threshold before antlerless harvest is permitted.

The southern end of the Bear River Range lies in Units 77 and 78. The winter range on the east side of the range is especially important due to the increasing development of lands below the Forest boundary. Population numbers have remained below state Plan objectives over several years. To improve habitat in this area we need to look at winter, summer and fall seasons. IDFG manages harvest in the area by restricting harvest by non-residents (tags sell out in four hours) and residents (bucks only).

Table 118. Mule Deer Objectives and Current Status for Southern End Bear River Range (Units 77 and 78).

Trend Areas	Minimum*	1995	1996	1997	1998	1999	2000	2001	2002
W. Bear Lake (78)	3,000	1,884	3,441	2,760	2,548	1,790	1,707	3150	1,405
Bear L. Plateau (76)**	3,000	nd	nd	nd	nd	3,427	3,467	5,106	2,378
Soda Hills (72)**	4,000	nd	nd	nd	3,428	1,826	2,378	4,576	2,877

* Minimum antlerless threshold before antlerless harvest is permitted. Nd = no data.
** part of the deer on these winter range trend areas summer on South end Bear River range.

The Portneuf Range also has mule deer numbers below the Plan objectives. The winter range area on the west/southwest end of the range is especially important as it borders a state-owned parcel managed for winter range. Improving summer, fall and winter habitats would help address concerns.

Table 119. Mule Deer Objectives and Current Status for Portneuf Range (Unit 71).

Trend Area	Minimum*	1995	1996	1997	1998	1999	2000	2001	2002
Portneuf	1,700	nd	1,003	978	978	1,097	1,113	920	899

* Minimum antlerless threshold before antlerless harvest is permitted.

Measures Or Considerations For Seasonal Habitats

Summer habitat effectiveness is defined as the percent of available habitat that is usable by elk from late green-up to hunting season (Christensen, *et al*, 1993). Factors that influence summer habitat effectiveness include roads; special features such as wet sites, riparian areas, and movement corridors; cover; domestic livestock grazing; and land ownership patterns. Roads have been identified as the most significant consideration on elk summer range.

During hunting season, vulnerability results from a complex relationship between access, cover, topography, hunter density, type of season and weather. The measure of this is the level of compatibility between Forest Service and State management plans, such as number of bulls per hundred cows (Christensen, *et al*, 1993).

The main considerations for winter range are forage quantity and quality; thermal cover; roads and other disturbances; and livestock management (Christensen, *et al*, 1993).

SUMMER HABITAT EFFECTIVENESS

Christensen, *et al*, (1993) identified open road densities for elk habitat. For areas intended to benefit summer habitat range and retain high use, habitat effectiveness should be greater than seventy percent (70 percent) or more. This roughly equates to an open route density of 0.7 miles per square mile (mi/mi^2). For areas where big game is a primary resource consideration, habitat effectiveness should be fifty percent (50 percent) or greater. This roughly equates to an open route density of 1.9 mi/mi^2. For purposes of analysis, OMRDs were rounded to 1.0 mi./mi^2 and 2.0 mi/mi^2 in the development of the alternatives and prescription area direction.

All four areas being analyzed for big game were assigned a goal of a maximum open motorized route density of 1.0 mi/mi^2.

Table 120. Existing Summer OMRDs and Status in Relationship to Goal.

Summer HE	Existing OMRD*	OMRD goal	Status
Malad South	1.1 mi/mi^2	1.0 mi/mi^2	Doesn't meet
Portneuf Range	0.9 mi/mi^2	1.0 mi/mi^2	Meets
South end Bear River	1.4 mi/mi^2	1.0 mi/mi^2	Doesn't meet
Diamond Creek	1.4 mi/mi^2	1.0 mi/mi^2	Doesn't meet

* = Open motorized route density.

VULNERABILITY DURING HUNTING SEASON

Vulnerability results from a complex relationship between access, cover, topography, hunter density, and weather. The measure of success for elk vulnerability is often the number of bulls per hundred cows surviving the hunting season.

Access and use of roads appear to be the most significant factors in vulnerability analysis (Christensen, *et al*, 1993). In areas where heavy cover is not available, reduced open road densities contribute to reducing both deer and elk vulnerability. In areas with more open cover and gentler terrain, roads speed up the harvest of available bulls and make bulls more vulnerable throughout the season. Increased emphasis

should be placed on security where poor cover conditions exist. Additionally, decreases in OMRD might occur where population objectives are not being met.

Security is the result of a combination of factors that allow elk to remain in a specific area while under stress from hunting. Specifically, security areas are defined as areas of cover (vegetative or topographic) large enough and far enough away from open roads to provide security. In one southwestern Montana analysis (Hillis, *et al*, 1991), security was defined as non-linear blocks, over .5 miles from an open route and at least 250 acres in size. They also determined that there should be at least a minimum of thirty percent (30 percent) security in a herd's summer/fall range. These same criteria were used to map security areas for the Caribou NF through use of Geographic Information Systems (GIS).

The map was produced and checked for accuracy. Several polygons were at the minimum size, but were dominated by sagebrush cover and dropped. Several polygons were adjacent to the Forest Boundary, and roads on adjacent lands had not been incorporated. These polygons were revised to be more accurate.

Table 121. Existing Security Area and Relationship to Goal.

Hunting Season Vulnerability	Percent Security in Area	Status
Malad Range south	19%	Does not meet
Portneuf Range	40%	Meets
South end Bear River	19%	Does not meet
Diamond Creek	16%	Does not meet

Mapping Of Big Game Winter Ranges

Winter ranges were originally mapped for the 1985 Caribou Forest Plan. According to Compton (IDFG Biologist, pers. comm. 2/2/01), the 1985 winter range map was based on actual counts in established survey blocks. However, not all winter range was in survey blocks, and in 1994, survey protocols were changed and surveys focused on areas where the animals were wintering.

In 1999, winter range was remapped by Scott Feltis (FS) and Brad Compton (IDFG). Winter range areas were drawn larger, based on a combination of: 1) new data since the survey protocol had changed; 2) incorporation of "overflight" information; 3) a need for a better way to address access concerns on winter range; and 4) some lines reflected upper limits of "search units" rather than actual winter range. This is shown on Winter Range Maps 1 and 2 in the project file.

The 1985 winter range was incorporated into Alternatives 2 and 3 (Alternative 2 had already gone out as the Proposed Action and Alternative 3 is the "commodity" alternative, which does not have as much emphasis on winter range). The 1999 winter range was used for Alternatives 4-7 Prescription maps. Upon further review, there were concerns raised that some of the lines may not actually reflect winter range use and the decision was made (3/31/01) to reconsider the winter range lines, especially specific areas shown on Winter Range Map 3 in the project file.

On 2/2/02, Betsy Hamann (FS Biologist) met with Brad Compton to reconsider the lines. He thought the Bannock Range was appropriate as drawn. He indicated that the elevations were high on Portneuf, because of mule deer bucks seen on the side of Haystack Mountain in 1999. But we did come to agreement to move the line down to roughly the 8,000-foot contour line. He also brought up the point that we might want to look at State Population objectives, not just the current population. This is one area

where current mule deer numbers are well below population objectives. He pointed out that in the 1960s during a period of high mule deer populations, deer were using the whole western slope of the Portneuf range as winter range.

Other points that he brought up are: 1) before 1992, there were a lot of deer using the north end of the Oxford Unit; 2) winter range on the east-side of the Bear River range looked good for elk, but for mule deer it would be lower, and follow up some of the canyons where there are mountain mahogany-dominated south slopes; 3) generally, elk are at or above numbers with the existing open road densities; 4) in the Malad area, hunting seasons have changed from five weeks either sex season to three days of any buck and three weeks of two-point buck for the rest of the season. He expressed concern that population numbers and buck;doe ratios are not being met.

On 2/5/01, Betsy Hamann met with Gary Vecellio (IDFG) to review the map. Carl Anderson participated in part of the meeting. Notes and decisions made from both of these meetings are shown on Winter Range Map 4 in the project file.

On 2/12/01, the IDT met to finalize the winter range map with changes made from the above meetings. The Districts had had a few days to review and comment, and comments were received from Soda Springs and Montpelier. Soda Springs had four areas of concern, as shown on Winter Range Map 5 in the project file. Montpelier had one area of concern, the area west of Bear Lake over 8,000 feet. Decisions were made on the five areas in question, as shown on Winter Range Map 6 in the project file.

Later that day, Jerry Tower came in with a map with Westside Ranger District concerns (Winter Range Map 7 in the Project File). Ken Timothy, who has worked in the area for over twenty years had sat down and redrawn lines based on his knowledge of winter range. However, as Gary Vecellio (IDFG) had already left, these changes were not made. The decision was made to leave Westside Ranger District as it is, and if changes need to be made, it would be done between the draft and final EIS/PLAN.

Additional meetings were held in the summer of 2002 to address additional areas of concern to members of the public. The meetings involved snowmobilers, county representatives, IDFG, and other interested people. The final winter range prescription areas in Alternative 7R were modified based on concerns identified at these meetings. This is shown in Map 16: Big Game Winter Range on the Caribou.

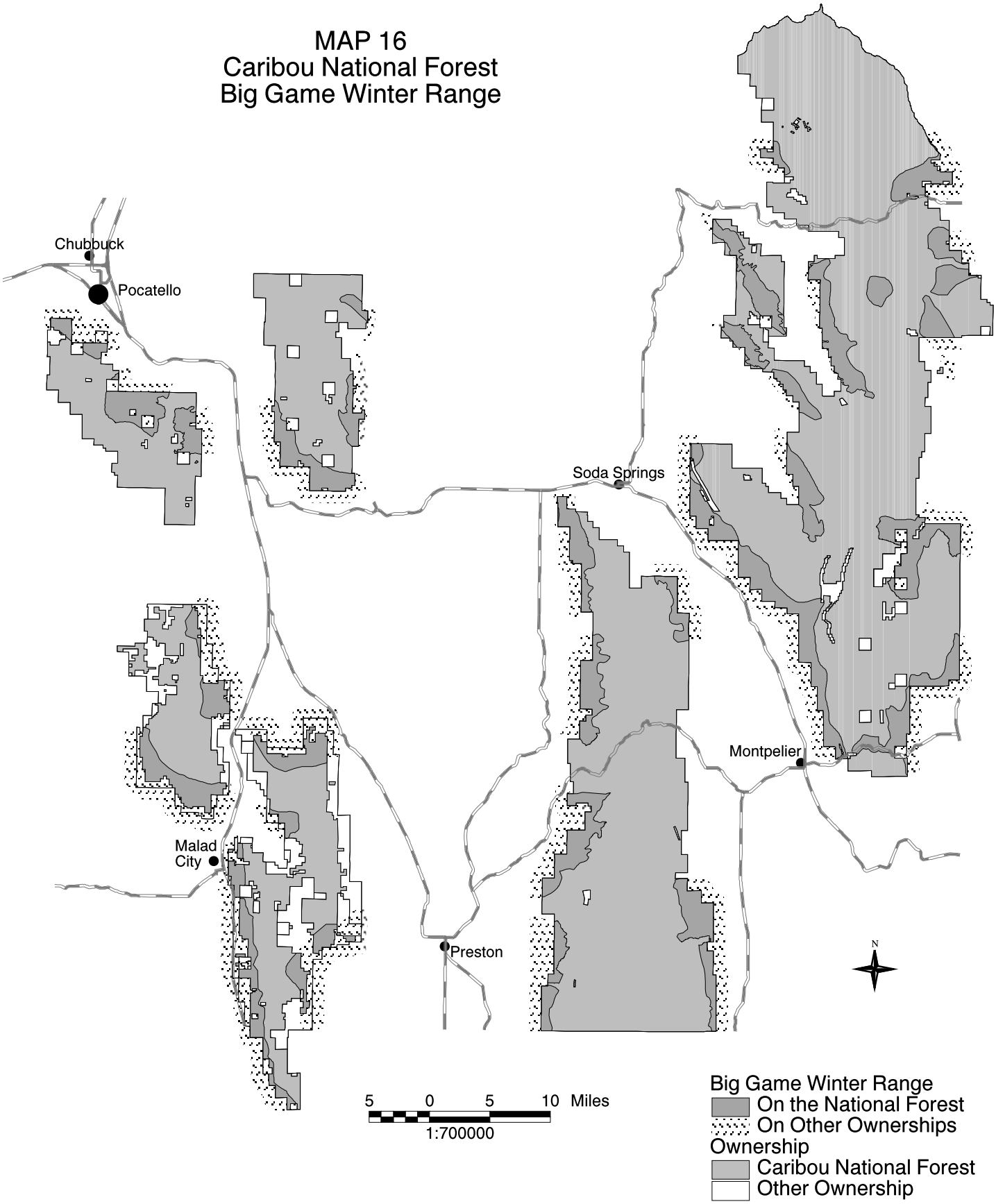
Big Game Movements

The following information does not address elk and mule deer over the whole Forest, but does discuss specific areas where elk and mule deer have been studied.

ELK

Thomas (2000) radio-collared elk on the Tex Creek winter range, to the north of the Caribou NF. Almost half the elk marked in his study summered in the area between Bald Mountain and Tincup Mountain (Unit 66a). He found that they move onto the Caribou NF through Fall Creek Basin. Fall migration dates varied, depending on weather conditions, but the mean date for movement off of summer range was December 14. Spring migration began in early April, with arrival on summer range in early May. The elk demonstrated high fidelity to summer home ranges between years.

MAP 16
Caribou National Forest
Big Game Winter Range



Brown (1980) also studied elk from the Tex Creek winter range. He found that 69 percent of his study elk summered in Unit 66a. They were on summer range by May 15, with the migration starting in late March to early May. They generally returned to winter range in mid-December to January. Again, Fall Creek Basin to the north was identified as a migration corridor. Generalized movements from Fall Creek then moved to Bear Creek, to South Fork Bear Creek, to Clear Creek and into the Caribou Basin. High fidelity to summer range was also found for elk with more than one years data. He did identify three areas that appear to be used as calf-rearing areas: south aspects of Tincup Mountain, Jacknife Creek in the vicinity of Trail Creek and adjacent south aspects; and the upper slopes of Black Mountain on both the east and west sides. He did notice minor shifts of three to seven miles for six elk during September/October period. These movements were into more inaccessible areas or areas of greater cover.

MULE DEER

Thomas (1987) studied movements of the mule deer wintering on the Willow Creek winter range (to the north of the analysis area). The summer range for part of these animals (66 percent) went south to Stump Creek and Blackfoot River and to the Salt River Mountains on the southeast (Units 66a and 76). The mule deer also showed a strong fidelity to summer home ranges, and the mean arrival date on summer home ranges was May 29.

He noted that mule deer in his study increased use of north and northwest aspects during hunting season and used higher elevations. Fall migration of mule deer began in mid-November and did not appear to be related to snow conditions.

Elk did not appear to affect deer distributions during his study. Avoidance of elk by individual deer was not observed; deer were observed feeding adjacent to, and mixed with, groups of elk on a number of occasions. He noted that livestock grazing was the only land use with high potential for altering the quality of summer ranges on the study area. Heavy grazing pressure in late summer and early fall has the potential to have greatest impact; livestock concentrate in high quality mesic patches of habitat, and opportunities for deer to shift habitat use appear extremely limited.

Migration corridors were associated with prominent geographical features, and were pronounced only where terrain channelized deer movements. These areas tended to become less distinct as distance from winter range increased (Thomas and Irby, 1990).

References cited in above section:

Brown, C. 1980. Spring-Fall Movements and Distribution of Tex Creek Elk in Southeast Idaho. IDFG. Idaho Falls, ID.

Thomas, T. 1987. Yearlong Movements and Habitat Use of Mule Deer Associated with the Willow Creek Winter Range in Southeastern Idaho. Masters Thesis, Montana State University, Bozeman, MT.

Thomas, T. 2000. Elk Radio Telemetry Study, Tex Creek Wildlife Management Unit, Final Report, January 1998 to December 2000. IDFG, Idaho Falls, ID.

Thomas, T.R. and L. R. Irby. Habitat Use and Movement Patterns by Migrating Mule Deer in Southeastern Idaho. Northwest Science, Vol. 64, No. 1, pgs. 19-27.

Big Game And Motorized Use

SUMMER

There is a large volume of research documenting the impacts of motorized access on elk habitat selection (such as Lyon 1983, Irwin and Peek 1979, Rost and Bailey 1979, Lyon 1979, Rowland, *et al*, 2000). Habitat management guidelines (Leege 1984, Lyon, *et al*, 1985) recognize roads as influencing elk use of summer habitat and provide guidelines for the management of roads.

Thomas (2000) radio-collared elk on the Tex Creek winter range, to the north of the Caribou NF. Almost half of the elk marked in his study summer in the area between Bald Mountain and Tincup Mountain (Unit 66a). He did an analysis of roads and trails and concluded that "by far, the greatest concentration of elk is in the area least accessible to motorized vehicles." He applied a one-half mile buffer along each motorized road and trail, and compared against elk locations and these patterns became even more evident. The analysis, as it applies to the Caribou, is shown on Map 17.

Rowland, *et al*, (2000) looked at elk distribution in relation to roads in northeast Oregon. They looked at three things; that elk habitat selection of habitats increases with increasing distance from roads; habitat effectiveness in relationship to open road densities; and last they considered different spatial patterns of roads and effects on habitat effectiveness. They concluded that roads and related human activities during spring and summer were important considerations for elk; and that a spatial component for roads needs to be incorporated into elk habitat models.

HUNTING SEASON

Generally, elk populations are stable or increasing in Idaho. The main factor to consider is the sex ratio and age class structures. Results from studies on the Starkey Experimental Forest in Oregon have shown that a lack of mature bulls in a herd can disrupt breeding seasons, delay conception dates and decrease calf survival. Younger bulls tend to breed later and over a longer period in fall. As a result, calves are born late in the spring and have less time to feed on high quality forage, and go into winter in poorer condition (Stalling, 1994).

Hillis, *et al*, (1991) analyzed elk security and vulnerability during the hunting season. Elk and bull vulnerability may be reduced and hunter opportunity may be increased, by providing security areas for elk during the hunting season. They recommended that to provide a reasonable level of bull survival, each security area should be a non-linear block of hiding cover greater than 250 acres in size and more than one-half mile from any open road. Collectively, these security areas should be at least 30 percent of the analysis unit. Vegetation density, topography, road access, hunter use patterns and elk movements are variables that must be considered when assessing security.

Gratson and Whitman (2000) looked at road densities as they influenced hunter access and hunter success, in north central Idaho. They acknowledge some problems associated with their study (lack of evaluation of terrain and habitat features in study areas) and caution about application of specific data from their study into other areas. However, they did conclude that road closures may significantly reduce densities of hunters, and increase success rates of hunters. They attributed this to greater bull densities in closed areas, lesser hunter:bull ratios, changes in elk behavior, environmental factors associated with road closures and the restricted areas attracting a different kind of hunter.

References cited in above section:

Gratson, M.W. and C.L. Whitman. 2000. Road Closures and Density and Success of Elk Hunters in Idaho. Wildlife Society Bulletin. 28(2): 302-310.

Hillis, J.M., M.J. Thompson, J.E. Canfield, L.J. Lyon, C.L. Marcum, P.M. Dolan and D.W. McCleerey. 1991. Defining Elk Security: the Hillis Paradigm. Elk Vulnerability Symposium, Montana State University, Bozeman, MT. April 10-12. p. 38-43.

Irwin, L.L. and J.M. Peek. 1979. Relationship Between Road Closures and Elk Behavior in Northern Idaho. In "North American Elk: Ecology, Behavior, and Management". Eds. M.S. Boyce and L.D. Hayden-wing. Laramie University, WY. P. 199-204.

Leege, T.A. 1984. Guidelines for Evaluating and Managing Summer Elk Habitat in northern Idaho. Idaho Department of Fish and Game, Wildlife Bulletin No. 11.

Lyon, L.J. 1983. Road Density Models Describing Habitat Effectiveness for Elk. Journal of Forestry, September 1983. p. 592-595.

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Lyon, L.J., T.N. Lonner, J.P. Weigand, C.L. Marcum, W.D. Edge, J.D. Jones, D.W. McCleerey and L.L. Hicks. 1985. Coordinating Elk and Timber Management; Final Report of the Montana Cooperative Elk-Logging Study 1970-1985.

Rost, G.R. and J.A. Bailey. 1979. Distribution of Mule Deer and Elk in Relation to Roads. Journal of Wildlife Management. 43(3): 634- 641.

Rowland, M.M., M.J. Wisdom, B.K. Johnson and J.G. Kie. 2000. Elk Distribution and Modeling in Relation to Roads. Journal of Wildlife Management 64(3); 672-684.

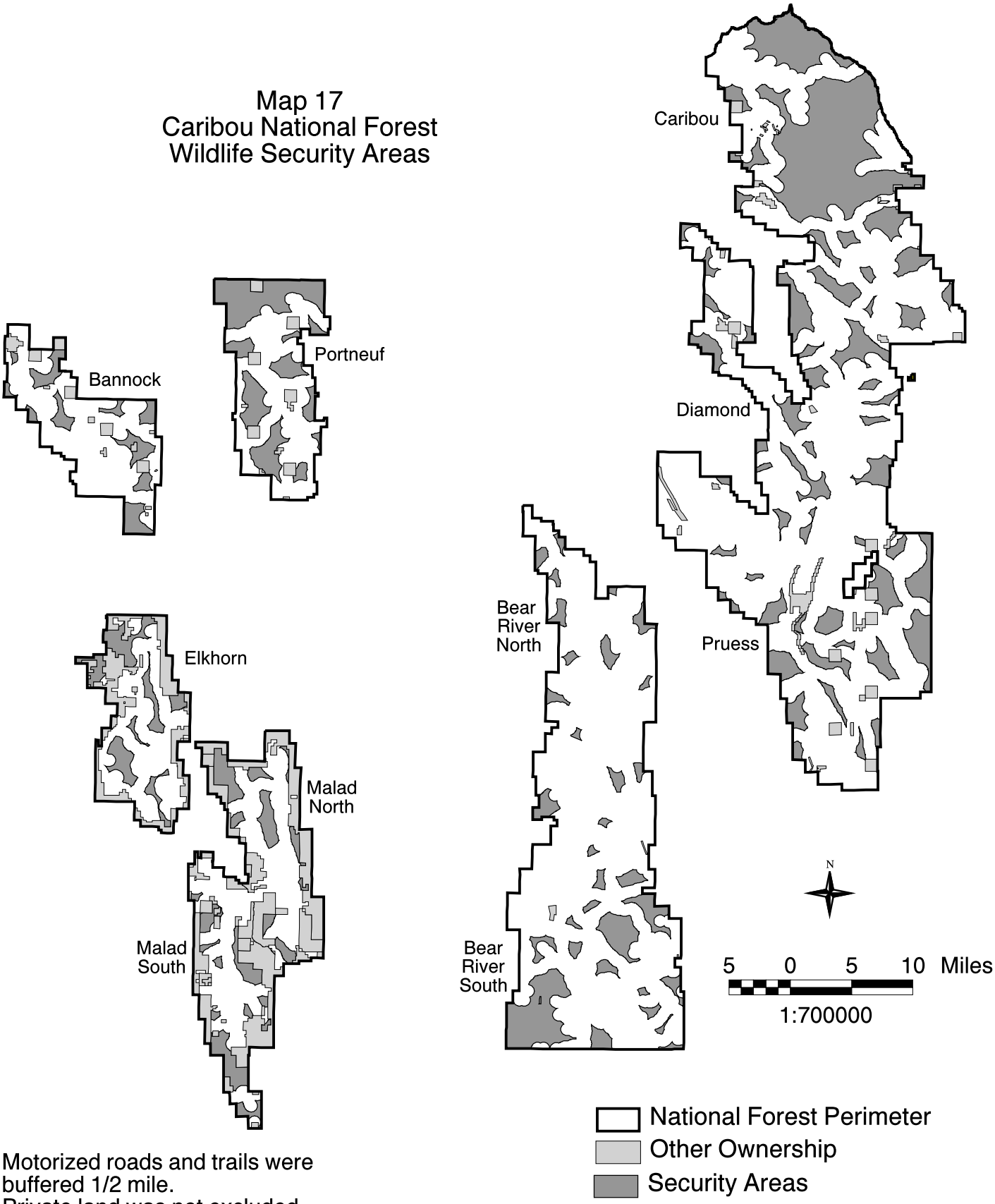
Stalling, D. 1994. Roads Closed: Making Bulls less Vulnerable. Bugle, Fall issue.

Thomas, T. 2000. Elk Radio Telemetry Study, Tex Creek Wildlife Management Unit, Final Report, January 1998 to December 2000. IDFG, Idaho Falls, ID.

Overview Of Hunting In The Four Areas Analyzed

While hunting seasons are outside of the scope of the Decision to be made for the Plan, an overview of the changes in hunting seasons in the areas analyzed will be included here. Hunting has an affect on big game populations, and it was brought up in numerous public comments on the Final Plan and EIS. The information was taken from Compton, *et al*, (1999).

Map 17
Caribou National Forest
Wildlife Security Areas



Motorized roads and trails were buffered 1/2 mile.
Private land was not excluded, nor were roads/trails on private land.

MULE DEER

Bannock (Unit 70) and Malad South (Unit 73)

Harvest management during the 1950s and 1960s was designed to maintain or reduce deer numbers in response to what was considered over-browsed winter ranges. Season frameworks in these units have varied considerably more than elsewhere in southeastern Idaho. General seasons have been the rule, with season lengths varying from three days to five weeks. Additionally, either sex opportunity has ranged from none to extra antlerless-only tags available in 1989 and 1990 for Unit 70 and 73. Following the winter of 1992/93, when significant winter mortality occurred, harvest management has been conservative. Despite conservative hunting seasons and low harvest since 1993, wintering populations in both Units 70 and 73 have either remained stable at low levels or declined.

Portneuf (Unit 71)

Harvest management during the 1950s and 1960s was designed to maintain or reduce deer numbers in response to what was considered over-browsed winter ranges. Long general either-sex seasons (three to five weeks) predominated. Following the decline in the early 1970's, harvest management became more conservative with two to four weeks of general season with varying amounts of either-sex opportunity offered. By the late 1980s, the deer populations had increased to the point that a population reduction was desired. The years 1989 and 1990 were marked by four-week general either-sex seasons with extra deer tags available. Following the winter of 1992/93, when significant winter mortality occurred, harvest management has been conservative.

ELK

Diamond Creek (Unit 76)

The elk population in this zone has increased dramatically from early historical records. Unregulated harvest in the late 1800s and early 1900s reduced populations to relatively low levels. By 1952 elk were believed to be numerous enough to warrant the first hunting season with 250 permits for either-sex elk in Units 66, 66a, and 69. An aerial survey of Unit 76 during 1952 counted 193 elk, with a total population estimate of 230. The first hunt in Unit 76 began in 1964 with 75 either-sex permits. As elk populations grew, so did hunting opportunity. Although most harvest has been through controlled permits, several general hunting seasons have occurred since regulated harvest began.

References cited in above section:

Compton, B.B. (ed). 1999. White-tailed Deer, Mule Deer, and Elk Management Plan. Idaho Department of Fish and Game. Boise, ID.

Hunter Access To Federal Public Lands

A recent report "Hunter Access to Federal Public Lands" (2002) outlines eight critical issues related to the issue of access. The questions that are associated with these issues are:

1) How are access issues incorporated into the agency land-use planning process?
2) How do wildlife and habitat management decisions affect hunter access and hunter satisfaction?
3) Do checkerboard ownership patterns and inadequate signage affect hunter access to public lands?
4) Do agencies provide hunters with enough information regarding access and do they provide it through effective channels?

5) What are the trends, impacts of and solutions to access problems caused by public lands that are "land-locked" by private property

6) Is there a need for an inventory of road ownership so hunters can be certain what roads can be legally used for access to public lands?

7) What are the trends for hunter use of public land, and the relationship between access to private lands and access to public lands?

8) Is there a need for a centralized clearinghouse that can be used to assess both the quantitative and qualitative impacts of these actions on hunter access?

The first two issues/questions will be addressed here, as they relate to this Forest Planning process. The 1985 Caribou Forest Plan included direction that restricted any increase in roads, and was silent on the issue of motorized trails. Current travel management allows cross-country motorized use on about 40 percent of the Forest.

Through the scoping process for the Plan Revision, recreation and access management was identified as an issue. Comments included a full range of feelings, on summer and winter access and on motorized and non-motorized use. Access issues have been incorporated into the Forest Plan in several ways. Maximum open motorized route densities were prescribed for most prescription areas, in each alternative. The Plan also includes direction on areas that are open to motorized use, either on designated roads or trails, or cross-country in both the summer and winter periods.

Table 122. Percent of the Forest Closed to Motorized Use.

Existing Condition	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 7R
4%	4%	4%	<1%	10%	10%	34%	8%	10%

As shown in the table, only a small part of the Forest provides for a more non-motorized type of hunting experience. Alternative 7R would increase this to 10 percent of the Forest. The other 90 percent of the Forest would still be open to motorized use (mostly on designated roads and trails.

The second question asks how wildlife and habitat management decisions affect hunter access and satisfaction. As mentioned previously, under current travel management, there are no restrictions on about 40 percent of the Forest. The other 60 percent has some kind of area, road or trail restrictions. There is a range of restrictions, ranging from year-round to winter versus summer. None are just confined to hunting season (except the Curlew National Grassland, which was not analyzed in this process).

In this planning process, open motorized route densities were applied to prescription areas as shown above. Actual numbers (1.0 mi/mi^2 and 2.0 mi/mi^2 in Alts 1-7) were based on research done on elk and mule deer but were assumed to be applicable and beneficial to other wildlife species, as well. (See the Roads and Motorized Trails section of this paper for more information.) Part of the Malad Range had a hunting season OMRD that was lower than the existing condition and this was applied because of concerns over mule deer in this area. OMRD's in Alternative 7R were largely based on existing condition, with a few areas needing reductions based on concerns for mule deer populations and elk hunting opportunities. The biological, social and economic impacts of these changes are displayed in the EIS.

Table 123. Access Direction by Prescription Area for Alternatives 1-7 (from Draft Revised Forest Plan, 2001).

Prescription	Summer motorized or non-motorized	Summer open or closed to cross-country	Winter motorized or non-motorized	Winter open or closed to cross-country
1.3	N	C	M	O
2.1.1	N	C	M	O
2.1.2	M	C	M	O
2.1.3	M	C	M	O
2.2	N	C	N	C
2.5	M	C	M	O
2.7.1(a)	M	C	N	C
2.7.1(b)	M	C	M	C
2.7.1(e)	M	C	M	C
2.7.2(a)	M	C	N	C
2.7.2(b)	M	C	M	C
2.8.3	M	C	M	O
3.1(b)	N	C	M	O
3.2(a)	M	C	N	C
3.2(b)	M	C	M	O
3.2(c)	M	O	M	O
3.2(d)	M	C	M	O
3.3(b)	M	C	M	O
4.1	M	C	M	O
4.2	M	C	M	O
4.3	M	C	M	O
5.1(b)	M	C	M	O
5.1(c)	M	O	M	O
5.1(d)	M	C	M	O
5.3(b)	M	C	M	O
5.4	M	C	M	O
6.1(b)	M	C	M	O
6.1(d)	M	C	M	O
6.3(b)	M	C	M	O
6.3(c)	M	O	M	O
6.3(e)	M	C	M	O
6.3(f)	N	C	M	O
8.1	M	C	M	O
8.2.2*	M	O	M	O

* Technically access does not apply here, but from a wildlife standpoint, mine activity is the same the disturbance from public access, so I considered them motorized and open to cross-country.

Table 124. Access direction by Prescription Area for Alternative 7R (from Draft Final Revised Forest Plan, 6/25/02).

Prescription	Summer motorized or non-motorized	Summer open or closed to cross-country	Winter motorized or non-motorized	Winter open or closed to cross-country
1.3(e)	N	C	M	O
2.1.1(e)	N	C	M	O
2.1.2(b)	M	C	M	O
2.1.3	M	C	M	O
2.1.4(b)	M	C	M	O
2.1.5(b)	M	C	M	O
2.1.6(b)	M	C	M	O
2.2(a)	N	C	N	C
2.5(b)	M	C	M	O
2.7.1(d)	M	C	M	C
2.7.1(f)	M	C	N	C
2.7.2(d)	M	C	M	C
2.7.2(f)	M	C	N	C
2.8.3*	M	C	M	O
3.1(a)	N	C	N	C
3.1(e)	N	C	M	O
3.2(b)	M	C	M	O
3.2(c)	M	O	M	O
3.2(f)	M	C	N	C
3.3(b)	M	C	M	O
4.1(b)	M	C	M	O
4.2(b)	M	C	M	O
4.3(b)	M	C	M	O
5.2(b)	M	C	M	O
5.2(c)	M	O	M	O
6.2(b)	M	C	M	O
6.2(e)	N	C	M	O
6.2(f)	M	C	N	C
8.1	M	C	M	O
8.2.2**	M	O	M	O

* Access table is missing from Plan, assume same at Alts 1-7

** Technically access does not apply here, but from a wildlife standpoint, mine activity is the same the disturbance from public access, so I considered them motorized and open to cross-country.

References cited in this section:

CSF and WMI. 2002. Hunter Access to Federal Public Land. A Report from the Congressional Sportsmen's Foundation and the Wildlife Management Institute. On file at SO, Idaho Falls, ID.

Potential For Competition Between Elk And Mule Deer

Lindzey, *et al*, (1997) reviewed research and analyzed the potentia l for competition between elk and mule deer. They found few studies claiming competition between elk and mule deer. The focus of more recent publications has been on exploitation competition, primarily for food. These species are generally spatially separated and separated by diet; however winter has the greatest dietary and habitat overlap.

The State's Big Game Plan (Compton, 1999) has identified that increasing numbers of elk in the Bannock Range (Unit 70), Malad (Unit 73) and Portneuf Range (Unit 71) may be of concern. Some of the winter ranges do not lend themselves to niche separation by elk and mule deer, and either direct competition and/or social intolerance will likely impact deer numbers. The state has stated that they will aggressively seek opportunities to minimize the occupancy by elk in key mule deer winter ranges.

References cited in above section:

Compton, B.B. (ed). 1999. White-tailed Deer, Mule Deer, and Elk Management Plan. Idaho Department of Fish and Game. Boise, ID.

Lindzey, F.G., W.G. Hepworth, T.A. Mattson and A.F. Reese. 1997. Potential for Competitive Interactions Between Mule Deer and Elk in the western United States and Canada. Prepared for the Western States and Provinces by Wyoming Cooperative Fisheries and Wildlife Research Unit, Laramie, WY.

Part 2 Rare Plant Viability Evaluation

Overview

The assessment of rare plant viability was conducted to evaluate the likelihood that habitat and other environmental conditions will be maintained within the planning area for plant species of viability concern. The number of plant species found to be of potential or known risk within the planning area was relatively few. As a result these plants were evaluated individually versus placing the species into groupings based on habitat, threats or other criteria. The best available scientific information was used concerning the species and where they exist within the planning area. Considering this evaluation was conducted at coarse-scale programmatic planning level rather than at a fine-scale, site-specific project level, the evaluation of the potential impacts to rare plants was viewed in the context of level of risk. None of the proposed management alternatives would affect the continued existence of plant species within the planning area; however some alternatives present a higher level of risk to the species, because they allow more activities that can adversely impact rare plants and their habitat.

Process

An interregional process (Forest Service Regions 1 and 4) was initially identified by the Forest Service to assess viability for species (R1/4 Terrestrial Protocols 1997). More recently, a national "White Paper on Managing Viable Populations" was prepared and evaluated through peer review and is currently being updated to incorporate new information and issues raised during the review (UDSA, 2001). The White Paper viability process involves several steps to address species viability and includes the following:

1) Description of the ecological context;
2) Identification of species-at-risk and collection of information;
3) Description of key conservation elements for those species;
4) Development of Forest Plan alternatives;
5) Risk Assessment and Analysis of effects on viability of the Forest Plan alternatives; and
6) Monitoring.

Identification of Plant Species of Viability Concern

Forest Service botanists compiled existing information of rare, or potentially rare, plant species from the Intermountain Region's Sensitive Species List (current and proposed, 2000) and from lists maintained by the Natural Heritage and Conservation Data Center network.

The species reviewed were placed in one of three categories:

1. **Species for which there is a viability concern**. Documentation exists indicating that the species occurs on the Forest and is of viability concern.

    - All species listed as Threatened, Endangered or Sensitive on the Forest

- Sufficient information exists indicating a viability concern

2. **Species needing more information to determine status**.

- Suspected or known to occur within the planning area; however, information is too limited to indicate the level of concern and to evaluate viability within the planning area

- All species in this category will be recommend for addition to a "Forest Watch" list, because information is lacking for these species; an objective will be included in the Revised Forest Plan to develop a "forest watch" list to insure that species will not be ignored simply because of a lack of information.

3. **Species for which there is clearly no concern for the species viability on the Forest.**

- Sufficient information exists to confidently determine viability will be maintained within the planning area, i.e., no threats to suitable habitat

- Sufficient information indicates the species does not occur within the planning area

Table 125. Species Review for Viability Concern on the Caribou NF.

Species Reviewed	Rank[2] Global	State[1]	Category	Justification for Category
Arabis lasiocarpa Wasatch rock-cress	G3	NR S3 (UT)	2	Tracked in Utah (Utah Division of Wildlife Resources, 1998) as a rare species; on review list for Idaho as a species that may be of conservation concern in Idaho (Mancuso 2001; Idaho Native Plant Society, 2002); Bob Moseley collection from wilderness peak - Bear River Range, Montpelier Ranger District; may be misidentification (Utah Division of Wildlife Resources, 1998); no suspected threats based on suitable habitat - high elevation rocky areas.
Asplenium septentrionale Grass-like spleenwort	G4	NR	2	One collection is known from rock crevices of the upper Hodge Nibley Creek (Mancuso, 2001); on review list for Idaho as a species that may be of conservation concern in Idaho (Idaho Native Plant Society, 2002); tracked in Utah as a rare species; M. Mancuso tried to relocate in 2002; no apparent threats to habitat
Asplenium trichomanes-ramosum (sym: *A. viride*) Green Spleenwort	G4	S1	1	One occurrence on Forest – of potential viability concern and is proposed to be added as a Region 4 sensitive species
Astragalus jejunus var. *jejunus* Starveling milkvetch	G3T3	S2	1	Found to be more common in Wyoming – not tracked in Wyoming (Fertig, 2000); currently a Region 4 sensitive species, but more appropriate as a "Forest Watch" species; potential viability concern within the planning area due to potential activities within suitable habitat

Species Reviewed	Rank[2] Global	State[1]	Category	Justification for Category
Botrychium lineare Slender moonwort	G1	SH	2	USFWS does not list Caribou NF for potentially suitable habitat; pop. on W-C is higher in elevation and with much greater winter snowfall; no historical or current documented occurrences; too little information to indicate a viability concern on the Caribou NF
Carex occidentalis Western sedge	G4	S1	2	Very limited information; possibly occurs on Forest, but no documented occurrences
Carex parryanna var. idahoa Idaho Sedge	G4T2	S2	1	Documented occurrences on Forest with potential threats – viability concern on Forest
Carex tumicola Foothill sedge	G4	S1	2	Historical 1931 collection; herbarium label just says "mink creek, fork of road" (Idaho Conservation Data Center, 2001); too little information
Cryptantha breviflora Uinta Basin Cryptantha	G4	S2	1	Documented occurrences on Forest; potential viability concerns within planning area due to potential activities within suitable habitat
Cryptantha caespitosa Tufted Cryptantha	G4	S1	2	One historical collection from 1910 may have been from near or on the Caribou NF (Montpelier Ranger District); Known occurrence in Idaho is about 17 miles southeast of Montpelier on BLM managed lands (Idaho Conservation Data Center, 2001); too little information to indicate a viability concern on the Forest
Juncus bryoides Moss rush	G4	SR	2	Idaho review list; record for species in Franklin Basin area in Bear Lake County (Mancuso, 2001); Idaho apparently represents the species northern range; too little information
Juncus hallii Hall's rush	G4G5	SR	2	Habitats include exposed slopes, stream banks, and meadows in montane and alpine areas; locally common in the Uintas in Utah; no records for Caribou NF; documented on Targhee NF; on review list for Idaho as a species that may be of conservation concern in Idaho (Idaho Native Plant Society, 2002)
Lepidium papilliferum Slick-spot peppergrass	G2	S2	3	Historical collection considered to be a misidentification or erroneous label; no habitat; recommend to Regional Forester to be removed from sensitive species list
Lesquerella multiceps Manyhead bladderpod	G3	S2	1	Potentially of viability concern, but new information may indicate that it is more common then originally thought
Lesquerella paysonii Payson's bladderpod	G3	S2	1	Regional endemic, but common when found; of conservation concern on Forest only because there is only one documented occurrence on Caribou Mountain and the species is a Region 4 sensitive species
Muhlenbergia racemosa Green muhly	G5	S2	2	Saturated soils in fens, on peat and mineral hummocks; not documented to occur on Forest Service managed lands; too little information
Musineon lineare Rydberg's musineon	G2	S1	1	Globally rare plant; one occurrence on Forest at Bloomington Lake; of viability concern on Forest; proposed Region 4 sensitive species
Penstemon compactus Cache penstemon	G2	S2	1	Currently a Region 4 sensitive species; few anthropogenic threats; of potential viability concern due to rarity
Primula maguirei Maguire's primrose	G1	S1 (UT)	2	Endemic to relatively lower elevations of Logan Canyon, UT (Utah Division of Wildlife Resources, 1998); USFWS does not consider Caribou NF to have habitat; listed as "Threatened"
Salicornia rubra Red glasswort	G4	S2	1	Documented as occurring on the Forest; population of potential viability concern
Salix candida Hoary willow	G5	S2	2	Documented to occur at Kelly Park by Soda Springs, Wilson Spring and Henry Stampede Park near but not on Forest (Jankovsky-Jones, 1997); no documented occurrences on Forest
Spiranthes diluvialis Ute ladies'-tresses	G2	S2	2	*Spiranthes diluvialis* was considered as a species of viability concern for the Draft EIS; however, with no documented occurrences and based on habitat potential on the Forest, the species is not considered to be of viability concern on the Forest; potential and occupied habitat is only suspected, not known to occur within the planning area; species is no longer listed for the Caribou NF by the USFWS (USFWS, 2002)

Species Reviewed	Rank[2] Global	State[1]	Category	Justification for Category
Stipa viridula Green needlegrass	G5	S2	2	Rare in Idaho but common in the northern Great Plains. Cultivated for pasture, grass, hay, and seed. Removed from Sensitive list in 1992 (US Forest Service, 1992); documented occurrence close to Caribou NF, but more likely on lower elevation lands, i.e., BLM
Triteleia grandiflora Large-flower triteleia	G4	S1 (WY)	2	Occurrence record for portion of Caribou NF administrated by the Targhee NF in Wyoming (Wyoming Natural Diversity Database, 2001); not tracked as rare in Idaho
Epilobium canum ssp. garrettii (Sym: Zauschneria garrettii) Garrett's firechalice	G5T?	SR	2	Southeast Idaho apparently represents the species northern range; relatively common in Utah; habitat is shady areas of cabonate cliffs/ledges/rock out-cropping; too little information, few threats to habitat; on review list for Idaho as a species potentially of conservation concern in Idaho (Idaho Native Plant Society, 2002)

1 State rank is for Idaho unless otherwise noted. Idaho state ranks obtained from the Idaho Conservation Data Center website (Idaho Conservation Data Center 2002)

2 Status = Global and state (Idaho) ranking as assigned by Natural Heritage and Conservation Data Center Network. The system is a one-through-five ranking system, ranging from species globally rare (G1-G3) to those rare in Idaho (G4-G5 with state ranks of S1 or S2).

Summaries for Plants in Category 1

The following information represents a review of information available for each species in Category 1 within the planning area, including known or suspected threats (risks) and conservation recommendations.

GREEN SPLEENWORT (*ASPLENIUM VIRIDE; SYM: A. TRICHOMANES-RAMOSUM*)

Family: *Aspleniaceae*

Rank/status : Global: G4 State: S1 Federal: Proposed Sensitive

Habitat:

Elevation: 8,500-8,900 feet above sea level

General: Rock crevices, cliff faces

Specific Habitat Description: Prefers rocks with a basic nature but have been found on quartz. Prefers moist habitat (Moseley and Mancuso, 1990). Spruce-fir and alpine communities (Welsh, 1987). On the forest it is found within a chute that is a unique micro-site of unusually cool/moist climatic conditions

Potential Habitat: Subsections with potential habitat include Cache Front, Bear River Mountains and Caribou Range Overthrust Mountains; however, it is likely limited to the microsite conditions only found to occur on the Headwall of Bloomington Lake Cirque.

Abundance (on Forest): One occurrence at Bloomington Lake Cirque; 30-40 plants in three small areas occupying approximately one acre (Moseley and Mancuso, 1990).

Range/Distribution: Green spleenwort is a boreal species sparsely distributed throughout the United States, Canada and Newfoundland. Range-wide, land ownership, land management, threats, and viability vary widely for this species. Green spleenwort also is considered rare in California, Colorado, Maine,

Michigan, New York, Oregon, South Dakota, Utah, Vermont, Wisconsin, Wyoming and various locations in Canada (NatureServe, 2001). Individual populations are often small and highly localized.

Trend: Range-wide: unknown Forest-wide: unknown

Protection of Occurrence: Cliff-face; protected due to habitat type

Threats: Currently no apparent anthropogenic threats – small potential of recreation impacts due to high use at Bloomington Lake; isolation/small size/dependency on micro-site climatic conditions increases the potential that the occurrence may not be maintained in the long term.

Fragility/Habitat Specificity: Likely would not be tolerant of a long-term change in the climate on the forest, i.e. global warming

Last Observed on Forest: 1990 (Moseley and Mancuso, 1990)

Information Needs: Unable to relocate during surveys in 2002 (Mancuso, 2002) – snow still in chute in July; re-survey in 2003

Key Forest Plan criteria for conservation: Recommend Bloomington Lake Cirque as a Special Interest Area or Special Management Area; recreation use at lake make it unsuitable as an RNA; discourage rock climbing.

IDAHO SEDGE (*CAREX IDAHOA; SYM: C. PARRYANNA SSP. IDAHOA*)

Family: *Cyperaceae*

Rank/status: Global: G2 State: S1 Federal: Proposed Region 4 Sensitive

Habitat:

Elevation: 6,000 – 8,000 feet above sea level

General: Low, level wetland transition zones

Specific Habitat Description: Rare to infrequent and very local, known to occur in suitable habitat associated with the Blackfoot River watershed. Located in meadows, swales, and on low, moist ground around streams and lakes range-wide. Prairies and high plains at moderate elevations in the mountains (Hurd, *et al*, 1998). Most often occurs in an ecotonal area at the border of wet meadow vegetation and sagebrush steppe. Restricted to nearly level sites and most commonly found on terraces associated with headwaters streams at elevations greater than 6,000 feet. Always found in sub-irrigated soils associated with low-gradient streams, springs or seeps. Theses soils are wet early in the growing season and moist the rest of the time. (Leisca, 1998)

Potential Habitat: Subsections with potential habitat includes Webster Ridges and Valleys & Caribou Range Overthrust Mtns in similar habitat.

Abundance (on Forest): 1000+

Range/Distribution: Regional Endemic – known to occur on Dubois District, Targhee NF; Blackfoot River Watershed, Soda Springs Ranger District; and Southwest Montana

Trend: Range-wide: unknown Forest-wide: unknown

Protection of Occurrence: None

Threats: Known threats include mining and potentially grazing on forest if overgrazed

Fragility/Habitat Specificity: Graminoid plants, such as sedges, are adapted to grazing and are usually able to persist with light to moderate grazing pressure. Evidence suggests that *Carex parryana* ssp. *Idahoa* responds to grazing like a typical palatable Graminoid, capable of persisting under light to moderate grazing, but declining with chronic heavy grazing. Experiments and monitoring studies to determine the actual response of *C.parryana* ssp. *idahoa* to grazing have not been conducted. Severe livestock grazing can result in stream bank destabilization followed by lowering of the water table and a reduction in the extent of hydropytic vegetation. Overgrazing could reduce the extent of *C.parryana* ssp. *Idahoa* habitat associated with riparian areas (Leisca, 1998). Road construction near riparian areas can reduce habitat available for *C. idahoa*; observed to occur in Montana (Leisca, 1998). Mining/Dredging for mineral extraction reduces habitat for *C. idahoa* (Leisca, 1998). Kentucky Bluegrass is a common associated species and may compete with Idaho sedge for resources (Leisca, 1998).

Last Observed on Forest: 1998 (Glennon and Holte, 1998)

Information Needs: Trend monitoring; surveys in potentially suitable habitat; Impact grazing has on the species

Key Forest Plan criteria for conservation: Low-moderate grazing utilization; AIZ management direction; monitoring

UNITA BASIN CRYPTHANA (*CRYPTANTHA BREVIFLORA*)

Family: *Boraginaceae*

Rank/status: Global: G4 State: S2 Federal: Proposed Sensitive

Habitat:

Elevation: 6,400 to 6,900 feet above sea level

General: Shale, barren, harsh sites on Twin Creek Limestone substrate

Specific Habitat Description: Forest - Restricted to exposed Twin Creek Limestone substrate that is a raw, loose, and eroding shale; the same habitat for Starveling Milkvetch. Uinta Basin *Cryptantha* appears to be sensitive to substrate texture, as does Starveling Milkvetch. It is less abundant in soils where shale size is greater than approximately 5centimeters, and is absent from large rocky sites. On all slopes and aspects – southern exposures dominate and most common on low to moderate slopes (Mancuso and Moseley, 1990). Range-wide it exists in mostly heavy clay soils, poor substrates of eroding knolls and badland slopes. Dry Salt desert shrub, sagebrush, rabbitbrush, pinyon-juniper and mountain brush communities (Welsh 1987).

Potential Habitat on Forest: See specific habitat description.

Abundance: Six occurrences on Forest support approximately 900 to 1,300 plants (Mancuso and Moseley, 1990)

Range/Distribution: Known to occur in Colorado, Idaho, and Utah. On the Forest the species occurrences and habitat is on the Montpelier Ranger District.

Trend: Range-wide: unknown Forest-wide: unknown

Protection of Occurrence: None

Threats: Livestock trampling, roadwork, and prospecting (if resumed) (Mancuso and Moseley, 1990).

Fragility/Habitat Specificity: For the Caribou NF and surrounding lands, evidence points to a mostly small, widely scattered, relatively low density population structure (Mancuso and Moseley, 1990).

Last Observed on Forest: 2001 (habitat condition); last inventory was in 1990 (Mancuso and Moseley, 1990).

Information Needs: Surveys needed to further determine the extent of the species.

Key Forest Plan criteria for conservation: Low-moderate grazing utilization; monitoring.

MANYHEAD BLADDERPOD (*LESQUERELLA MULTICEPS*)

Family: *Brassicaceae*

Rank/status: Global: G3 State: S1 Federal: Proposed Sensitive

Habitat:

Elevation: 6,000 – 10,000 feet

General: Dry, Gravely – usually associated with limestone

Abundance: Ten from historical records (Mancuso, 2000). 2002 surveys for the species found it to be much more common then originally thought; occurrence records will be updated winter 2002/2003; population estimated in the thousands.

Range/Distribution: Bear River Range in north-central Utah and adjacent mountains of southeastern Idaho and southwestern Wyoming.

Trend: Range-wide: unknown Forest-wide: unknown

Protection of Occurrence: Many occurrences are within proposed wilderness areas.

Threats: Potential threats are most likely related to roads (construction and maintenance), trails, various recreational activities, and sheep grazing. The species' habitat tends to have low threats overall indicating that all activities would have a low impact on the species.

Fragility/Habitat Specificity: Tolerant of disturbances and may benefit from disturbances

Last Observed on Forest: 2002 (Mancuso, 2002)

Information Needs : Review at 2003 Idaho Native Plant Conference to determine if species is still of conservation concern in Idaho; report from 2003 inventory

Key Forest Plan criteria for conservation: protection status of habitat, i.e. recommend wilderness and cross-country travel

Recommended Status : Forest "Watch List" or not tracked, depending on review (See "Information Needs" section above).

> *Note: Information in spring of 2001 indicated that viability of species was a concern on the Forest, however new information gathered in 2002 indicate that there is no viability concern for the species on the forest.*

PAYSON'S BLADDERPOD (*LESQUERELLA PAYSONII*)

Family: *Brassicaceae*

Rank/status : Global: G3 State: S1 Federal: Sensitive

Habitat:

Elevation: 6,000 – 9,950 feet above sea level, most often above 8,000 feet

General: Open ridgetops and slopes, occasionally in openings in sagebrush and forest stands

Specific Habitat Description: Carbonate parent material (limestone) with gravelly, skeletal soils. Open plant communities with low percent cover (Moseley, 1996).

Abundance: One occurrence on Caribou Mountain, 10 – 1000+ in sites ranging from ten square feet to four miles; population occurs on private and public land (Moseley, 1996).

Range/Distribution: Largely endemic to the carbonate mountain ranges of west-central Wyoming and adjacent Idaho. Two disjunct populations are known from southwestern Montana. In Idaho, it occurs on ridges and high peaks of the Snake River Range above the escarpment that parallels the Snake River. These populations are contiguous with its known distribution in Wyoming where numerous occurrences are documented and extend about twelve miles northwest into Idaho from the border. One population is disjunct from its main range in Idaho, occurring nineteen miles southwest on Caribou Mountain. (Moseley, 1996).

Trend: Range-wide: stable Forest-wide: stable

Protection of Occurrence : Currently no protection specifically for the species

Threats: Potential - Sheep grazing, off highway vehicle use, trampling may impact plants, prospecting

Fragility/Habitat Specificity: *L. paysonii* grows on carbonate soils high on ridge tops. It prefers low competition with other species or grows in low forb communities.

Last Observed on Forest: 1996 (Moseley, 1996)

Key Forest Plan criteria for conservation: Protection status of known occurrence

RYDBERG'S MUSINEON (*MUSINEON LINEARE*)

Family: *Apiaceae*

Rank/status: Global: G2G3 State: S1 Federal: Proposed Sensitive

Habitat:

Elevation: 8,800 – 9,000 feet above sea level

General: Rock Crevices

Specific Habitat Description: Limestone cliff faces, rock crevices and ledges between 8,800 to 9,300 feet (Moseley and Mancuso, 1990). Dry mesic; crest; North, Northeast and Northwest aspects; 15 percent to vertical slope; open to filtered light and shade (Moseley and Mancuso, 1990).

Potential Habitat on Forest: High probability that the only occurrence of the species on the Forest is at Bloomington Lake Cirque.

Abundance: Two occurrences at Bloomington Lake Cirque on Forest, estimated at 500 in 1990. In Utah, according to Ben Franklin (Utah Natural Heritage, 1998), *Musineon lineare* can be common in places and the most abundant endemic in some places at Logan Canyon in Utah.

Range/Distribution: Prior to 1990, Rydberg's *musineon* was thought to be endemic to Cache County, Utah, where it is known only from the Bear Range.

Trend: Range-wide: stable Forest-wide: stable

Protection of Occurrence: Protected due to habitat type

Threats: No clear anthropogenic threats to the populations of Rydberg's *musineon* at Bloomington Lake were seen in 1990. The populations are extremely small, however, with a combined total of less than 500 individuals seen in 1990. For this reason it remains vulnerable to extirpation in Idaho (Moseley and Mancuso, 1991).

Fragility/Habitat Specificity: Very specific to carbonate parent material; n. facing cool/cold on forest and a narrow endemic.

Last Observed on Forest: 2002 (Mancuso, 2002)

Information Needs: Review at 2003 Idaho Native Plant Conference to determine level of concern in Idaho; report from 2002 inventory.

Key Forest Plan criteria for conservation: Protection status of habitat, i.e. prescription and recreational use

CACHE PENSTEMON (*PENSTEMON COMPACTUS; SYM: P. CYANTHUS VAR. COMPACTUS*)

Family: *Scrophulariaceae*

Rank/status: Global: G2G3 State: S2 Federal: Sensitive

Habitat:

Elevation: 8,800 – 9,300 feet above sea level

General: Bedrock habitats, outcrops or cliff bands, usually rooted in crevices; open and dry near ridgelines or summits, moderate to steep slopes, all aspects on carbonate substrates

Specific Habitat Description: High elevation on ridge tops on carbonate substrates (St. Charles or Garden City limestone or Fish Haven Dolomite)

Potential Habitat on Forest: Southern end of Bear River Range; most high potential habitat has been surveyed (Mancuso, 2002).

Abundance: Seven occurrences. In 1954 population was described as "frequent." In 1990 populations ranged from 10-2,000 individuals in areas ranging from .10 to 35 acres.

Range/Distribution: Endemic to the Bear River Range in Idaho and Utah, on the Caribou-Targhee and the Wastach-Cache National Forests.

Trend: Range–wide: appears stable Forest-wide: appears stable

Protection of Occurrence: Proposed wilderness and areas difficult to access.

Threats: Potential - Sheep grazing, off highway vehicle use – none observed in 2002

Fragility/Habitat Specificity: *P. compactus* is very specific to the carbonate substrates at high elevations in Bear River Range; a long-term risk to the species could be global warming due to the species specifically only being found at the highest points of the highest mountains in the range.

Last Observed on Forest: 2002

Information Needs: Report from M. Mancuso's 2002 surveys

Key Forest Plan criteria for conservation: Protection status of habitat, i.e. prescription and cross-country travel

STARVELING MILKVETCH (*ASTRAGALUS JEJUNUS VAR. JEJUNUS*)

Family: *Fabaceae*

Rank/status: Global: G3 State: S2 Federal: Sensitive

Habitat:

Elevation: 6,000 – 7,100 feet above sea level

General: Dry hilltops, gullied bluffs and barren ridges or river terraces, on tuff, shale, sandstone, or derived gumbo clays (Barneby [1989] as cited in ref. Mancuso and Moseley, 1990).

Specific Habitat Description: On the Caribou NF its habitat is relatively more restricted. Forest populations occur strictly on exposed Twin Creek Limestone substrate that is a raw, loose, and eroding shale. Soil texture can vary greatly on an outcrop and between outcrops and is an important edaphic attribute. Starveling milkvetch is less abundant where shale size is greater than approximately 5 centimeters, and is absent from large rocky sites. It also decreases in abundance when the texture becomes fine/powdery. Most common on south to west aspects with slopes less then 20 percent (Mancuso and Moseley, 1990).

Potential Habitat on Forest: See specific habitat description.

Abundance: Nine occurrences support 5,000-6,000 plants. Most occurrences are relatively small, with only three found to contain more than 500 individuals. The largest known occurrence occurs at Whiskey Flats. All populations are restricted to a narrow range of habitat conditions that are generally discontinuous and not very extensive. All are on the Montpelier Ranger District.

Range/Distribution: Regional endemic to southeastern Idaho, southwestern Wyoming and Northeastern Utah.

Trend: Range-wide: appears stable Forest-wide: appears stable

Protection of Occurrence: None specific for species, not within a "protection" prescription.

Threats: Livestock trampling, road improvements (construction, prospecting (if resumed), off-road vehicles. Any one of these alone would probably not adversely affect the overall population, but due to the limited localized habitat the cumulative affects of any combination of these threats may adversely affect the long-term viability in Idaho (Mancuso and Moseley, 1990).

Fragility/Habitat Specificity: Very specific habitat criteria in Idaho (See habitat description). Likely tolerant of ground disturbance based on high erosion rate of substrate.

Last Observed on Forest: 1990; general review of habitat and population in 2001.

Information Needs: More surveys needed to strengthen understanding of the conservation status on the Forest.

Key Forest Plan criteria for conservation: Cross-country travel and grazing utilization levels

Note: Not of region-wide conservation concern; currently not tracked in Wyoming – known from over sixty occurrences throughout southwestern Wyoming (Fertig, 2000).

RED GLASSWORT (*SALICORNIA RUBRA*)

Family: *Chenopodiaceae*

Rank/status: Global: G4 State: S2 Federal: Sensitive

Habitat:

Elevation: 4,380-7,450 feet above sea level

General: Low elevation flats, prefers basic, saline soils

Specific Habitat Description: Occurs in moist saline or alkaline soil. Associated species may include other chenopodium species, such as *Distichlis spicata* and *Monolesis nuttaliana (J-J)*

Abundance: The known occurrences of red glasswort on the Forest occur at Elk Valley Marsh and Stump Creek Guard Station. Data for Elk Valley Marsh indicate thousands of individuals in a twenty-acre area (CDC, 2001). No data is available for the Stump Creek population.

Range/Distribution: Red glasswort is distributed from southern British Columbia and eastern Washington to Nevada, east to Saskatchewan, Kansas and New Mexico. Occasionally it is introduced west of the Cascades. In Idaho, Red glasswort occurs in the southeastern port of the state in Cassia, Franklin, Caribou, Bingham, Bear Lake, Oneida, and Bannock Counties (Jankovsky-Jones, 1997).

Trend: Range-wide: unknown Forest-wide: unknown

Protection of Occurrence: None specific for species, not within a "protection" prescription.

Threats: Threats include alterations of hydrologic cycles, grazing and agriculture conversion (off Forest). Populations persist with light grazing, but numbers decline as ground becomes hummocky. Potential habitat observed, which had been plowed and left fallow, had many of the expected associates present, but no Red glasswort was found (Jankovsky-Jones, 1997).

Fragility/Habitat Specificity: Refer to habitat description

Last Observed on Forest: 1995

Information Needs: More surveys needed to strengthen understanding of the conservation status on the Forest.

Key Forest Plan criteria for conservation: Protection status/management of Elk Valley Marsh, grazing utilization.

Recommended Status: Forest "Watch List" – not of region-wide conservation concern

Evaluation Of Species Threats Specific to Species

The current and potential threats to each individual TES plant species were determined from current scientific literature and professional botanical knowledge and expertise. The process included using GIS technology, to create the table in FEIS, Chapter 4, Other Resources: Threatened, Endangered and Sensitive (TES) plant species) by overlaying prescriptions with the most current distribution information for element occurrences of TES plant species for each alternative. Species associated with riparian/wetland habitat would occur in most prescriptions under 2.8.3 (Aquatic Influence Zone) that is not included in this table, because it is not a GIS-mapped prescription. *Lesqurella multiceps* in not included in this table, since many new occurrences have not been updated in the Idaho Conservation Data Center element occurrence records.

To assess the "continued existence" of a species, it may be best expressed through varying levels of risk. A risk assessment includes reviews of risks to species habitat or populations at the Forest-wide scale. Three levels of risk have been used: low, medium and high.

> **Low risk** – A high likelihood exists that the populations would meet population viability criteria. Effects to individuals and habitat are unlikely and short-term; populations and habitat are expected to be maintained or improved in the long-term.
> **Moderate risk** – An intermediate likelihood exists that populations would stabilize. Impacts to individual populations and habitat may occur in the short-term; populations and habitat expected to be maintained in the long-term.
> **High risk** – It is unlikely that species populations would be maintained. Effects on individual populations and habitat from direct and indirect impacts are expected to be chronic in the short-term; maintaining populations and habitat in the long-term is expected to be low.

Monitoring

Significant uncertainty is involved in the processes of managing for and evaluating species viability. This uncertainty is due both to simple lack of knowledge and to unpredictability of ecological systems. Because of these high levels of uncertainty, it is critical to implement an effective monitoring and adaptive management program (Viability White Paper, 2001).

Taking into account current knowledge of rare plants on the Forest, there is uncertainty on the type, level and amount of monitoring needed for each species. As a result, no specific monitoring is recommended for specific species; rather a recommendation is made to conduct monitoring for plant species of viability concern overall. Monitoring would include an annual review of what monitoring should be done and for what species, based primarily on site-specific project work on the Forest. The intent is to insure that plant species are either monitored or evaluated each year and assessed for population trends, viability, or habitat conditions while retaining the flexibility to focus monitoring attention on the species that need the most attention, based on the most current information at the time. (See Plan, Chapter 5, Monitoring and Evaluation)

Part 3 Fish Population Viability Evaluation

Introduction

During the Forest Plan revision, a determination was made as to the long-term viability of fish populations on the Forest. There is currently no cookbook for fish population viability evaluations. Forest Service researchers, scientists, and policy-makers are currently developing a strategy. This viability analysis was influenced by a draft Forest Service White Paper on managing for species viability (2/2/01), and input from the Rocky Mountain Research Center and the Intermountain Regional Office.

This fish species viability evaluation has several parts. Generally, this viability evaluation will identify evaluation species (species at risk), describe their ecological context, determine their metapopulations (if the principle applies), identify risks and threats to the evaluation species, determine the effects of each Forest Plan alternative upon the evaluation species, identify conservation approaches, and recommend monitoring. The overall objective is to evaluate the potential of long-term persistence of at-risk fish populations given the effects of each alternative of the Forest Plan.

Fish Species on/near the Caribou Portion of the Caribou-Targhee National Forest

The Caribou portion of the Caribou-Targhee National Forest supports a diversity of both native and non-native fish. The fish species on/near the Caribou portion of the Caribou-Targhee National Forest are listed below with their common names, scientific names, and status. This list is followed by narrative descriptions of each native and some selected non-native fish.

Native Fish

Common Name	Scientific Name	Status
Yellowstone cutthroat trout	(*Oncorhynchus clarki bouvieri*)	S, SC-A
Bonneville cutthroat trout	(*Oncorhynchus clarki utah)*	S, SC-A
Mountain whitefish	(*Prosopium williamsoni*)	
Bonneville cisco	(*Prosopium gemmifer*)	SC-A
Bear Lake whitefish	(*Prosopium abyssicola*)	SC-A
Bonneville whitefish	(*Prosopium spilonotus*)	SC-A
Leatherside chub	(*Gila copei*)	SC-C
Utah chub	(*Gila atraria*)	
Mottled sculpin	(*Cottus bairdi*)	
Piute sculpin	(*Cottus beldingi*)	
Bear Lake sculpin	(*Cottus extensus*)	SC-A
Longnose dace	(*Rhinichthys cataractae*)	
Speckled dace	(*Rhinichthys osculus*)	
Redside shiner	(*Richardsonius balteatus*)	

Utah sucker	(*Catostomus ardens*)
Bluehead sucker	(*Catostomus discobolus*)
Mountain sucker	(*Catostomus platyrhynchus*)

Introduced Nonnative Fish

Common Name	Scientific Name
Rainbow trout	(*Oncorhynchus mykiss*)
Brown trout	(*Salmo trutta*)
Brook trout	(*Salvelinus fontinalis*)
Lake trout	(*Salvelinus namaycush*)
Channel catfish	(*Ictalurus punctatus*)
Walleye	(*Stizostedion vitreum*)
Yellow perch	(*Perca flavescens*)
Carp	(*Cyprinus carpio*)
Brown bullhead	(*Ictalurus nebulosus*)
Green sunfish	(*Lepomis cyanellus*)
Bluegill	(*Lepomis macrochirus*)
Black crappie	(*Pomoxis nigromaculatus*)
Largemouth bass	(*Micropterus salmoides*)
Smallmouth bass	(*Micropterus dolomieui*)

Status Codes

S: USDA Forest Service Regional Forester Sensitive species designation (Forest Service Manual 2670.5). Those plant and animal species identified by the Regional Forester for which population viability is a concern as evidenced by:

- Significant current or predicted downward trends in population numbers or density.
- Significant current or predicted downward trends in habitat capability that would reduce a species existing distribution.

SC: Idaho Fish & Game Species of special concern: native species that are either low in number, limited in distribution, or have suffered significant population reductions due to habitat losses, but is not likely to become threatened in the near future. There are 3 categories:

- SC-A: Species, which meet one or more of the criteria listed above and for which Idaho presently contains, or formerly constituted, a significant portion of their range (i.e. priority species).
- SC-C: Species that may be rare in the state but for which there is little information on their population status, distribution, and/or habitat requirements (i.e. undetermined status species).

Habitat Descriptions

Native Fish Species Descriptions

YELLOWSTONE CUTTHROAT TROUT (*ONCORHYNCHUS CLARKI BOUVIERI*)

U.S. Fish and Wildlife Service was petitioned to list Yellowstone cutthroat trout in August 1998. In February 2001, U.S. Fish and Wildlife Service determined the petition did not provide substantial

information to indicate listing may be warranted listing. Yellowstone cutthroat trout currently retains its status as a Sensitive species on the Regional Foresters Sensitive Species List. The Caribou side of the Caribou-Targhee National Forest is currently addressing the needs of Yellowstone cutthroat trout by maintaining consistency with the Caribou Forest Plan as amended by INFISH. An interagency conservation memorandum of agreement for Yellowstone cutthroat trout was prepared and signed in 2000.

Intensive surveys for Yellowstone cutthroat trout distribution have been conducted on the Caribou-Targhee National Forest since 1996. The subspecies appear to be well distributed throughout the parts of the Forest within the Snake River Basin, but populations in various streams or stream segments vary in strength. While some populations are threatened by competition and interbreeding with nonnative, introduced fish species, others appear to be thriving in some streams or stream reaches. Apparently, some populations have been replaced by nonnative, introduced fish species. Genetic interactions between existing Yellowstone cutthroat trout populations have diminished from historic conditions because of a decrease in connectivity. Distribution surveys continue.

Within Idaho, the original cutthroat trout native to the Snake River system may have been the Yellowstone cutthroat trout. It is believed they were replaced by rainbow trout and other subspecies of cutthroat trout in drainages downstream of Shoshone Falls. Shoshone Falls isolated cutthroat trout from contact with rainbow trout and the Yellowstone subspecies remains the native trout in the upper Snake River basin. Yellowstone cutthroat trout are adapted to cold water. Water temperatures between 4.5 and 15.5 C appear to be optimum for the subspecies. This subspecies migrates for spawning when threshold water temperatures approach 5 C (optimum 10 C) and streamflows subside from spring peaks. Streams selected for spawning are commonly low gradient (up to 3 percent), perennial streams, with groundwater and snow fed water sources. Use of intermittent streams for spawning is not well documented, but has been noted in some intermittent tributaries to Yellowstone Lake. Spawning occurs wherever optimum size gravel (12-85 mm in diameter) and optimum water temperatures (5.5-15.5 C) are found. Depending on variations in growth, spawning populations are comprised of individuals age three and older (primarily ages 4-7). Juveniles congregate in shallow, slow-moving parts of the stream (USDA Forest Service, 1996).

Three life history patterns of Yellowstone cutthroat trout occur on the Caribou section of the Caribou-Targhee National Forest: resident, fluvial, and adfluvial. Resident trout spend their entire lives in small streams. Fluvial fish spend most of their lives in large streams and rivers, migrating into small streams in the spring to spawn. Their offspring spend the first couple years of their lives in these small streams and eventually migrate to the large streams and rivers downstream. Fluvial and resident populations may interact in the spawning stream. Adfluvial fish spend most of their lives in lentic waters, migrating upstream to small streams to spawn. Their young generally rear in these streams for a couple years and return to the lakes downstream. All adfluvial life history patterns exhibited by Yellowstone cutthroat trout on the Caribou Section of the Forest were forced into this pattern by the construction of reservoirs with no fish passage at the dams. For centuries, adfluvial and fluvial populations were instrumental in re-founding extirpated resident populations.

Both large-spotted and fine-spotted varieties of Yellowstone cutthroat trout occur on the Forest. The two varieties have been observed inhabiting same streams and, in fact, the same habitat within the stream. While some biologists prefer to split these forms of Yellowstone cutthroat trout when analyzing effects, there has been no genetic, behavioral, or biologic reason to do so to date.

BONNEVILLE CUTTHROAT TROUT (*ONCORHYNCHUS CLARKI UTAH*)

U.S. Fish and Wildlife Service received a petition to list Bonneville cutthroat trout as Threatened in February 1998. The agency responded the petition presented substantial information indicating that listing this species may be warranted. They initiated a status review of the subspecies. On 9 October 2001, US Fish and Wildlife Service found the Bonneville cutthroat trout to not be warranted for listing. The Bonneville cutthroat trout currently retains its status as a Sensitive species listed on the Regional Foresters Sensitive Species list. The Caribou-Targhee National Forest is currently addressing the needs of Bonneville cutthroat trout by maintaining consistency with the Caribou Forest Plan as amended by INFISH. An interagency conservation agreement for Bonneville cutthroat trout was prepared and signed in 2000.

Intensive surveys for Bonneville cutthroat trout distribution have been conducted on the Caribou-Targhee National Forest since 1998. The subspecies appear to be distributed throughout the southern part of the Forest, but populations in various streams or stream segments vary in strength. While some populations are threatened by competition and interbreeding with nonnative, introduced fish species, others appear to be impacted by habitat alterations. Some populations have been completely replaced by nonnative, introduced fish species. Genetic interactions between existing Bonneville cutthroat trout populations have diminished from historic conditions because of a decrease in connectivity due to irrigation diversions and dams. Distribution surveys continue.

Only one trout subspecies, the Bonneville cutthroat trout, is endemic to the Bonneville Basin. While some stream populations survive, this subspecies evolved primarily in a lake environment. Upon the desiccation of Lake Bonneville, trout were primarily restricted to perennial tributaries and connected watersheds and subbasins. Only Bear, Utah, and Panguitch Lakes retained lacustrine populations. These historic lake populations have been extirpated except in Bear Lake. During the last 150 years, the Bonneville cutthroat trout populations have been significantly reduced through anthropogenic activities, including habitat degradation, over utilization, and the introduction of non-native fish species. They spawn in spring, from April to June. Like other cutthroat, they require a clean, gravel substrate in cool, well-oxygenated water for spawning. They reach sexual maturity at two to three years of age. They eat mainly aquatic insects and terrestrial insects that fall into the water from overhanging vegetation. Larger Bonneville cutthroat trout feed on small fish (USDA Forest Service, 1996). Resident, fluvial, and adfluvial life history patterns are exhibited by Bonneville cutthroat trout on the Forest.

MOUNTAIN WHITEFISH (*PROSOPIUM WILLIAMSONI*)

Mountain whitefish is widely distributed throughout the western United States and occur in large streams on the Caribou section of the Caribou-Targhee National Forest. They are considered abundant. Its preferred habitat is cold mountain streams where it rests in the deep pools and feeds in the riffle areas. They spawn in the fall in riffles. Whitefish are active feeders throughout the year, feeding on aquatic and terrestrial insects and fish eggs (Idaho Fish and Game, 2000).

BONNEVILLE CISCO (*PROSOPIUM GEMMIFER*)

The natural range of Bonneville cisco is restricted to Bear Lake, generally in deep, cool water. Spawning occurs in late January through early February in water generally 2-3 feet deep, usually after the lake ices over. The adults form large schools and spawn over the lake's limited rocky areas (Utah

Natural Resources, 2000). Cisco eat zooplankton. The fish are a popular sport fish during the spawning season, when they are caught in the lake with dipnets (Simpson and Wallace, 1982).

BEAR LAKE WHITEFISH (*PROSOPIUM ABYSSICOLA*)

The natural range of the Bear Lake whitefish is confined to Bear Lake, generally at a depth of 60 feet. At this depth, the water temperature is generally at 39F. They spawn at a water depth of 60 to 100 feet January through February. Bear Lake whitefish eat ostracods, copepods, insects, and aquatic earthworms. During the pioneer times, a few commercial fishermen harvested Bear Lake whitefish and offered them for sale in meat markets. It was also used as bait on lines to harvest cutthroat trout (Simpson and Wallace, 1982).

BONNEVILLE WHITEFISH (*PROSOPIUM SPILONOTUS*)

The native range of Bonneville whitefish is also confined to Bear Lake. Most inhabit the cold, deeper parts of the lake, but some have been observed in shallow waters, near the mouths of tributaries. They spawn in shallow areas of the lake on rocky or sandy bars, in late November through early December. Bonneville whitefish eat midge larva, copepods, ostracods, aquatic worms, and miscellaneous aquatic and terrestrial insects. Bonneville whitefish are more readily harvested by hook and line than Bear Lake whitefish (Simpson and Wallace, 1982).

LEATHERSIDE CHUB (*GILA COPEI*)

Little is known about the leatherside chub in Idaho. Available information suggests it was never abundant, and rarely reported. Prime chub habitat generally occurs at a lower elevation in the watershed than prime cutthroat trout habitat. They have not been observed in high gradient stream reaches. They inhabit clear, cool streams and prefer a pool environment. However, leatherside chub cease growth when the water temperature goes below 10C.

It is likely the fish spends its entire life history in a limited segment of stream. It utilizes off channel pool or main channel pocket pool habitat and avoids pocket pool habitat when predators such as brown trout are present. The leatherside chub is dependent upon channel complexity for cover, particularly large instream wood and undercut banks (Belk, 2001). This chub species is less likely to be found in areas with a high frequency of surface fine sediment deposition. Leathersides have seldom been observed in eroded, heavily silted stream reaches or in areas that have been channelized. Young-of- the-year leathersides were often observed in shallow waters and larger individuals in deeper waters. Overhanging vegetation also appears to be an important component to quality leatherside habitat (Wilson and Belk, 1996).

Wilson and Belk (1996) noted as numbers of brown trout increased, the probability of encountering leathersides decreased. They may be preyed upon by nonnative brown trout.

The natural distribution of leatherside chub in Idaho was confined to the upper Snake River and Wood River drainages and the Bonneville Basin. Even though extensive stream sampling has occurred throughout its range, observations of the species have been limited. It probably spawns in midsummer. It may be a forage fish for trout where they are found in the same stream (Simpson and Wallace, 1982). In 2000, leatherside chub were collected in upper Tygee Creek and Tincup Creek on the Caribou portion of the Forest. A historic collection has been documented in Angus Creek.

Leatherside chub are currently listed as a State of Idaho Species of Special concern for 3 reasons. First, the current distribution is not well known and may be greatly reduced compared to its original range. Second, little is known about their basic habitat requirements. This makes it difficult to make recommendations concerning management of rehabilitation of waters where this fish occurs. Third, leatherside chubs occur in areas that have and will be impacted by future water development projects (Wilson and Belk, 1996).

The biological and habitat requirements of leatherside chub will not likely be entirely met if solely managing stream habitat for native cutthroat trout. Leatherside chub water temperature (cool, but not below 10C), habitat type (pocket pools and off-channel/margin pools), and habitat elevation requirements (lower) do not specifically overlap with those of native cutthroat trout (Belk, 2001).

UTAH CHUB (*GILA ATRARIA*)

In Idaho, the Utah chub is native to the Bear River drainage and the Snake River Drainage upstream of Shoshone Falls. It prefers a lake, pond, or reservoir environment and is very abundant in waters with aquatic vegetation. These fish spawn in late spring and early summer when surface waters reach or exceed 60F. The eggs are scattered indiscriminately over varied types of lake bottom in a water depth of 2 feet or less. Young chubs eat zooplankton until they reach 6-7 inches in length. They then become omnivorous, eating aquatic plants, insects, and crustaceans (Simpson and Wallace, 1982).

The Utah chub is very prolific and is a strong competitor with small trout for food and space (Simpson and Wallace, 1982). Although they are native to waters of the Caribou section of the Forest, they have been introduced in some waters, including the Henry's Fork upstream of Mesa Falls (Targhee section of the Forest), by some anglers using them as bait.

MOTTLED SCULPIN (*COTTUS BAIRDI*)

The mottled sculpin occur in the Snake River upstream of Shoshone Falls and in the Bear River Basin. It is abundant over its entire range and prefers streams with rubble stream bottoms (Simpson and Wallace, 1982). They are seldom found in silted areas (AFS, 2000). Spawning season is in May and early June. Their eggs are deposited in burrows, on the undersides of rocks (Hendricks, 1997). A male usually protects the spawning nest until the eggs hatch. Mottled sculpin eat immature aquatic insects, crustaceans, small sculpins, fish eggs, annelids, and plants (Hendricks, 1997). Sculpin are an important forage fish for trout, particularly cutthroat, rainbow, and brown trout (Simpson and Wallace, 1982).

PIUTE SCULPIN (*COTTUS BELDINGI*)

Piute sculpin occur in the upper Snake River and Bonneville Basins. It is known to occur in both lakes and streams where rubble is present. In streams, it occurs in riffle areas among rubble or large gravel. It prefers clear, cold water with slight to moderate current. It also serves as an important food source for trout (Simpson and Wallace, 1982).

Nothing is known of the life history of this species in Idaho, but in Lake Tahoe, Piute sculpins spawn in the spring. Eggs are laid in clusters on the undersides of rocks and are guarded by the male. Females produce from 20 to about eggs. Their food consists of a variety of aquatic invertebrates (AFS, 2000).

BEAR LAKE SCULPIN (*COTTUS EXTENSUS*)

Bear Lake sculpin occur only in Bear Lake. It lives in association with the bottom, from the shallows to a depth of over 50 meters (AFS, 2000). Spawning takes place in the spring around rocks near shore. Eggs are deposited on the underside of rocks or other substrate. After spawning, the fish move to deeper water, to a depth of 175 feet. In Bear Lake, sculpins have been sampled with gill nets at a depth of 175 feet. Bear Lake sculpin are an important forage fish for other fish in Bear Lake, including cutthroat trout (Simpson and Wallace, 1982).

LONGNOSE DACE (*RHINICHTHYS CATARACTAE*)

Longnose dace is widespread from the Pacific to the Atlantic in north-central America. In Idaho it is a common species in every river system. It occurs primarily in the riffle areas of streams, but has been taken from lakes where the shoreline is composed of small rubble. Spawning likely occurs over gravel in riffle areas of streams. It eats immature aquatic insects. Because of its small size and preference for living in riffle areas, it is an important forage fish for trout. It is reported to hybridize with redside shiners (Simpson and Wallace, 1982).

SPECKLED DACE (*RHINICHTHYS OSCULUS*)

Speckled dace are present in tributaries of the Snake and Bear Rivers in Idaho. They will live in a variety of habitat, but normally prefer the shallow, cool, and quiet waters in contrast to the longnose dace that prefer the fast riffle areas (Simpson and Wallace, 1982). They spawn in the spring, usually in May, and broadcast their eggs over the gravelly stream bottom. They are omnivorous, feeding on aquatic insects, plant material, and zooplankton (AFS, 2000). Speckled dace are an important forage fish for trout and have been used as a baitfish in parts of its range.

REDSIDE SHINER (*RICHARDSONIUS BALTEATUS*)

The redside shiner occurs in the Columbia River System and the Bonneville Basin. In Idaho, it is found in all the major river systems. It prefers the slow moving currents of lakes, ponds, ditches, springs, sloughs, streams, and rivers (AFS, 2000). Spawning generally occurs in June or July in water depths of less than 6 inches. Eggs are broadcasted by the female and settle to the stream bottom, attaching to substrate or submerged vegetation. The fry of redside shiners feed on small planktonic organisms but switch to a diet of insects, mostly terrestrial, by their second year of life. They will prey on eggs, often their own (Simpson and Wallace, 1982).

UTAH SUCKER (*CATOSTOMUS ARDENS*)

The Utah sucker is presently found in the Snake River drainage above Shoshone Falls and the Bear River Drainage. It is an adaptable species and lives in lakes, rivers, or streams in warm to very cold water. If living in a stream, it prefers a slow moving current where there is a variety of bottom material (Simpson and Wallace, 1982).

The Utah sucker spawns during the spring in small tributaries. Their diet is varied and includes animals and plants found at the bottom of its habitat. Many of the early settlers of the Bear River area harvested large numbers of suckers during their spawning runs. They were eaten fresh and some were salted and stored in wooden barrels or earthen crocks for winter consumption (Simpson and Wallace, 1982).

BLUEHEAD SUCKER (*CATOSTOMUS DISCOBOLUS*)

The bluehead sucker occurs on the Forest within the Bonneville basin and the Snake River above Shoshone Falls. It is a river dwelling species, occurring in a variety of habitats, ranging from cold, clear trout streams to warm, very turbid waters. It prefers riffle areas with rocky substrates. It spawns in late spring/early summer and probably scrapes its food off rocks (AFS, 2000). Little is known about the life history of this species, but it is assumed to be similar to that of other members of the sucker family. It is often found associated with mountain sucker but can easily be distinguished from it by the smaller scales and by its size when mature (generally larger). It is relatively rare in Idaho waters (Simpson and Wallace, 1982).

MOUNTAIN SUCKER (*CATOSTOMUS PLATYRHYNCHUS*)

Mountain sucker are widespread throughout the Snake and Bear River Systems in Idaho. The preferred habitat of this fish is usually clear, cold streams with clean rubble or sand bottoms. It is seldom found in lakes. This is a small species, when compared with bluehead sucker (AFS, 2000). Spawning occurs in late spring or early summer in riffles of clear, swift streams. Its food consists almost entirely of algae that are scraped from the rocks by means of the cartilaginous sheath on the jaws. Because of its preference for cool water, it may serve as an important forage fish to several trout species Simpson and Wallace, 1982).

Selected Non-Native Species Descriptions

Fourteen non-native fish species have been introduced to or just downstream of the waters of the Caribou portion of the Caribou-Targhee National Forest. Of those 14 species, 3 are particularly important to describe because they are valued by some anglers and are considered a threat to some native fish species on the Forest.

RAINBOW TROUT (*ONCORHYNCHUS MYKISS*)

Rainbow trout are native to the Pacific coast. They have been introduced to the Snake River above Shoshone Falls and the Bear River System. Naturally reproducing populations occur in many streams on the Forest where past introductions have occurred. Idaho Department of Fish & Game still stocks non-native rainbow trout in some streams on the Forest to cater to some recreational anglers. Future rainbow trout releases will primarily be sterile fish.

Naturally reproducing populations generally spawn from March through June. They are basically stream spawners and usually search out the small tributaries where gravel riffles are abundant. After hatching, young alevins drift into deeper pools of the streams. Their diet consists mainly of aquatic insects. Large individuals take small fish of any available species as well as aquatic invertebrates (Simpson and Wallace, 1982).

Rainbow trout may interbreed with native cutthroat trout, affecting their gene pool. In addition, rainbow trout compete with cutthroat trout for habitat.

BROWN TROUT (*SALMO TRUTTA*)

The brown trout is native to Europe. Successful introductions to Idaho waters began in 1948. The species is now well established in several river systems, including the Snake and Bear Rivers. Its

preferred habitat is larger streams, rivers, lakes, and reservoirs at lower elevations. It is more tolerant of the less favorable environment of the lower reaches of streams and rivers than are rainbow and cutthroat trout. The fish spawn in October through December. They usually move upstream some distance to small tributaries to spawn. They spawn by excavating a redd in gravel or small rubble, like other salmonids. Brown trout normally live longer than cutthroat trout. They eat aquatic insects and other fish (Simpson and Wallace, 1982). Brown trout use some streams on the Caribou portion of the Forest to spawn. They may prey upon native cutthroat trout and other fish species.

BROOK TROUT (*SALVELINUS FONTINALIS*)

Brook trout are native to eastern Canada and the United States. It has been extensively planted in lakes, rivers, and streams in the West, including on the Caribou portion of the Caribou-Targhee National Forest. It competes for habitat with native cutthroat trout and has completely displaced some cutthroat populations on the Forest. Brook trout appears to more readily compete with native fish when habitat has been altered (Marcus, *et al*, 1990). Brook trout also prey upon cutthroat trout juveniles and other native fish.

Like other salmonids, brook trout excavate redds while spawning. They spawn in the fall, usually in late September and October in gravels of small streams. The fry emerge from the gravel in April and May and move into pools in the stream. Brook trout generally eat aquatic insects and other small aquatic invertebrates. Large individuals also eat small fish.

Effects Analysis

Selection Of Fish Species For Analysis

Considering the Caribou half of the Caribou-Targhee National Forest spans 2 river basins (Snake River and Bear River), the diversity of aquatic life on the Forest is obviously great. Aquatic biota includes plants and animals that depend upon the aquatic environment for at least part of their life history. Native fish communities are an integral element in the composition, structure, and function of aquatic ecosystems. Fish typically dominate the aquatic vertebrates. They are sensitive to disturbance, and potentially integrate the effects of landscape and watershed processes over large spatial and temporal scales. Fish have influenced the development, status, and success of human social and economic systems. They can also be important pathways for nutrient and energy flows between aquatic and terrestrial systems. Even in waters historically barren of fish, introduced fishes profoundly influence the structure of aquatic communities (USDA Forest Service and USDI BLM, 1997). This analysis will concentrate upon select native fish species. It is believed that if their habitat and aquatic/riparian areas that influence their habitat are protected and restored, other important aquatic biota that have evolved to similar habitat conditions will also benefit.

It is unnecessary to specifically address the viability of each of the species listed above because some are common, the viability of some can be addressed while discussing others with the same requirements, and/or Forest management activities are not likely to affect their habitat downstream. The Caribou-Targhee National Forest developed the following filter to determine which species would be used in this assessment:

1. Is the species listed by the Regional Forester as Sensitive or Idaho Department of Fish & Game as a Species of Special Concern?

Species are listed as Sensitive by the Regional Forester if there are significant current or predicted downward trends in population numbers/density or habitat capability. Species listed by the State of Idaho as a Species of Special Concern are either low in number, limited in distribution, have suffered significant population reductions due to habitat losses, or little is known about their population status, distribution, and/or habitat requirements. The following fish species meet this requirement:

Species	Status
Yellowstone cutthroat trout	Regional Forester Sensitive, State SC-A
Bonneville cutthroat trout	Regional Forester Sensitive, State SC-A
Leatherside chub	State SC-C
Bonneville cisco	State SC-A
Bear Lake whitefish	State SC-A
Bonneville whitefish	State SC-A
Bear Lake sculpin	State SC-A

The other fish species on the Forest are considered common and will not be directly considered in this evaluation. However, the habitat requirements of these common species are addressed through the development of general watershed, water quality, and riparian goals, objectives, standards, and guidelines. Non-native fish were not analyzed because the selection process filtered them out. They are often common and/or increasing where they have been introduced. In fact, one of the primary challenges in the conservation of some of our native fish populations lies in addressing the competition and interbreeding impacts from invading non-natives.

2. **Can land management on the Caribou-Targhee National Forest have an effect upon the population and habitat of these species?**

Bonneville cisco, Bear Lake whitefish, Bonneville whitefish, and Bear Lake sculpin spend their entire life histories in Bear Lake. Two streams originating on the Forest actually flow into Bear Lake, St. Charles and Fish Haven Creeks. Both streams flow through private land prior to reaching the lake and Fish Haven Creek is dry during the summer due to irrigation diversions on private land. Land management in these drainages would not likely affect habitat conditions in the lake. The only impact with the potential of reaching the lake is sedimentation from management actions or natural events on the Forest. The effects of sediment delivery to spawning habitat in the lake was considered for Bonneville cisco, Bear Lake whitefish, Bonneville whitefish, and Bear Lake sculpin. They spawn in rocky areas. Most rocky areas occur on the east side of the lake. The mouths of St. Charles and Fish Haven Creeks occur on the west side of the lake. Potential sediment production from future land management activities on the Forest would not affect these spawning areas. It is not likely these species that occur solely in Bear Lake could be affected by land management activities on the Forest.

Yellowstone cutthroat trout, Bonneville cutthroat trout, and leatherside chub occur in streams within the Forest. They can be directly affected by management activities on the Forest and will be subject to this viability evaluation. The combined ranges of Yellowstone cutthroat trout, Bonneville cutthroat trout, and leatherside chub overlap with the more common fish species and other aquatic biota that occur on the Forest. Because

of this overlap, the habitat requirements of the more common native aquatic species that occur on the Forest and have the potential of being affected by Forest management activities are indirectly addressed through this analysis.

Ecological Context

General range- and Forest-wide species and habitat assessments were made for the 3 evaluation species; Yellowstone cutthroat trout, Bonneville cutthroat trout, and leatherside chub. Historic cutthroat trout habitat occurs throughout the Forest, Yellowstone to the north and Bonneville to the south. Leatherside chub also occurs in both the Snake and Bonneville Basins. However, the chub generally occurs at lower elevations than the cutthroat trout and is restricted to pocket pools, margin waters, and off channel habitat. Its water temperature requirements are different than cutthroat trout. The leatherside chub ceases growth when water temperatures are below 10C. This makes its habitat and biological requirements somewhat different than cutthroat trout and warrants separate analysis.

This assessment used USDA Forest Service (1996), recent Forest stream survey data, Inland West Watershed Initiative and Interior Columbia Basin Ecosystem Management Project fish distribution data, and scientific literature as information sources.

Distribution maps were prepared to depict the status of evaluation species and key non-native species throughout the Forest. The Inland West Watershed Initiative fish status definitions were used while preparing these maps. The definitions are available below.

YELLOWSTONE CUTTHROAT TROUT

Range-Wide Species Status

Many Yellowstone cutthroat trout populations currently exist as localized remnants of original subpopulations with little or no connectivity. Others owe their existence to hatchery programs. Current estimates indicate that Yellowstone cutthroat trout occupy 41 percent of historic riverine environments throughout the historic range. In addition, there are about 450 lake environments, within the historic range that currently support Yellowstone cutthroat trout. The number of lake environments currently supporting Yellowstone cutthroat populations represents a 380 percent increase over historic levels. Additionally, there are now numerous riverine and lake populations in existence outside of the historic range resulting from extensive stocking.

Caution should be applied before developing conclusions relative to overall Yellowstone cutthroat trout status. Many populations have not received sufficient testing for a definitive assessment of genetic status. Based on the findings in Montana, genetic contamination is probable for most cutthroat trout populations that have been exposed to rainbow trout or cutthroat of hatchery origin.

Fragmentation and population isolation has occurred as a result of stream dewatering, replacement by introduced nonnative fish, hybridization, substantial environmental change, and over-harvest. Many populations owe their current existence to passage barriers (natural or human caused) that have effectively controlled access of both contaminating and competitive species that are present in nearly all areas of the current range. At the same time these populations find themselves restricted to relatively small patches of habitat that have, in many cases, been degraded by human activity. Viability concerns increase with decreasing patch size, declining habitat quality and complexity, and increased isolation from source populations. Yellowstone cutthroat trout are a Regional Forester Sensitive species.

Forest-Wide Species Status

The Caribou half of the Caribou-Targhee National Forest comprises approximately 1/20 of the surface area of the historic range of Yellowstone cutthroat trout. A Yellowstone cutthroat trout distribution map was updated on December 2001 for the Forest. Of the fifty-one 6th code HUC's with Yellowstone cutthroat trout data on the Caribou half of the Forest, thirty-four HUC's had populations that were considered strong, fourteen had populations that were considered depressed, and three had populations where we expected them to be present but they were absent.

It appears that Yellowstone cutthroat trout are well distributed throughout the Caribou portion of the Forest within the Snake River Basin. Perhaps one of the most significant threats to the species within the Forest is the introduction of nonnative fish. As an example, rainbow trout are stocked in Blackfoot Reservoir. Historically, rainbow trout with the ability to reproduce were stocked there. Today, the majority of the stocked rainbow trout are sterile. The presence of naturally reproducing rainbow trout in the headwaters of the Blackfoot River, including Diamond Creek, is on the increase (Scully 2001). Rainbow trout interbreed with native cutthroat trout affecting their genetic purity. They also compete for habitat with native fish.

In the following section titled Evaluation of Species Metapopulation Risk Factors, the Yellowstone cutthroat trout metapopulations that occur on the Forest are rated per risk of extinction.

Range-Wide Habitat Condition

Aquatic environments inhabited with Yellowstone cutthroat trout on National Forest lands tend to be in better condition and support more populations. Present estimates indicate that 63 percent of historic riverine habitats on National Forests still support populations of Yellowstone cutthroat trout. Most of the currently occupied lake habitat is found on National Forest administered lands.

Forest-Wide Habitat Condition

Composite ecological ratings for the six (4th HUC) subbasins in the Caribou portion of the Forest within the range of Yellowstone cutthroat trout estimated that four were low, 1 was moderate, and one was high in overall ecological condition. The Interior Columbia River Basin Report (USDA Forest Service and USDI BLM, 2000) and Forest fish distribution survey reports (2000-2001) documented impacts to Yellowstone cutthroat trout habitat that included agriculture, urban expansion, timber harvest, livestock grazing, road building/maintenance/use, dispersed camping, off-road motor vehicle use, and mining. In some areas, these activities have affected aquatic and riparian habitat through dewatering, sedimentation, nutrification, stream bank erosion, channel widening/shallowing, isolating populations, and direct trampling of fish. In some areas, these activities have decreased riparian vegetation, decreasing available stream shade and nutrients, stream bank stability, and sources for large instream wood. These impacts affect the habitat requirements described in the Native Fish Species Descriptions section above, decreasing population productivity and, potentially, long term population viability. For additional information on Forest-wide habitat condition, please refer to the discussion in the Inland West Watershed Initiative section of Riparian Areas, Wetlands, and Aquatic Ecosystems. Additional information on geomorphic integrity, water quality integrity, and watershed vulnerability can be found in the watershed section of FEIS.

BONNEVILLE CUTTHROAT TROUT

Range-Wide Species Status

Current information on Bonneville cutthroat trout indicates that the range-wide status of this species has been improving over the last 20-year period. There are currently an estimated 163 tentative

populations inhabiting over 1365 miles of lotic habitats and 70,088 surface acres of lentic habitats. The largest single population occurs in Bear Lake with an estimated population size of over 30,000 individuals. Of the populations being managed for conservation, 62 have been identified as core or reintroduced populations, and two have been designated introgressed populations (Lentsch, *et al*, 2000). Nonnative fish such as brook trout, rainbow trout, and brown trout have been introduced to streams throughout the range of Bonneville cutthroat trout. Several populations have been completely displaced with brook trout. The Regional Forester of the Intermountain Region has designated Bonneville cutthroat trout as Sensitive.

Forest-Wide Species Status

The Caribou half of the Caribou-Targhee National Forest comprises approximately 1/30 of the surface area of the historic range of Bonneville cutthroat trout. A Bonneville cutthroat trout distribution map was updated on November 2001 for the Caribou portion of the Caribou-Targhee National Forest. Of the thirty-five 6th code HUC's expected to support Bonneville cutthroat trout populations, six HUC's had populations that were considered strong,[5] fifteen had populations that were considered depressed, and fourteen included watersheds where populations were expected but were absent.

In the following section titled Evaluation of Species Metapopulation Risk Factors, the Bonneville cutthroat trout metapopulations that occur on the Forest are rated per risk of extinction. Range-Wide Habitat Condition

Researchers speculate that Bonneville cutthroat trout historically inhabited all streams in the Bonneville Basin with suitable habitat. However, in the last 100 years, human land use and stream alterations have restricted their range through loss of connectivity between populations and loss and degradation of suitable habitat.

Habitat degradation within the range of Bonneville cutthroat trout has fragmented and reduced the complexity of aquatic habitat. Reservoirs and irrigation diversions have eliminated migratory corridors throughout their range, decreasing connectivity. Human activities such as water development, agricultural activities, energy development, mining, timber harvest, grazing, over fishing, and nonnative species introductions have directly impacted Bonneville cutthroat trout populations and habitat. Lentsch et al (2000) have identified water development, livestock grazing, timber harvest, road construction, energy development, and mining activities as primary causes of Bonneville cutthroat trout habitat loss.

Forest-Wide Habitat Condition

The Caribou-Targhee Forest Fish Distribution Crew has sampled all Bonneville cutthroat trout streams on the Forest between 2000 and 2001. Habitat has been impacted by land management activities in all of these streams to various degrees. The primary impacts documented were from grazing, dewatering (irrigation), roads and trails (passage barriers, riparian vegetation, and sedimentation), and recreational vehicle use. In some areas, these activities have affected aquatic and riparian habitat through dewatering, sedimentation, nutrification, stream bank erosion, channel widening/shallowing, isolating populations, and direct trampling of fish. In some areas, these activities have decreased riparian vegetation, decreasing available stream shade and nutrients, stream bank stability, and sources for large instream wood. These impacts affect the habitat requirements

[5] **Strong population**- All life histories that historically occurred in the subwatershed are still present, and numbers of fish are stable or increasing. The local population is likely to be half or more of its historic density. Greater than 50 percent of the total salmonid community consists of native trout.

described in the Native Fish Species Descriptions section above, decreasing population productivity and, potentially, long term population viability. For additional information on Forest-wide habitat condition, please refer to the discussion in the Inland West Watershed Initiative section of Riparian Areas, Wetlands, and Aquatic Ecosystems of the DEIS. Additional information on geomorphic integrity, water quality integrity, and watershed vulnerability can be found in the watershed section of DEIS.

LEATHERSIDE CHUB

Range-Wide Species Status

The leatherside chub is native to the eastern and southern areas of the Bonneville Basin of Utah, Idaho, and Wyoming, to Wood River, Idaho and to regions of the Snake River, Idaho and Wyoming, above Shoshone Falls. Even though extensive stream sampling has occurred throughout its range, observations of the species have been limited. The general status of the species throughout its range is unknown. Observations of leatherside chub have been documented in the following streams:

Table 126. Observations of Leatherside Chub in Idaho, Utah, and Wyoming.

Stream	County	State	Year
Cassia Creek	Cassia	ID	1986
Goose Creek	Cassia	ID	1986
Trapper Creek	Cassia	ID	1975, 1986, 1994
Beaver Dam Creek	Cassia	ID	1987
Little Wood River	Lincoln	ID	1934
Tincup Creek	Caribou	ID	1969. 2000
Angus Creek	Caribou	ID	Prior to 1995
Big Wood River	Lincoln	ID	1960
Tygee Creek	Caribou	ID	2000
Thistle Creek	Utah	UT	1995
Salina Creek	Sevier	UT	1995
Buffalo Fork		WY	1934
Pacific Creek		WY	1941
Bear River		WY	1972
Muddy Creek		WY	1974
Third Creek		WY	1974
Twin Creek		WY	1975
Rock Creek		WY	1975
Yellow Creek		WY	1972
Sulphur Creek		WY	1972

Forest-Wide Species Status

A leatherside chub distribution map was updated on March 2001 for the Caribou portion of the Caribou-Targhee National Forest. There were two 6th code HUC's with leatherside chub present. An additional 6th code HUC containing leatherside chub, Tygee Creek, is located just outside of the Forest boundary. We do not currently know the status of the populations. It is likely they occur elsewhere on the Forest, but they have only currently been documented in distribution surveys. The historic and current number of streams occupied by leatherside chub is unknown.

Idaho Department of Fish & Game and the Forest have been conducting fisheries surveys on the Caribou portion of the Caribou-Targhee National Forest for decades. During this time, extremely limited documented observations have been made of leatherside chub. This may be because surveys

were concentrating on salmonids or other game species or because of their sparse distribution. Forest-wide species status is unknown.

In the following section titled Evaluation of Species Metapopulation Risk Factors, the leatherside chub populations that occur on the Forest are rated per risk of extinction.

Range-Wide Habitat Condition

Leatherside chub prefer pool habitat in mid- to low- watershed elevations. Channel complexity, including large instream wood undercut banks, and overhanging vegetation, appears to be an important component of their habitat. No detailed range-wide habitat condition assessments were made for leatherside chub. Range-wide impacts to leatherside chub habitat include irrigation diversions, overgrazing of livestock, mining, timber harvest, and road construction. Interactions between leatherside chub and non-native fish may also affect populations, range-wide (USDA Forest Service and USDI BLM, 1997).

Forest-Wide Habitat Condition

On the Forest, the stream segments preferred by Leatherside chub are generally low in the watershed, in low gradient depositional areas. They may also be on neighboring private land. No Forest-wide habitat condition assessment for leatherside chub has been performed on the Forest, so general habitat condition is mostly unknown. A Properly Functioning Condition Assessment was performed on Angus Creek and it was functioning at risk-high. Angus Creek was surveyed by the Forest Fish Crew in 2001 and found to have high frequencies of instream sediment and bank instability. Primary causes identified included grazing and mining. A Properly Functioning Condition (PFC) Assessment was performed on Tincup Creek and it was functioning at risk-moderate. The Forest Fish Crew surveyed Tincup Creek in 2000. Areas with high frequencies of instream sediment and bank instability were observed in Tincup Creek. Those in excess to natural conditions were attributed to cattle grazing, roads, and recreation. The habitat impacts in Angus and Tincup Creeks affect the habitat requirements described in the Native Fish Species Descriptions section above, decreasing population productivity and, potentially, long term population viability. For additional information on Forest-wide habitat condition, please refer to the discussion in the Inland West Watershed Initiative section of Riparian Areas, Wetlands, and Aquatic Ecosystems. Additional information on geomorphic integrity, water quality integrity, and watershed vulnerability can be found in the watershed section of FEIS.

Metapopulations

A metapopulation is a collection of populations that interact through the exchange of individuals. Metapopulations are associated with large watersheds, lakes, or river basins, depending on the level of connection among streams and the straying or dispersal rates and distances typical of each species. When habitat is lost or streams are blocked, metapopulations may become fragmented into isolated local populations (Rieman, *et al*, 1993).

Based on existing conditions, metapopulations have been estimated for each of the evaluation species below. For cutthroat trout, these metapopulations are based upon known migration barriers (dams). Some of the cutthroat trout populations within these metapopulations are isolated due to irrigation diversions in the lower reaches of the streams.

YELLOWSTONE CUTTHROAT TROUT

Four general Yellowstone cutthroat trout metapopulations are currently considered to exist on the Forest; Palisades/Salt, Grays Lake, Blackfoot, and Portneuf/American Falls. Palisades/Salt includes McCoy Creek Watershed, the Salt River, and its tributaries. Resident, fluvial, and adfluvial life history patterns exist in this metapopulation. The adfluvial fish have developed with the establishment of Palisades Reservoir. Grays Lake includes those streams that drain into Grays Lake. These populations may exhibit resident and adfluvial life history patterns. The Blackfoot metapopulation includes Blackfoot Reservoir upstream to the headwaters of the Blackfoot River. The Blackfoot metapopulation likely exhibit resident, fluvial, and adfluvial life history patterns. The adfluvial pattern developed with the establishment of Blackfoot Reservoir. Portneuf/American Falls includes tributaries to the Portneuf River and the few streams originating on the Forest that drain directly into American Falls Reservoir. These fish have resident, fluvial, and adfluvial life history patterns. The adfluvial life history pattern developed with the establishment of American Falls Reservoir.

BONNEVILLE CUTTHROAT TROUT

Four general Bonneville cutthroat trout metapopulations are currently considered to exist on the Forest; Bear River East, Bear River West, Deep Creek Reservoir, and Daniels Reservoir. Each metapopulation is in various degrees of internal disconnect.

Bear River East includes the Bear River and its tributaries upstream of Alexander Reservoir. These fish may exhibit resident, fluvial, and adfluvial life history patterns. The adfluvial cutthroat trout may use Bear Lake and Alexander Reservoir.

Bear River West includes the Bear River and its tributaries downstream of Alexander Reservoir. The disconnect within this metapopulation is severe. Grace, Cove, and Oneida dams in Idaho affect river migration. Migration between the river and its tributaries is frequently affected by water diversions. These fish may exhibit a resident or fluvial life history pattern.

Small metapopulations also occur upstream of the dams at Deep Creek and Daniels Reservoir. These fish are likely resident and potentially adfluvial.

LEATHERSIDE CHUB

The metapopulation principle is much easier to apply to species with migratory behaviors such as salmonids. Leatherside chub appear to spend their entire life history in an abbreviated segment of stream (Belk, 2000), perhaps in one pool and its surrounding riffles. To date, no migratory behavior has been observed. The degree of genetic mixing in populations is unknown. It may be that genetic interaction occurs with individuals drifting downstream. There is a potential the leatherside chub observed in Tincup and Tygee Creeks are part of a metapopulation consisting of the Salt River and its tributaries. There is natural no genetic mixing or exchange of individuals between the Salt River tributaries and Angus Creek (within the Blackfoot River Drainage) due to disconnect. It is likely leatherside chub occur in other tributaries to the Blackfoot River, making the Blackfoot River a potential metapopulation. The two individual populations known to exist on the Forest will be used in this evaluation and referred to as populations.

Evaluation Of Species Metapopulation Risk Factors

The Yellowstone and Bonneville cutthroat trout metapopulations and the known leatherside chub populations were evaluated for their risk to extinction using a set of variables developed by the USDA Forest Service Intermountain Research Station (Rieman, *et al*, 1993). Six parameters were used:

1. **Temporal Variability**: This is the ability of the habitat to be altered by environmental disturbance. Low risk is associated with complex habitat within the drainages, providing for a variety of life stages. The more complex the habitat, the lower the risk of extinction. Temporal variability becomes more critical with small population sizes. The risk value presented is an average for the populations found in the metapopulation.

2. **Population Size** : This refers to the current population size and structure. The greater the number of breeding adults, the less risk of extinction there is. Population size, density dependent factors, and genetic diversity are critical risk factors that directly relate to population size. The risk value presented is an average for the populations found in the metapopulation.

3. **Growth and Survival**: This rates the quality of the habitat. Quality of habitat aids the resiliency of the fish populations. The risk value presented is an average for the populations found in the metapopulation.

4. **Isolation**: This rates the ability of individuals from a population to contribute genes to another population in the metapopulation. Consideration should be given to the ability of a population to be refounded or its gene pool strengthened (maintenance of genetic variability) through genetic interchange. The risk value presented is an average for the populations found in the metapopulation.

5. **Replication**: This considers the number of populations in the metapopulation. Several strong populations in a metapopulation decrease risk. The risk value presented is for the metapopulation.

6. **Synchrony**: Risk to metapopulation persistence is low when environmental variation (floods, low flows, fire, etc.) is low and populations are found in high quality and complex habitats. In this case, there is little evidence that populations fluctuate together. The risk value presented is for the metapopulation.

Each of these six risk factors was used to rate the Yellowstone and Bonneville cutthroat trout metapopulations. A general discussion follows regarding the known leatherside chub populations. A numeric rating system was used, with “1” meaning low risk, “2” meaning moderate risk, “3” meaning high risk, “4” meaning extreme risk, and “6” meaning unknown. The ratings are in the table below, followed by a discussion degree of risk associated with each metapopulation (and leatherside chub populations).

Table 127. Risk Factor Ratings for Trout Metapopulations.

Fish Species	Metapopulation Name	Temporal Variability	Population Size	Growth and Survival	Isolation	Replication	Synchrony
Yellowstone cutthroat	Palisades/Salt	1	1	1	1	1	1
Yellowstone cutthroat	Grays Lake	1	6	2	1	2	2
Yellowstone cutthroat	Blackfoot	1	1	1	1	1	1
Yellowstone cutthroat	Portneuf/American Falls	1	1	2	1	1	1
Bonneville cutthroat	Bear River East	2	2	2	2	2	2
Bonneville cutthroat	Bear River West	2	2	2	6	2	3
Bonneville cutthroat	Deep Creek Reservoir	2	2	3	2	4	3
Bonneville cutthroat	Daniels Reservoir	2	2	3	2	3	3
Leatherside chub	Angus Creek Population	2	3	2	6	4	3
Leatherside chub	Tincup Creek Population	1	3	2	6	4	1

PALISADES/SALT YELLOWSTONE CUTTHROAT TROUT METAPOPULATION

The Palisades/Salt Yellowstone Cutthroat Trout Metapopulation is robust, with a low risk of local population extinction. The populations are closely located, well distributed throughout the metapopulation area and streams, and barriers to interactions are few. Generally, the available habitat is complex and provides some of the highest quality Yellowstone cutthroat trout refugia in the analysis area. Stream hydrographs are generally predictable with infrequent flooding beyond spring snowmelt. There are no known isolated populations in this metapopulation area. Palisades Dam, a formative feature of this metapopulation, provides the only fragmentation. There may have been historic interchange between these populations and populations downstream of the dam, prior to dam construction. The occurrence of rainbow trout in the metapopulation area is minimal, minimizing the concern for introgression. Brook trout populations are strong in tributaries of the upper Salt River. In some streams, they are out competing Yellowstone cutthroat trout for habitat. An example of this is in Smoky Canyon Creek. There is an excellent potential for this metapopulation to exist over both the short (10 years) and long (100 years) terms.

GRAYS LAKE YELLOWSTONE CUTTHROAT TROUT METAPOPULATION

The Forest has limited land base in the Grays Lake Drainage. It generally occurs in the headwaters of six 6th code HUCs. Yellowstone cutthroat trout have been documented in three of these watersheds. Population size is unknown at this time. Additional surveys are being conducted. Environmental conditions appear to be stable enough to not have an effect on the entire metapopulation. However, the majority of the available stream habitat is located off Forest and in places, cattle grazing has impacted its quality. Three of the major streams on the Forest have been rated functioning at risk-high, functioning at risk moderate, and functioning at risk-low. This may have affected cutthroat

trout survival and growth. There is a potential for these stream populations to intermix when they are connected through channels in vicinity of Grays Lake. At best, a few populations occur within this metapopulation. There is moderate risk associated with the metapopulation replication parameter. Although streams are well distributed in this drainage, stream habitat primarily occurs on private land and has been simplified by livestock use. Metapopulation synchrony was rated at a moderate risk because of the simplified habitat. There is a moderate potential for this metapopulation to continue to exist over the short (10 years) and long (100 years) terms. A Forest Fish Distribution Crew is stationed out of Grays Lake National Wildlife Refuge during the 2002 Field Season to gather additional data.

BLACKFOOT YELLOWSTONE CUTTHROAT TROUT METAPOPULATION

The Blackfoot Yellowstone cutthroat trout metapopulation has well distributed populations that are well connected to each other. Available habitat is relatively high in quantity and quality. Numerous populations occur in tributaries of the Blackfoot River, from Blackfoot Reservoir to its headwaters. Spawning populations are in close proximity, making risk associated with isolation low. The risk associated with each evaluation parameter was low. Brook trout and rainbow trout occur in depressed populations in headwaters. There is an excellent potential for this metapopulation to exist over both the short (10 years) and long (100 years) terms.

PORTNEUF/AMERICAN FALLS YELLOWSTONE CUTTHROAT TROUT METAPOPULATION

The Portneuf/American Falls Yellowstone cutthroat trout metapopulation consists of several well-distributed populations in relatively stable streams. Although there is a lack of information on fish populations occurring on private land, all fish bearing streams on the Forest have been surveyed for fish distribution and relative abundance. The streams we know are occupied with Yellowstone cutthroat trout are close enough to each other to allow interchange of individuals. There is little evidence of population sizes fluctuating together. Moderate risk is associated with growth and survival due to stream impacts decreasing fish survival and growth. Some tributaries to Inman, Mink, and Pebble Creeks are nonfunctional. There are some migration barriers, generally associated with irrigation diversions. There is a moderate potential of this cutthroat trout metapopulation existing over both the short (10 years) and long terms (100 years).

BEAR RIVER EAST BONNEVILLE CUTTHROAT TROUT METAPOPULATION

The Bear River East Bonneville cutthroat trout metapopulation has moderate risk associated with each risk evaluation parameter. Though there is no exact way to combine the risk evaluation parameters, a population at moderate risk in several evaluation parameters is likely to be at high risk overall (Rieman, *et al*, 1993).

This metapopulation has two populations considered to be strongholds by the Caribou-Targhee National Forest; Giraffe and Emigration Creeks. These populations have access to the river system (a fluvial life history component) and no non-native fish present in their watersheds. However, their neighboring watersheds harbor strong populations of brook trout and there is a potential for colonization. Brook trout can out compete Bonneville cutthroat trout, completely displacing them from streams. This is recently evident in Georgetown and Little Beaver Creeks (in the metapopulation area). Fish distribution surveys, conducted in 1994, documented Bonneville cutthroat trout in these streams. 2000 fish distribution surveys could not detect their continued existence in these streams. Only brook trout exist in these streams today.

There is a moderate risk associated with temporal variability because environmental disturbances are relatively frequent. These environmental disturbances are both natural and management related. In recent years, draught conditions have affected Bonneville cutthroat trout populations. This is evident in the Idaho Department of Fish & Wildlife fish population monitoring data of Preuss and Giraffe Creeks in which there were decreases during the draught in the early to mid 1990s and population increases after the draught. Nonfunctional and functioning at risk streams have been documented throughout the metapopulation area and livestock grazing-related impacts have been documented in 2000-1 stream surveys.

Low population size is commonplace throughout most of the metapopulation area. Strong populations of brook trout are apparently displacing some of these populations. Total displacement (local extirpation of Bonneville cutthroat trout) has occurred in at least five 6th code HUC's in this metapopulation.

Fine sediments and riparian vegetation impacts, generated from land management activities (primarily grazing and roads) have affected riparian and aquatic habitat in stream segments distributed through most of the metapopulation area. This has resulted in a moderate risk associated with cutthroat trout growth and survival.

Isolation is also a concern for many local populations in the metapopulation. This isolation is caused by irrigation diversions, usually occurring on private land in the lower watersheds. This practice often either dries the stream or presents a physical barrier (headgates or dams), isolating local populations upstream. The Bear River East Metapopulation is fragmented.

Considering replication, there is moderate risk associated with this metapopulation because only a small percentage of the populations represent most of the fish production. There is also moderate risk associated with the synchrony evaluation parameter because most populations are depressed.

In summary, the Bear River East Metapopulation of Bonneville cutthroat trout have a high risk of extinction. Although this metapopulation may persist over the short term (10 years), without changes in resource use and management, this metapopulation may not continue to exist in the long term (100 years). The extirpation of some local populations has already been documented. These populations were displaced by brook trout. This displacement was facilitated by management impacts to aquatic and riparian habitat (primarily grazing, roads, and irrigation).

BEAR RIVER WEST BONNEVILLE CUTTHROAT TROUT METAPOPULATION

The Bear River West Bonneville cutthroat trout metapopulation consists of approximately 7 closely located local populations. Malad River tributaries, which are part of this metapopulation area, have the highest concentration of nonfunctioning and functioning at risk streams on the Forest. Because of this, the risk associated with temporal variability is rated moderate. Each of the populations currently identified are considered to be depressed. There is moderate risk associated with growth and survival due to stream habitat conditions. The degree of connectivity between these populations is unknown and needs to be investigated. There is a moderate risk associated with replication because the few populations that have been identified in this metapopulation have been rated as depressed. There is also a high risk associated with synchrony because the populations are located close together and they may respond to the same environmental variations.

Brook trout have been documented in some of the 6th code HUC's within this metapopulation area, compounding the risk of extirpation.

In summary, although we need to do further fish distribution surveys in the Bear River West Metapopulation area, we have enough information to indicate a high risk of metapopulation extinction over the long term (100 years) under current conditions. The metapopulation may continue to exist over the short term (10 years).

DEEP CREEK RESERVOIR BONNEVILLE CUTTHROAT TROUT METAPOPULATION

There is at least a high risk of extinction for this metapopulation. These small populations (approximately three) exist in a few short tributaries to Deep Creek Reservoir. The dam creating the reservoir has no fish passage facility, isolating the metapopulation. The reservoir is small, and roads surround 75 percent of it. Resident and forced adfluvial (reservoir dwelling) life history patterns likely exist. Risk associated with temporal variability is moderate because environmental disturbances will likely affect each of the closely located populations and poor stream habitat quality and quantity will exacerbate impacts. Risks associated with the population size are moderate due to the limited available habitat. Risks associated with growth and survival are rated high due to poor habitat quality. Each main tributary to the reservoir is rated nonfunctional or functional at risk. These impacts are primarily cause by overgrazing. These small populations are connected but the isolation parameter was rated moderate risk because of intense habitat disruption. The risk associated with the replication parameter is extreme. These are a few small populations, each with high risks of extirpation. The risk associated with synchrony is high due to the close proximity of the populations and documented habitat impacts.

There is at least a high risk this metapopulation will be extirpated over the short term (within approximately 15 years) due to limited habitat quantity and quality and brook trout presence.

DANIELS RESERVOIR BONNEVILLE CUTTHROAT TROUT METAPOPULATION

The Daniels Reservoir Bonneville cutthroat trout metapopulation has a high risk of extinction over the long term (100 years). This is a metapopulation with similarities to the Deep Creek Metapopulation; isolated by an impassable dam and restricted to low quantity and low quality habitat. It is likely resident and forced adfluvial life history patterns exist. Risk associated with temporal variability is moderate because environmental disturbances will likely affect each of the closely located populations and poor stream habitat quality and quantity will exacerbate impacts. Risks associated with the population size are moderate due to the limited available habitat. Risks associated with growth and survival are rated high due to poor habitat quality. All but 1 main tributary to the reservoir are rated functional at risk. One of the main tributaries is properly functioning. These impacts are primarily caused by overgrazing. These small populations are connected but the isolation parameter was rated moderate risk because of habitat disruption. The risk associated with the replication parameter is high. These are a few small populations, each with high risks of extirpation. The risk associated with synchrony is high due to the close proximity of the populations and documented habitat impacts.

In summary, this metapopulation has similar isolation and habitat problems as the Deep Creek metapopulation. A bright point is brook trout have not been documented upstream of Daniels Dam. Because of this, this metapopulation may be sustained over the short term (10 years), but has a high likelihood of extirpation under existing conditions over the long term (100 years) due to habitat impacts and isolation. 2001 fish distribution surveys could not detect Bonneville cutthroat trout in this area.

ANGUS CREEK LEATHERSIDE CHUB POPULATION

The Angus Creek leatherside chub population was evaluated using the same method as the cutthroat trout metapopulations above. Although this method was developed for salmonids, some of the evaluation parameters provide a good forum to discuss the potential of sustaining the leatherside chub population over time.

There is moderate risk associated with temporal variability and growth and survival in this population due to low habitat complexity and quality. Angus Creek has been rated as functioning at risk. High risk is associated with population size because of the small number of individuals typically found in local populations. The isolation parameter was rated unknown because future surveys are required to determine other populations in the area. The risk associated with replication (subbasin-wide) was extreme because there is only a single known population in this area at this time. The risk associated with synchrony (subbasin-wide) was rated as high due to the localized nature of this one population and its simplified habitat.

Although the extinction risk consideration model developed by Rieman, *et al*, (1993) was developed for salmonids, there are some conclusions we can provide from analyzing this population. Leatherside chub are likely restricted to the lower reach of Angus Creek. The stream is functioning at risk due to grazing, road, and mining impacts. Leatherside chub are dependent on habitat complexity that may include instream wood and overhanging vegetation. They utilize pools primarily off-channel slow water habitat types such as alcoves and oxbow cut offs (Belk, 2001). These stream features occur in less frequency in streams functioning at risk. Lack or absence of critical habitat components may lead to deterministic extinction (Rieman, *et al*, 1993). The collection of leatherside chub in Angus Creek was vouchered by Idaho State University at least a decade ago. The current status of the species in Angus Creek is unknown. If the Angus Creek leatherside chub population still exists, it is at a high risk of extinction primarily due to habitat quality.

TINCUP CREEK LEATHERSIDE CHUB POPULATION

Although it was developed to evaluate extinction risks for salmonids, the consideration of extinction risks process (Rieman, *et al*, 1993) was used for the Tincup leatherside chub population as a forum to discuss population viability. The risk associated with temporal variability was rated low due to moderate quality habitat in lower Tincup Creek and the short-lived, predictable environmental disturbances (snowmelt) that occur there. The risk associated with population size was rated as high due to low numbers of individuals observed. The risk associated with survival and growth was rated as moderate due to silt in stream substrate, highway related impacts, and stream bank cutting documented during the 2000 fish distribution survey. In addition, a recent PFC assessment of Tincup Creek rated it as functioning at a moderate risk. The degree of population isolation is unknown. There is a need for further chub distribution surveys. Based on our current data, there is only a single population or several very small populations, making the risk associated with replication within the subbasin extreme. The risk associated with synchrony (throughout subbasin) is low because the frequency of large-scale catastrophic events is low in the lower watershed where the species occurs.

Although the extinction risk consideration model developed by Rieman, *et al*, (1993) was developed for salmonids, there are some conclusions we can provide from analyzing this population. Based upon our knowledge of the species and their habitat preferences, leatherside chub are likely restricted to the lower reaches of Tincup Creek. The stream is functioning at moderate risk. Leatherside chub are dependent on habitat complexity that may include instream wood and overhanging vegetation. They utilize pools primarily off-channel slow water habitat types such as alcoves and oxbow cut offs

(Belk, 2001). The 2000 fish distribution survey noted a lack of large wood in the stream, even in reaches with conifers dominating the riparian area. Fine sediment deposition on the stream substrate was common in the lower reach. Lack or absence of critical habitat components may lead to deterministic extinction (Rieman, *et al*, 1993). The Tincup Creek leatherside chub population may have a moderate risk of extinction due to moderate habitat quality.

Evaluation Of Species Metapopulation Threats

Aggregated threats to each evaluation metapopulation were determined. Blanks were left where the parameter was not applicable. For some parameters, data were available. For others, a call was made based on the general knowledge of land managers located at the District and from knowledge gained from stream survey observations. The seven threats discussed were grazing, roads/trails, off trail motorized vehicle use, mining, vegetation management (logging and prescribed fire), recreation facilities, and non-native fish.

Table 128. Aggregated Threats to Metapopulations from Forest Management.

Fish Species	Metapopulation Name	Grazing	Roads/ Trails	Off Trail Motorized Vehicle Use	Mining	Vegetation Management	Recreation Facilities	Non-native Fish
Yellowstone cutthroat	Palisades/Salt	X	X	X	X	X	X	X
Yellowstone cutthroat	Grays Lake	X	X	X	X	X		X
Yellowstone cutthroat	Blackfoot	X	X	X	X	X	X	X
Yellowstone cutthroat	Portneuf/American Falls	X	X	X	X	X	X	X
Bonneville cutthroat	Bear River East	X	X	X	X	X	X	X
Bonneville cutthroat	Bear River West	X	X	X		X	X	X
Bonneville cutthroat	Deep Creek Reservoir	X	X				X	X
Bonneville cutthroat	Daniels Reservoir	X	X		X	X		
Leatherside chub	Angus Creek Population	X	X	X	X			X
Leatherside chub	Tincup Creek Population	X	X	X	X		X	X

GRAZING

Livestock grazing occurs throughout each cutthroat trout metapopulation and in each leatherside chub population watershed. In most areas, livestock grazing presents a moderate aggregated threat to the metapopulations. This indirectly affects the temporal variability, population size, and growth/survival metapopulation risk factors defined above. Grazing-related impacts to riparian and aquatic habitat have been documented during stream surveys and were reported by district specialists. The Bear River West Bonneville cutthroat trout metapopulation is experiencing a high threat relating to grazing. The Forest's highest concentration of nonfunctional streams occurs in the Malad Drainage. Due to their limited available habitat, Bonneville cutthroat trout populations in Deep Creek and Daniels Reservoir metapopulations are experiencing a high threat from grazing impacts. The Angus and Tincup leatherside chub populations have a high threat relating to grazing due to their habitat

requirements. They require low elevation, low gradient pool and off-channel habitat. These areas are often the most susceptible to grazing impacts.

ROAD/TRAILS

A moderate threat to fish and their habitat from roads and trails is common throughout the planning area. Roads and/or trails have frequently been constructed parallel to streams and often serve as sources of sediment to the stream. Road crossings may be barriers to upstream-migrating fish. In addition, these roads and trails affect riparian vegetation, potentially affecting stream temperature, frequency of large instream wood, and available floodplain (stream energy dissipation). These threats are considered higher in the Daniels Reservoir Bonneville cutthroat trout metapopulation and the leatherside chub populations because roads and trails parallel most of the limited stream habitat available. Threats to populations associated with roads and trails indirectly affect the temporal variability, population size, isolation, and growth/survival metapopulation risk factors defined above.

Watersheds were considered to have high road densities if they had greater than 1.8 miles of road per square mile (USDA Forest Service and USDI Bureau of Land Management, 1997). High road densities are more likely to affect watershed drainage patterns and deliver sediment to streams. The table below shows the watersheds with high road density, the evaluation species in the watershed, their status, and their associated metapopulation.

Table 129. Watersheds with High Road Densities

Watershed(s)	Species at Risk	Population Status	Associated Metapopulation
Mabey Creek	Yellowstone Cutthroat Trout	Depressed	Blackfoot
Diamond Creek	Yellowstone Cutthroat Trout	Depressed	Blackfoot
Slug Creek	Yellowstone Cutthroat Trout	Extirpated	Blackfoot
Crow Creek	Yellowstone Cutthroat Trout	Strong	Palisades/Salt
Montpelier Creek	Bonneville Cutthroat Trout	Depressed	Bear River East
Eightmile Creek	Bonneville Cutthroat Trout	Depressed	Bear River East
Pearl Creek	Bonneville Cutthroat Trout	Depressed	Bear River East
Skinner/Coop Creeks	Bonneville Cutthroat Trout	Depressed	Bear River East
North Creek	Bonneville Cutthroat Trout	Depressed	Bear River East
Emigration Creek	Bonneville Cutthroat Trout	Strong	Bear River East
Paris Creek	Bonneville Cutthroat Trout	Depressed	Bear River East
Mink Creek	Yellowstone Cutthroat Trout	Depressed	Portneuf/American Falls

OFF TRAIL MOTORIZED VEHICLE USE

Based on areas currently open to cross country travel, moderate threat from Off Trail Motorized Vehicle use occurs in the Palisades/Salt, Grays Lake, and Blackfoot Yellowstone cutthroat trout metapopulations, the Bear River East and Bear River West Bonneville cutthroat trout metapopulations, and the Angus and Tincup leatherside chub populations. During recent stream surveys, off trail motorized vehicle impacts to aquatic and riparian habitat has been documented in the Palisades/Salt and Blackfoot Yellowstone cutthroat trout metapopulations and the Bear River East and West Bonneville cutthroat trout metapopulations. Threats associated with off trail motorized vehicle use indirectly affect the temporal variability, population size, and growth/survival metapopulation risk factors defined above.

MINING

Large-scale developed mines pose a moderate threat to the Palisades/Salt and Blackfoot Yellowstone cutthroat trout metapopulations and a high threat to the Angus Creek leatherside chub population. There are low threats posed from mining in the Grays Lake and Portneuf/American Falls Yellowstone cutthroat trout metapopulations, Bear River East and Daniels Reservoir Bonneville cutthroat trout metapopulations, and the Tincup Creek leatherside chub population. Threats associated with mining indirectly influence the temporal variability, population size, and growth/survival metapopulation risk factors defined above.

VEGETATION MANAGEMENT

Vegetation management activities pose a low threat to all three evaluation species in the planning area. This includes timber harvest and prescribed burns. INFISH standards and guidelines prohibit vegetation management projects in riparian areas if those projects do not benefit aquatic and riparian dependent species habitat. Threats associated with vegetation management indirectly influence the temporal variability, population size, and growth/survival metapopulation risk factors defined above.

RECREATIONAL FACILITIES

Recreational facilities (developed and dispersed camping areas) have a low threat to the evaluation species in the planning area. They occur throughout the Forest and are often located near streams and rivers. However, their potential impacts (trampled streambanks, reduced riparian vegetation, increased fishing pressure, reduced instream and riparian large wood) are over a short stream distance. Threats associated with recreation facilities use indirectly influence the temporal variability, population size, and growth/survival metapopulation risk factors defined above.

NON-NATIVE FISH

The non-native fish considered in this evaluation as threats to the Yellowstone cutthroat trout, Bonneville cutthroat trout, and leatherside chub populations are brook trout, rainbow trout, and brown trout. Brook trout compete for habitat with native cutthroat trout and prey upon them. Rainbow trout can interbreed with native cutthroat trout, affecting their genetics. They also compete with cutthroat trout for habitat. Brown trout are aggressive predators, preying upon cutthroat trout and leatherside chub when they occur in the same stream segment.

The presence of non-native fish poses a moderate threat to the Palisades/Salt and Grays Lake Yellowstone cutthroat trout metapopulations. Brook trout occur in the upper tributaries of the Salt

River and tributaries of Grays Lake and brown trout occur throughout the Salt River. Rainbow trout (a source of introgression) have been reported by Idaho Department of Fish & Game in tributaries of the Salt River (Jacknife and Crow Creeks) in low densities.

The presence of non-native fish poses a high threat to Blackfoot and Portneuf/American Falls Yellowstone cutthroat trout metapopulations, the Bear River East, Bear River West, and Deep Creek Reservoir Bonneville cutthroat trout metapopulations, and the Tincup Creek leatherside chub population. Brook trout are common throughout these cutthroat trout metapopulations, competing with native cutthroat trout for habitat and preying upon young cutthroat trout. Strong populations of brook trout occur in sixteen of the twenty-four inhabitable 6th Code HUC's in the Bear River East Bonneville cutthroat trout metapopulation area. Strong brook trout populations are also in key fisheries in the Portneuf/American Falls Yellowstone cutthroat trout metapopulation, including Mink and Pebble Creeks. Brook trout presence in the Deep Creek Reservoir Bonneville cutthroat trout metapopulation area is a grave concern, considering the lack of available habitat. Rainbow trout occur in high densities in the Pebble, Toponce, and Mink Creek Drainages in the Portneuf/American Falls Yellowstone cutthroat trout metapopulations. They occur in the upper Blackfoot River in low but increasing densities.

Rainbow trout occur in high densities in the Georgetown and Bloomington Creek Drainages within the Bear River East Metapopulation. Cutthroat trout have been extirpated from Georgetown Canyon and are near extinction in Bloomington Creek. Rainbow trout stocking still occurs in some cutthroat trout metapopulation areas. An effort has been made by Idaho Department of Fish & Game to sterilize the majority of the rainbow trout stocked in these waters. Although this mostly addresses the introgression issue, it does not address rainbow trout competition with cutthroat trout for habitat. Discussions continue regarding the appropriateness of rainbow trout stocking in a struggling (high risk of extinction) Bonneville cutthroat trout metapopulation area.

There is a negative response (avoidance) of leatherside chub to the presence of brown trout, a predator (Belk, 2001). Leatherside chub and brown trout both occur in lower Tincup Creek. Threats associated with the presence of non-native fish indirectly affect the population size, growth/survival, and replication metapopulation risk factors defined above.

Evaluation of Revised Forest Plan Alternatives by Threat

For a discussion regarding the way each Revised Forest Plan alternative addresses threats upon the long-term viability of evaluation species, please refer to the FEIS, Chapter 4, Issue 6: Riparian/Watershed Areas and Aquatic Biota.

CONSERVATION APPROACHES

Under existing conditions, concern over the long-term persistence of Yellowstone cutthroat trout on the Forest is moderate, concern for Bonneville cutthroat trout on the Forest is high, and concern for leatherside chub is moderate. The concern for the long-term persistence of Yellowstone cutthroat trout in the planning area stems from the existence of rainbow trout in the Portneuf/American Falls and Blackfoot Metapopulations, potentially affecting the southern extent of the species' range on the Forest through introgression and competition for habitat. In addition, brook trout occur in strong populations within some streams in the same metapopulations. Non-native brook trout also compete for habitat with native cutthroat trout and have been documented in the Palisades/Salt, Blackfoot, and Portneuf/American Falls Metapopulations. Brook trout have the potential to completely displace

populations of cutthroat trout, particularly when habitat is degraded or the stream is disconnected. Some degree of management-related habitat impacts have been documented in most Yellowstone cutthroat trout streams surveyed during the 1999-2002 field seasons.

The high concern for the continued existence of Bonneville cutthroat trout on the Forest stems from the existence of non-native rainbow and brook trout in the planning area, tributary disconnect from irrigation diversions on private land, and documented habitat impacts. Although we can address management-related impacts to Bonneville cutthroat trout habitat through the Forest Plan Revision, there is a need to work cooperatively with other agencies and willing private landowners to address threats to the populations throughout their watersheds. As an example, the high risk of extinction associated with the Deep Creek Reservoir and Daniels Reservoir Bonneville cutthroat trout metapopulations will not likely be reduced by management actions on the Forest alone. Addressing fish passage at the dams and non-native fish populations are also required. In another example, we cannot expect the population of Bonneville cutthroat trout in Preuss Creek to perpetuate over the long term without addressing the lack of connectivity between the stream and the Thomas Fork River. To meet our requirements to maintain viable native fish populations in habitats distributed throughout their range on National Forest System lands, Forest Service Biologists must cooperatively work with other agencies and willing private landowners to actively address connectivity concerns and the threat of invading non-native fish species. This direction is included in the Forest Plan revision.

The moderate concern for the continued existence of the Tincup Creek leatherside chub population and the high concern for the continued existence of the Angus Creek leatherside chub are based on current knowledge of their habitat requirements and biology and our lack of knowledge of their distribution and population densities. There are also concerns generated from documented habitat impacts within the range of known populations.

Prior to the signing of the Record of Decision that will accompany this FEIS, conservation approaches to protect and restore Yellowstone and Bonneville cutthroat trout and leatherside chub could be found in existing agreements and the Inland Native Fish Strategy (INFISH) (USDA Forest Service, 1995). Maintaining consistency with elements pertaining to the Caribou part of the Caribou-Targhee National Forest within these sources of direction and supplementing this direction with site-specific direction (where needed) will better ensure the protection and restoration of these evaluation species.

Conservation goals and objectives have been developed for Yellowstone cutthroat trout in the Memorandum of Agreement for Conservation and Management of Yellowstone Cutthroat Trout among Montana, Idaho, Wyoming, Nevada, Utah, US Forest Service, Yellowstone National Park, and Grand Teton National Park (Anonymous, 2000). Although these are general and rather broadly worded, they provide some conservation direction. Direction pertaining to the Caribou half of the Caribou-Targhee National Forest has been incorporated into Forest Plan Direction.

The Range-Wide Conservation Agreement and Strategy for Bonneville Cutthroat Trout (Lentsch, *et al*, 2000) provides conservation approaches for Bonneville cutthroat trout. Key elements of this document should be incorporated into the Forest Plan Revision to ensure implementation. These measures will also benefit Yellowstone cutthroat trout if implemented in their range. Direction pertaining to the Caribou half of the Caribou-Targhee National Forest has been incorporated into Forest Plan Direction. INFISH was developed by USDA Forest Service as an interim direction to protect habitat and populations of resident native fish. Its management direction, riparian goals, riparian management objectives, establishment of riparian habitat conservation areas, and standards and guidelines are effective in the conservation of resident fish and their habitat. The application of INFISH direction that is applicable to the Forest will benefit Yellowstone cutthroat trout, Bonneville

cutthroat trout, and leatherside chub if applied to projects in their watersheds. The direction of INFISH that applies to the Caribou half of the Caribou-Targhee National Forest has been incorporated in the Forest Plan Revision.

The riparian grazing protocol was developed and included in the Forest Plan Revision to address the threat of overgrazing by livestock upon riparian and aquatic habitat. Its implementation will likely maintain quality aquatic and riparian habitat and help to restore livestock-impacted habitat. The goal of the riparian grazing protocol is to maintain or trend towards functioning riparian and aquatic habitat considering the inherent characteristics of the riparian areas and stream channels and their existing conditions and capabilities. Bank disturbance, soil disturbance, grass/sedge stubble height, woody vegetation utilization, and key vegetation utilization are parameters used to gage livestock use and trigger their movement when use is exceeded. Allowable disturbance levels are tailored to specific stream-type groups depending on how similar the riparian area and stream channel are to desired conditions and the ability of the stream channel to resist impacts or recover from impacts. This channel type-specific direction has been missing from previous Forest plan direction on the Caribou and is expected to benefit Yellowstone cutthroat trout, Bonneville cutthroat trout, and leatherside chub when implemented.

There is currently no conservation strategy or agreement for leatherside chub. Little is known about the biology and habitat requirements of the species. What is known is summarized above in Native Fish Species Descriptions. Generally, the species appears to prefer cool, clear water with low frequencies of fine sediment and complex aquatic habitat with overhanging vegetation, pocket pools and margin/off channel slow water. Although much of the low elevation habitat where the species have been observed has been downstream of the Forest, Forest management actions that affect water quality, create sedimentation, and decrease channel complexity, have the potential to affect the viability of leatherside chub populations. Direction in the Forest Plan revision maintains and improves water quality and channel complexity.

MONITORING

1. Perform distribution surveys for Bonneville cutthroat trout, Yellowstone cutthroat trout, and leatherside chub throughout the Forest.

2. Perform genetic analysis of cutthroat trout to determine degree of introgression. Collect tissue for genetic analysis in association with fish distribution surveys.

3. Perform aquatic and riparian habitat surveys to determine habitat condition and monitor trends. Utilize R1/R4 methodology for physical surveys of general riparian and instream conditions. Use other methodologies (embeddedness, core samples, riparian greenline, etc.) as needed.

4. Re-survey streams at a minimum of every 10 years to determine trends, when appropriate. Re-survey of fish distribution and R1/R4 survey steams would be especially valuable to document trends in introgression, non-native species invasions, and habitat quality/quantity.

Supplemental Information

Definitions

FISH DISTRIBUTION MAPS

Fish distribution maps for the analysis species can be found in the Fisheries Section of Chapter 3 of the Forest Plan Revision FEIS. The following excerpts from the Inland West Water Initiative document defines the status determination found in the legend of the distribution maps.

INLAND WEST WATER INITIATIVE

Biotic Information/Imperiled Fishes

The ultimate goal of this module is to consistently evaluate the status and distribution of fish on NFS lands in the Inland West. Final objectives are to evaluate current condition of key fish species and species assemblages in order to help assess aquatic ecosystem integrity, to identify crucial subbasins for conservation of imperiled fish species and communities, and to show linkages between fish status-distribution and landscape features. The focus will be on imperiled and selected introduced fishes for now. Fish species assemblages (all fish taxa per subwatersheds) must be assessed later.

Regions will list TES fish species by icthyological subregion (Maxwell et al. 1995). Forest fisheries biologists can work with State/Federal biologists to classify the status of naturally-reproducing populations. If populations are supported solely by hatchery-reared fish, naturally-spawning fish will be rated Absent. Judge status from population factors (life-history forms, abundance status and trends), not from landscape factors or the presence of other species (e.g., habitat condition or introduced fishes). The overall status of each species will be **PRESENT**, **ABSENT**, or **UNKNOWN** as detailed below.

Present (Spawning And Rearing Habitat)

1. **SPAWNING AND REARING HABITAT**

   a. **PRESENT STRONG**: Subwatershed has ALL of the following conditions:

   -All major life-histories (e.g., stream resident or migratory) that historically occurred in the subwatershed are still present; AND

   -Numbers are stable or increasing, and the local population is likely to be half or more of its historic size or density; AND

   -The population or metapopulation in the subwatershed, or in the larger region of which it is a part, likely is at least 5,000 individuals or 500 adults.

***NOTE*: Number of individuals and/or adults may need revision based on population characteristics of species not in interior Columbia River basin (e.g., Lahontan cutthroat trout).**

b. **PRESENT DEPRESSED**: Subwatershed has ONE OR MORE of the following conditions:

-A major life-history component (e.g., migratory or resident form of cutthroat trout) has been eliminated; OR

-Numbers are declining, or species occurs in less than half of its historic habitat, or numbers are less than half of historic; OR

***NOTE*: If historic information is unavailable, densities are less than half of comparable undegraded streams where the species is well-distributed. If numbers are strong, but the population is seriously hybridized with introduced fish, the pure native population is considered to be depressed.**

-The population or metapopulation in the subwatershed, or in the larger region of which it is a part, is less than 5,000 individuals or 500 adults (fish in the subwatershed are isolated by distance or natural barriers from other populations that would collectively exceed these numbers).

***NOTE:* Number of individuals and/or adults may need revision based on population characteristics of species not in interior Columbia River basin (e.g., Lahontan cutthroat trout).**

2. **PRESENT MIGRATION CORRIDOR**: Migration corridors do not support spawning or rearing, and are solely routes or staging/wintering areas for migrating fish. Areas that support transient or subadult fish (e.g., mainstem rivers or lakes) are migration corridors. Pre-migration rearing areas are not.

3. **PRESENT UNKNOWN**: The species is present, but there is no reliable information to determine current status.

Absent

The subwatershed is within the natural range of the species, but the species is not present. It is extinct or never occupied the subwatershed.

Unknown

No information exists about presence or absence of the species.

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Yellowstone And Bonneville Cutthroat Trout Biological Evaluation

YELLOWSTONE and BONNEVILLE CUTTHROAT TROUT
BIOLOGICAL EVALUATION
FOR THE
PREFERRED ALTERNATIVE
OF THE
Caribou Forest Plan Revision
Westside, Soda Springs, and Montpelier Ranger Districts
CARIBOU-TARGHEE NATIONAL FOREST

Summary of Conclusion of Effects for the Proposed Action
upon Yellowstone and Bonneville Cutthroat Trout

Species	No Impact	May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing Or Loss Of Viability To The Population Or Species	Will Impact Individuals Or Habitat With A Consequence That The Action May Contribute To A Trend Towards Federal Listing Or Cause A Loss of Viability To The Population Or Species	Beneficial Impact
Yellowstone Cutthroat (*Oncorhynchus clarki bouvieri*)		X		
Bonneville cutthroat trout (*Oncorhynchus clarki utah*)		X		

Prepared/Approved by: _____ Date:___1 September 2002_____
James Capurso
Forest Fisheries Biologist
Caribou-Targhee National Forest

Reviewed by: _____ Date:_____
Jerry B. Reese
Forest Supervisor
Caribou-Targhee National Forest

Caribou Forest Plan Revision

The Caribou-Targhee National Forest is preparing an Environmental Impact Statement in conjunction with a revision of the Land and Resource Management Plan for the Caribou portion of the Caribou-Targhee National Forest. This Revised Forest Plan will do the following:

- Establish multiple-use goals and objectives [36 CFR 219.11];
- Establish forest-wide management requirements (standards and guidelines);
- Establish management areas and management area direction through the application of management prescriptions;
- Identify lands not suited for timber production [36 CFR 219.3];
- Establish monitoring and evaluation requirements;
- Recommend areas for official designation of Wilderness

The authorization of project-level activities on the Forest occurs through separate project, or site-specific, decision-making. Project-level decisions must comply with National Environmental Policy Act procedures and must include a determination that the project is consistent with the Forest Plan. The proposed action does not address specific project actions but will set the Forest-wide direction that frames those actions.

SPECIES: Yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri*)

BACKGROUND

U.S. Fish and Wildlife Service was petitioned to list Yellowstone cutthroat trout in August 1998. In February 2001, the agency finalized their finding on the petition to list Yellowstone cutthroat trout. They indicated the petition did not provide substantial information to indicate listing was warranted. Yellowstone cutthroat trout currently retains its status as a Sensitive species on the Regional Forester's Sensitive Species List.

The Caribou-Targhee National Forest is currently addressing the needs of Yellowstone cutthroat trout by maintaining consistency with their Forest Plans. Within the range of Yellowstone cutthroat trout, Forest activities are guided by the Targhee Forest Plan Revision (Targhee Forest) and the Caribou Forest Plan as amended by INFISH (Caribou Forest).

Intensive surveys for Yellowstone cutthroat trout distribution have been conducted on the Caribou-Targhee National Forest since 1997. The subspecies appear to be distributed throughout most of the Forest, but populations in various streams or stream segments vary in strength. While some populations are threatened by competition and hybridizing with nonnative species, others appear to be thriving in isolated streams or stream reaches. Some populations have been replaced by introduced nonnative fish species. Genetic interactions between existing Yellowstone cutthroat trout populations have diminished from historic conditions because of a decrease in connectivity. The forest continues to better define fish distribution through ongoing surveys.

BIOLOGY

Within Idaho, the original cutthroat trout native to the Snake River system may have been the Yellowstone cutthroat trout. It is believed they were replaced by rainbow trout and other subspecies of cutthroat trout in drainages downstream of Shoshone Falls. Shoshone Falls isolated cutthroat trout from contact with rainbow trout and the Yellowstone subspecies remains the native trout in the upper Snake River basin. It is also believed cutthroat trout may have been native to the Sinks drainages (Dubois District), but further research is needed. Yellowstone cutthroat trout are adapted to cold water. Water temperatures between 4.5 and 15.5 C appear to be optimum for the subspecies. This subspecies migrates for spawning when threshold water temperatures approach 5 C (optimum 10 c) and streamflows subside from spring peaks. Streams selected for spawning are commonly low gradient (up to 3 percent), perennial streams, with groundwater and snow fed water sources. Use of intermittent streams for spawning is not well documented, but has been noted in some intermittent tributaries to Yellowstone Lake. Spawning occurs wherever optimum size gravel (12-85 mm in diameter) and optimum water temperatures (5.5-15.5 C) are found. Depending on variations in growth, spawning populations are comprised of individuals age thee and older (primarily ages 4-7). Juveniles congregate in shallow, slow-moving parts of the stream.

DISTRIBUTION AND HABITAT CONDITION

Range-Wide Species Status

Many Yellowstone cutthroat trout populations currently exist as localized remnants of original subpopulations with little or no connectivity. Others owe their existence to hatchery programs. Current estimates indicate that Yellowstone cutthroat trout occupy 41 percent of historic riverine environments throughout the historic range. In addition, there are about 450 lake environments, within the historic range that currently support Yellowstone cutthroat trout. The number of lake environments currently supporting Yellowstone cutthroat populations represents a 380 percent increase over historic levels. Additionally, there are now numerous riverine and lake populations in existence outside of the historic range resulting from extensive stocking.

Caution should be applied before developing conclusions relative to overall Yellowstone cutthroat trout status. Many populations have not received sufficient testing for a definitive assessment of genetic status. Based on the findings in Montana, genetic contamination is probable for most cutthroat trout populations that have been exposed to rainbow trout or cutthroat of hatchery origin.

Fragmentation and population isolation has occurred as a result of stream dewatering, replacement by introduced nonnative fish, hybridization, substantial environmental change, and over-harvest. Many populations owe their current existence to passage barriers (natural or human caused) that have effectively controlled access of both contaminating and competitive species that are present in nearly all areas of the current range. At the same time these populations find themselves restricted to relatively small patches of habitat that have, in many cases, been degraded by human activity. Viability concerns increase with decreasing patch size, declining habitat quality and complexity, and increased isolation from source populations. Yellowstone cutthroat trout are a Regional Forester Sensitive species.

Forest-Wide Species Status

The Caribou half of the Caribou-Targhee National Forest comprises approximately 1/20 of the surface area of the historic range of Yellowstone cutthroat trout. A Yellowstone cutthroat trout distribution map was updated on December 2001 for the Forest. Of the fifty-one 6th code HUC's with Yellowstone cutthroat trout data on the Caribou half of the Forest, thirty-four HUC's had populations that were

considered strong, fourteen had populations that were considered depressed, and three had populations where we expected them to be present but they were absent.

It appears that Yellowstone cutthroat trout are well distributed throughout the Caribou portion of the Forest within the Snake River Basin. Perhaps one of the most significant threats to the species within the Forest is the introduction of nonnative fish. As an example, rainbow trout are stocked in Blackfoot Reservoir. Historically, rainbow trout with the ability to reproduce were stocked there. Today, the majority of the stocked rainbow trout are sterile. The presence of naturally reproducing rainbow trout in the headwaters of the Blackfoot River, including Diamond Creek, is on the increase (Scully 2001). Rainbow trout interbreed with native cutthroat trout affecting their genetic purity. They also compete for habitat with native fish.

In the following section titled Evaluation of Species Metapopulation Risk Factors, the Yellowstone cutthroat trout metapopulations that occur on the Forest are rated per risk of extinction.

Range-Wide Habitat Condition

Aquatic environments inhabited with Yellowstone cutthroat trout on National Forest lands tend to be in better condition and support more populations. Present estimates indicate that 63% of historic riverine habitats on National Forests still support populations of Yellowstone cutthroat trout. Most of the currently occupied lake habitat is found on National Forest administered lands.

Forest-Wide Habitat Condition

Composite ecological ratings for the 6 (4th HUC) subbasins in the Caribou portion of the Forest within the range of Yellowstone cutthroat trout estimated that 4 were low, 1 was moderate, and 1 was high in overall ecological condition. The Interior Columbia River Basin Report (USDA Forest Service and USDI BLM, 2000) and Forest fish distribution survey reports (2000-2001) documented impacts to Yellowstone cutthroat trout habitat that included agriculture, urban expansion, timber harvest, livestock grazing, road building/maintenance/use, dispersed camping, off-road motor vehicle use, and mining. In some areas, these activities have affected aquatic and riparian habitat through dewatering, sedimentation, nutrification, stream bank erosion, channel widening/shallowing, isolating populations, and direct trampling of fish. In some areas, these activities have decreased riparian vegetation, decreasing available stream shade and nutrients, stream bank stability, and sources for large instream wood. These impacts affect the habitat requirements described in the Native Fish Species Descriptions section above, decreasing population productivity and, potentially, long term population viability. For additional information on Forest-wide habitat condition, please refer to the discussion in the Inland West Watershed Initiative section of Riparian Areas, Wetlands, and Aquatic Ecosystems. Additional information on geomorphic integrity, water quality integrity, and watershed vulnerability can be found in the watershed section of FEIS.

SPECIES: Bonneville cutthroat trout (*Oncorhynchus clarki utah*)

BACKGROUND

U.S. Fish and Wildlife Service received a petition to list Bonneville cutthroat trout as Threatened in February 1998. The agency responded the petition presented substantial information indicating that listing this species may be warranted. They initiated a status review of the subspecies. On 9 October 2001, US Fish and Wildlife Service found the Bonneville cutthroat trout to not be warranted for listing. The Bonneville cutthroat trout currently retains its status as a Sensitive species listed on the Regional

Foresters Sensitive Species list. The Forest informally agreed with U.S. Fish and Wildlife Service to analyze the effects of projects upon this species in the biological assessment as if the species were proposed for listing.

If the Bonneville cutthroat trout are proposed for listing prior to the implementation of this project, the Caribou-Targhee National Forest should request, in writing, that the U.S. Fish and Wildlife Service consider this biological assessment and concurrence as acceptable for the proposed species. If there have been no significant changes in the planned action and no new information that should be included in the biological assessment, the U.S. Fish and Wildlife Service will concur with the request.

The Caribou-Targhee National Forest is currently addressing the needs of Bonneville cutthroat trout by maintaining consistency with their Forest Plans. Within the range of the subspecies, Forest activities are guided by the Caribou Forest Plan as amended by INFISH (Caribou Forest).

Intensive surveys for Bonneville cutthroat trout distribution have been conducted on the Caribou-Targhee National Forest since 1998. The subspecies appear to be distributed throughout the southern part of the Forest, but populations in various streams or stream segments vary in strength. While some populations are threatened by competition and interbreeding with nonnative, introduced fish species, others appear to be thriving in isolated streams or stream reaches. Apparently, some populations have been replaced by nonnative, introduced fish species. Genetic interactions between existing Bonneville cutthroat trout populations have diminished from historic conditions because of a decrease in connectivity. Distribution surveys continue.

BIOLOGY

Only one trout subspecies, the Bonneville cutthroat trout, is endemic to the Bonneville Basin. While some stream populations survive, this subspecies evolved primarily in a lake environment. Upon the desiccation of Lake Bonneville, trout were primarily restricted to perennial tributaries and connected watersheds and subbasins. Only Bear, Utah, and Panguitch Lakes retained lacustrine populations. These historic lake populations have been extirpated except in Bear Lake. During the last 150 years, the Bonneville cutthroat trout populations have been significantly reduced through anthropogenic activities, including habitat degradation, over utilization, and the introduction of non-native fish species. They spawn in the spring from April to June. Like other cutthroat, they require a clean, gravel substrate in cool, well-oxygenated water for spawning. They reach sexual maturity at 2-3 years of age. They eat mainly aquatic insects and terrestrial insects that fall into the water from overhanging vegetation. Larger Bonneville cutthroat trout feed on small fish.

DISTRIBUTION AND HABITAT CONDITION

Range-Wide Species Status

Current information on Bonneville cutthroat trout indicates that the range-wide status of this species has been improving over the last 20-year period. There are currently an estimated 163 tentative populations inhabiting over 1365 miles of lotic habitats and 70,088 surface acres of lentic habitats. The largest single population occurs in Bear Lake with an estimated population size of over 30,000 individuals. Of the populations being managed for conservation, 62 have been identified as core or reintroduced populations and two have been designated introgressed populations (Lentsch, *et al*, 2000). Nonnative fish such as brook trout, rainbow trout, and brown trout have been introduced to streams throughout the range of Bonneville cutthroat trout. Several populations have been completely displaced with brook trout. The Regional Forester of the Intermountain Region has designated Bonneville cutthroat trout as Sensitive.

Forest-Wide Species Status

The Caribou half of the Caribou-Targhee National Forest comprises approximately 1/30 of the surface area of the historic range of Bonneville cutthroat trout. A Bonneville cutthroat trout distribution map was updated on November 2001 for the Caribou portion of the Caribou-Targhee National Forest. Of the thirty-five 6th code HUC's expected to support Bonneville cutthroat trout populations, six HUC's had populations that were considered strong,[6] fifteen had populations that were considered depressed, and fourteen included watersheds where populations were expected but were absent.

Range-Wide Habitat Condition

Researchers speculate that Bonneville cutthroat trout historically inhabited all streams in the Bonneville Basin with suitable habitat. However, in the last 100 years, human land use and stream alterations have restricted their range through loss of connectivity between populations and loss and degradation of suitable habitat.

Habitat degradation within the range of Bonneville cutthroat trout has fragmented and reduced the complexity of aquatic habitat. Reservoirs and irrigation diversions have eliminated migratory corridors throughout their range, decreasing connectivity. Human activities such as water development, agricultural activities, energy development, mining, timber harvest, grazing, over fishing, and nonnative species introductions have directly impacted Bonneville cutthroat trout populations and habitat. Lentsch, *et al*, (2000) have identified water development, livestock grazing, timber harvest, road construction, energy development, and mining activities as primary causes of Bonneville cutthroat trout habitat loss.

Forest-Wide Habitat Condition

The Caribou-Targhee Forest Fish Distribution Crew has sampled all Bonneville cutthroat trout streams on the Forest between 2000 and 2001. Habitat has been impacted by land management activities in all of these streams to various degrees. The primary impacts documented were from grazing, dewatering (irrigation), roads and trails (passage barriers, riparian vegetation, and sedimentation), and recreational vehicle use. In some areas, these activities have affected aquatic and riparian habitat through dewatering, sedimentation, nutrification, stream bank erosion, channel widening/shallowing, isolating populations, and direct trampling of fish. In some areas, these activities have decreased riparian vegetation, decreasing available stream shade and nutrients, stream bank stability, and sources for large instream wood. These impacts affect the habitat requirements described in the Native Fish Species Descriptions section above, decreasing population productivity and, potentially, long term population viability. For additional information on Forest-wide habitat condition, please refer to the discussion in the Inland West Watershed Initiative section of Riparian Areas, Wetlands, and Aquatic Ecosystems of the DEIS. Additional information on geomorphic integrity, water quality integrity, and watershed vulnerability can be found in the watershed section of DEIS.

[6] **Strong population**- All life histories that historically occurred in the subwatershed are still present, and numbers of fish are stable or increasing. The local population is likely to be half or more of its historic density. Greater than 50 percent of the total salmonid community consists of native trout.

COMPLIANCE WITH FOREST SERVICE AND INTERAGENCY AGREEMENT FISH CONSERVATION DIRECTION

The selection of Alternative 7R is consistent with fisheries conservation direction provided by the Forest Service Manual, 36 CFR 219.19-20, the Interagency Memorandum of Agreement for Conservation and Management of Yellowstone Cutthroat Trout, and the Rangewide Conservation Agreement and Strategy for Bonneville Cutthroat Trout.

- Forest Service Manual Direction: Agency guidelines requiring the management of ecosystems, fish and wildlife populations, natural community diversity and productivity, and population viability can be found in several places within the Forest Service Manual.

- 2602-Objectives: Maintain ecosystem diversity and productivity by maintaining at least viable populations of all native and desired non-native wildlife, fish, and plants in habitats distributed throughout their geographic range on National Forest System lands. The selection of Alternative 7R maintains ecosystem diversity and productivity through improving existing conditions. Viable populations of Yellowstone and Bonneville cutthroat trout will be maintained over the long-term.

- 2603 Policy: Serve the American People by maintaining diverse and productive wildlife, fish and sensitive plant habitats as an integral part of managing National Forest ecosystems. This includes recovery of Threatened or Endangered species, maintenance of viable populations of all vertebrates and plants, and production of featured species commensurate with public demand, multiple-use objectives and resource allocation determined through the land management planning process. The selection of Alternative 7R is expected to maintain viable populations of Yellowstone and Bonneville cutthroat trout over the long-term.

- 2670.22 Sensitive Species

    - Develop and implement management practices to ensure that species do not become Threatened or Endangered because of USFS actions.
    - Maintain viable populations of all native and desired nonnative wildlife, fish, and plant species in habitats distributed throughout their geographic range on National Forest System lands.
    - Develop and implement management objectives for populations and/or habitat of Sensitive species. The selection of Alternative 7R will maintain viable populations of Yellowstone and Bonneville cutthroat trout and includes management objectives for populations and habitat.

- 2670.32 Sensitive Species: Avoid or minimize impacts to species whose viability has been identified as a concern. The selection of Alternative 7R will minimize impacts to Yellowstone and Bonneville cutthroat trout, Sensitive species.

- Code of Federal Regulations 36CFR219.19-20: This part of the Code of Federal Regulations has to do with the National Forest System land and resource management planning and directs the USFS to maintain or restore ecological sustainability and diversity, and species viability (U.S. GPO, 2001). The selection of Alternative 7R is consistent with this direction. A viability evaluation was performed on metapopulations of Yellowstone and Bonneville cutthroat trout and most metapopulations are expected to be maintained long term.

- The Interagency Memorandum of Agreement for Conservation and Management of Yellowstone Cutthroat Trout between Montana, Idaho, Wyoming, Nevada, Utah, USDA Forest Service, Yellowstone National Park, and Grand Teton National Park provides some direction pertaining to Yellowstone cutthroat trout. The direction pertaining to the Forest has been incorporated in Alternative 7R.

- The Range-wide Conservation Agreement and Strategy for Bonneville Cutthroat Trout provides some direction pertaining to Bonneville cutthroat trout. The direction pertaining to the Forest has been incorporated in Alternative 7R.

DIRECT/INDIRECT EFFECTS

Direct and indirect effects of selecting and implementing Alternative 7R considered the potential impacts of the major management actions of the Caribou portion of the Forest, including, livestock grazing, roads/trails, off-trail motorized use, mining, vegetation management, and recreation, upon Yellowstone and Bonneville cutthroat trout.

Effects from Livestock Grazing

Impacts from excessive grazing may include bank trampling, trailing, and heavy utilization of vegetation in some locations. These impacts typically contribute sediment to streams, decrease stream bank stability, increase stream channel width, decrease stream channel depth, and decrease riparian vegetation and associated shading (Shaw and Clary, 1996; Fleischner, 1994; Whisenant, 1999; Neary and Medina, 1996; Platts, 1981; Platts and Nelson, 1985). These impacts would likely affect Yellowstone cutthroat trout population viability because they prefer cold, clear streams with low frequencies of fine sediment (See Native Fish Species Descriptions in FEIS Appendix B). Alternative 7R addresses the concern of overgrazing, aiding the long-term viability of Yellowstone and Bonneville cutthroat trout populations within the Forest.

Alternative 7R proactively addresses the threats associated with grazing. It prescribes herbaceous utilization, browse utilization, and stubble height standards on a site-specific basis (with a restrictive default until a site-specific prescription can be developed).

Effects from Roads/Trails

The impacts upon aquatic and riparian habitat associated with roads and trails were evaluated through changes in road density, miles of road projected to be constructed during vegetation treatment projects, surface area proposed for wilderness, whether new road construction is allowed in roadless areas, and summer motorized recreation use restrictions.

Increasing road densities and their attendant effects are associated with declines in the status of native inland fish (USDA Forest Service and USDI BLM, 1997). Roads can affect streams through increased erosion rates, increased mass soil movement, surface erosion, migration barriers at stream crossings, alterations in channel morphology, and decreasing riparian vegetation and large wood sources. Roads can affect fisheries by interrupting upstream-migrating fish, increasing fine sediment delivery to spawning and rearing habitat, and simplifying stream channels through constriction (Furniss, *et al*, 1991). An expanded road network augments peak flows since water traveling as concentrated surface flow reaches the channel faster than water traveling as subsurface flow (Wemple, *et al*, 1996). These impacts can affect analysis species and their habitat through sedimentation, stream bank instability, and stream

channel simplification. In addition, roads and trails increase access for anglers that may increase fish mortality or illegal non-native fish introductions. Alternative 7R helps address these concerns.

In Alternative 7R, road densities would increase or decrease, depending upon prescription. Approximately eighteen miles of road are proposed for construction per decade in vegetation treatment project areas in this alternative. Approximately 47,200 acres would be proposed for wilderness acres. No roads would be constructed in roadless areas and summer motorized use of those areas would remain unchanged. The 47,200 acres of proposed wilderness includes portions of McCoy and Jackknife Creeks. The Forest considers both as Yellowstone cutthroat trout stronghold streams. The designation of these wilderness areas will eliminate road- and motorized vehicle-related threats to this population.

Effects from Off Trail Motorized Vehicles

The effects of Off Trail Motorized Vehicles upon aquatic and riparian habitat have been observed in Forest fish distribution surveys and documented in several survey reports between 2000 and 2001. They include increasing stream bank erosion and decreasing riparian vegetation. An increase in the frequency of fine sediment in aquatic habitat is a result. Increases of instream fine sediment have the potential to affect aquatic biota and their habitat, including native trout.

Alternative 7R helps address off-trail motorized threats by discontinuing it in all but approximately 36,000 acres. The area left open is fishless so populations will not likely be affected.

Effects from Mining

Mining has the potential to affect aquatic biota, including native trout, and their habitat through the introduction of toxic materials to streams, sedimentation from the mining activity and associated roads, and changes in hydrology (Nelson, *et al*, 1991). Alternative 7R has an adaptive approach to address the effects of mining. The approach would require mining companies to meet established and well-defined desired future conditions without detailed Forest Plan direction. Mining will be consistent with state and federal laws. Detailed directions for mine operation and reclamation can be included in the operation plan. The adaptive approach allows for changes and additions to these requirements as we learn more or on a site-specific basis.

Moderate threats from mining occur in the Palisades/Salt and Blackfoot Yellowstone cutthroat trout metapopulations. These metapopulations are at a low risk of extinction.

Effects from Vegetation Management

Vegetation management could affect aquatic biota, including the viability evaluation species, and their habitat through influencing hydrology, affecting soil structure, changing water quality/temperature/suspended sediment, and increasing mass movements and sedimentation (Chamberlin, *et al*, 1991). Changes in stream hydrology could result in scoured reproductive nests and decreases in available quality habitat. Peak flows may increase in magnitude and low flows may be lower. Changes in soil structure may increase runoff and erosion. Increases in stream temperatures may decrease coldwater biota health and reproductive success. Increases in sediment delivery to aquatic habitat may decrease and simplify available habitat and decrease reproductive success and hiding habitat. Alternative 7R helps address these concerns.

Only a low degree of threat exists on Yellowstone and Bonneville cutthroat trout as a result of vegetation management activities, because of Revised Forest Plan riparian and aquatic related standards and

guidelines. Current site-specific planning/mitigations and guidance from Revised Forest Plan riparian and aquatic related standards and guidelines protect these populations from logging and prescribed fire related impacts. Alternative 7R will likely sustain these protection measures and are not expected to directly affect cutthroat trout or their habitat.

Depending on site-specific treatment areas, indirect effects may include sediment generation from haul routes and increases in stream flow extremes in treatment watersheds (higher peak flows and lower low flows). The extent of these short-term, indirect effects is expected to be proportional with the degree of harvest. In other words, more timber harvest roughly equates to more log hauling and potentially more road related sediment delivered to stream segments near haul routes.

Effects from Recreational Facilities

This discussion includes consideration of developed and dispersed recreational areas (primarily camping). Traditionally, camping areas have developed in riparian areas, near water. Associated impacts to riparian areas may include a decrease in riparian vegetation from foot and vehicle traffic and resulting erosion. Because of the proximity to aquatic habitat, fine sediment from this erosion is often delivered into aquatic habitat. Fine sediment affects the quality of aquatic habitat, including that of the viability evaluation species, often resulting in less carrying capacity. In addition, recreation sites located in riparian areas may affect the frequency of downed wood located in the floodplain and stream due to firewood gathering and hazard tree treatment. Because recreation sites located in riparian areas typically do not cover large percentages of riparian surface area, total impacts from recreation sites are usually minor at a watershed scale, but could play more of a role when considering cumulative effects.

Alternative 7R increases developed and dispersed recreation sites beyond what currently exists. This would have a negative effect on aquatic and riparian habitat if these sites were located in riparian areas. The low frequency of these facilities and sites along any particular stream will not likely impact Yellowstone and Bonneville habitat and populations to a degree that could affect their viability.

CUMULATIVE EFFECTS

The cumulative effects upon the Forest fisheries resource were considered. Analysis boundaries included any areas that had the potential of affecting the quality and quantity of aquatic and riparian habitat. Some of these fish species, such as the migratory life history patterns of cutthroat trout, may spend only a portion of their life on the Forest. They often spend part of their adult lives in larger river systems off the Forest. Because of that, the cumulative effects analysis boundary extends downstream to all habitats they use. Due to their migratory nature, the potential long-term viability of these fish populations may be affected by occurrences off of the Forest. Although these occurrences, such as grazing, development, road construction and maintenance, irrigation diversions, etc., affect these fish, they affect them the same under all Forest plan alternatives. However, when considered in combination with the cumulative effects associated with each Forest Plan alternative, there may be more of an additive effect when adding impacts off the Forest with higher cumulative effects associated with alternatives with more intensive land management activities (Alternatives 1, 2, and 3). When compared to the intensive management alternatives, Alternative 7R has a moderate amount of cumulative effects associated with it.

DETERMINATION OF EFFECTS

Consideration was given to the effects of implementing Alternative 7R of the Revised Forest Plan upon Yellowstone and Bonneville cutthroat trout. The selection and implementation of Alternative 7R **may**

impact individuals or habitat, but will not likely contribute to a trend towards federal listing or loss of viability to the population or species.

Other discussion of effects upon these species, other aquatic biota, and their habitat can be found in Chapter 4 and Appendix B of the FEIS.

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A general list of Yellowstone cutthroat trout references can be obtained by contactin g the Caribou-Targhee Forest Fisheries Biologist.

Section 7 Consultation for the Caribou National Forest, Revised Forest Plan

USDI-Fish and Wildlife Service

Letter of Concurrence

United States Department of the Interior

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CARIBOU-TARGHEE N.F.
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Action	To	Info
	Supervisor	✓
	P.A.O.	
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	Ecosystem Mgr.	
	Engineer	
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	Fire	
	Contracting/Proc.	
	B & F	
	Partnerships	
	Pro. Mgr.	
	Comp. Serv.	
	Filing	

September 25, 2002

Jerry Reese, Forest Supervisor
Caribou-Targhee National Forest
Supervisor's Office
1405 Hollipark Drive
Idaho Falls, ID 83401

Subject: Section 7 Consultation for the Caribou National Forest, Revised Forest Plan for the Caribou-Targhee National Forest
File # 111.0000 FWS # 1-4-02-I-0190

Dear Mr. Reese:

This letter transmits the U. S. Fish and Wildlife Service's (Service) letter of concurrence for the Caribou National Forest's (Caribou) preferred alternative (Alternative 7R), Caribou Forest Plan Revision (Plan) for the Caribou-Targhee National Forest (Forest). It was prepared in response to your August 5, 2002, request to initiate informal consultation under Section 7 of the Endangered Species Act (Act) of 1973, as amended. Your letter was received by this office on August 6, 2002.

This document represents the Service's evaluation of the effects of that proposed action on the threatened Canada lynx (*Lynx canadensis*), bald eagle (*Haliaeetus leucocephalus*), Ute ladies'-tresses (*Spiranthes diluvialis*), the experimental, non-essential populations of gray wolf (*Canis lupus*), and whooping crane (*Grus Americana*), and candidate species, the yellow-billed cuckoo (*Coccyzus americanus*) in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. et seq.).

Proposed Action. The purpose of the Revised Plan is to provide an approved land and resource management plan to establish direction for future decisions in the planning area (Caribou) which will include an interdisciplinary approach to achieve integrated consideration of physical, biological, economic and other sciences. The Caribou portion of the Forest encompasses eleven counties in three states (Idaho, Wyoming, and Utah) and is broken into three Ranger Districts: Westside, Soda Springs and Montpelier.

Future proposed projects and activities on the Caribou would be proposed, analyzed and carried out within the framework of the Plan. The Plan is a controlling consideration, but project decisions are only made after site-specific review with public involvement. Ongoing activities and uses will be regulated through the direction contained in regulations for management of the U.S. Forest Service (USFS). These site or activity-specific decisions must be consistent with applicable Plan direction or the Plan may be amended to permit the activity. The Plan allows or prohibits some uses and establishes standards and guidelines that regulate future resource use. The consistency requirement of the National Forest Management Act (NFMA) directs the USFS to evaluate proposed activities against the standards and guidelines and management area prescriptions of the Plan. The Plan focuses small landscape planning on the mix of activities and projects needed to meet forest-wide goals and implementation. All projects remain subject to site-specific and continuing compliance with Federal environmental laws, such as the Endangered Species Act, National Environmental Policy Act, Clean Water Act, and Clean Air Act.

One major requirement of the NFMA is to implement regulations that specify guidelines for land management plans. Plans are developed to achieve the goals which provide for a diversity of plant and animal communities based on the suitability and capability to meet overall multiple use objectives. The fish and wildlife resource regulations provide for diversity within multiple use objectives. The USFS uses the planning process and ongoing monitoring, evaluation and adjustment of fish, wildlife, and rare plant standards to prevent listing of species under the Act and avoid extirpation of species from its actions.

Several agency actions have directly influenced the structure of this Plan and determined how it is to be used. These include the Interior Columbia Basin Ecosystem Management Project (ICBEMP), the Inland Fish Strategy (INFISH), and the combining of the Caribou and Targhee National Forests. The existing Caribou Plan was amended in July, 1995 to provide interim direction to manage inland native fish (INFISH). The relevant parts of this interim direction was incorporated into this proposed Plan.

Preferred Alternative. Alternative 7R is the Preferred Alternative. This alternative was developed in response to public comment and has an emphasis on adaptive management and monitoring to resolve uncertainties. Alternative 7R proposes to manage resources using a mix of restoration strategies, including timber harvest, thinning, fire, grazing management, and managing motorized access.

Some disturbances would be allowed to operate naturally in order to maintain or restore ecological processes and functions. Insect and disease disturbances would be allowed to play their natural role where appropriate and desirable, although epidemic disturbances generally would be controlled. Wildfires would be suppressed in some areas to protect public safety and resource values, but would be allowed to burn in other areas to benefit resource values. Prescribed fire, mechanical treatment and wildland fire for resource benefit would be used to manage vegetation, reduce hazardous fuels, and recycle nutrients with priority on reducing fuels near interface communities.

Alternative 7R proposes to treat a total of 89,000 acres of vegetation over the next 10 years (about 8% of the Caribou). Conifer sites, particularly mixed conifer and aspen/conifer, and aspen would be managed to maintain 40% of these acres in a mature/old age structure. Non-forested vegetation treatments would focus on sagebrush, mountain shrub and tall forb sites. Sagebrush and mountain shrub sites would be managed to allow 50% of the acres to remain in greater than 15% canopy cover. Tall forb sites, where they exist, would be managed to maintain or restore sites, based on research findings. Areas that were once tall forb sites, but have lost the capability to maintain tall forb communities as a result of topsoil loss or site potential, would be managed for watershed stability.

Livestock grazing would be managed to maintain or restore watersheds, aquatic systems, soils, plants and animals. Livestock would be managed through forest-wide livestock forage utilization levels on upland and riparian sites. Generally, upland utilization would be set at 25-35% for browse and 35-55% for herbaceous species. On key winter ranges, utilization would be lowered to 10% and 35% respectively. These levels are lower than the current utilization level of 35-45% for browse and 50-60% for upland herbaceous species.

Riparian areas and watersheds would be aggressively managed to maintain water quality and aquatic ecosystems and to restore degraded conditions where they exist. The primary focus of management activities would be on achieving proper functioning condition of riparian areas, watershed protection and restoration. Streams that are in proper functioning condition would be managed to maintain or improve that condition. Streams that are functioning, but "at risk" of further degradation would have more stringent standards and guidelines applied. Streams considered not functioning would have the most prohibitive standards and guidelines applied. Additional standards and guidelines would be applied to streams identified by the State of Idaho as water quality limited or containing Threatened and Endangered Species.

Alternative 7R would maintain motorized access at approximately the current levels. Open motorized route density (OMRD) goals were set at 0.5 mi/mi2, 1.0 mi/mi2, 1.5 mi/mi2, 2 mi/mi2 or higher, based largely on the existing situation and with some consideration of resource concerns in specific areas. These OMRD's were assigned to prescription areas. The biggest changes in open motorized route densities would be across the Bear River Range and the Bannock Range, where OMRD's would be reduced by .1 mi/mi2.

Under this alternative, an adaptive approach to mining operations, reclamation and hazardous substance management would require a greater use of native plants, on-site topsoil/subsoil management, and more stable, natural appearing landscapes in reclamation activities.

Wildlife habitat management would restore habitat quality for species-at-risk, including Threatened, Endangered, Proposed and Sensitive species and other identified species-at-risk.

Habitat for hunted species, such as big game and upland birds, would be managed to maintain or restore habitat quality. Management actions include vegetation treatments in habitats-at-risk, establishment of upland and riparian livestock forage utilization levels, and establishment of road/motorized trail densities. Big game winter range would be emphasized in selected areas

through livestock forage utilization and access management. A high emphasis would be placed on improving stronghold habitats for wildlife and fish addressed in specific recovery plans. Moderate emphasis would be placed on retaining and improving wildlife corridors, through allocation of prescriptions in existing security areas adjacent to the Greater Yellowstone Ecosystem, the Bridger-Teton and Wasache-Cache National Forests.

List of Species

In March 2000, the Service provided the Forest with a list of endangered, threatened, proposed and candidate species which may occur on the Caribou (SP#1-4-00-SP-292). This letter listed the bald eagle, Canada lynx, gray wolf, whooping crane, and Ute ladies'-tresses, as species that may be present on the Caribou, in southeast Idaho. The Service provided periodic updates to these Species List, letters of March 2001 (SP#1-4-01-SP-316), March 2002 (SP#1-4-02-SP-459) and September 2002 (SP#1-4-02-SP-909). The list of species for the Caribou has remained the same since March 2000, except for the addition of a new candidate species in March of 2002, which is the yellow-billed cuckoo. A comment letter from the Service on the Draft Environmental Impact Statement from February 6, 2002, addressed these same species.

Canada Lynx

The Canada lynx was listed as threatened on April 24, 2000, (65FR16052). No critical habitat has been designated for the Canada lynx.

The Northern Rocky Mountains/Cascades Region (Washington, Oregon, Idaho, Wyoming, and Utah) supports the most viable resident lynx populations in the contiguous United States, while recognizing that, at best, lynx in the contiguous United States are naturally rare. In Idaho, lynx were not abundant, but were distributed throughout northern Idaho in the early 1940s, occurring in eight of the ten northern and north-central counties. Based on the time frames, many of the historical lynx records correlated with lynx movement out of Canada and may have represented dispersing, transient individuals. Early trapping and harvest records for Idaho are unreliable, because no distinction was made between lynx and bobcats until 1982 when Idaho Department of Fish and Game initiated a mandatory pelt tagging program. Although records of lynx in Idaho are relatively common, the Service is not able to substantiate the historic or current presence of resident lynx populations on the Caribou.

A summer lynx hair-snagging survey is being conducted on the Forest. This survey uses a nationwide lynx protocol for collecting lynx hair using hair-snagging techniques and DNA analysis. The Caribou has two years of sampling completed and the Targhee has three years of sampling completed on two grids and one year of sampling completed on two grids. To date, no lynx hair samples have been identified on the Caribou or Targhee.

The Caribou agreed to incorporate Canada lynx conservation measures as outlined in the Lynx Conservation Assessment and Strategy (LCAS) at the programmatic and project level. Draft Lynx Analysis Units (LAUs) were mapped for the Caribou soon after release of the LCAS. Primary habitat included all mixed conifer on the Caribou's vegetation layer (subalpine fire and

Engelmann spruce intermixed with other species). Secondary habitat included lodgepole pine, Douglas-fir, aspen and aspen/conifer. All of the draft LAU's had less than 20% primary habitat as described in the LCAS.

On September 5th, 2001 in Leadore, ID, it was jointly decided by Forest and Service personnel that primary vegetative types (lynx habitat) on the Caribou were too patchy and disjunct to provide suitable lynx habitat, as described in the LCAS. At that meeting, it was agreed that the Caribou portion of the Forest would be dropped as suitable lynx habitat, and no LAU's would be delineated on the Caribou. As a result, the Montpelier and Soda Springs Ranger Districts were identified as Canada lynx linkage habitat. The Westside Ranger District was not considered as linkage habitat.

A final LAU map was released by the Forest on September 18, 2001, reflecting these changes. The Service agreed the final mapping (by letter dated February 5, 2002), met the requirements of the LCAS. As outlined in the preferred alternative, the Montpelier and Soda Springs Ranger Districts would implement conservation measures as described in the LCAS regarding lynx connectivity, movement and dispersal.

An interagency meeting was held in Boise, ID, on January 25, 2002, where potential lynx linkage areas for the Caribou were identified and mapped. This mapping effort focused on highways as the major factor affecting lynx movements and dispersal, especially 4-lane highways. As a result of that mapping, two areas on or adjacent to the Caribou were mapped as linkage across highways. They are Highway 34 along the Tincup Highway and Highway 34 between Manson and Georgetown. Landscape level linkages have been identified as areas that could allow movement of lynx from the Greater Yellowstone Ecosystem on the north to adjacent national forests to the south. On the Caribou, areas that were considered as most important include 1) the south end of the Bear River Range that connects with the Wasatch-Cache National Forest to the south; 2) the Gannett Hills area that connects with the Bridger-Teton National Forest to the east; and 3) the McCoy Creek area that connects with the Targhee on the north and Bridger-Teton to the east.

The LCAS identifies range-wide risk factors to lynx movement. These include highways, railroads and utility corridors, land ownership patterns, ski areas and large resorts. The Plan incorporates the standards and guidelines at the programmatic and individual project level from the LCAS and incorporates the Ecology and Conservation of Lynx in the United States (Ruggiero, et al. 2000) as the basis of analysis. Conservation measures were developed to address risk factors to lynx, such as: 1) Maintaining and where feasible, restoring habitat connectivity across forested landscapes; 2) Identifying key linkage areas that may be important in providing landscaped connectivity within and between geographic areas, across all ownerships; 3) Developing and implementing plans to protect key linkage areas on the Caribou from activities that would create barriers to movement. Barriers could result from an accumulation of incremental projects, as opposed to any one project; 4) Evaluating the potential importance of shrub-steppe habitats in providing landscaped connectivity between blocks of lynx habitat; 5) Where feasible, maintaining or enhancing native plant communities and patterns, and habitat for potential lynx prey, within identified linkage areas; 6) Pursuing opportunities for

cooperative management with other landowners; 7) Ensuring that connectivity is maintained across highway right-of-ways; 8) Working cooperatively with the Federal Highway Administration and Idaho Transportation Department to identify land corridors necessary to maintain connectivity of lynx habitat and mapping "key linkage areas" where highway crossings may be needed to provide habitat connectivity and reduce mortality of lynx; 9) Evaluating whether land ownership and management practices are compatible with maintaining lynx highway crossings in key linkage areas; 10) Identifying, mapping and prioritizing site-specific locations, using topographic and vegetation features, to determine where highway crossing are needed to reduce impacts to lynx; 11) Retaining lands in key linkage areas in public ownership; 12) Identifying key linkage areas by management jurisdictions in management plans and prescriptions; 13) Evaluating proposed land exchanges, land sales and special use permits for effects on key linkage areas; and 14) Maintaining foraging habitat over the long-term for lynx movement and dispersal across shrub-steppe habitats.

Based upon the information provided in the Biological Assessment and the Revised Forest Plan, the Service concurs with the Forest's determination that the Caribou Forest's Preferred Alternative (7R) programmatic level actions, as proposed, *may affect but are not likely to adversely affect* the threatened Canada lynx.

Gray Wolf

In 1994, the Service signed the decision to reintroduce wolves into Yellowstone and Central Idaho as nonessential, experimental. In Idaho, the division between these two populations is Interstate 15 . As a result of this division, the Caribou lies in both the Central Idaho and the Greater Yellowstone non-essential, experimental gray wolf recovery areas. The Rocky Mountain Wolf Recovery 2001 Annual Report states that the minimum population for fall wolf breeding pairs is 13 wolf packs in the Yellowstone Recovery Area and 14 packs in the Central Idaho Recovery Area.

For Section 7 consultation purposes, wolves designated as nonessential, experimental and that are within the boundaries of any unit of National Park system or the National Wildlife Refuge System are treated as a *threatened* species; wolves designated as nonessential, experimental that are not within units of the National Park System or National Wildlife Refuge System are treated as *proposed* species. As such, Federal Agencies are only required to confer (on actions outside the boundaries of any unit of National Park system or the National Wildlife Refuge System) with the Service when they determine that an action they authorize, fund, or carry out "is likely to jeopardize the continued existence" of the species. No critical habitat has been designated for the nonessential, experimental populations of gray wolf.

There have been reported sightings of wolves across the east-side of the Caribou over the last 20 years. These have been individual animal sightings. All of these sightings were in the vicinity of Montpelier and Soda Springs Ranger Districts. At this time, no breeding pairs of gray wolves are known to occur on the Caribou. On November 22, 2000, a female wolf was captured on private lands adjacent to the Caribou by a Wildlife Services employee following documented

sheep depredations. During this time, this individual wolf apparently traveled and lived on both the Caribou and nearby private lands.

The Caribou should advise all permittees using public grazing allotments on the procedures to follow if wolf depredations occur. Permittees are not allowed to kill wolves, even in the act of attacking livestock, except by Lethal Take Permit. The Special Rules for Experimental Populations of Gray Wolves (50 CFR, Part 17, Subpart H, Section 17.84) outlines the provisions for livestock producers that are legally using public lands to harass any wolf in a non-injurious manner at any time. The Special Rules describe steps to be taken by a livestock producer or permittee with livestock grazing allotments on public land, which has livestock depredations determined by Wildlife Service personnel to be wolf caused. The producer/permittee may receive a written "take" permit, valid for up to 45 days, from the Service or other agencies designated by the Service to "take" a wolf that is in the act of killing, wounding, or biting livestock.

Also, with regard to the provisions of section 9 of the Act, the Special Rules allow for taking gray wolves in an nonessential, experimental area provided that the taking is incidental to an otherwise lawful activity, accidental, unavoidable, unintentional, not resulting from neglectful conduct lacking reasonable due care, and due care was exercised to avoid taking a gray wolf. Such taking is to be reported within 24 hours to a Service or Service-designated authority. Take that does not conform with such provisions may be referred to the appropriate authorities for prosecution. This means that Federal Agencies must exercise due care to avoid taking a gray wolf when conducting their normal operations.

Identified risks to gray wolves that may occur on the Caribou include trapping, shooting, predator control activities resulting from grazing activities by permittees, activities that decrease prey populations, and increased accessability of humans. Travel Management plans in Alternative 7R restrict motorized use to designated routes year-round in over 97% of the Caribou. Highways across the Caribou are all 2-lane and generally lower speed highways. Any highway reconstruction, re-alignment or improvement that crosses federal lands would be assessed in a site-specific analysis and mitigated as needed. The risk of shooting or trapping should not increase over current conditions, based on OMRDs. Alternative 7R improves suitability of habitat for mule deer and elk and no decrease in abundance or major changes in distribution are expected. Predator control activities are performed by Wildlife Services under existing regulations. The Idaho Wildlife Services program completed a programmatic consultation with the Service regarding predator damage management activities on all threatened and endangered species in Idaho south of Interstate 90.

Based upon the above measures, the Service concurs with the Caribou's determination that Alternative 7R, as proposed, *is not likely to jeopardize the continued existence* of the non-essential, experimental population of gray wolves.

Bald Eagle

The bald eagle, which is listed as *threatened,* occurs on the Caribou. The Caribou is part of the Pacific Recovery Region for bald eagles which encompasses the states of Idaho, Nevada, California, Oregon, Washington, Montana, and Wyoming. The Pacific States Bald Eagle Recovery Plan was developed in 1986. Risk factors identified at listing were the effects of organochlorine pesticides (caused eggshell thinning) and predator control campaigns. To promote recovery, efforts have focused on these factors as well as habitat protection.

The Caribou lies within three bald eagle management zones, as identified in the Recovery Plan; Caribou/Green River in the southern part of the Caribou, the Greater Yellowstone in the northeast part, and Great Basin on the northwestern part of the Caribou. The Recovery Plans established habitat and population goals for these zones. The habitat management goals are considered the minimum number of territories needed to provide secure habitat for a recovered population.

There are two known bald eagle nest territories on or adjacent to the Caribou. One is located in Wyoming and the other is in Idaho. Both lie in the Greater Yellowstone Management Zone.

One nesting territory on the Caribou is found near Thayne, Wyoming. The Nest Management Plan for this nest has been approved by the Service and includes land management recommendations for different zones. The territory has been occupied since 1977 and includes at least three nest sites, two of which are on Forest lands. The territory is considered occupied but inactive for the last 2 years. Access to the nests is by foot only and the nearest bridge to cross the Salt River is privately owned and one-half mile from the nest, so the nests are relatively secluded from human activity.

The other bald eagle nest territory on or near the Caribou is found on Grays Range. The Grays Range primary nesting area is located on private land, however, one nest tree may be located on the Caribou. The Grays Range nest was observed in 1996 and 1997, but first shows up in the 1998 Idaho Bald Eagle Nesting Report. This nest was successful raising young in 1998 - 2000. Nest information was not available for 2001 or 2002. Alternative 7R includes an objective to prepare a Nest Management Plan for the Grays Range Nest territory and any other new territories that may become established on the Caribou. This will include management direction by zone (nest, primary use area and home range), as summarized below and described in the Plan.

Occupied Nesting Zone. Zone 1 is an area within a 400 meter radius of an occupied nest. Critical nesting periods vary throughout the recovery area, but generally fall between 1 March and 31 August. Human activity should not exceed minimal levels during the period from first occupancy of the nest site until two weeks following fledging. Human activity restrictions for Zone 1 may be relaxed during years when a nest in not occupied. During the nesting period, exclude all activities which may negatively impact critical periods of nest use. Excessive disturbances should also be regulated up to 800 meters from nests and roosts where eagles have line-of-sight vision.

If activities are located more that 400 meters from a nest site, this will fall into Zone II and program activities should be as outlined and described under the Zone II in the Pacific States Bald Eagle Recovery Plan (Service 1986). Zone II, the Primary Use Area includes the area within an 800 meter radius of the active nest and of all known alternate nests.

Zone III: Home Range. Ideally, home ranges are delineated by monitoring eagle movements during nesting and brood rearing for several years. Lacking such data, this zone should include all potential foraging habitat with a 4 km (2.5 miles) radius of the center of Zone I. The primary purposes of this zone are to maintain adequate foraging conditions and aid in maintaining the integrity of Zones I and II.

Risks to eagles involve exposure to lead poisoning, secondary poisoning from insect and predator control programs, collision and electrocutions associated with power transmission, and loss of perching, foraging and roosting opportunities due to human disturbance or activities. The Plan also includes direction and standards in nest zones and primary use areas to reduce the potential of adverse effects from powerlines.

Wildlife Services field personnel may use some toxicants on the Caribou resulting from predator management activities. However, Wildlife Service has completed consultation with the Service regarding all predator management methodologies used and mitigated potential adverse affects to bald eagles.

Bald eagles clearly respond to the proximity of humans by modifying activity and movements to avoid encounters. Relationships of human activity and eagle responses are highly complex and difficult to quantify. Responses vary depending on type of activity, intensity, duration, timing, predictability and location of human activity. The way in which these variables interact depend on age, gender, physiological condition, sensitivity, residency, and mated status of affected eagles. Prey base, season, weather, geographic area, topography and vegetation in the vicinity of the activity also influence eagle responses. Some eagles are more tolerant of human activity than others. Whether individual eagles become more tolerant of human activity over time or if areas subjected to excessive human activity are occupied by more tolerant eagles is unknown.

Human activities and potential adverse impacts around nests can be avoided through implementation of Nest Management Plans. Both nest locations on or adjacent to the Forest are in areas that are fairly inaccessible to the general public. They are both within 1 - 2 miles of main roads. The site near Thayne is within two miles of Highway 89, which receives heavy traffic.

The highway near the Grays Range nest site receives much less traffic. There may be some activities on adjacent private lands, but probably at fairly low levels. Current levels of human activity do not appear to be affecting use of these nest territories, especially the Grays Range site (Ann Keysor, personal communication). The Thayne site has been occupied but inactive, but no clear reason has been identified for this. Vehicular traffic traveling along prescribed routes or within strict spatial limits and at relatively predictable frequencies is least disturbing to bald eagles. Snowmachines and all terrain vehicles are more disturbing, due to random, unpredictable movements, loud noise and visibility of operators.

There are four monitored winter use areas monitored by the Caribou, all of which are located adjacent to main access routes. Other roost sites may also be adjacent to main roads, since road locations often follow major riparian corridors. There is the potential for disturbance, but if the traffic stays on the road, they may become habituated to it and not be displaced.

As outlined in Alternative 7R, if bald eagles are de-listed, monitoring on the Caribou will continue, management plans will be followed and bald eagles would continue to be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Based upon the above measures, the Service concurs with the Caribou's determination that the Preferred Alternative 7R, as proposed, *may affect but are not likely to adversely affect* the threatened bald eagle.

Ute ladies'-tresses

Ute ladies'-tresses orchid was federally listed as threatened on January 17, 1992, under the Act. Since that time, numerous surveys have been done on the Forest and in adjacent areas. To date, no populations of Ute ladies'-tresses have been discovered on the Caribou. One lower elevation area on the Caribou, where potential habitat for the species may occur, is along McCoy Creek, however, this area has been surveyed multiple times by qualified botanists and no Ute ladies'-tresses have been found. The Service will continue to ask that the Caribou consider the species when activities occur within potentially suitable habitat.

In Idaho, the orchid occurs along the South Fork of the Snake River where the plant is endemic to moist soils at relatively low-elevation riparian edges, gravel bars, old oxbows, and moist-to-wet meadows along the South Fork. Ute ladies'-tresses appears to be well adapted to disturbances caused by water movement through flood plains over time. The orchid often grows on point bars and other recently created riparian habitat. The orchid appears to require permanent sub-irrigation, with the water table holding steady throughout the growing season and into late summer and early autumn. Ute ladies'-tresses occurs primarily in areas where the vegetation is relatively open and not very dense.

Habitat that would be considered suitable for Ute ladies'-tresses is limited on the Caribou based on topography, elevation, vegetation and stream types and other factors. There are no river systems similar to the South Fork of the Snake River on the Caribou.

Under Preferred Alternative 7R, riparian areas and watersheds would be aggressively managed on the Caribou to maintain water quality and aquatic ecosystems and to restore degraded conditions where they exist. The primary focus of management activities would be on achieving riparian proper functioning condition, watershed protection and restoration.
Though the majority of the Caribou's potential habitat has been surveyed with no populations found, the Caribou will continue to consider potentially suitable habitat for Ute ladies'-tresses that may be impacted by proposed and ongoing activities. There are no measurable risks to Ute ladies'-tresses based on the low potential of occurrences on the Caribou.

Based upon the information provided in the BA, Alternative 7R of the Plan, and County Species List changes, the Service concurs with the Forest's determination that the Caribou Forest's Preferred Alternative (7R) programmatic level actions, as proposed, *may affect but are not likely to adversely affect* the threatened Ute ladies'-tresses.

Whooping Crane

In 1997, the Service designated the Rocky Mountain population of whooping cranes as an experimental, nonessential population. During the late 1970s and 1980s, the Service tried to establish a flock of whooping cranes at Grays Lake National Wildlife Refuge which is encompassed by the Caribou. The program attempted to "cross-foster" the whooping cranes, which was to allow sandhill cranes to hatch and raise young whooping cranes. The cross-fostering program was terminated in 1989, because the whooping cranes were not pairing, and mortality was too high to establish a self-sustaining population.

The last known whooping crane in the Rocky Mountain population has not been seen since last winter. Thus, the experimental, non-essential Rocky Mountain whooping crane population is considered to be extinct.

Due to the fact that no remaining whooping cranes exist in the Rocky Mountain populations, the Service concurs with the Caribou's determination of *no affect*.

Yellow-billed cuckoo

The yellow-billed cuckoo was petitioned for listing in 1998, and in 2000, the Service concluded that the petition presented information to indicate that listing may be warranted.

In Idaho, the yellow-billed cuckoo is generally considered a rare and local summer resident. There are many reports of yellow-billed cuckoos occurring in eastern Idaho during migration periods. In 1998, V. Saab (Effects of Recreational Activity and Livestock Grazing on Habitat Use by Breeding Birds in Cottonwood Forests along the South Fork Snake River), describes five records of yellow-billed cuckoos located along the South Fork of the Snake River. These yellow-billed cuckoos were detected in 5 of 57 cottonwood forest patches ranging in size from .40 hectares to 205 hectares during the four year study. Since this time, the Service has no documentation of yellow-billed cuckoos breeding or nesting in southeast Idaho. It is currently believed the breeding population of yellow-billed cuckoos in Idaho is likely limited to a few breeding pairs. The Caribou does not have these large tracts of riparian cottonwood habitat available as are located along the South Fork of the Snake.

Western yellow-billed cuckoos breed in large blocks of riparian habitats, especially woodlands with cottonwoods and willows. Dense understory foliage appears to be an important factor in nest site selection, while cottonwood trees are an important foraging habitat in areas where they have been studied in California. Western yellow-billed cuckoos appear to require large blocks of riparian habitat for nesting. This species is strongly associated with relatively large expansive stands of mature cottonwood-willow forests. They appear to be dependent on a combination of a

dense willow understory for nesting, a cottonwood overstory for foraging and large patches of habitat in excess of 20 hectares (about 50 acres). The species will occupy a variety of marginal habitats, particularly at the edge of their range, but is not known to use non-native vegetation in the majority of its range.

On the Caribou, The National Wetlands Inventory (1980) only identified about 50 acres of deciduous forest riparian areas, with no differentiation between aspen or cottonwood. Conversations with Caribou District personnel confirmed that cottonwood/willow riparian habitat types are very limited. If they do occur in small places, they are well below the 50-acre minimum patch size to be considered suitable habitat.

Because of the lack of suitable habitat for this species on the Caribou and the information contained in the BA, the Service concurs with the Caribou's determination that Alternative 7R will *not affect* the yellow-billed cuckoo.

This concludes informal consultation on the action as outlined in the Preferred Alternative (7R) and BA. As provided in 50 CFR § 402.16, re-initiation of consultation is required where discretionary Federal Agency involvement or control over the action has been retained (or is authorized by law) and if - (l) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (2) if the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered; or (3) a new species is listed or critical habitat designated that may be affected by the action.

If you have any questions, please contact Larry Dickerson at the Snake River Basin Sub-Office in Chubbuck at (208)237-6975.

Sincerely,

Deb Mignogno
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