APPENDIX H
Fire Effects on Wildlife

Appendix H

Fires 2000 Assessment
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Introduction: Wildlife in the Northern Rockies adapted with fire and, therefore, the occurrence of fire within the Kootenai should not be viewed as a catastrophe from a wildlife perspective. When viewed from the standpoint that roughly 98 percent of the Forest did not burn and that there is a large group of species that benefit from fire, the results of this year's fires can be seen as an asset to manage for many wildlife species. A historical picture of wildlife on the Kootenai National Forest and the role fire played is available in the Phase I report by Ecological Planning and Toxicology Inc. (1995).

Fire is not the end result of a process—but rather the entry into a series of events that shape the land and affect wildlife. It is important to consider the situation by looking back in time at historical patterns that shaped the current vegetation and looking ahead in time to ascertain how this fire season will shape future vegetation. This includes considering the effects on several scales. Local, site-specific fire effect may cause immediate, short-term changes for some species (e.g., loss of a nest tree, forage loss for a season, or cover loss). At the mid-scale, changes may reflect the pattern of vegetation within a drainage. For example, changes could be expressed as a new source of seeds for some bird species, modification of cover:forage ratios on summer range for ungulates, or a source of stressed trees for beetles that will attract woodpeckers and a host of secondary bird species. At the large scale, one must look at how these fires fit into the existing mosaic of vegetation across the forest and determine how they contribute to the maintenance of diversity. The concept of context is extremely important, especially at the large scale. Here, fire can be seen in its most elemental form as an ecological process that shapes the vegetation across the landscape over time. The results of any fire in the past can be seen in the species and patterns of vegetation and the current year's fire can best be viewed as to how it will fit into this pattern and affect future conditions.

In general, management should strive to retain all the elements of this year's fire (e.g., vegetation that burned in all intensities and in different stands across the forest). This should not be a problem as there will be opportunities to leave intact burned areas, and those that are further managed offer opportunities to retain representative elements of the fire.

The major fires considered in this assessment are listed in appendix W-1.

Threatened, Endangered and Proposed terrestrial wildlife species: For several years after a burn there is a negative correlation between lynx use and the amount of burned area. Lynx persistence in and around the burned areas depends on the burn pattern, fire intensity, and the size of the unburned areas. If sufficient habitat remains for snowshoe hares with the burned area, lynx will likely stay. If not, lynx are highly mobile and would move to other lands outside of the fire, returning when the area supports a sufficient prey base. Over time, as the burned trees fall, down logs will provide important denning and foraging habitat.

Sixteen of the forty-seven Lynx Analysis Units (LAUs) on the Kootenai National Forest experienced wildfire activity in 2000 (see map W-A and Appendix W-2). The changes in lynx habitat may be viewed as somewhat beneficial because the lynx forage habitat component, generally in short supply across LAUs, will increase within 5-15 years. Short-term changes in lynx habitat to an unsuitable condition may be a concern in LAUs 14110, 14404 and 14407 due to exceeding the 30% level prescribed in the Lynx Conservation and Assessment Strategy (LCAS) (USDA Forest Service et.al. 2000, pg. 77). The LCAS also prescribes a maximum change of lynx habitat to an unsuitable condition of 15% per 10-year period (ibid, pg. 79) by management activities. Any proposed restoration action in LAUs 14102, 14103, 14107, 14109, 14404, and 14407 will need to analyze this effect carefully to assure compliance with the LCAS direction. Where fire burned in late succession stage stands, an evaluation of the potential for lynx denning habitat should be completed (LCAS pg. 80). **Analysis to assure compliance with LCAS objectives and guidelines for all projects in lynx habitat is required**.

Major wildfires burned in ten of the 17 grizzly bear management units (BMUs) in the Cabinet Yaak Recovery Zone on the Kootenai National Forest in 2000 (see map W-B and Appendix W-3). The greatest number of acres burned in BMU 16 (over 9,000 acres), with three other BMUs (1, 10, 17) experiencing more than 1000 acres of fire activity. Core habitat was impacted in nine BMUs (see map W-B and Appendix W-3), but only three (1, 16, 17) had over 1000 acres of core burned. About 14% of the core acres experienced fire severity level 1 with the remaining acres equally split between intensities 2 and 3. Impacts include changes in cover and short-term loss of food sources due to fire, and reductions in habitat effectiveness and core habitat due to opening roads for fire suppression activities. **Based on the current lawsuit regarding grizzly bear effects analysis, proposed restoration projects will need to conduct grizzly bear effects analysis using BOTH the current Forest Plan (as refined through USFWS consultations) and the Interim Access analysis methods**.

The affect of fire on gray wolf populations is best measured as a function of the effects to the wolf's preferred prey species, deer and elk (see section on big game). The gray wolf ranges widely across the Kootenai National Forest, but most pack activity currently is documented on the Fortine and Libby Ranger Districts, which had very few acres burned during the 2000 firestorm. The fires probably pose no significant change in use or habitat given the range of this species; the current use pattern, and the small amount of acres burned in the primary pack use areas.

While some acres within the consultation area for Bald Eagle (Harms 1992) burned during the 2000 fire season, only one fire (Cliff Point) occurred within zone one or two (USDI 1994, pp 20-24) of a known nesting territory (Webb Mountain nest). The fire in zone one was an underburn with some fire intensity one occurring in zone two. The site remains suitable for bald eagle nesting. The remaining fires resulted in no significant change in habitat and given fire locations, restoration activities are not likely to cause habitat reduction or disturb bald eagle behavior.

Birds (snags, old growth, downed wood habitats): This year's fires provide the opportunity to recognize and retain burned vegetation that supports a host of avian species. Hutto (1995) identified over 80 species that utilize early fire succession sites. Due to human expansion and development, species associated with old growth, snags, down wood, and fire may be less abundant than historically. Fire exclusion from fire dependent forest habitats may be of equal significance (Hejl, 94). Open forest species may be lost with fire suppression. The number of small diameter snags increases with unnaturally reduced fire frequency because stocking levels increase, leading to many early deaths, particularly given the likely association between fire suppression and increased insects and disease (Harris 1999, pg 14). Harris (1999, pg 15) indicates that in unmanaged stands average snag densities may be higher, due to fire suppression, than historic levels by about 10 percent. Also, with increased stocking densities, due to fire suppression, tree growth rates decline potentially resulting in fewer trees growing to large diameters and thus reducing the potential for recruitment of large snags and down logs. With this in mind, the effects of this year's fires can be viewed as an important change on the landscape that will benefit many forest avian species. The scale of the fires (less than 2% of the Forest) makes it unlikely that the habitat changes would be detrimental to species preferring green-forested habitats.

The effect of a fire on bird populations varies with the severity of fire (stand replacement verses under burn) and pattern of the burn. Most bird species present prior to a stand replacement fire are canopy dwelling species, however, in the post fire environment, ground dwelling bird species become more dominant. High intensity fires often create habitat for primary cavity excavators, secondary cavity

nesters and shrub users, whereas low intensity fire create habitats for birds that prefer open forests (Hejl 1994).

The fires of 2000 burned in late succession forestland allocated as "old growth" under the Kootenai Forest Plan. Over 3900 acres burned, but just over 500 acres (mostly in small patches) experienced fire intensity level one. Species dependent on older vegetation, such as the northern goshawk, may still persist in the area but, depending on the amount and distribution of remaining late succession forest, could be present in lower numbers.

Allowing natural disturbance patterns (especially from fire) to return to these ecosystems and retaining all ages, components, and landscape patterns of natural forests will help maintain avian populations and diversity. Logged burns probably benefit fewer burn-associated species than burns not logged (Hejl 1994). Harris (1999) demonstrates that historical cutting practices have reduced snag densities on western Montana forests, most likely to levels below those that prevailed prior to fire suppression. If biodiversity and long-term forest health are highly valued, then at least on the landscape scale characteristics of standing snags and down logs (abundances, species, distribution of size classes) should approximate those occurring historically.

Considerations for recognizing and managing key elements of these burns, in order to provide habitat for benefiting species focus on degree of fire severity (beetle use of burned trees), tree species (thick barked trees preferred), stand conditions (retaining intact stands), pre-existing snags and down logs (greater use by wildlife), and scale (diversity). See Appendix W-4 for a more detailed explanation. **To facilitate providing snag habitat at a landscape level, consider using the Northern Region Snag Management Protocol (USDA Forest Service 2000).**

Big Game: In general, big game species are well adapted to changes in landscape patterns as a result of fire. However, lack of hiding and thermal cover may initially limit big game utilization levels in the burn area, depending on burn patterns and the distribution of cover patches. With the exception of the initial direct loss of existing forage, the fires have likely improved foraging habitats for deer and elk in most of the burned areas. Areas of low intensity fire are expected to recover quickly. New sprouts of brush species provide higher nutritional value than older decadent brush. Grasses and forbs are expected to sprout soon after fire and provide highly palatable forage. In areas where the fire burned hottest and seed banks were destroyed, natural re-vegetation will take much longer. Given the scale of this year's burns it seems unlikely that the direct effect of fire will pose any problems except, perhaps, on some site specific local scales. It is far more likely that the suppression efforts posed a much higher likelihood of disturbance with the development of new

access or opening of closed roads. This years fires reflect opportunity for big game. Recognition of burn sites that will benefit species that prefer early succession stages (e.g., mule deer and big horn sheep) is important, and appropriate follow-up is an opportunity.

Losses in key cover components may be partially off set by access restrictions until conditions change. Access developed by suppression efforts should be analyzed. Generally, road closure to motorized vehicles provides the most favorable benefit to wildlife use. Stand-replacement fires may offer the opportunity for planting mixed conifer species stands for future cover needs.

Site-specific loss of forage destined for winter use may be recognized, but on a population level will probably not be of significance. This may not hold on bighorn sheep winter range (Stonehill fire) and warrants some investigation. A second concern on winter range is the invasion of noxious weeds. Opportunities may exist to further reduce noxious weeds or to prevent further spread (especially on the Elk Mountain fire).

Far-Ranging Carnivores: It is important to view at landscape and Forest or larger level. These fires probably pose no significant change in use or habitat given the ranges of these species (e.g. wolverine, fisher, mountain lion, black bear). Carnivores will follow their prey species, should any be displaced due to the fires.

Amphibians and Reptiles: Reichel (personal communication, reported in USDA Forest Service 1994) reports both amphibians and reptiles present in burned areas apparently "hold their own" in the aftermath of major fires.

The focus of concern for amphibians is meadows, fresh water ponds and streams where reproduction and the early developmental stages are focused (e.g., eggs, larvae). This is also especially true for salamanders and, therefore, in post-fire activity, the identification and protection of these sites is very important. It is likely that fires did little to damage these sites directly. However, indirectly, fires may have altered the conditions that provided for the presence and maintenance of wet sites. This may be partially offset by vigorous rehabilitation efforts with a focus on restoring vegetation conditions that contribute to and favor these wet sites and streams.

Of significant concern will be the recognition and protection of these sites during post-fire rehabilitation and salvage efforts. Any new road development, salvage harvest operations, and rehabilitation should consider these sites. The fires have provided an opportunity for large woody debris as well. Recognition and retention

of large diameter standing and down material is an asset in providing shelter and food sources for a number of reptiles and amphibians.

Small Mammals: The makeup of mammalian populations will also change after a large fire event. Small mammals are generally more abundant in the post fire environment, while rabbits and snowshoe hares generally avoid areas of recent stand replacement fires.

Undoubtedly, given the intensity of the fires in many instances this year, conditions amenable to small mammals were completely destroyed. Many acres burned with high intensity and destroyed ground vegetation, trees, downed woody material and snags. Prey sources for species like marten and downed woody debris conditions that are conducive to marten use are gone from some sites. However, it is likely that any effects to small mammals from this fire season will be very site specific, generally short lived. Consider that on the Kootenai 98 percent of the forest did not burn and of the burned acreage, many are small fires and contain a mosaic of burned and unburned conditions. Some sites will provide an abundant seed supply for some small mammals and could be re-colonized very quickly. Other sites will take time to recover enough to support a community of small mammals and ultimately, the predators that they support.

Recognition and retention of large woody debris and snags will be important to small mammals (including bats) as well as other species. Again, this component of fires has the capacity to provide variable and long-term benefits to many species, and it is very important to recognize and retain large snags and large downed trees where available.

VEGETATION RESPONSE UNIT (USDA Forest Service 1999) CONSIDERATIONS:

This section provides a brief description of the historic condition of each VRU and then describes current conditions and/or opportunities related to wildlife habitat. Additional information on wildlife habitat as it relates to the VRUs can be found in "Vegetation Response Unit Characterizations and Target Landscape Prescriptions" (USDA Forest Service 1999) and "Forest Assessment of 1994 Major Fires" (USDA Forest Service 1994).

VRU 1 (warm and dry) – This unit would typically have minimal down woody material and low numbers and diversity of snags, with both components primarily in the larger diameter sizes. The VRU provides important big game winter range habitat. Specialized habitat for flammulated owls (R1 sensitive species) is found here. Interior forest habitat and cover are not primary considerations, however cover should be found in some draws. Consider restoring ponderosa pine by

reducing stocking levels of other species (low severity prescribed fire and timber harvest) and planting. Opportunity may exist to reduce stocking of smaller diameter trees killed by fire (snags). Restoration of native vegetation over noxious weeds is critical here.

VRU 2N & 2S (moderately warm and dry) - Important big game winter range is provided in this VRU. Snag and down woody material levels would generally be described as low, due to frequent low intensity fires. Flammulated owl use does occur here, but is reduced due to increased stocking of Douglas fir and loss of ponderosa pine. Opportunities may exist to restore flammulated owl habitat. Restoration activities may also focus on promoting the availability and palatability of many browse and forage species for elk, deer, bighorn sheep, and moose. Noxious weed control (especially spotted knapweed) is very important in this VRU.

VRU 3 (moderately warm and moderately dry) - Summer range for big game species is found in this VRU, with some winter range at lower elevations. Cover (hiding and thermal) is an important habitat component provided. Interior habitat is also present here. Protection of native vegetation through noxious weed control is important.

VRU 4N & 4S (moderately warm and moist) – Interior habitat for big game security and neotropical migratory birds is a important component provided in this VRU. Old forest habitat features would generally be found here. Big game summer range habitat components of thermal cover and forage areas, with high quality browse, are provided. Snags and down woody material are typically abundant in this VRU. Habitat for pileated and black-backed woodpeckers is provided. Numbers and diversity of snags and down woody material are high. Currently much of this VRU is in mid-seral condition and presents an opportunity to enhance the development of old forest character (larger diameter trees and small openings) through intermediate treatments (prescribed fire, thinning from below).

VRU 5N & 5S (moderately cool and moist) – Large contiguous interior habitat areas provided here. Old growth habitat is a major component found in this VRU. Patches of aspen, cottonwood and birch are found in this VRU. High levels of snags (especially larch) and down wood material to provide habitat for small mammals and birds. Currently much of this VRU is in mid-seral condition and presents an opportunity to enhance the development of old forest character (larger diameter trees and small openings due to mixed severity burns) through intermediate treatments (prescribed fire, thinning from below).

VRU 6 (moderately cool and wet) and **VRU 8** (cool and wet) – These VRUs are very wet forest riparian areas, generally along streams or associated with wetlands.

Stands with old growth characteristics are an important component in this portion of the landscape. Specialized habitats such as elk wallows are often found here. Aspen and cottonwood are distributed across the VRU. Numerous snags and down woody material are characteristics of these VRUs and provide habitat for many wildlife species, including pine marten and fisher. These VRUs are the most productive for browse species (shrubs and forbs). Travel corridors between winter and summer range are important here. Consider retaining most, if not all snags and down woody material in these VRUs.

VRU 7 (cool and moist) – This VRU typically has multi-storied stands with multiple age classes, larger patch sizes and high structural diversity. The long fire interval contributes to stable interior forest habitat with high levels of old growth. Habitat for lynx, boreal owls, and grizzly bear occur here. Special habitat features like elk wallows are also present. Opportunity to restore lynx forage habitat may be present. Consider providing lynx denning habitat by leaving clumps (5 acres and larger) of larger diameter fire killed trees to either fall down naturally or felled and left to create high density down woody material den sites.

VRU 9 (cool and moderately dry) – This VRU is important lynx habitat, often along ridges that provide movement routes. The lodgepole stands provide high quality black-backed woodpecker habitat. Fall bear habitat and denning sites are found here. Lynx forage habitat should be a strong consideration for restoration activities. Retention of the largest snags should be a priority, especially where high quality species like larch exist.

VRU 10 (cold and moderately dry) – This VRU also provides lynx habitat, along with sites for bear denning, and high elevation big game summer range. Snags and down woody material levels are generally low. Opportunity to restore whitebark pine vegetative communities may exist, which will benefit grizzly bear, Clark's nutcracker and many other species.

VRU 11 (cold) – Summer range for mountain goat, elk, and mule deer along with fall grizzly bear habitat are found here. Opportunity to restore whitebark pine vegetative communities may exist, which will benefit grizzly bear, Clark's nutcracker and many other species.

Major Fires: Impacts by Lynx Analysis Unit

LAU	Fire Severity 1 (High) Acres	Fire Severity 2 (Moderate) Acres	Fire Severity 3 (Low) Acres	Fire Severity 4 Unburned Acres *	Total Acres
14101	477	358	39	0	874
14102	759	1499	0	24	2282
14103	1323	751	105	58	2237
14109	1448	1128	709	10	3295
14110	4343	3591	1441	291	9666
14401	6	8	114	0	128
14402	164	57	16	0	237
14403	54	249	41	0	344
14404	1677	5365	3053	0	10095
14405	204	385	130	40	759
14407	107	651	145	0	903
14408	0	144	21		165
14409	138	165	1046	3	1352
14513	225	532	15	0	772
14702	199	444	38	0	681
14705					73

* Unburned acres within the exterior boundary of the fires.

LAU	Major Fires in LAU
14101	Young J
14102	Cliff Point, Fan Creek
14103	Cliff Point
14109	Stone Hill, Lydia Mountain
14110	Stone Hill, Lydia Mountain
14401	Grubstake
14402	Runt, Bonnet Top
14403	Runt, Mt Baldy
14404	Okaga, Upper Beaver, Kelsey
14405	Lucky Point, Roderick South, Sheepherder
14407	Prospect, O'Brien, Pulpit Mtn., Studebaker Draw, Kedzie, Feeder Mtn., Noseeum Creek
14408	FrezKat, Survey Mtn.
14409	Grambauer Face, Taylor Peak
14513	Elk Mountain
14702	Green Mountain, Engle
14705	McNeeley

Major Fires: Impacts by Bear Management Unit

BMU	Fire Severity 1 (High) Acres	Fire Severity 2 (Moderate) Acres	Fire Severity 3 (Low) Acres	Fire Severity 4 Unburned Acres *	Total Acres
1	164	239	1438	3	1844
6	167	339	38	0	544
9	0	145	21	0	166
10	150	871	165	0	1186
11	213	388	194	39	834
13	4	60	16	0	80
14	194	190	39	0	423
15	27	64	98	0	189
16	1391	4753	3332	0	9476
17	398	1935	494	0	2827

* Unburned acres within the exterior boundary of the fires.

Major Fires: Impacts on Core Habitat by BMU

BMU	Fire Severity 1 (High) Acres	Fire Severity 2 (Moderate) Acres	Fire Severity 3 (Low) Acres	Fire Severity 4 Unburned Acres *	Total Acres
1	162	200	1268	3	1633
6	77	181	0	0	258
9	0	57	5	0	62
10	82	576	77	0	735
11	173	370	88	2	633
13	4	60	16	0	80
14	194	190	39	0	423
15	0	0	0	0	0
16	326	1677	1708	0	3711
17	200	644	285	0	1129

* Unburned acres within the exterior boundary of the fires.

BMU	Major Fires in Bear Management Unit
1	Grambauer Face, Taylor Peak
6	Green Mountain, Engle
9	Frezkat, Survey Mountain
10	Prospect, O'Brien, Pulpit Mtn., Studebaker Draw, Noseeum Creek, Feeder Mtn., Kedzie
11	Lucky Point, Sheepherder, Roderick South
13	Mt. Baldy
14	Runt
15	Grubstake, Bonnet Top
16	Okaga, Upper Beaver
17	Kelsey Creek

Snags and Birds

This year's fires provide the opportunity to recognize and retain burned vegetation that supports a host of avian species. Hutto (1995) identified over 80 species that utilize early fire succession sites. In general, existing data do not provide any clear perspective on long-term historic population changes for bird species in coniferous forests in Western North America (Hejl, 94). Due to human expansion and development, species associated with old growth, snags, and fire are probably less abundant than historically and fire exclusion from fire dependent forest habitats may be of equal significance (Hejl, 94). With that thought in mind, the effects of this year's fires can be viewed as an important change on the landscape that will benefit many forest avian species.

Among the 80+ species Hutto (1995) documents in early fire succession, several are seen to be very dependent on this stage and, in the case of black-backed woodpeckers, distribution is nearly restricted to standing dead trees associated with crown fires. This association is driven by the presence of primary bark beetles that are attracted to dying and damaged trees associated with recent fires (Amman and Ryan 91). These fire associated outbreaks last for several years and then decline. Both the insect and bird species that capitalize on these effects are mobile and able to find and exploit recent fires (Hutto 1995).

Considerations for recognizing and managing key elements of these burns, in order to provide habitat for benefiting species focus on the following parameters:

1) Degree of fire severity—Canopy fires that defoliate trees, scorch or burn the bark but do not burn or dry out the inner bark provide a suitable host site for beetles (Amman and Ryan 91, Hutto 1995). Without the ability for beetles to utilize burned trees, a significant element in post-fire wildlife benefits is lost.

2) Species of tree—Hutto (1995) determined that Douglas fir, ponderosa pine and western larch supported 47-80 percent feeding use by woodpeckers while Engleman spruce, lodgepole pine and subalpine fir demonstrated 0-2 percent use. Clearly, thick barked trees are preferred, probably because of the insulating ability of the bark and the need to retain a moist inner bark to support beetles.

3) Stand conditions—Hutto (1995) recommends retaining intact stands because of the ability of birds to exploit different microhabitats. Therefore, rather than salvage across an entire burn area, it is probably better to take trees from part of a burn and retain, intact, other portions of a burn. This has the added benefit of safety considerations as well.

4) Pre-existing conditions—Hutto (1995) found that snags, which were present in a stand before a fire (also aspen), were used disproportionate to their availability after a fire. Recognizing and retaining pre-existing snags in recent burns is important. This concept can be expanded on a mid-scale basis as well. Where recent fires created new snags and future snags via delayed mortality and where existing conditions reflect a paucity of snags due to recent harvest or other conditions, there is an opportunity to retain and manage snags. It is important to view this opportunity at the broader level in order to retain diversity within a landscape. Use this opportunity to supplement a habitat that is in short supply by leaving numbers of snags in excess of normal standards.

5) Scale—Hutto (1995) does not clearly recommend a scale of application. However, it is important to "step back" when viewing the effects of recent fires and attempt to place individual burns in context with the landscape. Over 200 fires occurred on the Kootenai. Many were small but will contribute to local diversity and probably will not be salvaged. Larger fires offer the opportunity for closer examination and identification and retention of key attributes. Hutto reports (1995) that bird abundance did not vary with burn size and that relative bird abundance varied among species and across the landscape. He concludes that each site may be differently suited for occupancy by various species. Therefore, developing a landscape perspective and retaining representative elements of this year's fires across the landscape seems most appropriate. Rather than simple 50:50 "give and take" guidelines, recommendations should reflect fire severity, preferred tree species, retention of existing snags, and a landscape reflection of availability.

REFERENCES

Amman, Gene D. and Devin C. Ryan. 1991. Insect Infestation Of Fire Injured Trees In The Greater Yellowstone Area. Intermountain Research Note 398. USDA Forest Service. 9 pp.

Ecological Planning and Toxicology Inc. 1995. Temporal Ecological Synthesis: for Kootenai National Forest Phase I Report. Corvallis, OR. 225 pp.

Hejl, Sallie. 1994. Human-Induced Changes In Bird Populations In Coniferous Forests In Western North America During The Past 100 Years. Studies in Avian Biology, No 15:232-246.

Harris, Richard B. 1999. Abundance and Characteristics of Snags in Western Montana Forests. USDA Forest Service, Rocky Mountain Research Station. General Technical Report: RMRS-GTR-31. 19 pp.

Harms, Dale. 1992. Section 7 Consultation Procedures: letter and map. U.S. Fish & Wildlife Service memo to Robert Schrenk (Forest Supervisor, Kootenai National Forest). 1 pg.

Hutto, Richard L. 1995. The Composition of Bird Communities Following Stand-replacing Fire in the Northern Rocky Mountains (U.S.A.) conifer forests. Conservation Biology 9:1041-1058

USDA Forest Service. 1994. Forest Assessment of 1994 Major Fires. Kootenai National Forest. Libby, MT. 24 pp plus Appendix

USDA Forest Service. 1999. Vegetation Response Unit Characterizations and Target Landscape Prescriptions 1999. Kootenai National Forest. Libby, MT. 168 pp.

USDA Forest Service et.al. 2000. Canada Lynx Conservation Assessment and Strategy. Northern Region, Missoula, MT. 120 pp.

USDA Forest Service. 2000. Northern Region Snag Management Protocol. Northern Region. Missoula, MT. 34 pp.

USDI. 1994. Montana Bald Eagle Management Plan. July 1994. USDI Bureau of Reclamation. Billings, MT. 104 pp.