



United States
Department of
Agriculture

Forest
Service

February 2004



Final Environmental Assessment

SILVER RUN

Laramie Ranger District

**MEDICINE BOW-ROUTT NATIONAL FORESTS &
THUNDER BASIN NATIONAL GRASSLAND**

Albany County & Carbon County, Wyoming

T.15N., T.16N., & T.17N., R.78W. & R.79W.

For Information Contact: Terry DeLay
PO Box 249, Saratoga, WY 82331
(307) 326-2518
tdelay@fs.fed.us

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

Table of Contents

Summary	3
Introduction	4
Document Structure	4
Background	5
Purpose & Need for Action	8
Proposed Action	17
Decision Framework	17
Public Involvement	17
Issues	18
Comparison of Alternatives, including the Proposed Action	19
Alternatives	19
Environmental Measures Common to All Action Alternatives	29
Monitoring Common to All Action Alternatives	34
Comparison of Alternatives	35
Alternatives Considered but Eliminated from Detailed Study	38
Identification of a Preferred Alternative	38
Environmental Consequences	39
Other Required Disclosures	124
Consultation and Coordination	125
Appendix A - Watershed Rehabilitation Projects	127
Appendix B – Management Area Maps & Unit Table	128
Appendix C - Response to Public Comment	131
Literature Cited	168
Table 1. Management Area Prescriptions	14
Table 2. Proposed Action - Treatments	21
Table 3. Proposed Action - Roads	21
Table 4. Alternative 2 - Treatments	24
Table 5. Alternative 2 - Roads	24
Table 6. Alternative 3 - Treatments	26
Table 7. Alternative 3 - Roads	27
Table 8. Comparison of Alternatives	35
Table 8. Comparison of Alternatives (Purpose & Need)	36
Table 8. Comparison of Alternatives (Significant Issues)	37
Table 9. Summary of Cumulative Effects in the Silver Run Analysis Area	39
Table 10. Cumulative Effects of Alternatives on Roadless Area Characteristics	42
Table 11. Summary of Selected Characteristics of Soils in the Silver Run Project Area	45
Table 12. Watersheds within the Analysis Area	47
Table 13. Estimated Equivalent Clearcut Area by Watershed	49
Table 14. Estimated ECA Increase for Proposed Action, Alternatives 2 and 3	56
Table 15. Threatened or Endangered Aquatic or Riparian-Dependent Species that May Occur in the Project Area or be Impacted by the Silver Run Timber Sale Project	60
Table 16. Forest Service Listed Sensitive Aquatic Species that May Occur in the Project Area or be Impacted by the Silver Run Timber Sale Project	62
Table 17. Aquatic And Riparian-Dependent Management Indicator Species (MIS) Known or with Potential to Occur in the Silver Run Timber Sale Project Area	64
Table 18. Recent Timber Sales in Analysis Area	71
Table 19. Past Timber Harvest Since 1949	71

Table 20. Candidate Threatened and R2 Sensitive Plant Species Suspected to Occur in the Analysis Area	81
Table 21. Silver Run Visual Quality Objectives	93
Table 22. Summary of Management Indicator Species Consideration.....	101
Table 23. Wildlife Sensitive Species Likely to Occur, or Habitat Potentially Affected by Proposed Action	109
Table 24. Documented Occurrences of Federally Listed Species within the Project Treatment Areas	112
Table 25. Federally Listed or Proposed Species Possibly Present or within the Area of Effect.....	113
Table 26. Federally Listed or Proposed Species Considered, but Eliminated after Pre-field Review Based on Absence of Suitable habitat or No Project Disturbance	114
Table 27. Lynx Habitat in Northeast Snowy Range LAU – 54,794 acres.....	116
Table 28. Lynx Habitat in French/Upper Douglas LAU – 57,860 acres	117
Table 29. Economic Efficiency by Alternative (in Thousands of Dollars)	121
MAP 1. Vicinity Map	6
MAP 2. Analysis Area.....	7
MAP 3. Proposed Action.....	22
MAP 4. Alternative 2.....	25
MAP 5. Alternative 3.....	28

SUMMARY

The Silver Run Environmental Assessment (EA) describes the environmental effects of a proposal to treat area vegetation with a commercial timber sale, to reduce the spread of dwarf mistletoe, increase patch size of areas that have had past harvest, thin lodgepole pine pole timber stands to reduce susceptibility to insects and disease, and promote and maintain aspen within the Snowy Range portion of the Laramie Ranger District, Medicine Bow-Routt National Forests.

The area that was analyzed is located within a 6th level watershed—North Fork of the Little Laramie River, on the eastern slope of Snowy Range. Located one air mile to the west and northwest of the town of Centennial, almost the entire estimated 31,000-acre analysis area is within Albany County, Wyoming. A small part of the northernmost portion of the analysis area is within Carbon County, Wyoming. The legal description for the area is T.15, 16, and 17N., R.78 and 79W.

This EA describes and compares the environmental consequences of implementing the proposed action that has been developed for the Silver Run Analysis Area. A No Action alternative (Alternative 1) and two additional action alternatives were also analyzed. Impacts that may occur on lands adjacent to the National Forest and impacts that may occur in surrounding communities are also described in this document. Federal and State agencies, and local groups and individuals have assisted in the analysis and disclosure of these environmental consequences. The proposed action is consistent with the overall management direction provided within the Medicine Bow National Forest Land and Resource Management Plan (Forest Plan). The objectives and methods presented are in compliance with the Forest Plan, as required by 36 CFR 219.10(e). This EA is tiered to the Forest Plan and Final Environmental Impact Statement and does not repeat information they contain.

Site-specific data and a more complete discussion of the valuation of effects for the individual resources can be referenced in the specialist reports. The project file is located at the District Office in Saratoga, Wyoming. This is not a decision document and does not contain the Deciding Officer's decision. Based upon this effects analysis of the alternatives and public comments on the proposal, the responsible official will decide to implement the proposed action or another alternative. This decision will be stated and explained in a future Decision Notice.

INTRODUCTION

Document Structure

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four parts:

- *Introduction:* The section includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- *Comparison of Alternatives, including the Proposed Action:* This section provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes possible mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- *Environmental Consequences:* This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource area. Within each section, the affected environment is described first, followed by the effects of the No Action alternative that provides a baseline for evaluation and comparison of the proposed action that follows.
- *Agencies and Persons Consulted:* This section provides a list of preparers and agencies consulted during the development of the Environmental Assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project record located at the Brush Creek/Hayden Ranger District Office in Saratoga, Wyoming.

Background

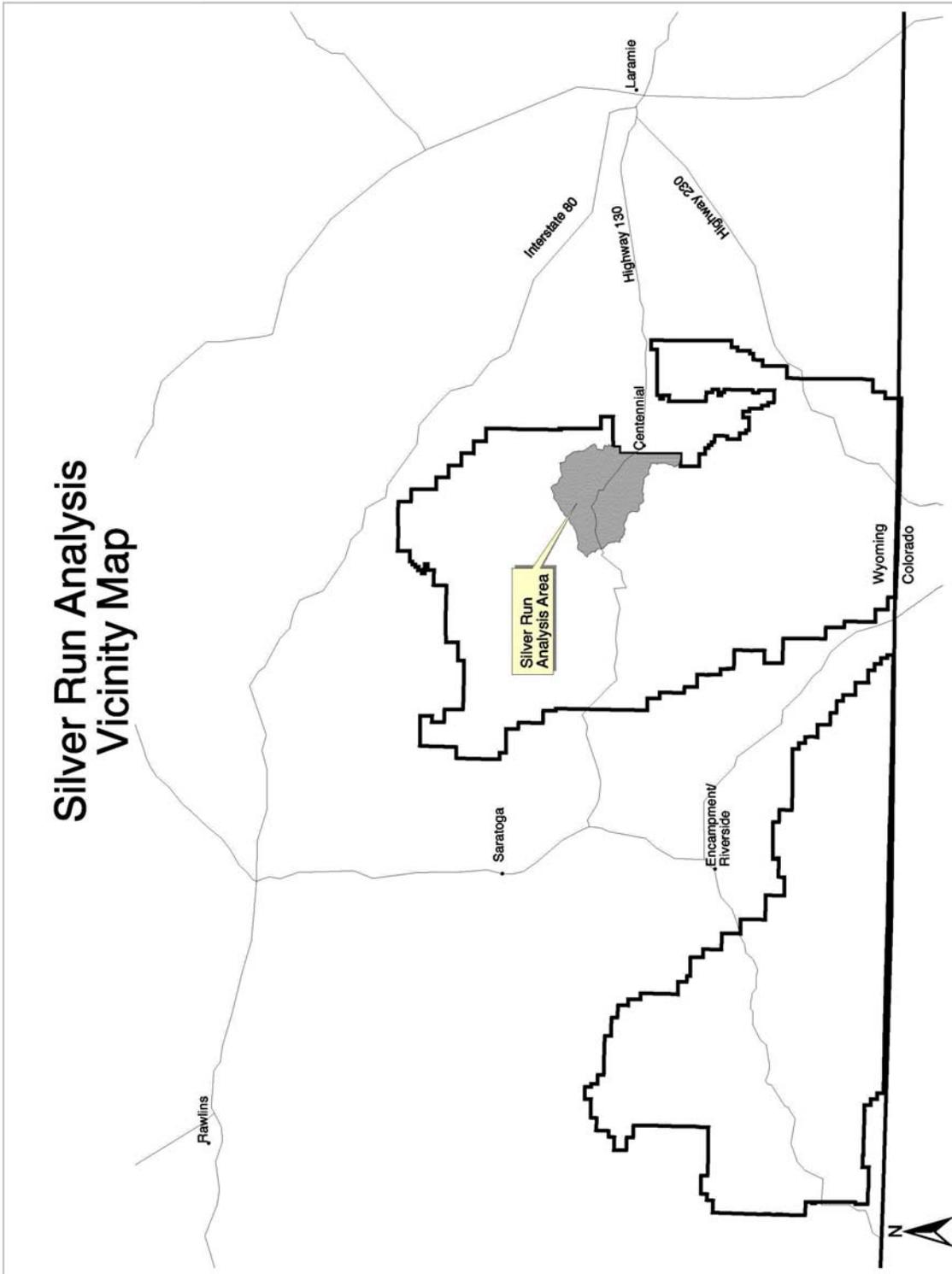
As set forth in law, the mission of the Forest Service is to achieve quality land management under the sustainable multiple use management concept to meet the diverse needs of people. It includes advocating a conservation ethic in promoting the health, productivity, diversity, and beauty of forests. It also includes listening to people and responding to their diverse needs in resource decisions. Our job is to help communities and states wisely use the forests to promote rural economic development and a quality rural environment.

The Forest Service has responsibility for implementing the Forest Plan by completing analysis and evaluation of site-specific projects. The Forest Plan guides natural resource management activities and provides the Forest Service, forest users, and the public with an overall strategy for managing the Forest. The intent of this plan is to manage National Forest System lands for multiple-use and not for any single purpose.

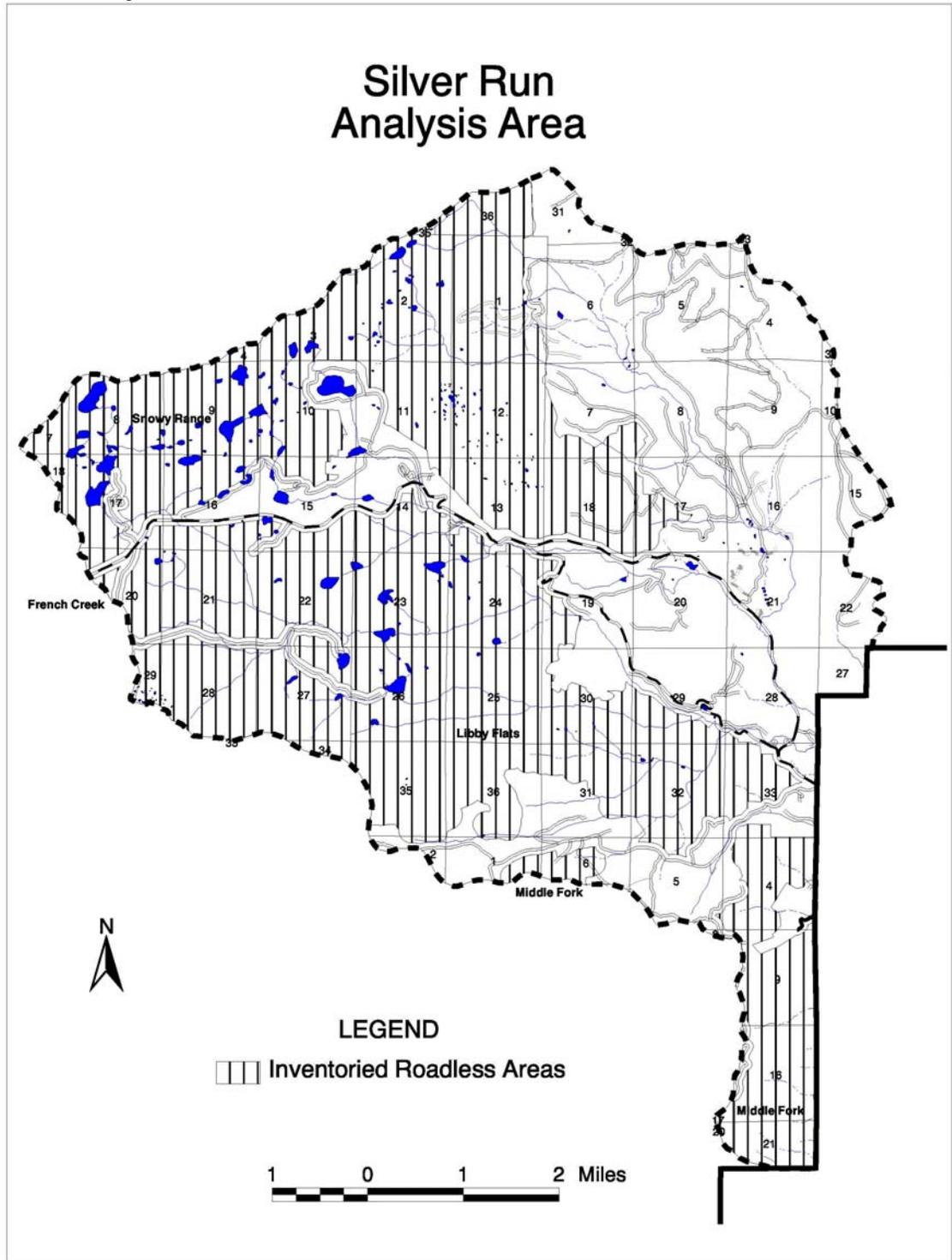
Listed on the Medicine Bow-Routt Five-Year Timber Sale Action Plan, the Silver Run analysis will analyze the site-specific effects of implementing the goals and objectives of the Forest Plan. Under the Medicine Bow Forest Plan, goals are concise statements describing a desired condition to be achieved sometime in the future. They are expressed in general terms and are timeless, in that they have no specific date by which they are to be completed. These goals are listed in the Forest Plan in Chapter III, pages III-3 through III-5.

A preliminary Interdisciplinary Team (ID Team) of District specialists for the analysis met, discussed, and shared information about the area's various resources on field trips to the Silver Run area on August 31, 1999, May 30, 2000, and July 9, 2003, along with meetings at the Laramie office on February 7 and 23, 2000, and April 22, 2003.

MAP 1. Vicinity Map



MAP 2. Analysis Area



Purpose & Need for Action

Existing Condition

The Silver Run Analysis Area is situated on the eastern slope of the Snowy Range. Located one air mile to the west and northwest of the town of Centennial, almost the entire estimated 31,000-acre analysis area is within Albany County, Wyoming. A small part of the northernmost portion of the analysis area is within Carbon County, Wyoming. The legal description for the area is T.15, 16, and 17N., R.78 and 79W. The analysis area includes portions of the Snowy Range, Libby Flats, Middle Fork, and French Creek Inventoried Roadless Areas. The majority of the 1,400-acre Glacier Lakes Ecosystem Experiments Site (GLEES) lies along the northwestern boundary within the Snowy Range roadless area. The Snowy Range Research Natural Area is situated in the western portion of the analysis area within the Libby Flats roadless area. There are no wilderness areas within the vicinity.

The main access to the area is on Wyoming Highway 130 (Snowy Range Highway), which passes from east to west through the center of the analysis area. Designated a National Scenic Byway in the late 1980's, the Snowy Range Highway was the second such byway designated nationally. National Forest System Road (NFSR) 101 (Sand Lake Road) is the major access road off Hwy 130 to the northern portion of the area. NFSR 338 (Ehlin Road) provides access to the south. Along with the Centennial Visitor Center, the analysis area contains a number of developed campgrounds and picnic grounds—including the Sugarloaf Recreation Area. The Snowy Range Ski Area is situated off Hwy 130 within the center of the area. A number of permitted lodges and cabins are situated to the west of the ski area off Hwy 130, Barber Lake Road (NFSR 351), and Brooklyn Lake Road (NFSR 317).

Ranging in elevation from 8,000' to 12,000', the analysis area is predominantly forested with parks or meadows of various sizes scattered across the landscape. The higher elevations are characterized by tree-less tundra and windswept "krummholtz." Engelmann spruce and subalpine fir dominate the higher elevations, along with many north facing slopes and riparian areas. The middle elevations of the area are dominated by stands of lodgepole pine pole timber and saw timber. Descending in elevation to the east, the lodgepole pine becomes more mixed with aspen. These lower elevation stands are interspersed with a number of sizeable parks—including Clark Park, small meadows, sparsely forested, windswept ridges, and non-forested southerly facing slopes. At the lower treeline at about 8,200 feet the lodgepole pine and aspen become mixed with scattered limber pine, and unique, relic stands of Douglas fir, along with a few scattered ponderosa pine.

The analysis area is drained by a number of sizeable creeks that find their sources within the higher elevations of the Snowy Range. The analysis area is made up of one sixth-level watershed--the North Fork of the Little Laramie River. Silver Run, Gold Run, Libby Creek, Nash Fork, and the North Fork make up the major creeks within the watershed. The town of Centennial has wells within the watershed that supply water to the town.

The Silver Run Analysis Area probably contains the highest amount of year-round recreational use of any watershed within the Medicine Bow National Forest. Several multiple use trails can be found within the analysis area. The Corner Mountain and Little Laramie River trail systems are year-round systems suitable for hiking, biking, and cross-country skiing. The area also contains several of the Snowy Range trails, which are used mostly for hiking in the summertime. Other trails, used primarily for cross-country skiing, include the Barber Lake and Libby Creek trails and trails leaving the Snowy Range Ski Area. The winter closure of Hwy 130 at the Green Rock Picnic Area serves as a trailhead for skiers and snowmobilers alike. In addition to the numerous trail opportunities, the area contains numerous developed campgrounds and picnic areas.

There are a number of grazing allotments within the analysis area. Primary range for the allotments are located within sagebrush meadows at the lower elevations, stream bottoms and non-forested hillsides at the middle elevations, and within meadows at the higher elevations.

Wildlife species occurring in the project area are typical of those occurring in similar habitats throughout the Snowy Range portion of the Medicine Bow-Routt National Forests. One species of concern is elk, which has both winter range and calving areas at the lower elevations in the vicinity. Past and recent raptor surveys have found a number of northern goshawk nests in the project area. Much of the analysis area is within the known elevational range for goshawks (under 9,200' in elevation). Although the area has been identified as potential habitat for Canada lynx, there are no threatened or endangered species known to exist in the project area.

Fire/Disturbance History

The existing vegetation patterns in the Silver Run area are but a snapshot in time along the path of plant succession. Following a continuing process of self-renewal, for thousands of years the subalpine and montane forests in this vicinity have regenerated, matured, and died. Disturbances are a part of ecosystem processes. Forests are adapted to disturbances. Short-term changes can be dramatic and substantial, but forests will regenerate and thrive again. In the Central Rocky Mountain ecosystem, disturbance is the critical factor in maintaining co-existing species. Without disturbance, climax species such as subalpine fir and Engelmann spruce would replace disturbance dependent species such as lodgepole pine, aspen, and ponderosa pine. The most common disturbance that has affected the forests seen today in the Silver Run area has been wildfire.

Natural and human-caused wildfires have been a major factor in forming the forests we see today in the Silver Run vicinity. It is known that fire has periodically burned large portions of the area, playing an important role in the appearance of the landscape, and maintaining a mix of tree species in various successional stages. The presence of lodgepole, aspen, and ponderosa at the lower and middle elevations of the analysis area is reflective of disturbance in the form of fire. These lower elevations tend to be drier and have a shorter fire return interval, while wetter, higher elevations have a longer fire return interval. Lodgepole, aspen, and ponderosa are very dependent on natural disturbance such as fire to propagate themselves. Lodgepole and aspen stand origin dates, estimated from tree ring growth data, provide a rough map of where and approximately when stand replacing/regenerating fires occurred.

A study conducted in the higher elevations of the Savage Run Wilderness, ten air miles to the southwest, found a fire interval frequency of approximately 200 to 300 years. In other words, on average it would take approximately 200 to 300 years for a series of stand replacing fires to burn the entire area. Other studies conducted on the Forest indicate that large stand replacing fires (1,000+ acres) burned portions of the Forest every 100 years or so. In examining the fire history or stand origin data for the vicinity, it appears that the majority of existing stands resulted from fires that burned the area between 1860 and 1909. Origin dates would tend to indicate that the majority of the trees in the area began growing following fires that burned this portion of the Snowy Range during this early to post settlement period. Portions of the analysis area, including Corner Mountain and the upper part of the Silver Run drainage, appear to have burned after 1910. Fires appear to have been effectively controlled within the vicinity since that time.

Shortly after the establishment of the Forest in 1902, the newly created Forest Service started a strict policy of fire suppression in the area. Early firefighting efforts were aided by the construction of fire lookout towers on Medicine Bow Peak and (still in existence) Spruce Mountain to the south of the area. The control of fire since this time appears to have contributed to the noticeable conversion through natural succession of what were aspen, and in some cases ponderosa pine stands, to subalpine fir and lodgepole pine stands at the lower forested elevations such as the east face of Centennial Ridge.

Past Timber Harvest

Many of the lower elevation forested stands within the analysis area show evidence of tie hack and pre-1950 selective logging. Spurred by the construction of the first transcontinental railroad to the north of the Forest and, later, the Laramie, Hahn's Peak, and Pacific (LHP&P) line from Laramie through Centennial to Walden, Colorado, much of the Snowy Range was cut over by "tie hacks" between 1860 and 1920. Completed in 1885, the construction of the LHP&P rail line opened up much of the southern Snowy Range of what was to become the Medicine Bow National Forest to year-round cutting by tie hacks. Tie hacks were loggers that cut railroad ties for the railroad. In working their trade the tie hacks would typically cut lodgepole pine (11" DBH was optimum), discriminately selecting the straightest, best formed trees to hand hewn ties from. Along with ties, early day loggers cut timber in the vicinity for the area mines on Centennial Ridge, and within the Gold and Silver Run subwatersheds. Early logging also supplied material for the construction of homesteaded ranches along the North Fork of the Little Laramie River and within the Centennial Valley. Evidence of this cutting, in the form of stumps, and old, overgrown logging roads can be found throughout the lower elevations of the area.

The greatest effect the early day loggers had on the Silver Run area's vegetation was probably not their cutting, but the wildfire(s) that they may have caused. The fires that burned much of the area between 1860 and 1909 were probably caused and fueled by slash from early day cutting. There was virtually no regulation of logging until after the Forest was created in 1902. Another major effect of this early logging and subsequent cutting up until around 1950 was to create forest conditions that promoted the spread of dwarf mistletoe within area lodgepole pine stands. Many of the openings created by this era's selective cutting regenerated to lodgepole pine, changing what were single-storied stands to the current multistoried stands. Dwarf mistletoe in the lodgepole overstory that was not cut has spread into much of this lodgepole regeneration within these stands. It was during this era that the first major trails and roads were constructed into the vicinity. This access allowed for other uses such as livestock grazing, water diversions, commercial hunting, and recreation to begin in the area.

Large scale timber harvesting began in the area in the late 1950's. As with other parts of the Medicine Bow National Forest, early clearcut harvesting of a number of stands in the Silver Run area (southern portion) and off the beginning of the Fallen Pines Road (NFSR 329) in the northern portion was done with alternate strips. Since that time clearcut harvesting has been done with small, irregular shaped units. Since 1950 a number of lodgepole pine poletimber stands along the Ehlin and Sand Lake Roads have been commercially thinned for post and poles. The Laramie Ranger District records identify portions of eight timber sales that occurred within the analysis area over the last 28 years. During this time and to the present an estimated 9% of what is forested has had some sort of harvest treatment in the area. Regeneration units within previous sales are currently predominantly stocked with seedling and sapling size lodgepole pine. Many stands harvested over 15 years ago have been precommercially thinned.

Forest Health and Resiliency

Though there are a number of species-specific insects and diseases that affect the forested stands in the area, the dominance of lodgepole pine make it the primary timber species of concern. The two biggest pests of lodgepole pine across its range are dwarf mistletoe and mountain pine beetle.

The most damaging pest to affect lodgepole pine in the Silver Run Analysis Area is dwarf mistletoe. Dwarf mistletoe is a parasitic plant that grows into the bark of host trees--feeding off the food and nutrients the tree produces. Mistletoe deforms trees, causes rot, and weakens the tree so that it is more susceptible to insects and disease. In the case of the Silver Run Analysis Area, the Resource Inventory System (RIS) database information and on-site field inspections would tend to indicate that approximately 84% of the existing lodgepole pine stands are infected with mistletoe across the project area. Associated with this, there are a number of forested stands where yearly tree mortality exceeds yearly tree growth.

Much like droughts, mountain pine beetle epidemics are cyclic. When conditions are favorable the beetle population increases to epidemic levels. Dense mature stands of lodgepole pine that have moderate to high infestations of dwarf mistletoe have little or no defense against these beetles and are extremely susceptible when these insects reach epidemic levels. When beetle populations increase, even healthy trees are subject to infestation. Beetles often kill entire stands of trees during an epidemic. Fire often follows, taking “advantage” of the large accumulation of fuels and burning over the sites. Under dry conditions and with an ignition source such as lightning, tree mortality from bark beetles can provide a ready source of dead fuels for the inevitable wildfire. Fire can also occur without the predisposition created by bark beetles. There are indications that mountain pine beetle activity is on the increase in the analysis area at the lower elevations.

Another potentially damaging insect that may pose a threat to the Engelmann spruce within the analysis area in upcoming years is spruce beetle. Spruce beetle is similar to the pine beetle in that is cyclic, and when conditions are favorable the beetle populations can increase to epidemic levels. Once an epidemic occurs, all spruce 5” in diameter and greater are susceptible to attack. There are indications that spruce blow-down that has occurred in recent years within watersheds to the west of the analysis area may provide a medium and/or epicenter for the start of a spruce beetle epidemic that could spread into the spruce dominated forests at the higher elevations. Situated primarily within the two roadless areas in the western portion of the area, the current spruce dominated stands have a medium to high risk to a future spruce beetle epidemic.

Aerial surveys of the area also found an appreciable amount of subalpine fir mortality, primarily within the lower elevations of the vicinity. Recent years have seen a dramatic increase in fir mortality due to a root disease, *Armillaria* sp. and an insect--fir engraver, within this area. This increase in fir mortality in the area is linked to overstocked conditions within these fir stands.

Watershed Restoration

Stream surveys conducted in the area between 1997-2000 found there were several streams that have adjoining disturbed areas, primarily from historic mining and logging, along with more recent recreation activity. These disturbed areas are contributing sediment to the adjoining streams. A Roads Analysis report examining the current road system was completed for the area. Along with identifying potential future road closure candidates, the analysis also identified roads in need of maintenance. Scheduled to begin in 2004, information from this report will be incorporated into the upcoming Snowy Range Travel Management Phase II effort.

Forest Plan Direction

Under the Medicine Bow Land and Resource Management Plan, management emphasis within the analysis area is distributed among several management area prescriptions. The largest management area is 4B, which emphasizes wildlife habitat for one or more management indicator species. Situated in the northern and southern portions of the project area, the 4B area constitutes approximately 11,971 acres, or 39% of the analysis area.

The next largest management area is 2B, which emphasizes rural and roaded natural recreation opportunities. Situated along the Snowy Range Hwy corridor, the 2B area constitutes approximately 5,105 acres, or 16% of the analysis area. It is also within this corridor and the western part of the area where there are a number of other management areas with recreation emphases, including: 2A semi-primitive motorized recreation (2,826 acres), 3A semi-primitive non-motorized recreation (2,400 acres), 1A developed recreation site(s) (1,178 acres), and 1B winter sports site (1,273 acres).

Situated in the northeastern portion of the project area, the 7E management area, which emphasizes wood fiber production and utilization, constitutes approximately 2,766 acres of the analysis area. The remaining area is divided up between a number of management areas, including: 5A big game non-forested winter range (766 acres), 5B big game forested winter range (451 acres), 10A research natural area (749 acres), 4D aspen management (738 acres), 7C management of steep forested areas (168 acres), and 9A riparian emphasis (52 acres). There are approximately 13,400 acres within the analysis area that are currently classified as being suitable for timber harvest.

The Medicine Bow National Forest Land and Resource Management Plan contains the following direction that is pertinent to this analysis:

- Forest Plan direction (p. III-4) Manage fish and wildlife habitats, including plant diversity, to maintain viable populations.
- Forest Plan direction (p. III-14) Maintain structural diversity of vegetation.
- Forest Plan direction (p. III-20) Design and locate vegetation manipulation in a scale, which retains the color and texture of the characteristic landscape.
- Forest Plan general direction (p. III-34 #1) Use both commercial and non-commercial silvicultural practices to accomplish wildlife habitat objectives.
- Forest Plan general direction (p. III-36 #3) Improve habitat capability through direct treatments of vegetation.
- Forest Plan direction for Management Area 7E (p. III-77 #3) Maintain stands in a variety of age classes and sizes.
- Forest Plan general direction (p. III-46 #3) Clearcuts may be applied to dwarf mistletoe infected stands of any forest cover type.
- Forest Plan general direction (p. III-47 #6) Lists commercial thinning as an appropriate practice.

- Forest Plan direction (p. III-84) Prevent or suppress epidemic insect and disease populations that threaten forested tree stands with an integrated pest management approach consistent with resource management objectives.
- Forest Plan direction for Management Area 7E (p. III-193) Apply intermediate treatments to maintain growing stock levels.
- Forest Plan direction (p. III-4) states as a goal: Provide for timber harvest to support local dependent industries and management of the many Forest resources in a manner that meets silvicultural needs of timber species, places timber stands under management, minimizes timber management costs, and supplies wood products to meet National needs.
- Also stated as goal within this section (Medicine Bow p. III-4): Treat vegetation to provide a Forest environment for the uses compatible with the Management Area Objectives.
- Forest Plan direction for Management Area 7E (p. III-189) Management emphasis is on wood fiber production and utilization.
- Forest Plan general direction (p. III-74) Maintain soil productivity, minimize man-caused soil erosion, and maintain the integrity of associated ecosystems.

Table 1. Management Area Prescriptions

	MANAGEMENT AREA PRESCRIPTION	Acres
1A	Developed Recreation Sites	1,178
1B	Winter Sports Site	1,273
2A	Semi-primitive Motorized Recreation	2,826
2B	Rural and Roded Natural Recreation	5,105
3A	Semi-primitive Non-motorized Recreation	2,400
4B	Habitat for One or More Management Indicator Species	11,971
4D	Aspen Management	738
5A	Big Game Winter Range in Non-forested Areas	766
5B	Big Game Winter Range in Forested Areas	451
7C	Management of Forested Areas on Steep Slopes	168
7E	Wood Fiber Production and Utilization	2,766
9A	Riparian Area Management	52
10A	Research Natural Area	749
	TOTAL ACRES	30,443

Based on an analysis of the existing condition and Forest Plan management direction, the following resource management needs have been identified for the Silver Run Analysis Area:

- **Characteristic Landscape** - Before fire suppression was initiated, the characteristic landscape was composed of generally larger patches of vegetation following natural breaks in topography. Harvesting--especially alternate strip clearcutting, and road construction in the area since 1950 has reduced the patch size of a number of stands in the area, which has decreased their value for big game security and as potential habitat for dependent wildlife species - such as the northern goshawk.
- **Forest Health and Resiliency** - Low to high levels of dwarf mistletoe are present in approximately 75% of the lodgepole pine stands within the analysis area. Associated with this mistletoe, there are a number of stands where annual tree mortality exceeds annual tree growth. Mistletoe deforms trees, causes rot, and weakens the tree so that it is more susceptible to insects and disease.
- **Providing a Flow of Timber** - The National Forests have as a legitimate use, the sale of timber resources. This use originates in the Organic Act of 1897, and is reaffirmed in the 1960 Multiple Use - Sustained Yield Act and the 1976 National Forest Management Act. The Medicine Bow Forest Plan states as a goal (p.III-4): Provide for timber harvest to support local dependent industries and management of the many forest resources in a manner that meets silvicultural needs of timber species, places timber stands under management, minimizes timber management costs, and supplies wood products to meet national needs. Much of the proposed project area is within a 7E management area, which places emphasis on wood production.
- **Watershed Restoration** – Stream surveys in the project area have found there are several adjoining disturbed areas that could be rehabilitated through erosion control measures and revegetation. There are a number of open roads within the project area that have been identified as requiring maintenance to reduce soil erosion and sediment entering area creeks.

Desired Condition

Desired future condition refers to how an area would appear and function in the future under various management scenarios. A desired condition is developed, based on what exists now, knowledge of how it got that way, what is ecologically possible, what is economically feasible, and what is socially desirable. A description of a desired condition provides the management goals for an area. Goals for each resource are fairly broad under these descriptions, and are built on the general desired condition discussed in the Forest Plan.

Based on the Forest Plan and an analysis of existing condition, a preliminary desired future condition was developed for the Silver Run Analysis Area. Under this desired future condition, the vicinity will be managed to provide a mix of quality habitat to promote viable populations of native wildlife species. Large blocks of mature (old growth) forest for dependent wildlife species are maintained within the Snowy Range and Libby Flats roadless areas and designated old growth stands. Areas with past and future harvest in the northern and southern portions of the area will provide habitat for generalists and early successional species.

The high amount of recreation that occurs within the area makes it the most determining resource use in formulating a desired future condition for the area. The special status that has been placed on the Snowy Range Highway as the second Scenic Byway designated Nationally, the ski area, the high number of campgrounds, permitted lodges and cabins, the GLEES and research natural area, along with the Sugar Loaf high elevation lakes within the analysis area, all show how desirable this area is for a number of recreational uses. Due to this demonstrated value and the high amount of recreational infrastructure already in place, all resource management within the vicinity should be geared to facilitating and maintaining this use. Paramount among considerations for future resource management is how it will negatively or positively affect the visual resource and/or natural appearance of the landscape.

In areas that have had past timber harvesting, historical timber type patterns will serve as a guide as to what tree specie(s) would be emphasized within these blocks of stands. Associated with elevation, harvesting will be used to maintain and promote aspen at the lower elevations, aspen and lodgepole pine at the middle elevations, and spruce-fir at the higher elevations. A special emphasis is placed on consolidating areas that were clearcut in the past to better emulate the natural patch size of forested stands in the vicinity. Treatments are also used to improve the health and resiliency of the area's forested stands by decreasing their susceptibility to insects and disease. The resulting Silver Run area landscape will consist of a mix of large stands of undisturbed, mature forest and smaller stands in earlier successional stages.

Proposed Action

Based on a review of the existing condition of the area's resources, resource management needs, and Forest Plan(s) standards and guidelines, the following potential opportunities or proposed actions were identified for the Silver Run Analysis Area.

A preliminary analysis of the area has found that a multi-product commercial timber sale(s) could be used to move vegetation within the analysis area towards the desired future condition. Under this proposal, harvest units cover approximately 473 acres. The proposal is situated primarily in a 7E timber emphasis (49%), along with 2B roaded recreation emphasis (30%), 4B wildlife habitat emphasis (18%), and 1A developed recreation site (3%) management areas (see Appendix B for map of management areas). The Proposed Action is designed to increase patch size of areas that have had past harvest, and reduce the spread of dwarf mistletoe to improve and promote tree health, resiliency, and growth. A number of soil and water projects would be also be implemented to minimize human-caused soil erosion in the area.

Potential silvicultural treatments include: clearcutting, overstory removal, sanitation/salvage, and shelterwood. It is anticipated that approximately 0.9 miles of new specified construction, 0.7 miles of specified reconstruction, along with an estimated 2.0 miles of temporary roads would be required to access this proposal.

There are no proposed harvest units or road construction within any of the vicinity's inventoried roadless areas under this proposal. Associated projects with the multiproduct timber sale(s) would include: lodgepole pine seed collection, slash treatment, regeneration surveys, release and weed thinning, personal use firewood, and noxious weed control.

Decision Framework

Given the purpose and need, the deciding official reviews the proposed action and the other alternatives in order to make the following decisions:

- What alternative would do the most to improve forest health and resiliency to insects and disease, create vegetative diversity, minimize soil erosion, and contribute to the goal of providing for timber harvest?
- What measures and/or mitigation would be necessary to adequately address concerns and meet Forest Plan direction for other resources, such as wildlife, aesthetics, soils, area streams, etc.?

Public Involvement

The proposal was listed in the Schedule of Proposed Actions quarterly reports in 1997, and each subsequent report thereafter. The proposal was provided to the public and other agencies for comment during scoping in June of 1997. Press releases on the scoping were sent to area newspapers and radio stations. Using comments from the public, other Federal and State agencies, and local groups, the interdisciplinary team developed a list of significant issues to address.

On October 24, 2003, a Draft Environmental Assessment (EA) was mailed to those who had requested the document. A legal notice was published in the Laramie Boomerang on October 28, 2003, requesting public comment on the EA. Sixty-one responses were received from interested individuals, organizations, and public agencies. Responses to the comment letters can be found in Appendix C of this document.

Issues

The Forest Service separated the issues into two groups: significant and non-significant issues. Significant issues were defined as those directly or indirectly caused by implementing the proposed action. Non-significant issues were identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council for Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7(a)(3), "...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)..."

The following inter-connected issues and concerns were identified from public comments received for the scoping letter for the Silver Run Analysis Area:

Clearcutting

Many recreational users of this area are sensitive to the use of this silvicultural treatment on National Forest lands. There are concerns that there has been too much clearcutting within the analysis area. Use of this controversial harvest prescription could further degrade the aesthetics of the vicinity by creating logging slash and openings that do not blend in with the surrounding, natural landscape. Clearcutting will further reduce the amount of mature forest habitat that is available for dependent wildlife species.

Aesthetics/Visual Quality

The Silver Run vicinity has the highest and most varied recreational use of any watershed on the Medicine Bow National Forest. Bisected by the Snowy Range Highway National Scenic Byway (Hwy 130), Forest users of this area are sensitive to vegetation treatments that may negatively affect the natural appearance of the vicinity.

In addressing these two significant issues, Alternative 2 drops all harvest units in which clearcutting has been proposed.

New Roads

Many feel there are already too many roads in the vicinity that are negatively affecting the natural appearance of the area.

In addressing this significant issue, Alternative 3 drops all new specified road construction and associated harvest units.

COMPARISON OF ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This chapter describes and compares the alternatives considered for the Silver Run project. It includes a description and map of each alternative considered. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative, and some of the information is based upon the environmental, social, and economic effects of implementing each alternative.

Alternatives

Alternative 1

No Action

Under this alternative, natural succession would be allowed to continue during this entry in the Silver Run vicinity. Undeveloped lands are valued for their very existence in this state. This value is held by both users of the area, and intrinsically by those who place value on such undeveloped areas simply knowing they exist. In proposing no action, Alternative 1 would do the most in addressing the significant issues and concerns for the use of the clearcut prescription, maintaining area aesthetics, and new specified road construction. It also best addresses concerns for maintaining unharvested, intact mature stands in the area.

Alternative 1 would do the least during this entry in moving the area's forests towards the desired future condition. This alternative would allow the conversion of aspen to conifer stands, and lodgepole pine stands to predominantly subalpine fir stands, to continue within the vicinity, in time reducing the diversity of forested stands and their value as habitat to some wildlife species in the area. Dwarf mistletoe would continue to increase in already infected lodgepole stands, spreading into adjacent uninfected stands. The maintenance of a predominantly mature and overmature mistletoe infected lodgepole pine forest across the area will increase the future possibility of an insect epidemic affecting the pine of the area, along with increasing the potential for a stand replacing fire to burn portions of the area. By not addressing watershed restoration concerns, this alternative does not address the identified need of minimizing human-induced erosion and stream sediment.

Proposed Action

Under this proposal, harvest units cover approximately 473 acres. The proposal is situated primarily in a 7E timber emphasis (49%), along with 2B roaded recreation emphasis (30%), 4B wildlife habitat emphasis (18%), and 1A developed recreation site (3%) management areas (see Appendix B for map of management areas). The Proposed Action is designed to increase patch size of areas that have had past harvest, and reduce the spread of dwarf mistletoe to improve and promote tree health, resiliency, and growth. To better emulate pre-settlement vegetation patterns and patch size, harvest units have been concentrated in areas that have had past timber sale entries to consolidate and/or begin creating larger stands of trees with similar species makeup, age, and structures.

Along with consolidating areas with past harvest, clearcutting and overstory removal harvest methods will be used to promote new and maintain existing regeneration in the understory. These same harvest methods, along with the sanitation/salvage and shelterwood – seed cut treatments, will be used to reduce the spread of mistletoe and improve forest resiliency across the area. The overstory removal and shelterwood treatments will also be used to encourage new mixed conifer regeneration within these stands.

Approximately 0.9 miles of new specified road construction, 0.7 miles of specified reconstruction, and 2.0 miles of temporary road would be needed for this proposal. Following the completion of the proposal, all temporary roads would be obliterated and closed. All specified roads currently closed would be physically closed to motorized vehicle use following project completion, retaining their templates for future management entries.

Associated projects would include post sale evaluation, regeneration surveys, slash treatment, pile burning, release/weed thinning, noxious weed treatment, and native grass seeding. A number of soil and water projects would also be implemented to minimize human caused soil erosion in the area. See Appendix A for a list of these watershed restoration projects. There are no proposed harvest units and/or road construction within the inventoried roadless areas (see Map 3). The ID team identified the following management activities to occur under the Proposed Action:

Description of Silvicultural Prescriptions

Clearcut - Under the Silver Run analysis, the clearcut prescription has only been proposed in units that have lodgepole with high to moderate amounts of mistletoe adjacent to uninfected lodgepole stands, or in stands where a new aspen stand is the objective. Consideration has also been given to using clearcutting to increase patch size of areas that have had past harvesting. Under this treatment, all merchantable lodgepole and subalpine fir is harvested (100%). Slash treatment varies from lop and scattering, roller chopping, and/or spot piling, depending on the amount of residue slash left after harvest.

Overstory Removal - The overstory removal prescription has been proposed in units that have a predominantly lodgepole overstory with high to moderate amounts of mistletoe over a lodgepole, fir, and spruce seedling/sapling understory. Along with reducing the spread of mistletoe from the lodgepole overstory to the lodgepole understory, consideration has also been given to using overstory removals to increase patch size of areas that have had past harvesting. Due to inadequate existing regeneration in some portions of these units, there will be areas (most less than an acre in size) that will resemble a clearcut following harvest. Under this treatment, all merchantable lodgepole, subalpine fir, and Engelmann spruce is harvested (80%). Slash is lopped and scattered.

Sanitation/Salvage - Under this treatment, 20 to 30% of the overstory is removed to improve the resiliency of the stand to insects and disease. An emphasis is made on harvesting diseased and trees of poor form. Slash is lopped and scattered.

Shelterwood – Seed Cut - Under this second step of a three-step shelterwood, 40 to 60% of the overstory is removed, retaining the healthiest trees with the best form to act as a seed source. An emphasis is made on harvesting diseased and trees of poor form. Along with improving the resiliency of the stand to insects and disease, this treatment provides growing space for new and existing regeneration in the understory. Slash is lopped and scattered.

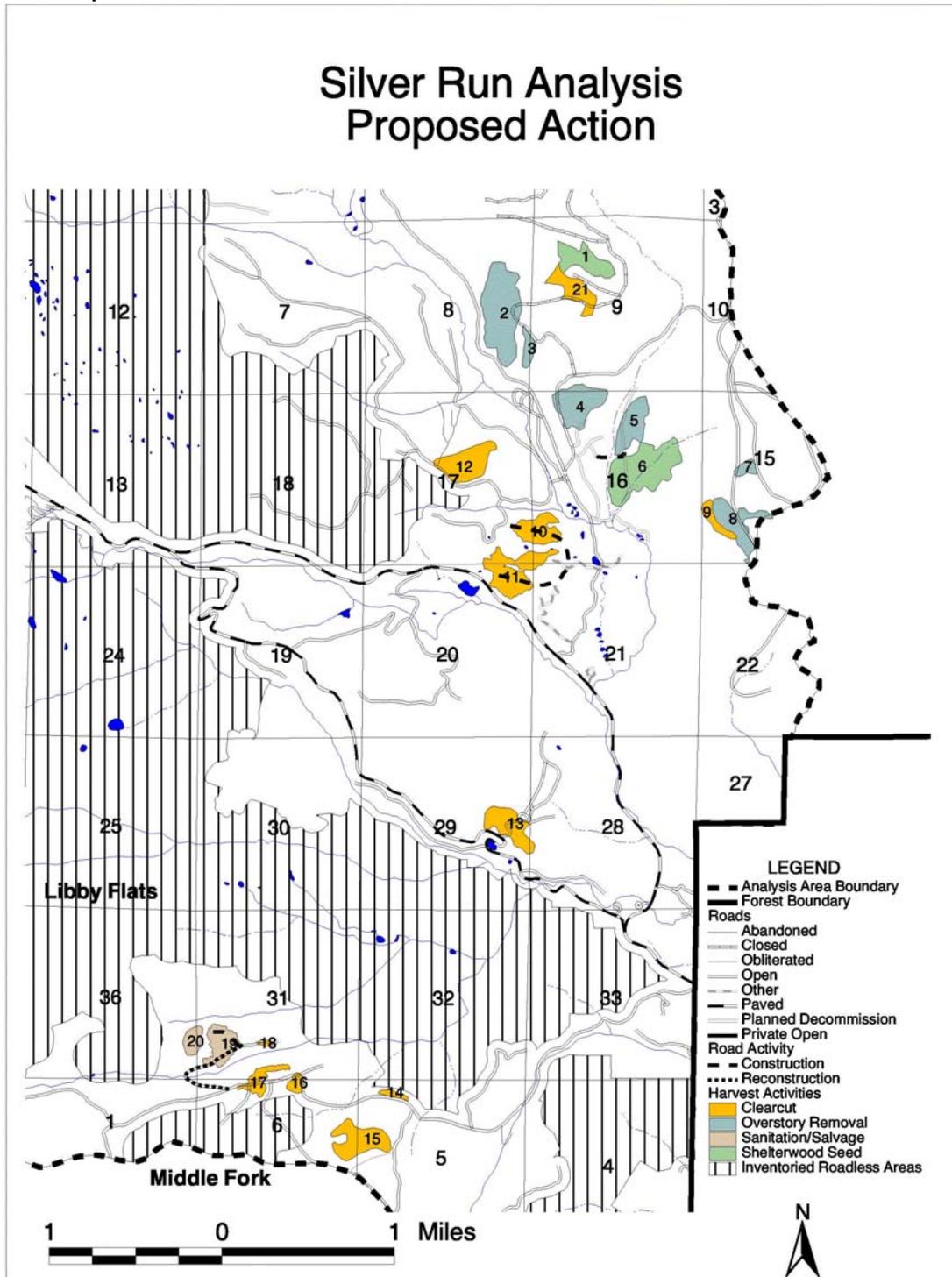
Table 2. Proposed Action - Treatments

Prescription	# of Units	Acres Treated	Volume (MBF)
Clearcut	11	197	2,423
Overstory Removal	6	161	1,513
Sanitation/Salvage	2	30	120
Shelterwood -Seed cut	2	85	383
TOTAL	21 Units	473 Acres	4,439 MBF

Table 3. Proposed Action - Roads

Type of Road	New Construction	Reconstruction Existing	Total Miles
Specified	0.9	0.7	1.6
Temporary	1.5	0.5	2.0
TOTAL MILES	2.4	1.2	3.6

MAP 3. Proposed Action



Alternative 2 – No Clearcutting

Situated primarily in the northeastern 7E timber emphasis portion and in the southeastern 4B wildlife habitat emphasis part of the watershed (see Appendix B), under Alternative 2, timber harvesting and associated slash treatment would be used to move the vicinity's vegetation towards the desired future condition that has been identified for Silver Run Analysis Area. This alternative differs from the Proposed Action, in that it is designed to address concerns for using the clearcut treatment. In addressing this significant issue, Alternative 2 drops all harvest units (197 acres) in which clearcutting has been proposed. Consideration was given to treating these dropped stands with other partial cut prescriptions. Due to moderate to high levels of mistletoe in the existing lodgepole overstory, it was felt that partially cutting these units would only exacerbate the mistletoe problem and further promote its spread.

As with the Proposed Action, to better emulate pre-settlement vegetation patterns and patch size, harvest units have been concentrated in areas that have had past timber sale entries to consolidate and/or begin creating larger stands of trees with similar species makeup, age, and structures. Along with consolidating areas with past harvest, overstory removal harvest method will be used to promote new and maintain existing regeneration in the understory. These same harvest methods, along with the sanitation/salvage and shelterwood – seed cut treatments, will be used to reduce the spread of mistletoe and improve forest resiliency across the area. The overstory removal and shelterwood treatments will also be used to encourage new mixed conifer regeneration.

Approximately 0.4 miles of new specified road construction, 0.7 miles of specified reconstruction, and 1.0 miles of temporary road would be needed for this proposal. Following the completion of the proposal, all temporary roads would be obliterated and closed. All specified roads currently closed would be physically closed to motorized vehicle use following project completion, retaining their templates for future management entries.

Associated projects would include post sale evaluation, regeneration surveys, slash treatment, pile burning, release/weed thinning, noxious weed treatment, and native grass seeding. As with the Proposed Action, a number of soil and water projects would also be implemented to minimize human-caused soil erosion in the area (see Appendix A). There are no proposed harvest units and/or road construction within the inventoried roadless areas (see Map 4).

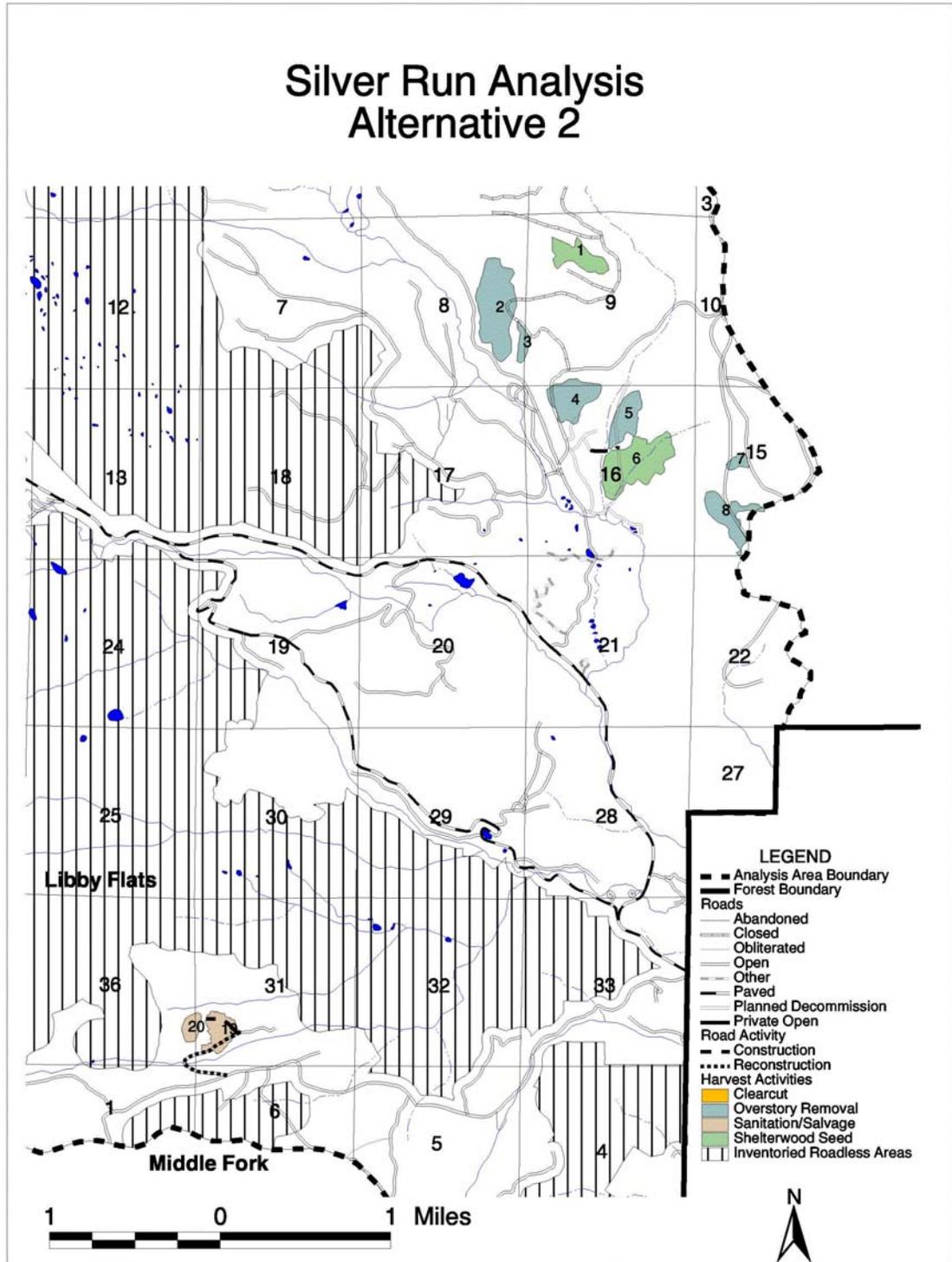
Table 4. Alternative 2 - Treatments

Prescription	# of Units	Acres Treated	Volume (MBF)
Overstory Removal	6	161	1,513
Sanitation/Salvage	2	30	120
Shelterwood -Seed cut	2	85	383
TOTAL	10 Units	276 Acres	2,016 MBF

Table 5. Alternative 2 - Roads

Type of Road	New Construction	Reconstruction Existing	Total Miles
Specified	0.4	0.7	1.1
Temporary	0.5	0.5	1.0
TOTAL MILES	0.9	1.2	2.1

MAP 4. Alternative 2



Alternative 3 - No New Specified Road Construction

Harvest units are situated primarily in the northeastern 7E timber emphasis portion, the central 2B roaded recreation emphasis area, and in the southeastern 4B wildlife habitat emphasis part of the watershed (see Appendix B). Under Alternative 3, timber harvesting and associated slash treatment would be used to move the vicinity's vegetation towards the desired future condition that has been identified for Silver Run Analysis Area. This alternative differs from the Proposed Action and Alternative 2, in that it is designed to address concerns for constructing new specified roads in the area. In addressing this significant issue, Alternative 3 drops all harvest units that would need to be accessed by new specified road construction.

As with the Proposed Action and Alternative 2, to better emulate pre-settlement vegetation patterns and patch size, harvest units have been concentrated in areas that have had past timber sale entries to consolidate and/or begin creating larger stands of trees with similar species makeup, age, and structures. Along with consolidating areas with past harvest, overstory removal (OR) harvest method will be used to promote new and maintain existing regeneration in the understory. These same harvest methods, along with the sanitation/salvage (S/S) and shelterwood – seed cut (SWS) treatments, will be used to reduce the spread of mistletoe and improve forest resiliency across the area. The overstory removal and shelterwood treatments will also be used to encourage new mixed conifer regeneration.

Approximately 0.7 miles of specified road reconstruction and 1.0 miles of temporary road and would be needed for this proposal. Following the completion of the proposal, all temporary roads would be obliterated and closed. All specified roads currently closed would be physically closed to motorized vehicle use following project completion, retaining their templates for future management entries.

Associated projects would include post sale evaluation, regeneration surveys, slash treatment, pile burning, release/weed thinning, noxious weed treatment, and native grass seeding. As with the Proposed Action and Alternative 2, a number of soil and water projects would also be implemented to minimize human-caused soil erosion in the area. There are no proposed harvest units and/or road construction within the inventoried roadless areas (see Map 5).

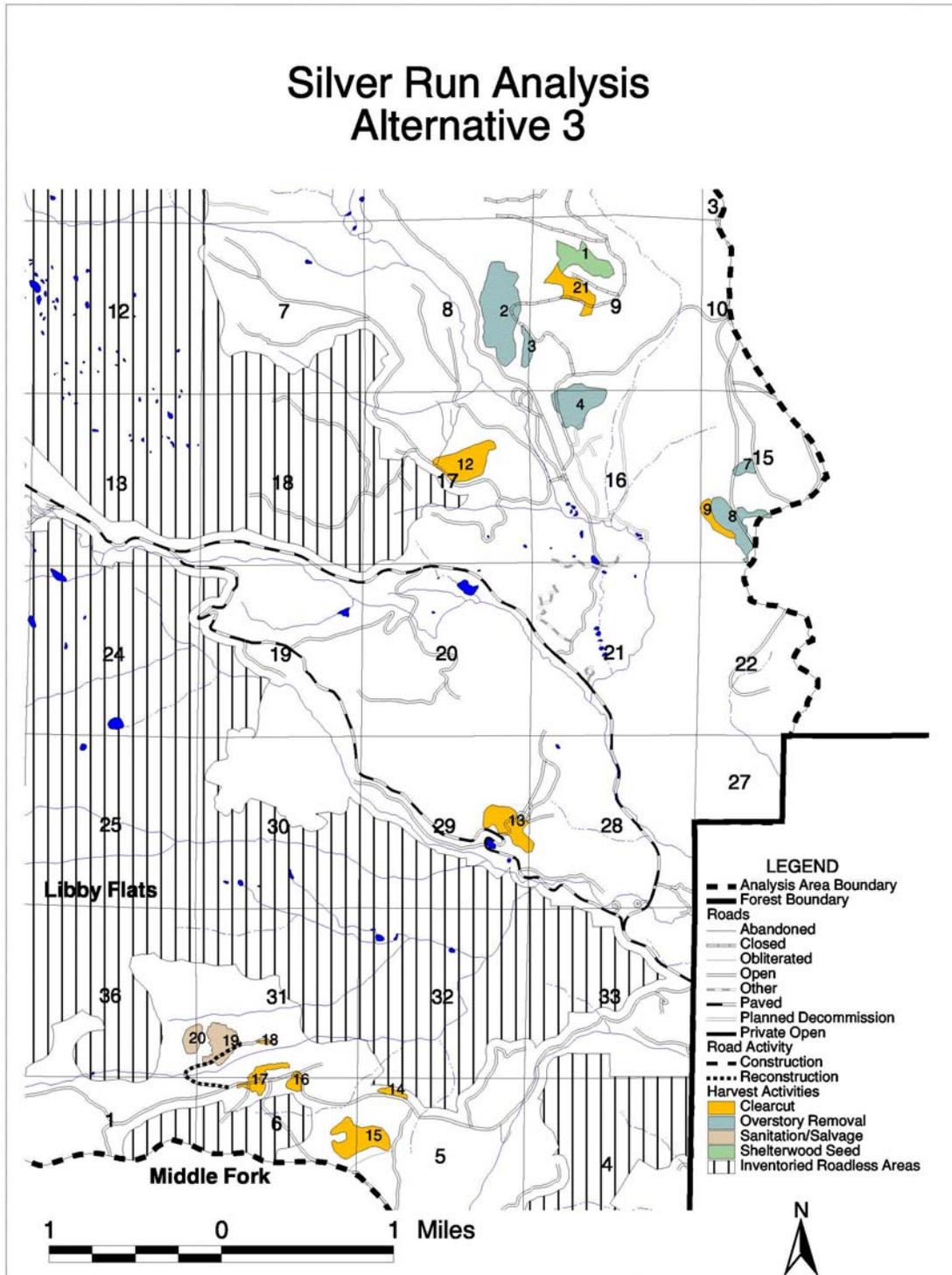
Table 6. Alternative 3 - Treatments

Prescription	# of Units	Acres Treated	Volume (MBF)
Clearcut	9	137	1,685
Overstory Removal	5	137	1,288
Sanitation/Salvage	2	30	120
Shelterwood -Seed cut	1	24	108
TOTAL	17 Units	328 Acres	3,201 MBF

Table 7. Alternative 3 - Roads

Type of Road	New Construction	Reconstruction Existing	Total Miles
Specified	0.0	0.7	0.7
Temporary	0.5	0.5	1.0
TOTAL MILES	0.5	1.2	1.7

MAP 5. Alternative 3



Environmental Measures Common to All Action Alternatives

In addition to Forest Plan standards designed to mitigate adverse impacts, the Deciding Officer and the ID team identified the following mitigation measures. These design features will be applied to reduce or prevent undesirable effects resulting from management activities.

Soils

The Watershed Conservation Practices (WCP) Handbook (FSH 2509.25) provides the Standards as well as the Guidelines or Design Criteria for the Forest Plan. Mandatory Best Management Practices per 33 CFR 323.4(a)(6) to meet the requirements of the Clean Water Act will be implemented, with the following specific mitigations to protect the soil, water, and riparian resources during project implementation.

- Ground cover will be established or maintained on disturbed areas (native surface roads, landings, skid trails, etc.). These actions will be current with purchaser's operations and will be completed immediately preceding seasonal periods of precipitation or runoff to reduce erosion and the spread of noxious weeds.
- At logging sites, adequate amounts of coarse woody debris will be left at the site, especially in units that have very little to begin with. A variety of diameters will be left. Whole tree skidding will not be allowed.
- In units CC10 and CC11, logging equipment will go around poorly drained closed depressions, susceptible to compaction and rutting.
- Logging equipment will not run in the drainageways, but will cross them at a perpendicular angle. Extra attention will be given to the deeper, intermittent drainages in ITM 1 and ITM 6. Due to the potential of causing more erosion, trees 25 feet on either side from the center of the main drainage of ITM 6 will not be cut.
- Main skid trails, temporary logging roads, and landings will be ripped. Construct water bars where necessary.
- Burn piles for excess slash in the timber harvest (if necessary) will be limited to approximately 300 square feet. After the piles are burned, they will be spread out and the site will be reseeded. This size limit will prevent excessive soil heating from the burn piles. The seeding will help prevent noxious weeds from spreading.
- Best Management Practices (BMPs) (Wyoming DEQ 1997) will be followed to prevent soil erosion into wetlands or streams.

Aquatics

- Any culvert installations or removals, or other in-channel construction activities on flowing streams may require a site-specific erosion control plan in order to reduce turbidity and fine sediments. These projects will be evaluated to determine if a waiver to the state water quality rule is necessary, which allows a maximum turbidity increase of 10 NTU (Nephelometric Turbidity Units).
- Road reconstruction should improve existing drainage and erosion problems to reduce fine sediment contribution to nearby creeks. NFSR 338 and 338.G are currently delivering sediment to local stream channels. NFSR 338 requires additional cross drainage (either ditch relief culverts or drain dips) and NFSR 338.G requires additional drain dips to reduce erosion of the road surface.
- Ditched roads below harvest units may need additional drainage to prevent increased flow from routing sediment to stream channels.
- The buffer area around glacial ponds and lakes will depend upon the type of wetland and riparian habitat. Three levels of mitigation have been developed to protect the types of wetlands specific to this project:
- Buffer distance for glacial (kettle) ponds and lakes with permanent or persistent water through most of the summer, and well-defined wetland and/or riparian vegetation will be maintained at the standard 31 meters (100 feet) starting outside the riparian/wetland vegetation.
- Glacial ponds that still retain riparian vegetation, but have silted in, become vegetated, and/or dried up, will be protected by the existing 31-meter (100 feet) buffer.
- Equipment operation will be excluded from dry depressions (formerly glacial ponds) that lack riparian vegetation. Even though they are now dried up, the soils in their bottom are highly compactable. There are many of these dried up old kettle ponds within Units 10 and 11.
- Maximize use of existing skid trails, landing and temporary roads as feasible, to reduce overall disturbance and to facilitate water barring of existing, eroding trails.
- Buffer eroded trail/channel in Unit 6 by 7.6 meters (25 feet) to allow for woody debris recruitment.
- Temporary road rehabilitation will include adequate drainage (water bars) on roads to prevent erosion and/or failure of the road surface. Stream crossings will be removed and the road fill removed to restore stream channel width. Fill material will be removed from the floodplain as well. Site-specific erosion control will be developed jointly between the engineering and watershed staff for each culvert removal on flowing streams.
- Water bar old skid trails and roads in the East Fork Tributary of North Fork of the Little Laramie River to reduce stream channel extension and sediment delivery.
- Fell trees along the eroded old trail/channel, which runs through Unit 6, to stabilize and restore the swale.

Recreation

- Signs will be posted and other public information campaigns undertaken in an effort to notify area users of the sale and general timing of logging activities in order to minimize disruptions and provide for visitor safety.
- Roads used for log hauling will have warning signs posted during periods of log hauling.
- Log hauling will be prohibited on holiday weekends and weekends during big game rifle season, and where alternate routes for snowmobiles are not available, in order to minimize conflicts between these and recreation activities.
- Sand Lake Road (NFSR 101) shall not be plowed to a bare surface in order that snowmobiling on this designated winter trail may continue.
- Temporary roads, skid trails, and log landings will be closed and/or rehabilitated in such a manner to facilitate future dispersed camping adjacent to NFSR 338 and NFSR 101.
- Harvest operations within Management Area 1A will enhance visual quality and recreation opportunities on existing and proposed recreation sites, as required by the current Forest Plan.
- The southeast section of Clearcut unit 13 will be excluded from treatment where it overlaps with existing designated trails of the Corner Mountain/Barber Lake system.
- A minimum of a 50-foot buffer will shield the Corner Mountain/Barber Lake trails from the views of the clearcut.
- Clearcut unit 13 will be harvested in a manner so as not to be visible from the Barber Lake fishing area and picnic ground.

Visual Resource

- The size and shape of clearcut and overstory removal units will mimic the size and shape of natural openings found within or adjacent to the analysis area.
- Follow the natural contour lines and avoid straight lines when laying units.
- Clean up all slash and cut stumps as low as possible within dispersed recreation sites.
- Within the immediate foreground of Forest arterial and collector roads and Forest trails, clean up all visible heavy slash and cut stumps as low as possible to meet retention and partial retention visual quality objectives (VQOs). Protect remaining trees and shrubs from logging equipment.
- Burn all slash piles within one year after completion of treatment to meet retention and partial retention visual quality objectives, and in three years to meet modification VQO.

- Shape and blend roads that are to be obliterated within the surrounding landscape. Scarify and seed the old road surface. When using large rocks for barriers, rocks will be buried at least 1/3 in the ground as to appear natural.
- To maintain aesthetics, an unharvested buffer of 200 feet will be retained between the edge of Snowy Range Scenic Byway (Highway 130) and Barber Lake Road (NFSR 351) and Clearcut units 11 and 13.

Range

- Existing drift fencing in the North Fork #511 allotment will be protected from damage by logging activities and extended approximately $\frac{3}{4}$ mile.
- Approximately 30 acres of noxious weeds will be planned for treatment with KV funding following completion of harvest operations. Landings and temporary roads that are ripped or otherwise decommissioned will be seeded with a native grass, forb, and/or shrub seed mix in order to reduce the opportunity for noxious weed invasions on highly disturbed sites.
- Provisions for prevention/treatment of noxious weeds, seeding of disturbed areas with native weed-free seed and protection/extension of fences will be included in contract provisions and/or KV plans for the harvested areas.

Rare Plants

- Identify on the ground and buffer areas with high concentration (core populations) or other important occupied sites of clustered lady's slipper orchid associated with timber activities that would directly or indirectly impact plant habitat or populations.
- The protection buffers for core populations of clustered lady's slipper orchid will be a minimum of a 100-foot radius from population boundaries. The protection buffer will maintain shading and micro-site conditions at the managed sites by retaining sufficient shrub and/or canopy cover so that plants are not exposed to more than intermittent direct solar radiation.
- Fell trees away from identified buffered populations.
- Exclude mechanized equipment from identified buffered sites.
- Do not place or burn slash piles or broadcast burn slash on identified buffered populations.
- Wherever possible, harvest activities in units known to contain clustered lady's slipper orchid plants will be carried out before emergence of the plants or after they wither. For our area this would mean avoiding harvest from around June 1 to August 15.
- The Forest Service maintains discretion to modify projects or contracts if other proposed, endangered, threatened, and sensitive (PETS) plant species are found in the analysis areas.

Wildlife

- A special provision will be added to the timber sale contract stating that no timber sale related activities will occur within ¼ mile of previously identified goshawk nest sites between March 1 and August 15th unless goshawk surveys are conducted to forest protocol before such activities occur, and the result of said surveys indicate that nesting is not occurring in the nesting territory. These restrictions apply to activities including sale layout, cruising, timber harvest, road maintenance, commercial road use (log haul), road construction, road decommissioning, and temporary road development within ¼ mile of identified nests. This provision will specifically affect harvest units 4, 5, 6, and 10, as well as Forest Roads 329.01, 329.02, 329.03, 329.04, 101.05, and all associated spurs and temporary roads proposed for use or creation in the vicinity of these harvest units. These restrictions need not apply to the main forest roads 101, 329, and 330 since they already receive moderate amounts of daily vehicle traffic.
- 30-acre nesting areas identified around active nests will remain in their current vegetative condition, thus providing a secure environment and stable landscape for continued annual nesting.
- Three 30-acre reserve areas containing suitable nesting habitat have been identified within the estimated goshawk territory. These areas will be retained in their current vegetative condition, provide additional nesting habitat within the post-fledging area, protect alternate nest sites which may not yet be identified, and provide returning goshawks with a wider range of options to avoid unforeseen project related disturbances.

Monitoring Common to All Action Alternatives _____

Monitoring is done to assure that Forest Plan standards and guidelines are being met and adhered to during project implementation. Though field surveys were conducted for raptors--including northern goshawk, and the R-2 sensitive plant clustered lady's slipper, past experience has shown that yearly variations in climatic conditions greatly determine the presence or absence of this fauna and flora. Likewise, although heritage surveys and a report were completed for the project area, the Wyoming State Historic Preservation Office (SHPO) requests that the area be monitored for potential sites that may have been overlooked during project implementation. The following specific items were identified by the ID team as needing monitoring during preparation and implementation of potential projects:

- Best Management Practices (BMPs) and mitigation outlined above will be monitored for implementation and effectiveness during project activities, especially after any significant precipitation events. If monitoring reveals unexpected effects in any of the drainages, additional monitoring for sediment deposition, turbidity, and fish or amphibians may be initiated. Steps would then be initiated to reduce effects detrimental to water quality, species habitats, or populations.
- Amphibians were selected for monitoring in this project, because they have relatively stable populations where they exist within the analysis area.
- Photo document effectiveness of watershed improvement activities mentioned above: water barring of old skid trails and woody debris recruitment.
- Monitor proposed treatment areas that occur in the vegetation/elevational range preferred by nesting northern goshawks during project implementation.
- Monitor management activities to ensure that the visual quality objectives will be met.
- Monitor for Management Indicator Species (MIS) will continue in order to track changes in populations and habitat Forest-wide.

Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 8. Comparison of Alternatives

Treatment	Proposed Action	Alternative 1 No Action	Alternative 2 No Clearcutting	Alternative 3 No new specified road construction
Clearcut	197 acres	0 acres	0 acres	137 acres
Overstory Removal	161 acres	0 acres	161 acres	137 acres
Sanitation/Salvage	30 acres	0 acres	30 acres	30 acres
Shelterwood – Seed cut	85 acres	0 acres	85 acres	24 acres
TOTAL	473 acres	0 acres	276 acres	328 acres
Road Type				
Specified:				
New Construction	0.9 mile	0 miles	0.4 mile	0 miles
Reconstruction	0.7 mile	0 miles	0.7 mile	0.7 mile
Temporary:				
New Construction	1.5 miles	0 miles	0.5 mile	0.5 mile
Reconstruction	0.5 mile	0 miles	0.5 mile	0.5 mile
TOTAL	3.6 miles	0 miles	2.1 miles	1.7 miles

Table 8. Comparison of Alternatives (Purpose & Need)

Purpose & Need	Proposed Action	Alternative 1 No Action	Alternative 2 No Clearcutting	Alternative 3 No new specified road construction
Characteristic Landscape	Designed to address the purpose and need for the proposal, all harvest units are adjacent to areas that have been strip clearcut and/or had past harvest since 1950.	With 0 acres of harvest treatment, No Action would not address this need.	With 197 acres less harvest than Proposed Action, addresses need to a lesser extent.	With 145 acres less harvest than Proposed Action, addresses need to a lesser extent.
Forest Health & Resiliency	Designed to address the purpose and need for the proposal, harvest treatments will reduce mistletoe spread and improve stand resiliency in 4% of area lodgepole stands.	With 0 acres of harvest treatment, No Action would not address this need.	Harvest treatments will reduce mistletoe spread and improve stand resiliency in 2% of area lodgepole stands.	Harvest treatments will reduce mistletoe spread and improve stand resiliency in 3% of area lodgepole stands.
Providing a Flow of Timber	Designed to address the purpose and need for the proposal, Proposed Action would produce an estimated 4.4 MMBF.	With 0 acres of harvest treatment, No Action would not address this need.	Would produce an estimated 2.0 MMBF.	Would produce an estimated 3.2 MMBF.
Watershed Restoration	Designed to address the purpose and need for the proposal, Proposed Action includes all watershed restoration projects.	With no watershed restoration projects, No Action would not address this need.	Includes all watershed restoration projects.	Includes all watershed restoration projects.

Table 8. Comparison of Alternatives (Significant Issues)

Significant Issues	Proposed Action	Alternative 1 No Action	Alternative 2 No Clearcutting	Alternative 3 No new specified road construction
Clearcutting	Includes 197 acres of clearcut.	No clearcutting will take place.	Designed to address issue, includes no clearcutting.	Includes 137 acres of clearcut.
Aesthetics/Visual Quality	Includes 473 acres of harvest treatment, with 197 acres of clearcut.	With no treatments, No Action will allow natural succession to continue.	Designed to address issue, includes 276 acres of harvest treatment, with no clearcutting.	Includes 328 acres of harvest treatment, with 137 acres of clearcut.
New Road Construction	Includes 0.9 miles of new specified road construction.	No new specified road construction will take place.	Includes 0.4 miles of new specified road construction.	Designed to address issue, includes no new specified road construction.

Alternatives Considered but Eliminated from Detailed Study

Original Proposed Action

A number of potential harvest units were eliminated from the original proposed action to better address Forest Plan standards and guidelines. In addition, all proposed units that fell within areas meeting the criteria of Inventoried Roadless were dropped from consideration. It was felt that by including these units, it would preclude a decision on the future classification of these lands under the Medicine Bow National Forest Plan Revision.

Uneven-aged Management

This alternative would only use selective harvesting or uneven-aged management to treat potential harvest units within the area. This alternative was eliminated from detailed study because the majority of stands considered for harvest within the analysis area are dominated by and/or have as a primary objective the promotion of disturbance dependent species such as aspen and/or lodgepole pine. Although uneven-aged management can be used to promote Engelmann spruce and subalpine fir, which typically grow in uneven-aged conditions, this treatment would create potentially unnatural conditions within aspen and lodgepole pine stands that typically grow in even-aged stands. Uneven-aged management within aspen stands would promote and speed up the invasion of other conifer species such as subalpine fir, further reducing the amount of aspen in the vicinity. Implementation of uneven-aged harvest prescriptions within mistletoed lodgepole dominated stands would increase the spread of mistletoe from the overstory to young trees in the understory.

Using Fire to Emulate Natural Disturbance Regimes

This alternative would use prescribed burning in the form of a stand replacing fire instead of management activities (such as timber harvesting) to mimic natural disturbance regimes and accomplish vegetation goals. This alternative was eliminated from detailed study because of potential adverse environmental effects and the risk of not confining a stand replacing, prescribed fire to the treatment area. Though the use of stand replacing fire(s) would be the best means to replicate natural disturbance patterns and encourage disturbance dependent species in the analysis area (such as aspen), potential detrimental impacts to cultural resources, soils, water quality, channel stability, wildlife habitat, developed recreation sites, and adjacent private land make this alternative unfeasible.

Identification of a Preferred Alternative

Since it best meets the purpose and need for action within the vicinity, the Forest Service has chosen the Proposed Action as the preferred alternative to be implemented in the Silver Run area.

ENVIRONMENTAL CONSEQUENCES

This section summarizes the physical, biological, social, and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for the comparison of alternatives presented in the previous Table 8.

The following Table 9 provides a tabular display of past harvest information since 1949 currently listed in the Forest Resource Information System (RIS) database for the Silver Run Analysis Area and the North Fork of the Little Laramie River 6th Level watershed:

Table 9. Summary of Cumulative Effects in the Silver Run Analysis Area

ANALYSIS AREA	ACRES
North Fork of the Little Laramie River 6 th Level Watershed	30,520
National Forest Land	30,443
Private Land	77
PAST HARVEST ACTIVITY SINCE 1949	ACRES
Clearcut/Overstory Removal	1,348
Partial Cutting	725
TOTAL	2,073
PROPOSED ACTION	ACRES
Clearcut/Overstory Removal	358
Partial Cutting	115
TOTAL	473
OTHER CURRENT PROJECTS IN AREA	ACRES
Rainbow Valley Hazardous Fuels (Located in the same 6 th level watershed)	-
Partial Cutting Treatments	225
Prescribed Burning – Non-Forested	286
FORESEEABLE FUTURE PROJECTS	ACRES
North Fork Allotment Management Plan (Located in the same 6 th level watershed)	-
Hwy 130 Winter Sports Parking Lot(s)	-

The information displayed in this section includes pertinent unedited excerpts from various resource specialist reports that were completed for the Silver Run Analysis. Though it is more difficult for the reader to follow, it was felt that rewording specialist report language to make this section more readable might unintentionally change the author's message and intent. Copies of these reports are available for public review within the project file.

Air Quality

AFFECTED ENVIRONMENT

The affected environment in terms of air quality is not limited to the immediate proposed project area. A large area must be considered because air is a dynamic resource. Situated approximately 10 to 15 air miles to the southwest, outside of the analysis area, Savage Run and Platte River Wilderness areas are classified as Class II Federal air sheds. The State of Wyoming Department of Environmental Quality (DEQ) has classified these wilderness areas as State Class I areas for air quality and visibility. Communities in close proximity to the analysis area include Centennial, Albany, and Laramie, Wyoming.

ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

Under this alternative, no action would occur. This alternative would have no effect on the existing air quality in the area.

Proposed Action

The proposed action would result in some temporary increases in airborne dust, and would result in exhaust emissions from heavy equipment. The proposed action includes the burning of slash piles. This work would be done only on days when smoke dispersal meets Wyoming Department of Environmental Quality burning criteria. The short duration of this burning, and burning on days with good smoke dispersal will address DEQ concerns for smoke and visibility within the Savage Run and Platte River Wilderness areas (which are typically upwind) to the southwest. It is anticipated that smoke from this proposal will have little or no effect to the vicinity's air quality.

Alternative 2 – No Clearcutting

Containing 197 fewer acres of clearcut treatments than the proposed action, it is anticipated that smoke (from pile burning), dust, and/or emissions from this alternative would be less than that produced by the proposed action, and would have little or no effect to the vicinity's air quality.

Alternative 3 – No Specified Road Construction

Containing 145 fewer acres of harvest treatments than the proposed action, it is anticipated that smoke (from pile burning), dust, and/or emissions from this alternative would be less than that produced by the proposed action, and would have little or no effect to the vicinity's air quality.

CUMULATIVE EFFECTS

Proposed Action, Alternative 2, & Alternative 3

Road dust, vehicle emissions, and smoke from pile burning produced by implementing the action alternatives would be temporary and would not degrade air quality in the vicinity.

Roadless Area

AFFECTED ENVIRONMENT

Identified under the recent National Roadless Rule effort and the on-going Medicine Bow Forest Plan Revision, much of the larger analysis area, or approximately 57% (17,674 acres), is within portions of four inventoried roadless areas (IRA), including: Snowy Range (R20617), Middle Fork (R20621), Libby Flats (R20620), and French Creek (R20619). There are no congressionally designated wilderness areas within the analysis area. The closest is Savage Run Wilderness, which is approximately 10 air miles to the southwest.

ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

Unroaded areas are valued for their very existence in an undeveloped state. This value is held by both users of the area, and intrinsically by those who place value on such undeveloped areas, simply knowing that they exist. Unroaded areas also provide security for wildlife and plant species, and opportunities for recreation in a non-motorized environment. As there are no treatments under this alternative, there would be no effect to the existing condition of this resource.

Proposed Action

Under the Proposed Action, there are no treatments and/or associated road construction proposed within an inventoried roadless area. Though this is the case, the treatments proposed under the Proposed Action are between and/or directly adjacent to three of the four IRAs, including Snowy Range, Libby Flats, and Middle Fork. As there are no treatments and/or road construction proposed in or directly adjacent to the French Creek Inventoried Roadless Area, there will be no significant effect to this area. Cutting units and temporary roads that are situated near the edge of the three roadless areas could indirectly impact users along the edges of these IRAs with greater noise, and could result in less solitude during implementation of the proposal.

Alternative 2 – No Clearcutting

As with the Proposed Action, under Alternative 2 there is no proposed cutting or road building within any of the IRAs in the vicinity. With 197 acres less (clearcut) treatment, it would be anticipated that cutting units and temporary roads under Alternative 2 that are situated near the edge of the three roadless areas would be less likely to impact users of these IRAs than what was disclosed under the Proposed Action.

Alternative 3 – No Specified Road Construction

As with the Proposed Action and Alternative 2, under Alternative 3 there is no proposed cutting or road building within any of the IRAs in the vicinity. With 145 acres less harvest treatment, it would be anticipated that cutting units and temporary roads under Alternative 3 that are situated near the edge of the three roadless areas would be less likely to impact users of these IRAs than what was disclosed under the Proposed Action.

CUMULATIVE EFFECTS

The following Table 10 displays the effects of the Silver Run alternatives on the nine roadless characteristics from the Forest Service Roadless Area Conservation Final Environmental Impact Statement, Volume 1. See individual resource discussions in this section (*Environmental Consequences*) for more specific explanations of the effects of treatments on inventoried roadless.

Table 10. Cumulative Effects of Alternatives on Roadless Area Characteristics

Roadless Area Characteristic	Proposed Action	Alternative 1 – No Action	Alternative 2 – No Clearcutting	Alternative 3 – No Specified Road Construction
High quality or undisturbed soil, water, and air.	Has no treatments in roadless. Short-term effect to air quality in all IRAs due to proposed slash pile burning.	Has no treatments in roadless, no effect.	Has no treatments in roadless. Short-term effect to air quality in all IRAs due to proposed slash pile burning.	Has no treatments in roadless. Short-term effect to air quality in all IRAs due to proposed slash pile burning.
Sources of public drinking water.	Town of Centennial has wells outside of the NFS boundary in the North Fork watershed.	Town of Centennial has wells outside of the NFS boundary in the North Fork watershed.	Town of Centennial has wells outside of the NFS boundary in the North Fork watershed.	Town of Centennial has wells outside of the NFS boundary in the North Fork watershed.
Diversity of plants and animal communities.	Has no treatments in roadless. Area aspen outside of the IRAs will be maintained and increased.	Has no treatments in roadless. Area aspen will continue to decline, decreasing area diversity.	Has no treatments in roadless. Area aspen outside of the IRAs will be maintained and increased to a lesser extent than under Proposed Action.	Has no treatments in roadless. Area aspen outside of the IRAs will be maintained and increased to a lesser extent than under Proposed Action.
Habitat for threatened, endangered, proposed candidate and sensitive species, and those species dependent on large relatively undisturbed areas of land.	Has no treatments in roadless, no effect.	Has no treatments in roadless, no effect.	Has no treatments in roadless, no effect.	Has no treatments in roadless, no effect.

Roadless Area Characteristic	Proposed Action	Alternative 1 – No Action	Alternative 2 – No Clearcutting	Alternative 3 – No Specified Road Construction
Primitive, semi-primitive, non-motorized classes of dispersed recreation.	Has no treatments in roadless. No effect to opportunities for non-motorized recreation. Directly adjacent to three IRAs could affect non-motorized recreation use in short-term.	Has no treatments in roadless. No effect to opportunities for non-motorized recreation.	Has no treatments in roadless. No effect to opportunities for non-motorized recreation. Directly adjacent to three IRAs could affect non-motorized recreation use in short-term, but less than Proposed Action.	Has no treatments in roadless. No effect to opportunities for non-motorized recreation. Directly adjacent to three IRAs could affect non-motorized recreation use in short-term, but less than Proposed Action.
Reference landscapes.	Has no treatments in roadless, no effect.	Has no treatments in roadless, no effect.	Has no treatments in roadless, no effect.	Has no treatments in roadless, no effect.
Natural appearing landscapes with high scenic quality.	Has no treatments in roadless, no effect.	Has no treatments in roadless, no effect.	Has no treatments in roadless, no effect.	Has no treatments in roadless, no effect.
Traditional cultural properties and sacred sites.	Has no treatments in roadless, no effect.	Has no treatments in roadless, no effect.	Has no treatments in roadless, no effect.	Has no treatments in roadless, no effect.
Other locally identified unique characteristics.	Has no treatments in roadless, no effect.	Has no treatments in roadless, no effect.	Has no treatments in roadless, no effect.	Has no treatments in roadless, no effect.

Heritage Resources

AFFECTED ENVIRONMENT

State Historic Preservation Office (SHPO) and Forest cultural resource record searches were conducted 09/28/99. The searches were conducted for Sections 5, 6, 7, and 8, T.15N., R.78W., Sections 1, 2, 3, 4, 9, and 10, T.15N., R.79W., Sections 8, 9, 15, 16, 17, 18, 19, 20, 21, 28, 29, 31, and 32, T.16N., R.78W., and Sections 13 and 36, T.16N., R.79W., 6th Principal Meridian, Albany County, Wyoming. The searches revealed that seventeen cultural resource surveys had been conducted within those sections. The file searches also revealed twenty-six previously recorded sites located within the sections listed. Of these, nine are considered to be eligible to the National Register of Historic Places (NRHP), twelve are considered to be ineligible to the NRHP, four sites have not been evaluated for cultural significance and remain unevaluated for eligibility to the NRHP, and, lastly, one site is listed on the National Register of Historic Places. A review of GLO plats, Forest historic map files, historic cutover records and archival records indicate that any number of historic sites may occur in the area, including mining cabins and camps, mine developments, logging camps, sawmills, historic roads and trails, recreation and administrative sites.

ENVIRONMENTAL CONSEQUENCES

A 100% intensive Class III field survey was completed during portions of September-October 1999 and July 2003. A total of approximately 500 acres were intensively surveyed, resulting in the location of fifteen new historic sites, reevaluation of an existing historic site, and twenty-one isolated finds. All the new sites and reevaluated sites were determined to be ineligible to the National Register of Historic Places. No previously recorded sites were known to exist within the proposed project areas.

Alternative 1 – No Action

Under this alternative, no action would occur. This alternative would have no effect on significant cultural resources. No further field inventory would be required, and consultation with the State Historic Preservation Officer and Advisory Council on Historic Preservation would not be required.

Proposed Action

A survey, subsequent report, and Wyoming SHPO review determined that since no significant cultural properties will be impacted by proposed project activities, “no historic properties will be adversely affected.”

Alternative 2 – No Clearcutting

Since this alternative is the same as the proposed action, with the exception of 197 less clearcut acres, and since no significant cultural properties will be impacted by proposed project activities, “no historic properties will be adversely affected.”

Alternative 3 – No Specified Road Construction

Since this alternative is the same as the proposed action, with the exception of 145 acres less harvest treatment, and since no significant cultural properties will be impacted by proposed project activities, “no historic properties will be adversely affected.”

CUMULATIVE EFFECTS

This project, in combination with other forest activities such as recreation and range activities, may have a cumulative effect on cultural resources in the form of increased soil erosion, increased visitor traffic and vandalism, and alteration of historic landscapes.

Soils

AFFECTED ENVIRONMENT

The parent material for the soil of the analysis area is predominantly glacial deposits. Along NFSR 338 the parent material is composed of metasedimentary and metavolcanic rocks, such as granite and felsic gneiss and amphibolite. The landform for most of the project area is moderately dissected, deeply incised mountain slopes. Higher elevations have a distinct glacial landform of hummocky hills with complex slopes and closed depressions. Most of the soils in the project area have an erosion hazard that is moderate.

Table 11. Summary of Selected Characteristics of Soils in the Silver Run Project Area

Map Unit Number	Texture	Mass Wasting	Natural Regeneration	Compaction	Erosion
105	v. stony loam	Low	Suited	Moderate	Moderate
76	v. cobbly loam	High	Suited	Moderate	Moderate
104	stony loam	Low	Well suited	Moderate	Slight
108	v. stony loam	Low	Suited	Moderate	Moderate
11	gravelly loam	Low	Well suited	Moderate	Slight
92	v. gravelly loam	Low	Poorly suited	No Data	Slight

ENVIRONMENTAL CONSEQUENCES

Alternative 1 - No Action

This alternative would have the least impact on the soil resource. No further effects on the soil beyond existing condition would occur. No further accelerated disturbance would occur, whether compaction, displacement or erosion, at whatever rate beyond the existing condition, due to any timber harvest activities.

Proposed Action

Direct effects would be potential soil erosion and displacement. The sheet and rill erosion hazard for the Silver Run harvest units is rated as slight to moderate, but within the harvest units there are areas of steep slopes (30 to 35%). Heavy equipment should be used with care on these steep slopes. Since there will be primarily overstory removal and shelterwood cuts on the units with the steeper slopes, the soil disturbance will not be as much as a total tree removal.

Loss of soil productivity due to compaction from the temporary roads, skid trails, or site preparation would be another short-term effect. When the logging operation is over, the roads, main skid trails, and landings are obliterated and seeded. When revegetation occurs, the soil productivity will eventually be restored to near pre-harvest levels.

Indirect impacts would be probable short-term decreases in soil productivity within the cutting units and in association with newly disturbed roads and skid trails. With Best Management Practices and mitigation, the impacts to the soil will be within the 15 percent Region 2 Standards and Guidelines.

Maintaining a certain amount of coarse woody debris is important in maintaining long-term soil productivity. Since there will be no whole tree logging on the harvest units, the coarse woody debris will be left on site. After meeting requirements for regeneration and fuel levels, as much coarse woody debris should be left as possible. Units that had very little coarse woody debris on the ground will have more fine and moderately sized coarse woody debris on the ground after the site is harvested.

Proposed road construction will impact the soil resource by temporarily taking land out of production. All temporary roads will be obliterated and closed. The construction of these temporary roads would use minimum ground disturbing procedures. Many of the impacts will take place the first couple years after the disturbance. Proposed road reconstruction will have a positive effect in terms of fixing existing drainage structures and reducing the amount of soil erosion occurring from these roads.

Alternative 2 – No Clearcutting

Since all the units that were proposed for clearcutting will be dropped, under this alternative there would be less soil impacts.

Alternative 3 – No Specified Road Construction

Under this alternative no new roads would be constructed and all associated harvest units would be dropped. Where the roads were planned for construction, the soil will stay productive. Since there will be less timber harvesting, there will be less impacts on the soil resource.

CUMULATIVE EFFECTS – ALL ALTERNATIVES

Existing past and present disturbance activities within the watersheds include roads, timber harvest, grazing, fires, and recreation. Repeated harvest activity within the same site or cutting unit can lead to detrimental loss of topsoil, or excessive compaction and displacement. Medicine Bow National Forest standards and guidelines call for minimizing soil compaction by reducing vehicle passes, skidding on frozen or dry soil conditions. Soils are considered to have compaction if there is a 15 percent increase in bulk density.

New road construction, both temporary and permanent, can be considered cumulative in nature, especially if roads are not properly drained or are placed in unstable locations. Use of proper Best Management Practices (BMPs) in any newly constructed roads will minimize cumulative impacts on soil productivity. BMPs help to insure that erosion from cutting units or roads are not excessive.

FOREST PLAN CONSISTENCY

The proposed action and alternatives 1 through 3 will meet the 1985 Medicine Bow National Forest Plan Standards and Guidelines for the soil resource, with given mitigation measures. For each alternative there will be no known irreversible or irretrievable commitment of resources.

Watershed, Fisheries and Aquatics

AFFECTED ENVIRONMENT

The Silver Run Analysis Area is situated on the east side of the Snowy Range, within the 6th level watershed of the North Fork Little Laramie River (HUC-101800100603). The proposed project occurs in the Upper North Fork Little Laramie and Libby Creek Watersheds of the North Fork of the Little Laramie River. These watersheds include the Gold Run tributary of Libby Creek and the East and Nash Fork tributaries of the North Fork Little Laramie River.

Table 12. Watersheds within the Analysis Area

Watershed Name	Hydrologic Unit Code	Total Watershed Area (acres)
East Trib. Upper North Fork Little Laramie River	1018001006030104	1,471
Nash Fork	1018001006030105 1018001006030106 1018001006030107	5,562
Upper North Fork Little Laramie River	10180010060301	15,889
Gold Run Creek	1018001006030205	3,083
Libby Creek	10180010060302	12,033
North Fork of the Little Laramie River	101800100603	38,263

Data from the Medicine Bow–Routt N.F. GIS database

The perennial streams in this area are designated Class 2AB - Fisheries and Drinking Waters. Class 2AB waters are those surface waters known to support or have the potential to support populations of game fish and/or drinking water supplies. They are considered to be high quality waters, which support the beneficial uses of aquatic life, fisheries, drinking water, recreation, wildlife, agriculture, and scenic value [Wyoming Department of Environmental Quality (WYDEQ) 2001]. Intermittent streams in this area are classified by the State of Wyoming as Class 3B if no fisheries are thought to be present. These waters support beneficial uses of aquatic life other than fish, recreation, wildlife, agriculture, and scenic value (WYDEQ 2001). None of the streams within the analysis area have been listed as impaired on the current WYDEQ 303d list (WYDEQ 2002).

Irrigation is the primary consumptive water use downstream of the Forest Service boundary. Numerous irrigation ditches divert water from just below the NFS boundary for use on private lands downstream. The Town of Centennial uses groundwater for municipal water supply from wells located outside of the NFS boundary. A small reservoir, Barber Lake, is located near Libby Creek, and is used as a recreational fishing lake operated by the Medicine Bow N.F. This reservoir has junior water rights and may be dry during drought years, as it was during 2002.

Management activities can increase sediment delivery to stream channels in a variety of ways; however, roads have been estimated to produce 85 to 90% of the sediment reaching streams in a forested watershed (Burroughs 1990). In addition, road ditches can intercept subsurface flow and so extend stream networks, which results in increased peak flows (Wemple et al. 1996). The Roads Analysis found that overall roads in this watershed were below regional guidelines for compacted area and potential stream network expansion (Snook 2000a). Field surveys did identify several areas contributing sediment to creeks, both from roads and past mining activities.

Generally, roads are located away from streams and riparian areas, with a few exceptions. NFSR 101A, located across the creek from the North Fork Campground, is within the riparian area, with several dispersed campsites located along the North Fork of Little Laramie River. This road is reducing riparian function by loss of vegetation and compaction adjacent to the stream banks. An abandoned road near the North Fork of Little Laramie River located near NFSR 101 is also located within the riparian area.

Several road segments within the analysis area, both open and closed, have been poorly maintained or constructed. Some road segments are user-created and fail to meet Forest Service standards or are creating resource damage. These segments contribute to stream network expansion and to the connected disturbed area, depositing sediment into adjacent streams.

The Equivalent Clearcut Method (ECA) was developed to estimate the effects of vegetation removal on streamflow. Experiments in the Coon Creek Watershed in the Encampment River Watershed, measured statistically significant increases in streamflow when 24% of the watershed was harvested (Troendle et al. 1998). Experiments on the Fraser Experimental Forest in Colorado indicate that water yield from timber harvest decline to zero over approximately 80 years (Troendle and King 1985).

Table 13. Estimated Equivalent Clearcut Area by Watershed

Watershed Name	Percent ECA
East Trib. Upper North Fork of the Little Laramie River	13.2 %
Nash Fork	0.5%
Upper North Fork of the Little Laramie River	3.8%
Gold Run Creek	6.8%
Libby Creek	0.5%
North Fork of the Little Laramie River	2.6%

Gold Run, Silver Run, Nash Fork, Libby Creek and the North Fork of Little Laramie River were all surveyed during the field season of 1997. All stream channels rated as 'Good' with localized areas of increased sediment due to local sediment sources such as roads and past mining activities (Snook 2000b). All channels appeared to be stable and resistant to management impacts. None of the field surveys observed impacts from the cattle allotments in the area.

There are many riparian areas within the analysis area [National Wetlands Inventory (NWI) 1990; Purchase 2003a]. Most are narrow strips associated with ephemeral and intermittent drainages. More complex and extensive riparian areas exist along the perennial streams in the analysis area, and in areas of beaver pond complexes. Glacial lakes and kettle ponds are located throughout this watershed. Kettle ponds vary between permanently wet, small aspen ringed ponds with developed riparian and wetland vegetation, and dry depressions that no longer have any wetland or riparian vegetation present. The ponds with either permanent or seasonal water, and riparian vegetation are wetlands that could provide breeding/rearing habitat for amphibians.

The dry ponds do have soils in the bottom of the depression that show a history of being saturated, although currently these areas appear to only retain water for a brief period during snowmelt in the spring. As these depressions do not appear to have wetland vegetation or have the hydrologic characteristics of a wetland, they do not meet the wetland definition criteria as defined by the National Wetlands Inventory.

Trout are not native to this portion of the National Forest. Their introduction as a sport game fish to the streams within the analysis area occurred during the tie-hack logging era and has continued at some locations into the present. Populations of native fishes (white suckers, long nose suckers, and long nose dace) have apparently declined from previously sampled native waters following trout introductions. This is based on the latest WGFD survey records (1991) and recent Forest Service fish population surveys (2002) replicating WGFD sites.

A review of the Wyoming Natural Diversity Database (WNDD 2002) indicated that western boreal toad (candidate and sensitive), leopard frog, and wood frog (sensitive) have been found in the vicinity of the proposed Silver Run Analysis Area in past and in current field surveys (Summer and Fall 2002). A new boreal toad population was found and documented during the 2002 field season northwest of the North Fork Campground area by Forest Service personnel on the Laramie Ranger District (Kozlowski, wildlife biologist, personal communication 2002). Tiger salamanders have habitat within the analysis area, but have only been documented in areas south of the analysis area (WNDD 2002).

ENVIRONMENTAL CONSEQUENCES

Watershed conditions are assessed using available data, both office generated statistics and field stream surveys. Upland watershed conditions are assessed, primarily using Forest Service data concerning past disturbance such as timber harvest and roads. Stream channel conditions were determined primarily by field information. Stream surveys were completed during the 1997 field season by then Medicine Bow Hydrologist, Ed Snook (Snook 1997). Pfankuch Stream Channel Stability method was used, and the stream condition ratings were modified by Rosgen channel type (Rosgen 1996). Stream channels are described using the stream classification system developed by Dave Rosgen (Rosgen 1996).

Biological accounts and determinations for this project are based on the best available information on population status, habitat quality and quantity. Species assessments in this analysis were prepared from existing Forest Plan data, Inland West Watershed Initiative (IWWI 1996-1999), Wyoming Natural Diversity Database (WNDD 2002) records, and recent project area field surveys (2002 and 2003). Because species cannot exist without their supporting habitats, direct, indirect, and cumulative impacts to both species and their habitats have been evaluated. Effects on MIS are disclosed as part of the NEPA disclosure. Wood frogs and boreal toads were selected where they currently exist for project monitoring.

Based on existing information, five issues were identified as being relevant to fisheries, aquatic, watershed, and soil resources (see R2 watershed effects checklist for list of minor effects dismissed from rigorous analysis):

Sediment: Proposed timber harvest and associated road activities in the proposed action or any alternative have the potential to cause erosion and deliver sediment to streams, thereby degrading aquatic habitat. Proposed road construction and reconstruction may disturb soil near stream crossings, creating the potential for sediment transport to stream channels.

Flow Regime: Removing vegetation can increase snowmelt runoff, due to reduction in interception and evapotranspiration losses. The effects of the proposed action and alternatives on water yield will be analyzed.

Riparian Areas: Although no riparian areas would be harvested under this project, riparian areas may be affected by adjacent timber harvest and from road stream crossings constructed or improved by road construction/reconstruction. Riparian areas may also be affected by watershed improvement activities.

Glacial Pond/Lake Areas: Harvesting timber up to or adjacent to glacially formed aquatic systems, even using current BMPs (100-foot buffer), could create hydrologic changes affecting temperatures, evaporation factors, soil compaction, and migration corridors utilization for amphibians.

Fish/Amphibian Habitats and Populations: Proposed timber harvest and associated road activities have the potential to adversely affect fish and amphibian habitats or populations due to potential degradation of water quality, riparian and aquatic habitat.

Environmental effects related to each of these issues are discussed below:

Alternative 1 - No Action

Current management plans would continue to guide management of the project areas. Treatments or actions to promote wood fiber production/utilization, set back seral configurations, pursue secondary aspen enhancement by reducing conifer encroachment, reduce tree density and treat dwarf mistletoe or mountain pine beetle infestations would not occur. Road conditions would remain essentially the same; annual road maintenance would still occur. Past timber harvest in the area would gradually recover as trees mature, and issues of new clearcutting and road construction would not occur.

Sediment: The No Action alternative would have no direct or indirect effects on sediment, as there would be no ground disturbing activities associated with this alternative.

Flow Regime: With this alternative, no vegetation would be removed, so there would be no direct or indirect effects on streamflow.

Riparian Areas and Wetlands: Under this alternative there would be no direct or indirect effects on riparian areas or wetlands.

Fish Habitat and Populations: The No Action alternative would have no *direct or indirect effects* on fish populations, since there would be no vegetative management activities or road construction, and there are no watershed improvement projects as part of this alternative.

Aquatic Ecosystems: The No Action alternative would have no *direct or indirect effects* detrimental to aquatic ecosystems or habitats, since there would be no vegetative management or road construction activities. Concurrently, there would be no watershed improvement projects as part of this alternative.

Proposed Action

Sediment: The proposed timber harvest would not increase sediment delivery to streams, as all stream channels, riparian areas, and wetlands would be buffered by a minimum of a 100-foot buffer from proposed harvest areas. These buffers have been shown to be effective in filtering sediment (Welsch 1991).

Several of the proposed harvest units occur where harvesting had occurred 3 to 5 decades previously. In some of these units, the old skid roads and trails are eroding, and are in need of water bars to reduce erosion and diversion of surface runoff. The proposed timber harvest would reutilize as many of these existing skid roads and trails as possible, both to decrease additional disturbance and to facilitate water barring these roads after the harvesting is completed. This would reduce the sediment reaching stream channels and reduce the stream channel network expansion from these old skid trails.

Road reconstruction and short temporary road construction would occur in the watersheds of East tributary of North Fork Little Laramie River (NFLLR) and Upper North Fork Gold Run Creek. New road construction would include one new stream crossing of the East tributary of the upper North Fork Little Laramie River. Additional stream crossings of small intermittent stream channels may also be necessary to access the treatment units. Road reconstruction includes improving NFSR 338.G, which is currently contributing sediment to Gold Run Creek. The other reconstruction may also reduce sediment to nearby creeks. Both the new road construction and reconstruction would temporarily (from one to three years) increase fine sediment into nearby creeks and at stream crossings. Long-term fine sediment contribution from the reconstructed roads would decrease due to improved drainage and surfacing.

Flow Regime: This alternative would increase water yield from 0.7% to 4.3% for the watersheds in this area. These flow increases are small, too small to be measured, and would not cause additional stream channel erosion or instability for the streams in the analysis area.

Riparian Areas and Wetlands: Unit 21 has a small stream channel within the proposed treatment area. This channel would be buffered by a minimum 100-foot strip with no harvest treatment or ground disturbance. Other wetland areas border treatment areas (Units 2, 3 and 11), but the 100-foot minimum buffer would apply as well, so the unit boundary would be a minimum of 100 feet from these wetlands.

Unit 6 has the old logging trail now an ephemeral stream channel (although no riparian vegetation is present) described under stream channel conditions. The planned timber harvest would maintain large woody debris recruitment along this channel, through a buffer of 7.6 meters (25 feet) of the channel. Planned watershed improvement projects would include felling trees every 25 to 50 meters (82 to 164 feet) along the channel to accelerate recovery. This would occur after the harvesting is completed. The woody debris should accelerate the stabilization of this channel, which eventually should recover to a vegetated swale. Photo documentation would be used to monitor the effectiveness of this treatment and the recovery of the channel.

Units 10 and 11 have numerous dry glacial depressions, as well as some that are wet long enough in the spring to have riparian vegetation. Two ponds with persistent water are located on the boundaries of these treatment units. Buffering the wetlands and ponds by 100 feet would reduce effects on these areas. The increased sunlight and runoff in these areas, resulting from the surrounding clearcut, may slightly increase the riparian and wetland vegetation in these depressions, as well as increase the amount and length of water in the ponds. The buffer around the depressions would exclude equipment and reduce the potential impacts on the local hydrology from compaction, as well as retain shade and ground cover immediately surrounding the ponds.

With the 100-foot buffer, riparian areas and wetlands would not be directly affected by the proposed timber harvest except at new road, and reconstructed stream crossings. The project would require at least one road crossing of an intermittent drainage. At these crossings, disturbance of riparian vegetation and soils would be minimized, and the disturbed area from temporary roads would be rehabilitated at the end of the project.

Fish Habitat and Populations: Associated activities with the proposed timber harvest could produce detrimental effects on fish habitats and populations. Falling trees, heavy equipment, and logging personnel in streams or on their banks could result in fish kill and habitat degradation. The use of Best Management Practices (BMPs) for forestry related to water quality, Water Conservation Practices Handbook (WCPs), and the Forest Service Standards and Guidelines should greatly limit detrimental exposure to fish habitat and populations. Consequently, no *direct effects* are anticipated for fish habitats or populations from the proposed action.

Indirect effects may occur as a result of eroded material from temporary road construction or decommissioning being transported to perennial streams, affecting spawning gravels, egg and larvae survival. Additionally, fuel and other fluid leaks from heavy equipment, trucks and saws (oil, hydraulic fluid, and antifreeze) could introduce potentially toxic substances into soil and water, detrimentally impacting aquatic biota and their habitats. Long-term effects are estimated to be negligible, due to the location of proposed activities away from perennial water sources, and the use of BMPs concerning any work being done in or around dry intermittent or ephemeral drainages.

Aquatic Ecosystems: The same associated activities specified for fish and their habitats apply in general for all aquatic ecosystems. Errant amphibians could be crushed by vehicular traffic or logging personnel on the road systems or a remote migration corridor. The proposed action alternative should have no *direct effects* on aquatic ecosystems or habitats, since there would be no vegetative management activities within riparian or wetland communities through the use of BMPs and watershed conservation practices.

Indirect effects: Sediment deposition is possible during temporary road construction, reconstruction, and during road decommissioning, but is limited in scope and time, so are expected to be minor. Over time road decommissioning and reseeded should stabilize upland areas, reducing erosion and sediment deposition. Amphibians are somewhat less mobile than fish, so degradation of their habitats and populations could be affected more quickly. They tend to congregate in back water pools, beaver ponds, and glacial ponds and lakes that lack the flushing capability of perennial streams. Potentially toxic liquids mentioned above can be absorbed through the permeable skin of amphibians, affecting their stress levels and overall health.

Alternative 2 – No Clearcutting

Sediment: This alternative would have similar effects to the Proposed Action, as the primary effects on sediment would be the road construction and reconstruction into units 1 and 19. The road construction accessing units 10 and 11 would not occur under this alternative. The same road reconstruction would occur as under the Proposed Action, with the same short-term increase from ground disturbance at stream crossings and long-term reduction in fine sediment due to improved road drainage.

Flow Regime: This alternative would have no increase in ECA for the Nash Fork Watershed, and the same or lower ECA increases than the Proposed Action for the other watersheds. As with the Proposed Action, ECA values are well below the level that could cause increased stream channel erosion. There would be no change in streamflow regime from this alternative.

Riparian Areas and Wetlands: Effects on wetlands and riparian areas would be similar to the Proposed Action, as the primary effects on these resources are from the road construction and reconstruction projects. No treatment would occur in units 10 and 11, the area with glacial depressions and nearby kettle ponds. This alternative would have no effects in this area.

Fish Habitat and Populations: Consequences and effects would remain the same as in the Proposed Action, except the amount of potential exposure is reduced by 200 harvest acres and 1.5 miles of road construction. The use of BMPs, Watershed Conservation Practices, and specified mitigation for this project alternative should protect fish and their habitats.

Aquatic Ecosystems: *Direct and indirect effects* would remain the same as in the Proposed Action through the use of BMPs, Watershed Conservation Practices, and specified mitigation for the project.

Alternative 3 – No Specified Road Construction

Sediment: This alternative would have less ground disturbance and produce slightly less fine sediment than the Proposed Action, with only road reconstruction. Road reconstruction would still produce short-term increases and a long-term decrease in fine sediment in Gold Run Creek. This alternative would produce slightly less fine sediment in East Trib. of Upper North Fork Little Laramie River, as no road construction or reconstruction would occur in this watershed.

Flow Regime: This alternative would have similar effects on flow regime as the Proposed Action, although with less water yield increase in the East Trib. of Upper North Fork. ECA increases are the same or slightly less than the Proposed Action for all alternatives.

Riparian Areas and Wetlands: Effects of this alternative would be similar to Alternative 2, as this alternative does not include units 10 and 11. As with the other alternatives, riparian areas and stream channels would be protected by a 100-foot buffer zone. In this alternative, Unit 1 includes a stream channel within the unit boundaries.

Fish Habitat and Populations: Consequences and effects would remain the same as in the Proposed Action except about 150 fewer harvest acres and 2.0 miles less of road construction reduce the amount of potential exposure. The use of BMPs, Watershed Conservation Practices, and specified mitigation for this project alternative should protect fish populations and their habitats.

Aquatic Ecosystems: Consequences and effects would remain the same as in the Proposed Action, except the amount of potential exposure is reduced by about 150 harvest acres and 2.0 miles of road construction. The use of BMPs, Watershed Conservation Practices, and specified mitigation for this project alternative should protect amphibians, other aquatic biota and their habitats.

CUMULATIVE EFFECTS

Alternative 1 - No Action

Sediment: Fine sediment levels would remain approximately the same in these watersheds. Localized fine sediment loads would decrease in the future as sediment sources are stabilized through future projects, such as the Snowy Range Road Analysis process, which is scheduled to begin within the next few years. Future watershed improvement projects may include water barring old skid trails and temporary roads in old harvest units. Stream channel surveys did not indicate any stream channel trampling or other impacts from grazing. Estimated cumulative water yield increases from past harvest activities are low in all watersheds and have not appeared to increase stream channel erosion in any of these watersheds.

The Rainbow Valley Hazardous Fuels Reduction Project Decision includes sanitation salvage as a fuels treatment in the lower watershed areas of the North Fork Little Laramie watershed along the NFS boundary. Minimal temporary roads and system road construction/reconstruction is needed to implement this project. Fine sediment levels would increase slightly and only in response to rainstorms as a result of the prescribed burning included in this project (Snook and John 2001). Eighty percent of the prescribed burning was completed during the spring of 2003.

Flow Regime: Streamflows would slowly decrease in these watersheds as vegetation recovers in past timber harvest units and wildfire areas. Water yield increase from Rainbow Valley would add 22 ECA to The North Fork of the Little Laramie River, or less than 0.1%.

Riparian Areas and Wetlands: With the use of standard BMPs, such as buffer and filter strips, stream channels and riparian areas within the Rainbow Valley treatment area will be protected (Snook and John 2001). Riparian areas and wetlands in this area would remain in essentially the same condition under this alternative.

Fish Habitat and Populations: The No Action alternative would not contribute to the *cumulative effects* incurred from past harvests, habitat degradation, or road construction. Past timber harvest in the area would gradually recover as trees and shrubs mature, securing habitats at their present level of protection, and in time increase habitat stability and security. Current fish populations appear to be strong throughout the watershed. Major changes are not expected either in population numbers or distribution.

Aquatic Ecosystems: The No Action alternative would not contribute to the existing cumulative effects incurred from past harvests, habitat degradation, or road construction. Past timber harvest in the area would gradually recover as trees and shrubs mature securing habitats at their present level of protection, and in time increase habitat stability and security. Current amphibian populations where they exist appear to be well established throughout the watershed. Major changes are not expected either in population numbers or distribution.

Table 14. Estimated ECA Increase for Proposed Action, Alternatives 2 and 3

Watershed	Proposed Action		Alternative 2 No Clearcutting		Alternative 3 No Road Construction	
	ECA acres/% increase	Watershed Cumulative ECA (%)	ECA acres/% increase	Watershed Cumulative ECA (%)	ECA acres/% increase	Watershed Cumulative ECA (%)
East Trib. Upper North Fork of the Little Laramie River	63.9/4.3%	17.5%	63.9/4.3%	17.5%	8.2/0.6%	13.8%
Nash Fork	38.6/0.7%	1.6%	0	1.5%	0	1.5%
Upper North Fork of the Little Laramie River	321.7/2.0%	6.6%	189.1/1.2%	5.6%	205.8/1.3%	5.8%
Gold Run Creek	60.5/2.0%	8.5%	30.1/0.3%	6.8%	60.5/2.0%	8.5%
Libby Creek	86.2/0.7%	2.9%	30.1/0.1%	2.3%	86.2/0.7%	2.9%
North Fork of the Little Laramie River	407.9/1.1%	3.8%	198.1/0.5%	3.2%	292/0.8%	3.5%

Proposed Action

Sediment: The cumulative effect would be an overall reduction of fine sediments in the long term on Gold Run Creek and East Trib. of the Upper North Fork due to the road reconstruction in those watersheds. Elsewhere, fine sediment levels would remain at about the same levels. The temporary increases in fine sediment from road construction and reconstruction for this project are far enough removed upstream, and in time, from the Rainbow Valley Fuels Reduction Project as to not overlap. It is likely that all effects from the Rainbow Valley Project would be completed prior to the implementation of this project.

Flow Regime: The cumulative water yield increase is low, under 10% for most watersheds. East Trib. of the Upper North Fork of the Little Laramie River has the highest water yield increase of 17.5%. Flow increases are not considered to be significant until approximately 25% of the forested basal area on the watershed has been removed (FSH 2509.25.11.1). The streams in this area have stable stream channels (Snook 1997) and can withstand water yield increases without adverse effects on the stream channels or sediment loads. It is anticipated that there will be no effect to the Town of Centennial municipal wells in the North Fork watershed.

Riparian Areas and Wetlands: Riparian and wetland areas would remain in essentially the same condition, although they may be slightly wetter due to locally increased runoff from timber harvest. Small areas near streams affected by new and/or temporary road construction would be impacted. Over the long term, future road decommissioning may occur under the Snowy Range Road Analysis, which would improve riparian areas and wetlands within this analysis area.

Fish Habitat and Populations: Effects on fish populations and habitats are expected to be minor for the project, due to limited temporary road construction and road removal post harvest. Potentially, cumulative effects for sedimentation affecting streams long term within the project area should be reduced substantially by the implementation of future road closures and repairs. Proposed reseeded of native grasses in uplands adjacent to streams should reduce the rate of active erosion and sedimentation in the analysis area.

Aquatic Ecosystems: As specified through harvesting protocols, the cumulative effects incurred should be minor in effect and duration from timber harvest and temporary road construction. Should toxic fluids mentioned above escape into aquatic ecosystems, it should be noted that they do settle out into the sands and mud bottoms of stream backwaters, ponds, and lakes. Cumulatively, this contamination could be reintroduced into the water column affecting amphibians and aquatic biota for an extended period of time. Habitat fragmentation should be minimal in effect for amphibians, as harvesting activities should be well out of the normal habitat for these species. Boreal toads are the exception, as they are known to travel outside riparian areas into adjacent timber stands.

Many changes have occurred within the analysis area over the past few decades. They include several timber sales, road construction, and heavy recreation use such as hunting, fishing, camping, and ATV/ORV use. Considering all this, amphibian populations where they exist in the analysis area appear to remain stable or are increasing.

Alternative 2 - No Clearcutting

Sediment: Cumulative effects of fine sediment would be similar to the Proposed Action, with short-term increases from road construction and reconstruction, and long-term decrease from the road improvements.

Flow Regime: This alternative would have the similar effects on flow regimes as the Proposed Action and would not affect stream channel stability.

Riparian Areas and Wetlands: Cumulative effects would be similar to the Proposed Action, with riparian and wetland areas remaining in essentially the same condition as currently.

Fish Habitat and Populations: Cumulative effects for this alternative should be reduced from those in the Proposed Action due to the lesser amount of disturbed acres from timber harvest and road construction. However, the future road decommissioning should have a beneficial bearing cumulatively on the affected watersheds overall health.

Aquatic Ecosystems: This alternative should reduce effects from those in the Proposed Action due to the lesser amount of disturbed acres in timber harvest and road construction. The elimination of clearcut units adjacent to aquatic systems would provide cover, protecting the area from the effects of solar radiation. The on-the-ground effects for this alternative would help to maintain the moisture levels for the area, reduce temperatures, inhibit vegetative growth slowing glacial pond/lake fill-in, and protect existing migration corridors. Additionally, previously mentioned future road decommissioning should have a beneficial bearing cumulatively on the overall health of affected watersheds.

Alternative 3 - No Specified Road Construction

Sediment: Cumulative effects would be similar to the Proposed Action, with the exception of East Trib. of Upper North Fork, which would have fine sediment levels similar to the No Action alternative.

Flow Regime: This alternative would have similar effects on streamflow regimes as the Proposed Action, with no adverse effects on stream channel stability.

Riparian Areas and Wetlands: Cumulative effects would be similar to Alternative 2, with all riparian areas and wetlands remaining in essentially the same condition as currently.

Fish Habitat and Populations: This alternative should reduce effects from those in the Proposed Action, due to the lesser amount of disturbed acres from timber harvest and road construction. However, proposed future road decommissioning should have a beneficial bearing cumulatively on the affected watersheds overall health.

Aquatic Ecosystems: This alternative should reduce effects from those in the Proposed Action, due to the lesser amount of disturbed acres in timber harvest and road construction. The reduction of clearcut acres adjacent to aquatic systems would continue to provide cover, protecting the area from the effects of solar radiation, but not to the degree of the no-clearcutting alternative. The reduced ground disturbance for this alternative would help to maintain the moisture levels for the area, reduce temperatures, inhibit vegetative growth slowing glacial pond/lake fill-in, and protect existing migration corridors. Additionally, previously mentioned future road decommissioning should have a beneficial bearing cumulatively on the overall health of affected watersheds.

Federally Listed Species

Table 15 represents federally listed aquatic or riparian-dependent T&E species identified by the USFWS (May 2003) that may occur or be affected by activities on the Medicine Bow NF. Candidate and Proposed species are included with the sensitive (S) species in the Biological Evaluation (BE) portion of the document. Not all listed species necessarily occur near, or are adversely affected by the proposed management activities within the project area. General descriptions of physical environmental consequences and mitigation measures for proposed activities are described in the Environmental Effects portion of this document for each of the alternatives. These effects are then applied to habitats and populations of affected threatened or endangered species below.

Species with Off-Site Habitat that May Be Affected by Activities within the Silver Run Timber Sale Project Area

Platte River Mainstem Ecosystem Species: The T & E species listed in Table 15 are native to the Platte River mainstem ecosystem. Their life cycles depend on natural flow regimes that include flood flows and usual sediment transport. Their biology is fully described by the USFWS (1999). These species are included in this BA, even though they occur far outside the project area, because projects that result in changes in timing or amounts of flow have been found to adversely affect habitat and populations of species in the Platte River mainstem ecosystem. The decline of the T and E species listed has been found to be due to water depletion factors resulting from and attributed to habitat loss from the construction of dams and reservoirs. Commercial, industrial, municipal, and agricultural water depletions interrupt or alter natural flows and change temperature, flow regimes, channel stability, and water quality. There are no depletion effects associated with the Silver Run Timber Sale.

Silvicultural treatments like the logging and burning of green trees create an increase in water yield rather than a depletion. There would be no measurable local change in water yield from the Silver Run Timber Sale project. The acreage involved is substantial, but even with the removal of green-timber, local increases in water yield would be small and often immeasurable. While real, these increased yields would not contribute significantly to enhance fish habitat at the local level or enhance wildlife habitats downstream in Nebraska. Furthermore, no legal means to protect this water are available, and any incidental water yield increases would be used through application of water rights for municipal and agricultural purposes long before water reached the Platte River mainstem ecosystem.

The Proposed Action would have *no effect* on downstream listed species or their habitats, because all listed species (except bald eagles) are not known or suspected to occur in the Silver Run Analysis Area. Therefore, no inadvertent taking of listed species could result in their direct mortality, critical habitat modification, or destruction. Results of the Proposed Action activities would be the same as the No Action alternative. All other alternatives would have a similar effect for listed aquatic species.

Table 15. Threatened or Endangered Aquatic or Riparian-Dependent Species that May occur in the Project Area or be Impacted by the Silver Run Timber Sale Project

Species	Status	Suitable Habitat In Project Area	Populations Known or Suspected to Occur in Project Area	Summary of Determination of Effects
Whooping crane (<i>Grus Americana</i>)	E	No, downstream in Platte River mainstem ecosystem.	No, but change in stream flows could affect habitat and populations downstream.	No Effect Project will not affect stream flow in suitable habitat.
Least tern (<i>Sterna antillarum</i>)	E	No, downstream in Platte River mainstem ecosystem.	No, but change in stream flows could affect habitat and populations downstream.	No Effect Project will not affect stream flow in suitable habitat.
Pallid sturgeon (<i>Scaphirhynchus albus</i>)	E	No, downstream in Platte River mainstem ecosystem	No, but change in stream flows could affect habitat and populations downstream.	No Effect Project will not affect stream flow in suitable habitat.
Eskimo curlew (<i>Numenius borealis</i>)	E	No, downstream in Platte River mainstem ecosystem.	No, but change in stream flows could affect habitat and populations downstream.	No Effect Project will not affect stream flow in suitable habitat.
Bald eagle (<i>Haliaeetus leucocephalus</i>)	T	No, downstream in Platte River mainstem ecosystem. (*Local populations evaluated in Wildlife Report)	No, but change in stream flows could affect habitat and populations downstream.	No Effect Project will not affect stream flow in suitable habitat.

Species	Status	Suitable Habitat In Project Area	Populations Known or Suspected to Occur in Project Area	Summary of Determination of Effects
Piping plover (<i>Charadrius melodus</i>)	T	No, downstream in Platte River mainstem ecosystem.	No, but change in stream flows could affect habitat and populations downstream.	No Effect Project will not affect stream flow in suitable habitat.
Western prairie fringed orchid (<i>Platanthera praeclara</i>)	T	No, downstream in Platte River mainstem ecosystem.	No, but change in stream flows could affect habitat and populations downstream.	No Effect Project will not affect stream flow in suitable habitat.

E = endangered species; T = threatened species; habitat is present within or adjacent to the proposed project area but not within any proposed treatment areas.

ENVIRONMENTAL CONSEQUENCES

All Action Alternatives

There are no federally listed aquatic species within the project area, so there would be no effect associated with the Silver Run Timber Sale project for federally listed aquatic species or their habitats either directly, indirectly, or cumulatively. The Wildlife BA addresses local populations of bald eagles, and this report addresses only downstream species and their habitats (see section below). None of the other listed aquatic species have habitat present within or adjacent to the proposed project area.

Listed T and E species or their habitats are not known or suspected to occur in the project area. Candidate western boreal toad and the petitioned Colorado River cutthroat trout are included in the Biological Evaluation (BE) and evaluated as a Forest Service sensitive (S) species.

CUMULATIVE EFFECTS

The Proposed Action would have *no effect* on listed species or their habitats. All the above downstream listed species except bald eagles are not known or suspected to occur in the Silver Run Analysis Area, and any effects would not be translated downstream to potential habitat. Suitable habitat is located over 100 miles downstream from the project area. Temporary local water quality changes (e.g., sediment) would not translate to downstream habitat. It has been suggested that increased water yield from vegetation treatment may be beneficial to Platte River mainstem ecosystem species, because vegetation treatment projects (timber harvest or burning of green trees) of sufficient size can lead to increases in water yield, due to a reduction in transpiration and reductions in snow interception losses by vegetation. The potential water yield increases from the proposed project are small, because of the distribution of timber treatments and the project is spread out over a number of smaller watersheds.

While water yield increases as a result of vegetative management are real and have been documented in watersheds less than a few square miles in size, research has not been able to detect changes in water yield on larger basins. Additionally, there are a variety of water users between the project area and suitable downstream habitats, which could nullify any increases in water before it reached downstream habitats. Therefore, this project is not expected to change streamflows where suitable habitat for these endangered species exists.

Completion of this biological assessment has not identified nor requires mitigation measures or recommendations for listed aquatic T&E species. There are not likely to be direct, indirect, or cumulative effects on downstream aquatic habitats or listed species in the Platte River mainstem river ecosystem. Consultation with the USDI Fish and Wildlife Service (FWS) is not required for the EA with any alternative selected for this project, and it is expected the FWS would likely concur with a finding of *no effect* from this project on potential, critical or suitable habitats downstream for any federally listed threatened or endangered species covered by this biological assessment (50 CFR 402.10) unless the project changes, or new information indicates different effects might be anticipated.

Forest Service Sensitive Species

The Rocky Mountain Regional Endangered, Threatened, and Sensitive Species Lists (USDAFS 94) were used to determine those species that may occur on the Medicine Bow National Forest. Table 16 provides the list of sensitive (S) aquatic species for the Silver Run Analysis Area.

Table 16. Forest Service Listed Sensitive Aquatic Species that May occur in the Project Area or be impacted by the Silver Run Timber Sale Project

Species	Status	Sensitive Species Carried Forward
Wood frog (<i>Rana sylvatica</i>)	S	YES** Species known or have potential to occur in riparian areas, streams, wetlands and ponds.
Tiger salamander (<i>Ambystoma tigrinum</i>)	S	YES** Species known or have potential to occur in riparian areas, streams, wetlands and ponds.
Western boreal toad (<i>Bufo boreas boreas</i>)	C, S	YES** Species known or have potential to occur in riparian areas, streams, wetlands and ponds.
Northern leopard frog (<i>Rana pipens</i>)	S	YES** Species known or have potential to occur in riparian areas, streams, wetlands and ponds.
Colorado River cutthroat trout (<i>Oncorhynchus clarki plueriticus</i>)	S	NO: Species native to and distributed on west side of Continental Divide in perennial streams.
Yellowstone cutthroat trout (<i>Oncorhynchus clarki bouvieri</i>)	S	NO: Species native to and distributed in the Columbia and Snake River basins.

C= candidate species; S = sensitive species; ** = habitat is present within or adjacent to the proposed analysis area, but not within any proposed treatment area.

ENVIRONMENTAL CONSEQUENCES

All Action Alternatives

Western boreal toad (*Bufo boreas boreas*), tiger salamander (*Ambystoma tigrinum*), leopard frog (*Rana pipens*), and wood frog (*Rana sylvatica*) have been documented to inhabit, and do have suitable habitat within or adjacent to the Silver Run Timber Sale proposed project area.

There is quality amphibian habitat and populations present within the analysis area. Past and present surveys (WNDD 2002 and summer 2002) for sensitive amphibians have reinforced their existence in the project and analysis area. Amphibians sometimes disperse relatively great distances from aquatic systems; therefore, there is the remote possibility that equipment or personnel activity in treatment areas could pose a risk to individual amphibians. Additionally, machine liquids such as fuel, hydraulic fluid, and antifreeze could more directly affect amphibians, as they also use their skin for respiration.

There are many perennial streams within and around the proposed harvest treatment units. All contain good to excellent “common trout” fish populations. However, there are no naturally occurring Forest Service listed sensitive fish species within the analysis area. It is unlikely that there would be any direct impacts to amphibians, fish, or their habitats, provided best management practices (BMPs) for timber harvesting, specified mitigation, and watershed conservation practices (WCPs) are utilized to protect individual species, water quality, and associated riparian/wetland habitats.

Loss of shading, ground vegetation, cover, and stream channel damage should not occur from personnel and equipment harvesting in the treatment units, provided there is compliance with BMPs, WCPs, and specified mitigation. There is the possibility of precipitation or snowmelt run-off causing sediment loading or chemical spill transport to lotic and lentic aquatic systems within the project area. Weekly monitoring following precipitation events should preclude this from happening, and, if it should occur, would be identified and corrected before there was damage to habitats or species.

CUMULATIVE EFFECTS

National Forest System lands represent a very large portion of the potential for good fish and amphibian populations in the Rocky Mountain West. Well-established populations of non-native trout occupy the stream habitat at most elevations within the project area, and there are no naturally occurring Forest Service listed sensitive fish species within the project area of the Medicine Bow NF. However, amphibians do not exhibit the same good population presence as “common trout” within the project area, even with the amount of suitable habitat present. Sediment deposition from road construction and run-off following timber harvest is expected to be the greatest cumulative impact for fish and amphibians, affecting spawning gravels, dissolved oxygen concentrations, and water quality. Project implementation of BMPs, mitigation, and monitoring, along with future proposed road closures and repairs following the travel management analysis should greatly reduce the cumulative impacts from erosion and sediment deposition. The activities included in the Proposed Action and Alternatives 2 and 3 *may adversely impact individuals, but is not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability Forest-wide* for “common trout, boreal toad, wood frog, northern leopard frog, and the tiger salamander.

Management Indicator Species

The Medicine Bow National Forest Land Management Plan (LMP) lists several potential aquatic MIS: western boreal toad, wood frog, and beaver are considered ecological indicators, and Colorado River cutthroat trout, rainbow trout, and brook trout (common trout species) are management indicators for fish (Table 17). There are no aquatic MIS listed for either recovery species or featured species.

Table 17. Aquatic and Riparian-Dependent Management Indicator Species (MIS) Known or with Potential to Occur in the Silver Run Project Area

Species	Status	MIS Species Carried Forward for Analysis
Common trout: Brook trout (<i>Salvelinus fontinalis</i>)	MIS	Alternate***Species known or have potential to occur in analysis area perennial streams, and sufficient data and populations exist where they occur to monitor and evaluate.
Brown trout (<i>Salmo trutta</i>)	MIS	NO** Species known or have potential to occur in analysis area perennial streams, but sufficient data and populations <u>do not</u> exist where they occur to monitor and evaluate.
Common trout: Rainbow trout (<i>Oncorhynchus mykiss</i>)	MIS	NO** Species known or have potential to occur in analysis area perennial streams, but sufficient populations or data <u>do not</u> exist where they occur to monitor and evaluate.
Wood frog (<i>Rana sylvatica</i>)	MIS	YES** Habitat in riparian areas, streams, ponds, and wetlands, and sufficient populations and data where they exist <u>are</u> available for monitoring and evaluation.

Species	Status	MIS Species Carried Forward for Analysis
Western boreal toad (<i>Bufo boreas boreas</i>)	MIS	NO** Habitat in riparian areas, streams, wetlands, and ponds, but sufficient data and populations <u>not</u> available for specific monitoring and evaluation.
Colorado River cutthroat trout (<i>Oncorhynchus clarki plueriticus</i>)	MIS	NO: Species native to and distributed on west side of Continental Divide, and are not known or have potential to occur in analysis area perennial streams.
Beaver (<i>Castor canadensis</i>)	MIS	NO** Species known or have potential to occur in beaver ponds and along streams with <u>accessible</u> riparian vegetation, but sufficient population is not available for monitoring and evaluation. Species can be better utilized as a keystone species.

MIS = management indicator species ** = habitat and populations are present within or adjacent to the proposed project area. *** = Not selected as a primary MIS species; however, should a particular stream be affected by extreme sediment loading or toxic contamination, brook trout could be used as an additional MIS on a site-specific basis.

ENVIRONMENTAL CONSEQUENCES

All Action Alternatives

None of the impacts associated with the Silver Run Timber Sale project for either the proposed or alternative activities would have adverse effects for Forest Service designated aquatic or riparian-dependent management indicator species (MIS) or their habitats. The activities included in the Proposed Action and Alternatives 2 and 3 may adversely impact individuals, but is not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability Forest-wide for wood frogs. Specified mitigation and monitoring measures should protect potential habitat for all aquatic and/or riparian dependent species.

The proposed vegetative management activities associated with any alternative for the Silver Run Timber Sale project are not expected to cause changes in aquatic habitat quantity or quality or to affect the status for known wood frog populations. There would be ***no detrimental direct, indirect, or cumulative effects on management indicator species, or their habitats***, through the use of BMPs, watershed conservation practices, Forest Standards and Guidelines. **Recommended mitigation measures for aquatic species and habitats should be implemented as described for areas where proposed activities and habitats coincide.**

CUMULATIVE EFFECTS

Extensive surveys on the Laramie Ranger District during the 2002 field season as part of the Silver Run timber sale project documented stable wood frog populations throughout the Silver Run timber sale analysis area. This frog population appears to be strong and stable even with the past decades of timber harvest, road construction and heavy recreational use.

Overall, aquatic habitat conditions in the affected drainages selected for timber harvest appear not to have been adversely modified or affected by past timber harvests, and the streams in the analysis area support strong populations for brook, and brown trout where they exist. The most likely source of adverse impact, from the cumulative impacts of past and proposed timber harvest activities could be increases in stream sedimentation. This could effectively reduce habitat quantity and quality with respect to potential spawning areas, and egg or larvae survival for fish and amphibians. Weekly monitoring has been recommended during project implementation including temporary road decommissioning and should catch increased sediment deposition before it can affect aquatic systems within the project area.

Forest Plan Consistency

The Silver Run Timber Sale project would be consistent with Forest Plan goals, guidelines and standards, because silvicultural activities have been specifically designed to stay out of riparian and wetland zones. The use of existing roads and the immediate closure of any temporary roads following the project will limit stream network expansion within the analysis area. The Silver Run Timber Sale project would be consistent with 9A management area direction, because riparian areas in the Silver Run project areas are adequately buffered by regulation and mitigation, and are not subject to silvicultural management. No Forest Plan amendment would be required to ensure project consistency with LMP direction for management of fisheries, aquatic, and riparian resources.

Vegetation

AFFECTED ENVIRONMENT

The existing vegetation patterns in the Silver Run area are but a snapshot in time along the path of plant succession. Following a continuing process of self-renewal, for thousands of years the subalpine and montane forests in this vicinity have regenerated, matured, and died. Along with past logging, natural and human-caused wildfires have played a major role in this succession process. Ranging in elevation from 12,000' to 8,000', the analysis area is dominated by uneven-aged stands of Engelmann spruce and subalpine fir (46%) at the higher elevations, north facing slopes, and riparian areas. The middle elevations are dominated by even-aged stands of lodgepole pine (49%). Descending further in elevation, the lodgepole becomes more mixed with aspen (4%). At the lower tree line at about 8,200 feet the lodgepole and aspen become mixed with limber pine (1%) and a few, relic stands of Douglas fir (>1%). (*Source: Forest RIS Database.*)

Disturbances are a part of ecosystem processes. Forests are adapted to disturbances. Short-term changes are dramatic and substantial, but forests will regenerate and thrive again. In the Central Rocky Mountain ecosystem, disturbance is the critical factor in maintaining co-existing species. Without disturbance, climax species such as subalpine fir and Engelmann spruce would replace disturbance dependent species such as lodgepole pine, aspen, and ponderosa pine. Two of the more common disturbances are bark beetles and fire.

Bark Beetles

Bark beetles are always present in the forest in low endemic numbers. The various types of bark beetles are typically specific to a tree genus and/or species. Mountain pine beetles only attack trees of the pine genus such as lodgepole, ponderosa, and limber. Western balsam bark beetles only attack trees in the abies genus such as subalpine fir, while spruce beetle is specific to the genus picea, which includes Engelmann and blue spruce. In attacking trees the beetles introduce a blue stain fungus into the tree's living tissues, interrupting the transport of water and nutrients, which eventually kills the tree. The tree's only defense against beetles is its sap, or resin, which the trees use to "pitch out," attacking beetles. Younger, healthier trees produce more sap, thus are better able to ward off attack. Trees growing in crowded conditions, or ones that are old, diseased, or weather/fire damaged, produce less sap, thus are more readily and successfully attacked by beetles. Under endemic conditions, the beetles cause periodic, very low amounts of single tree and small group mortality of what are typically the unhealthiest trees in the stand, providing important snag habitat to dependent wildlife. Endemic beetle populations are naturally regulated through cold winter temperatures and through predation by birds--such as woodpeckers, small mammals, and other insects.

Much like droughts, beetle epidemics are cyclic. When conditions are favorable, the beetle population increases to epidemic levels. Beetle epidemics were a part of the natural variation before settlement (Schmid and Mata 1996). A beetle epidemic is defined as the point in which annual tree loss is greater than annual tree growth, causing disturbances of normal relationships in the forest. Dense stands of trees have little or no defense against beetles, and are extremely susceptible when these insects reach epidemic levels. When beetle populations increase, even healthy trees are subject to infestation. Beetles often kill entire stands of trees during an epidemic. Fire often follows, taking "advantage" of the large accumulation of fuels and burning over the sites. Under dry conditions and with an ignition source such as lightning, tree mortality from bark beetles can provide a ready source of dead fuels for the inevitable wildfire. Fire can also occur without the predisposition created by bark beetles.

Fire

Natural and human caused wildfires have been a major factor in forming the forests we see today in the Silver Run vicinity. It is known that fire has periodically burned large portions of the area, playing an important role in the appearance of the landscape, and maintaining a mix of tree species in various successional stages. The presence of lodgepole, aspen, and ponderosa at the lower and middle elevations of the analysis area is reflective of disturbance in the form of fire. These lower elevations tend to be drier and have a shorter fire return interval, while wetter, higher elevations have a longer fire return interval. Lodgepole, aspen, and ponderosa are very dependent on natural disturbance such as fire to propagate themselves. Lodgepole have serotinous seed cones (cones that do not open at maturity and persist on the tree). Serotinous cones open and release the stored seed when heated. Aspen typically resprout from their interconnected root system following being burned over by fire. While lodgepole and aspen use fire to directly regenerate new stands, ponderosa have adaptations in the form of thick, fire-resistant bark that allows it to survive being under burned by frequent fire. Lodgepole and aspen stand origin dates, estimated from tree ring growth data, provide a rough map of where and approximately when stand replacing/regenerating fires occurred.

In examining the fire history or stand origin data for the area, it appears that the vast majority of existing stands at the lower and middle elevations resulted from fires that burned the area shortly after Euro-American settlement of the vicinity (1860-1909). Portions of the analysis area, including Corner Mountain and the upper part of the Silver Run drainage, appear to have burned after 1910. Fires appear to have been effectively controlled within the vicinity since that time. A study conducted in the higher elevations of the Savage Run Wilderness, ten air miles to the southwest, found a fire interval frequency of approximately 200 to 300 years. In other words, on average it would take approximately 200 to 300 years for a series of stand replacing fires to burn the entire area. Other studies conducted on the Forest indicate that large stand replacing fires (1000+ acres) burned portions of the Forest every 100 years or so.

Along with administering and regulating early day timber cutting and livestock grazing, shortly after the creation of the Forest in 1902, the newly created Forest Service started a strict policy of wildfire suppression in the area. Early firefighting efforts in the Silver Run vicinity were assisted by the construction of fire lookout towers on Medicine Bow Peak and Spruce Mountain to the south. The greatest effect fire suppression has had in the area has been the noticeable conversion of many aspen stands to lodgepole pine, Douglas fir, and subalpine fir--such as the east face of Centennial Ridge. Most of the aspen stands in the vicinity are considered overmature, with the vast majority being well over 100 years old. Relic small groups and individual ponderosa pine, which is currently relegated to southerly aspects at the lower elevations in the eastern portion of the area, appears to have been more prevalent at one time. As with aspen it appears the lack of fire has led to a decrease in this fire dependent tree species.

Past Timber Harvest

The Silver Run Analysis Area is very representative of the general eras of logging that have occurred on the Medicine Bow National Forest. The first logging era encompasses an eighty-year period, from the first European-American settlement of the Snowy Range vicinity to World War II. During this era the main emphasis behind logging was exploitation. Little or no consideration was given to the future of the forests being exploited. Logging concentrated on harvesting or "high grading" the best trees within the forest. What was considered the "best" tree depended on the product that was being made from the log. Due to the lack of roads and trails, the bulk of this era's cutting occurred in the more operable areas, or areas with flatter terrain at the middle and lower elevations of the watershed.

Spurred by the construction of the first transcontinental railroad to the north of the Forest and, later, the Laramie, Hahn's Peak, and Pacific (LHP&P) line from Laramie through Centennial to Walden, Colorado, much of the Snowy Range was cut over by "tie hacks" between 1860 and 1920. Completed in 1885, the construction of the LHP&P rail line opened up much of the southern Snowy Range, of what was to become the Medicine Bow National Forest, to year-round cutting by tie hacks. Tie hacks were loggers who cut railroad ties for the railroad. In working their trade the tie hacks would typically cut lodgepole pine (11" DBH was optimum), discriminately selecting the straightest, best formed trees to hand hewn ties from. Along with ties, early day loggers cut timber in the vicinity for the area mines on Centennial Ridge, and within the Gold and Silver Run subwatersheds. Early logging also supplied material for the construction of homesteaded ranches along the North Fork of the Little Laramie River and within the Centennial Valley. Evidence of this cutting, in the form of stumps, and old, overgrown logging roads can be found throughout the lower elevations of the area.

The greatest effect the early day loggers had on the Silver Run area's vegetation was probably not their cutting, but the wildfire(s) that they may have caused. The fires that burned much of the area between 1860 and 1910 were probably caused and fueled by slash from early day cutting. There was virtually no regulation of logging until after the Forest was created in 1902. Another major effect of this early logging and subsequent cutting up until around 1950 was to create forest conditions that promoted the spread of dwarf mistletoe within area lodgepole pine stands. Many of the openings created by this era's selective cutting regenerated to lodgepole pine, changing what were single-storied stands to the current multistoried stands. Dwarf mistletoe in the lodgepole overstory that was not cut has spread into much of this lodgepole regeneration within these stands. Lastly, it was during this era that the first major trails and roads were constructed into the vicinity. This access allowed for other uses such as livestock grazing, water diversions, commercial hunting, and recreation to begin in the area.

As with many other National Forests, the post World War II housing boom brought a new era of logging to the Silver Run vicinity. Beginning in the early 1950's, the first large-scale clearcutting was made within the analysis area. Evidence of this early clearcutting is evident in central portions of the analysis area. The management objective of this era was to find the most economically and scientifically sound way of roading, harvesting, and regenerating the predominantly old lodgepole pine forests of the area. Most of this early clearcutting was done as alternate north-south rectangular strips. As with elsewhere on the Forest, the clearcuts in the Silver Run area were a resounding success in meeting these objectives and converting these older forested stands into a young forest. Though some would call the end result a tree farm, these young forests are still functioning parts of the ecosystem.

With the advent of new legislation in the 1960's and 1970's, such as MUSYA, NFMA, and NEPA, the philosophy towards management began a transition from a timber resource emphasis to a more balanced multiple use management approach. Beginning in the 1980's, better consideration was given to other resources such as wildlife and recreation. Through the 1980's and into the 1990's, the major objective of timber sales (T.S.) within the area, such as the Fallen Pines, Trail Creek, and Gold Run T.S.(s), was to use harvesting to begin consolidating the strip clearcuts with each other and to create irregular, non-linear harvest patterns that blend in better with the natural landscape. The most recent entry within the analysis area was the Trail Creek T.S. Completed in 1993, the sale was primarily to the north of the analysis area.

From 1949 to 1993, approximately 10% (1,348 acres) of the suitable acres (13,400 acres) within the analysis area were harvested under the clearcut or overstory removal prescription. Approximately 724 acres of partial cutting occurred during this period. Approximately 16% of the suitable and 9% of forested acres within the watershed have had some form of harvesting since 1949. The most recent harvesting in the area occurred under the Fallen Pines and Trail Creek T.S.(s). Completed in 1992, the Fallen Pines T.S. consisted of primarily clearcut units. Situated primarily outside the analysis area to the northeast, the southern portion of the sale is situated along the watershed divide. The last large T.S. to occur in the area, the Trail Creek T.S. (completed in 1993) harvested a number of primarily, clearcut units in the north-central portion of the area. Like Fallen Pines, the bulk of the sale occurred outside the analysis area to the north. Other than personal use firewood cutting, currently there is no harvest activity occurring in the watershed.

In August 2002, Laramie Ranger District completed analysis work on the Rainbow Valley Hazardous Fuels project in the extreme eastern part of the Silver Run Analysis Area, along the Forest Boundary adjacent to the Rainbow Valley Subdivision and the Town of Centennial. Tiered to the 2000 National Fire Plan, the 280 acres of prescribed burning and 190 acres of mechanical fuels reduction treatments covered under this project decision are designed to treat area fuels in order to reduce the current threat to life and property from a future catastrophic fire. Burning under this proposal was started during the spring of 2003. Depending on funding, the mechanical treatments could begin as early as the fall of 2003.

The following Table 18 displays the timber sales that have occurred within the Silver Run vicinity in the last thirty years, while Table 19 displays the past harvest totals since 1949:

Table 18. Recent Timber Sales in Analysis Area

Sale Name	Year(s) Harvested	Remarks
Trail Creek	1990-93	Portion of sale on watershed divide in northern portion.
Fallen Pines	1980-92	Portion of sale on watershed divide in northern portion.
Sand Lake	1983-87	Portion of sale on watershed divide in northern portion.
Hanging Lake P&P	1985	Small post & pole sale that consisted of one clearcut unit.
Gold Run	1976-1978	Portion of sale on watershed divide in southern portion.
Libby Creek	1968-70	Primarily made-up of clearcuts in the central portion of analysis area.

Table 19. Past Timber Harvest Since 1949

Past Treatment	Acres
Clearcut	855
Overstory Removal	493
Shelterwood preparation cut	389
Sanitation/salvage	10
Individual Tree Selection	325

(Source: Forest RIS Database)

Resource Information System (RIS) database and on-site field observations by the Project Silviculturist indicate that past regeneration harvests in the vicinity have regenerated to fully stocked stands. It is the professional opinion of the District Silviculturist that there should be no problems in obtaining natural regeneration to meet the NFMA standard within five years of any proposed regeneration harvest in the Silver Run area.

Mountain Pine Beetle

As has been found elsewhere on the Forest, there are indications that mountain pine beetle activity is also on the increase in the analysis area. Aerial surveys of the District, conducted by a Forest Service entomologist during the summer of 1999, found an increase in recent lodgepole and limber pine mortality (faders) within many lower elevation stands. Situated within over-mature stands of lodgepole and limber pine, the pine beetle activity appears to be increasing, with mortality of groups of up to three to five trees in some area stands. The 2002 aerial survey of the area again verified much of the current beetle activity and spread is within forested areas at the lower elevations of the area.

Western Balsam Bark Beetle

Aerial surveys of the area also found an appreciable amount of subalpine fir mortality. Recent years have seen a dramatic increase in fir mortality due to a root disease, *Armillaria* sp., and an insect—western balsam bark beetle, within this area. Very noticeable on the east face of Centennial Ridge, this increase in fir mortality in the area is linked to overstocked conditions within these fir stands.

Spruce Bark Beetle

Another potentially damaging insect that may pose a threat to the Engelmann spruce within the analysis area in upcoming years is spruce beetle. Spruce beetle is similar to the pine beetle in that it is cyclic, and when conditions are favorable the beetle populations can increase to epidemic levels. Once an epidemic occurs, all spruce 5” in diameter and greater are susceptible to attack. There are indications that spruce blow-down that has occurred in recent years within watersheds to the west of the analysis area may provide a medium and/or epicenter for the start of a spruce beetle epidemic that could spread into the spruce dominated forests at the higher elevations.

Dwarf Mistletoe

The most damaging pest to affect lodgepole pine in the Silver Run Analysis Area is dwarf mistletoe. Dwarf mistletoe is a parasitic plant that grows into the bark of host trees--feeding off the food and nutrients the tree produces. Mistletoe deforms trees, causes rot, and weakens the tree so that it is more susceptible to insects and disease. Associated with this, there are a number of forested stands where yearly tree mortality exceeds yearly tree growth. The RIS database estimates that 84% of the lodgepole stands within the Silver Run Analysis Area have low to high levels of mistletoe infestation. The presence of mature and overmature lodgepole pine with low to high levels of dwarf mistletoe provides a ready source of vulnerable trees for a growing mountain pine beetle populations to spread into.

ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

Under this alternative, natural succession would be allowed to continue during this entry in the Silver Run vicinity. In proposing no action, Alternative 1 would do the most in addressing the significant issues and concerns for the use of the clearcut prescription, new specified road construction, and maintaining the areas aesthetics and visual quality. It also best addresses concerns for maintaining unharvested, intact mature stands in the area. Alternative 1 does not address the purpose and need for the proposal, including the restoration of more natural vegetation patterns, reducing the spread of dwarf mistletoe, along with improving forest health, and contributing to the Forest Plan goal for timber harvest. Lastly, by not addressing watershed restoration concerns for closing or reconstructing specific roads, this alternative does not address the identified need of minimizing human-induced erosion and stream sediment.

Alternative 1 would do the least during this entry in moving the area's forests towards the desired future condition for the area. This alternative would allow to continue the conversion of aspen to conifer stands and lodgepole pine stands to predominantly subalpine fir stands within the vicinity, in time reducing the diversity of forested stands and their value as habitat to some wildlife species in the area. Dwarf mistletoe would continue to increase in already infected lodgepole stands, spreading into adjacent uninfected stands. The maintenance of a predominantly mature and overmature mistletoe infected lodgepole pine forest across the area will increase the future possibility of an insect epidemic affecting the pine of the area, along with increasing the potential for a stand replacing fire to burn portions of the area.

Proposed Action

Because it contains the most harvesting and new road construction, the Proposed Action is the most aggressive proposal in moving the Silver Run vicinity's forests towards the desired future condition for the area. Designed to directly address the purpose and need for the proposal, under the proposed action a combination of harvesting and associated projects would be used to promote and maintain the characteristic landscape and stand patch size, to improve forest health and resiliency, to contribute to the Forest Plan goal of providing timber harvest, and to minimize human-caused soil erosion. Because it contains the most harvest in the form of clearcutting and the most new specified road construction of all action alternatives, the Proposed Action would do the least in addressing the three significant issues of no clearcutting, no new specified road construction, and maintaining aesthetic/visual quality.

Natural Patch Size

The proposed action is designed to treat intervening and/or stands adjacent to past harvest areas from past timber sales. By doing so, this alternative does the most to address the need to maintain and restore the characteristic landscape mosaic of large patches of vegetation of similar age and size. Timber harvest since the 1950's has created a pattern of older forest perforated by clearcut openings that average 10 to 15 acres in size, negatively affecting the area's aesthetics and decreasing the value of these stands to dependent wildlife species. Similar to the harvesting that was completed under a number of sales across the Forest in the 1990's, treating intervening stands will help consolidate these treatment areas into larger, more homogenous, like-aged stands of vegetation that are better able to mature into and/or function as beneficial habitat for dependent wildlife. The end result of treating these adjacent stands will be the consolidation and/or creation of sizeable blocks of vegetation with trees ranging in age from between 1 to 30 years old. Over time, as these stands mature, the younger trees will eventually catch up in size and height of the trees thirty to forty years older, creating an indiscernible, larger block of mature forest.

Forest Health and Resiliency/Mountain Pine Beetle

Along with addressing the need for maintaining the characteristic landscape, treatments of these intervening and/or adjacent stands have been designed to help in improving area stand health/resiliency. Treatment of these stands will not only reduce the spread of mistletoe from older infested lodgepole to adjacent healthy lodgepole regeneration, but will also reduce the current and future spread of mountain pine beetle within lodgepole pine and the spread of western balsam bark beetles within subalpine fir in the area.

A number of studies conducted on National Forests across the Rocky Mountain west have found that thinning lodgepole pine can greatly minimize mountain pine beetle mortality (Amman 1988). In the short term, thinning and/or partial cutting will change the treated stands' micro site conditions, increasing sunlight intensity, wind movement, and air temperature. This subtle change in the micro site conditions by opening the stand up appears to be disruptive to beetle spread and infestation. In the long term, reduced tree competition and increased tree vigor from the preventive thin allows the retained trees to produce more sap or resin thus they are better able to ward off future beetle attacks. The 473 acres of proposed harvest treatments are situated within stands that both have lodgepole pine with low to high infestations of mistletoe, and as shown by the 1997-2002 aerial surveys--an alarming increase in bark beetle activity. By removing lodgepole pine that has both dwarf mistletoe, and in a number of cases--pine beetles, the treatments will reduce the potential spread of both mistletoe and beetles into the remaining lodgepole pine. Similarly, removal of larger subalpine fir that has beetles and/or is highly susceptible to attack will also reduce beetle spread and mortality of remaining fir. The additional growing space and less competition for sunlight, nutrients, and water provided to the remaining lodgepole pine, fir, and in some cases Engelmann spruce, through the removal of diseased and overtopped lodgepole and fir, would over time allow the retained trees to become healthier or more resilient, which results in trees that are more likely to be resistant to future insect and disease attacks.

The direct effect of this alternative on these stands is that both dwarf mistletoe and beetle populations will be reduced in the short term. Suppression treatment will reduce beetle spread and restrict beetle populations to localized areas. The suppression treatments would have a positive effect to near or long-term objectives in these areas. Stands treated with the clearcut and overstory removal prescription will be effectively “beetle proofed” in both the short and near term. The subsequent lodgepole regeneration in these stands will have a low susceptibility to beetle for the next 60 to 80 years. The clearcut and overstory removal treatments will promote aspen regeneration in stands that currently have an aspen component. The maintenance and promotion of non-pine and/or non-host tree species such as aspen, fir, and spruce under these and the other treatments proposed will provide more future options to area management in the event of another beetle outbreak (Amman et al. 1977).

Stands treated with partial harvest suppression and preventative treatments such as sanitation/salvage and shelterwood will continue to be dominated by mature forest cover of live lodgepole pine, Engelmann spruce, subalpine fir, and aspen with stocking reduced by about one third (sanitation/salvage) to one half (shelterwood seed cut). Indirect effects include the potential for windfall following the thinning. Due to the current multistoried nature of these stands, these areas are not particularly hazardous for windfall, but a small amount of blowdown should be expected. Even with careful logging, damage to some retained trees will occur. Dwarf mistletoe is generally light in these stands (some individual, older stands have moderate to high levels of mistletoe). Mistletoe affects stands very slowly, and given that the thinning is meant only to preserve stands for future treatments, it is unlikely that severe mistletoe infections will have the time necessary to cause serious growth losses. The end result of the proposed treatments would be the reduction of lodgepole pine with dwarf mistletoe within approximately 2% of the forested acreage, or 4% of the stands currently dominated by lodgepole in the analysis area.

Alternative 2 – No Clearcutting

In addressing the significant issues of clearcutting and cumulative impacts of past management, this alternative differs from the Proposed Action and Alternative 3, in that it drops all proposed clearcutting. Similar to the Proposed Action, harvesting under Alternative 2 is designed to move the forests of the Silver Run area towards the desired future condition for the vicinity. Alternative 2 is similar to Alternative 1, in that no clearcutting is proposed under either proposal. In dropping all clearcutting, Alternative 2 does the most of any action alternative in addressing the clearcut issue, along with maintaining area aesthetics and addressing the maintenance of older forested stands in the area. In addressing concerns for new road construction, less harvest units under this alternative also result in needing one mile less new specified road construction as compared to the Proposed Action. Treating only 2% of what is suitable, or 1% of what is forested, Alternative 2 would have the least effect of the action alternatives in addressing the purpose and need for the proposal, including promoting aspen, addressing patch size/consolidation, forest resiliency, and providing for timber harvest. Containing all the remaining non-clearcut treatments and project proposals under the Proposed Action, it is anticipated this alternative would have the same effects as disclosed under the Proposed Action. See the Proposed Action for a discussion of the effects of the proposal on the vegetation and timber resource in the area.

Alternative 3 – No Specified Road Construction

Similar to the Proposed Action and Alternative 2, harvesting under Alternative 3 is designed to move the forests of the Silver Run vicinity towards the desired future condition for the area. Alternative 3 differs from the Proposed Action and Alternative 2, in that it is designed to address the significant issue of no new specified road construction. In dropping all proposed new specified road construction, Alternative 3 does the most of any action alternative in addressing this concern. Less road construction also will result in less negative effects to the area's aesthetics and visual quality than the Proposed Action. Alternative 3 differs from Alternative 2, in that it does include clearcutting. With approximately 29% less treatment acres than the Proposed Action, it would be anticipated that this alternative would be less effective in reducing mistletoe and beetle spread, along with improving stand health and resiliency. Because it does include the use of clearcutting, this alternative is second only to the Proposed Action in addressing the project's purpose and need to promote vegetative diversity, forest health and resiliency, and providing timber for dependent industries. It is also second only to the Proposed Action in promoting the consolidation of fragmented stands into young blocks of predominantly young lodgepole pine-aspen. Alternative 3 would treat approximately 3% of what is suitable, or 2% of what is forested. See Proposed Action for a description of the effects of this harvesting.

CUMULATIVE EFFECTS

Alternative 1 – No Action

There is no threat of ecological collapse or loss of ecological function from dwarf mistletoe, beetle outbreaks, and/or subsequent wildfires. Beetle populations naturally experience boom and bust cycles, and forests have proven resilient, if not dependent on these cycles (Alexander 1981). Disturbances become problematic when they threaten the uses we manage the forests for. Assessing and deciding between options where there is disagreement about the values at risk is a challenge. Some disturbances cannot be controlled, others can be "managed," while still others can be manipulated very successfully to achieve objectives. Where we can influence or control expected disturbances, and where we choose to do so for specific reasons, in most situations, is heavily dependent on what past management actions have occurred before the disturbance event occurs. These epidemics and/or disturbances will continue, to a degree that will be determined, in part, by future silvicultural and fire management practices (Schmid and Mata 1996).

Past timber management practices that have occurred on adjacent ownerships and on the Forest predominantly within the 7E timber emphasis management area have had a positive influence on the current situation. Areas that have been regenerated (clearcut, overstory removal, etc.) or that have received partial harvest treatments (thinning, sanitation/salvage, etc.) are less susceptible to bark beetle attack and aggregation. These past silvicultural treatments reduced the stand age, basal area, trees per acre, and arrangement of host trees, all of which reduce the attractiveness to beetles. Although many of the past treatments were not specifically designed to reduce bark beetle habitat, they accomplished that effect to some degree. Past timber management since 1950 in the form of clearcutting or overstory removal has effectively reduced stand beetle susceptibility and improved stand health and resiliency on forested National Forest lands in the Silver Run area by roughly 1,348 acres. An additional 724 acres that have received past partial harvest also have a reduced risk to beetle spread and mortality. Healthy, resilient stands provide several management options into the future, but susceptible and/or dead stands offer fewer options. Virtually all of the suitable timber sites in the areas are important for their near or long-term contribution to the goals for production of commercially valuable wood products. Susceptible stands are, almost by definition, the more productive, higher value, and higher volume stands.

Forest Plan Consistency

Alternative 1 is not consistent with standards and guidelines for the timber resource under the Medicine Bow Forest Plan (1985). The No Action alternative may result in deviation from these important guidelines from the Forest Plan 7E and other management areas:

- The Medicine Bow Forest Plan (III-4) states as a goal: Provide for timber harvest to support local dependent industries and management of the many Forest resources in a manner that meets silvicultural needs of timber species, places timber stands under management, minimizes timber management costs, and supplies wood products to meet National needs.
- Also stated as goal within this section (Medicine Bow III-4): Treat vegetation to provide a Forest environment for the uses compatible with the Management Area Objectives.
- Forest Plan general direction (p. III-34 #1): Use both commercial and non-commercial silvicultural practices to accomplish wildlife habitat objectives.
- Medicine Bow Forest Plan direction (p. III-84) is to prevent or suppress epidemic insect and disease populations that threaten forested tree stands with an integrated pest management approach consistent with resource management objectives.
- Management Emphasis is on wood fiber production and utilization for management area 7E, Medicine Bow Forest Plan (p. III-189).

The production of sawtimber is not emphasized in this alternative. The forest is not managed to produce sawtimber in an economically efficient manner. The forest is not managed using treatments that maintain acceptable growth rates, nor do they favor commercially valuable tree species.

Proposed Action

Past timber management practices that have occurred on adjacent ownerships and on the Forest have had a positive influence on the current situation. Areas that have been regenerated (clearcut, overstory removal, etc.) or that have received partial harvest treatments (thinning, sanitation/salvage, etc.) are less susceptible to bark beetle attack and aggregation. Those practices reduce the presence of dwarf mistletoe, stand age, basal area, trees per acre, and arrangement of host trees, all of which reduce the attractiveness to beetles. Although many of the past treatments were not specifically designed to reduce bark beetle habitat, they accomplished that effect to some degree. Past timber management since 1950 in the form of clearcutting or overstory removal has effectively reduced stand beetle susceptibility on National Forest lands in the Silver Run area by roughly 1,348 acres. An additional 724 acres that have received past partial harvest also have a reduced risk to beetle spread and mortality. Without this past treatment, it is doubtful whether the proposed action could ever approach being effective in reducing dwarf mistletoe, beetle spread, and associated mortality.

The relative high amount of past silvicultural treatments that have occurred in the Silver Run area provide a ready foundation for the 473 acres of suppression and preventative treatments included under the Proposed Action. Healthy, resilient stands provide several management options into the future, but dying and dead stands offer fewer options. Virtually all of the suitable timber sites in the 7E management area are important for their near or long-term contribution to the goals for production of commercially valuable wood products and timber sustainability. Susceptible stands are, almost by definition, the more productive, higher value, and higher volume stands. Approximately 4% of what is classified as suitable for timber production in the area would be treated under the proposal. Past timber harvest since 1950, in combination with the proposed action treatments, would cumulatively reduce mistletoe and beetle spread, along with the beetle hazard risk, on an estimated 19% of the total suitable timber base in the analysis area.

Forest Plan Consistency

The Proposed Action is consistent with standards and guidelines for vegetation and the timber resource under the Medicine Bow Forest Plan (1985).

Alternative 2 – No Clearcutting

Alternative 2 would have the least amount of cumulative effects of the action alternatives to area vegetation. Past timber harvest since 1950, in combination with the Alternative 2 treatments, would cumulatively reduce mistletoe and beetle spread, along with the beetle hazard risk, on an estimated 18% of the total suitable timber base, or 10% of what is forested in the analysis area. See the Proposed Action for a discussion of the cumulative effects of treatments under Alternative 2 on the vegetation and timber resource in the area.

Forest Plan Consistency

Alternative 2 is consistent with standards and guidelines for the timber resource under the Medicine Bow Forest Plan (1985).

Alternative 3 – No Specified Road Construction

Past timber harvest since 1950, in combination with the Alternative 3 treatments, would cumulatively reduce mistletoe and beetle spread, along with the beetle hazard risk, on an estimated 18% of the total suitable timber base, or 10% of what is forested in the analysis area. See the Proposed Action for a discussion of the cumulative effects of treatments under Alternative 3 on the vegetation and timber resource in the area.

Forest Plan Consistency

Alternative 3 is consistent with standards and guidelines for the timber resource under the Medicine Bow Forest Plan (1985).

Rare and Sensitive Plants

AFFECTED ENVIRONMENT

The U.S. Fish and Wildlife Service (USFWS) provided the Medicine Bow N.F. (February 20, 2002) with a list of endangered, threatened, and candidate species that may occur on the Medicine Bow National Forest.

The Wyoming Natural Diversity Database (WYNDD 2002) websites and Geographic Information Systems were consulted for the most up-to-date information regarding the occurrence of Sensitive Plant Species within or near the project area.

The Silver Run Analysis Area has no known occurrences or potential habitat for plant species formally listed or officially proposed as threatened or endangered under the Federal Endangered Species Act (CNHP 2002). There are 81 plant species on the 1994 R2 Sensitive species list, of which 12 are known to occur or are likely to occur on the Medicine Bow-Routt National Forests (Species Conservation Project Website, Fertig et al. 1994, Spackman et al. 1997). Of these twelve species, eight are not likely to occur within or near the project area and have been dropped from further consideration:

Species Addressed In This Report:

Plant species formally listed under the Federal Endangered Species Act that are **not** found and are not likely to occur on the Laramie Ranger District but occur in habitats of the mainstem Platte River downstream in Nebraska include:

- *Platanthera praeclara*, Western prairie fringed orchid.
- *Spiranthes diluvialis*, Ute ladies tresses' orchid.

The analysis area has potential habitat for one plant species that is a candidates for official listing as threatened or endangered under the Federal Endangered Species Act:

- *Botrychium lineare*, slender moonwort (Candidate Threatened):

The analysis area has potential habitat for the following four Region 2 Forest Service Sensitive plant species:

- *Cypripedium fasciculatum*, clustered lady's slipper orchid.
- *Carex livida*, livid sedge.
- *Drosera rotundifolia*, round leaf sundew.
- *Festuca hallii*, Hall fescue.

Survey Intensity

The field reconnaissance was conducted of the proposed Silver Run harvest units in the field season of 2003. With the exception of the slender moonwort, we searched at a time of year and at an intensity that would have allowed us to locate populations of all the plant species listed above, had they been present in the project area (Proctor 2003). Slender moonwort is a very small ephemeral species, which may not appear above the ground every year. It is possible that populations of slender moonwort populations could go un-detected in survey. Field reconnaissance for Silver Run would also have detected many species not mentioned in this document, if they are present in the project area. This includes those species that appear on the Wyoming Natural Heritage list, but are not listed by the Forest Service as Region 2 Sensitive.

Survey Results

Populations of the R2 sensitive plant, *Cypripedium fasciculatum* (Clustered lady's slipper orchid) were found as a result of the rare plant surveys that occurred in the Silver Run units of this project (Silver Run Plant Survey Notes). Most of the populations located were small (1-15 stems) and were highly isolated on the landscape. However, in the northern portion of the analysis area, in Units 1 and 21, larger populations (500-1,000+ stems) of Clustered lady's slipper orchids were found in high concentration. These populations would be protected through project design and layout.

Table 20. Candidate Threatened and R2 Sensitive Plant Species Suspected to Occur in the Analysis Area

Species	Vegetation Type and Habitat Requirements	Soil Type Required	Habitat Present in the Analysis Area	Species Potential to Occur in Analysis Area	Survey Method Utilized in the Analysis Area	Species present & carried forward for further Analysis
<i>Botrychium lineare</i> (slender moonwort) Candidate Threatened	Grassy slopes, among medium-height grasses, along edges of streamside forests.	Soil type can vary	YES	Low	Intensive	No *
<i>Carex livida</i> (livid sedge) R2 Sensitive	Float mats, bogs, fens, peatlands, marls, wetsedge hummocks.	Histisols	YES	Moderate	Intensive	No
<i>Cypripedium fasciculatum</i> (Clustered lady's slipper) R2 Sensitive	Open lodgepole pine/spruce fir.	Soil type can vary	YES	High	Intensive	Yes
<i>Drosera rotundifolia</i> (round leaf sundew) R2 Sensitive	Acid fens, floating mats, bogs & peatlands.	Histisols	YES	Moderate	Intensive	No
<i>Festuca hallii</i> (Hall fescue) R2 Sensitive	Montane meadows, conifer forest edge & openings.	Mostly Calcareous & Volcanic	YES	Low	Intensive	No

*Slender moonwort is a very small ephemeral species, which may not appear above the ground every year. It is possible that populations of slender moonwort populations could go un-detected in surveys. Therefore, effects to slender moonworts will be further discussed.

ENVIRONMENTAL CONSEQUENCES/CUMULATIVE EFFECTS

Alternative 1 – No Action

Under this alternative, no action would occur. Therefore under Alternative 1, natural environmental processes may impact individuals but are not likely to cause a trend to Federal listing or loss of viability.

All Action Alternatives

Platanthera praeclara, Western prairie fringed orchid (**Threatened**) and *Spiranthes diluvialis*, Ute ladies' tresses orchid (**Threatened**): Increases in water yield are real, but are almost impossible to measure beyond the project area, because they are masked by natural variation in flows at the watershed scale. There could be immeasurable, potentially beneficial effects to downstream species if this water reached habitat for listed species in the Platte River mainstem in Nebraska. However, because the Platte River Basin is significantly over-appropriated for water rights and any new water is likely to be used by water rights holders, any increases in water yield are not expected to reach Nebraska. Furthermore, there is no legal mechanism to protect the water yield increases and deliver them to the central Platte critical habitat. Flows from Colorado into Nebraska are not likely to change. Therefore, the project would not have any net effect on habitats in the main stem Platte River. Thus, the project is determined to have No Effect on Ute ladies' tresses orchid, or Western prairie fringe orchid populations or habitat. No consultation with the Fish and Wildlife Service is required for these species.

Cypripedium fasciculatum, clustered lady's slipper orchid (R2 Sensitive): The proposed harvest unit and proposed roads have been surveyed for *Cypripedium fasciculatum*. Through project design, high concentrations of *C. fasciculatum* populations were identified on the ground within and adjacent to Units 1 and 21 during surveys. Areas that have the highest concentrations of plants have been dropped from these harvest units. Assuming mitigation under all action alternatives, known high concentrations of *C. fasciculatum* would be protected and would not be lost as a result of management activity. Therefore, the proposed action **may adversely affect individuals but are not likely to result in a loss of viability on the planning area, nor cause a trend towards Federal Listing or a loss of Species Viability for clustered lady's slipper orchid.**

Botrychium lineare, slender moonwort (Candidate Threatened): There are no reported occurrences of the slender moonwort on the Medicine Bow-Routt National (WYNDD 2003, CNHP 2003). The proposed harvest units and proposed roads have been surveyed for *Botrychium lineare*. No populations of slender moonwort were found within the analysis area (Proctor 2003). However, slender moonworts may go undetected in field inventories because they are very small and they may not appear above ground every year. Because the presence of this plant can not always be detected we have determined that the Proposed Action **may adversely affect individuals but are not likely to result in a loss of viability on the planning area, nor cause a trend towards Federal Listing or a loss of Species Viability for slender moonwort.** The Forest Service maintains discretion to modify projects or contracts if the slender moonwort is determined to occur within a project or contract area.

Any project that could not limit effects to the no effect level on slender moonwort would be subject to informal consultation with the FWS under the interagency MOUs (unnumbered MOA of 08/30/00 and 94-SMU-058 of 01/25/94) that specify consultation procedures for the conservation of species tending towards federal listing.

Carex livida, livid sedge (R2 Sensitive): The proposed harvest unit and proposed roads have been surveyed for *Carex livida*. No *C. livida* populations were identified on the ground during surveys. Therefore, under all action alternatives, there would be no adverse impacts to *C. livida*.

Drosera rotundifolia, round leaf sundew (R2 Sensitive): The proposed harvest unit and proposed roads have been surveyed for *Drosera rotundifolia*. No *D. rotundifolia* populations were identified on the ground during surveys. Therefore, under all action alternatives, there would be no adverse impacts to *D. rotundifolia*.

Festuca hallii, Hall fescue (R2 Sensitive): The proposed harvest unit and proposed roads have been surveyed for *Festuca hallii*. No *F. hallii* populations were identified on the ground during surveys. Therefore, under all action alternatives, there would be no adverse impacts to *F. hallii*.

Recreation, Lands, Minerals, and Special Uses

AFFECTED ENVIRONMENT

The Silver Run Analysis Area comprises one of the highest, if not the highest, recreation use areas on the entire Medicine Bow National Forest. Major access is via the Snowy Range Highway (a National Scenic Byway), which passes throughout the center of the analysis area, NFSR 101 (Sand Lake Road) to the north, and NFSR 338 (Ehlin Road) to the south. There are seven developed campgrounds and five developed picnic grounds within the Silver Run Analysis Area. There are also numerous Recreation Summer Homes, four Recreation Lodge facilities, and the Snowy Range Ski Area under permit to operate within the Medicine Bow National Forest.

The area is used extensively for dispersed recreation activities during the summer and fall months, including: camping, hiking, horseback riding, big game hunting, mountain biking, viewing scenery from passenger vehicles, fishing, and Off-Highway Vehicle (ATV, 4x4, and motorbike) travel. Numerous trailheads provide access to high elevation ecosystems and pristine backcountry, in addition to developed facilities. The major system trails within the area include: North Fork (5 miles), Gap Lake (2.3 miles), Glacier Lakes (1.8 miles), a portion of the Medicine Bow Peak trail (1.5 miles), Libby Creek (6 miles), Ski Area trails (2.3 miles), Barber Lake (4.5 miles), Corner Mountain (6 miles), and Little Laramie (7.0 miles). Currently, all summer trails maintained by the Forest Service are designated as non-motorized. Many non-system trails—both motorized and non-motorized—also are found within the analysis area, which receive low to high levels of use.

In addition to summer season use, the analysis area provides numerous opportunities for winter recreation activities that have become exceedingly popular during the past decade. Several snowmobile trails maintained by the Wyoming State Trails Program and open, high-altitude terrain draw tens of thousands of visitors each year from across the country to this area. Additionally, groomed and un-groomed cross-country ski trails are located within the analysis area, with winter trailhead facilities located at Corner Mountain, Little Laramie, and Green Rock. Telemark or backcountry skiing is also popular within the analysis area, especially along Centennial Ridge and the Libby Creek drainage. The Snowy Range Ski Area offers opportunities for alpine skiing for a variety of skill levels.

The analysis area and surrounding areas have been modified by various activities, including timber harvest, road construction, grazing, water developments, mining, dispersed recreation, and concentrated recreation in developed sites. Timber harvest, mining, and grazing have created the majority of access and routes of travel for recreation, as well as destination sites. Recreation attractions in the area include: scenic trails, pristine roadless areas, high elevation peaks, and quality lakes and streams. Various historic and cultural features are also prevalent throughout the area, including evidence of old mining and tie-hack activities.

Recreation Special Uses

Special uses operating in the area include a variety of summer and winter outfitter guide activities, four Special Use Lodge permits, and numerous Recreation Summer Homes, located throughout the area from Barber Lake to Towner Lake. Single recreation events are also common at various times, including bike races, snowmobile events, and others.

Lands and Minerals

The majority of the high elevation Snowy Range is withdrawn from mineral activities, and only evidence of historic mining is present. There is current and past mining activity evident throughout the lower elevation portion of the analysis area. Activities include decorative stone and gold prospecting, and claims have been staked for potential gold, platinum, and uranium within the area.

The Recreation Opportunity Spectrum

The Recreation Opportunity Spectrum (ROS) is a planning system utilized by land managers to classify areas according to the types of recreation opportunities available therein. ROS classifications may range from *Primitive* inside a designated wilderness to *Urban* in forests adjacent to metropolitan areas, thereby enabling managers to provide a variety of settings in which to recreate, each with their own characteristics and opportunities. The Forest-wide standard concerning the ROS, as specified in the Medicine Bow Land and Resource Management Plan (Forest Plan), is to “conduct management activities to comply with the requirements of the adopted ROS class and the scenic integrity objective in the management area prescription.” Five recreation settings may be found within the analysis area: *Rural*, *Roaded Modified*, *Roaded Natural*, *Semi-primitive Motorized*, and *Semi-primitive Non-Motorized*.

The majority of the area surrounding the Snowy Range Scenic Byway is classified as *Rural*. This setting reflects areas that are often culturally modified and where the natural environment has been substantially modified. Contact frequency between other users may be moderate to high, and structures are readily apparent. Access and travel facilities are for individual intensified motorized use, and travel ways are generally paved (USDA FS 1990; USDA FS 2001). Scattered throughout the analysis area are *Roaded Natural* areas, which are characterized by a predominantly natural-appearing environment as viewed from sensitive roads and trails, with moderate evidence of the sights and sounds of people. Contact between visitors is low to moderate on trails and moderate to high on roads. Conventional motorized uses are provided for in the design of facilities, and moderate site modification is common for facilities (USDA FS 1990; USDA FS 2001).

Roaded Modified, *Semi-primitive Motorized*, and *Semi-primitive Non-Motorized* settings are also found within the analysis area; the majority of these areas are relatively distant from the proposed project area. The one exception to this is the *Semi-primitive Non-Motorized* area. *SPNM* settings have a predominantly natural-appearing environment, and there is a high probability of experiencing solitude, closeness to nature, self-reliance, challenge, and risk. Interactions between users are occasional, and motorized travel is not permitted. Access is via non-motorized trails, non-motorized primitive roads, or cross-country.

Forest Plan Direction

The current (1985) Medicine Bow Forest Plan is an overall strategy designed to guide the management of the Forest within the framework of the multiple use mandate of the Forest Service. To achieve this end, different Management Areas are assigned to segments of the Forest wherein a particular use type is given priority over other possible uses. The analysis area falls within numerous different Management Areas. While each Management Area Prescription (MAP) provides direction for recreation management, several MAPs emphasize recreation over other resource concentrations. Several such MAPs are found within this project's analysis area, including: 1A (Developed Recreation Sites), 1B (Winter Sports Site), 2A (Semi-primitive Motorized Recreation), 2B (Rural and Roaded Natural Recreation), and 3A (Semi-primitive Non-motorized Recreation). Like the ROS, these Management Areas reflect past activities and conditions on the Forest, as well as current uses and desired future conditions.

ENVIRONMENTAL CONSEQUENCES

Presently, there is little existing baseline data on the recreation usage patterns within the analysis area. Trailhead counts, winter use surveys, snowmobile trail counts, and recreation fee collection receipts constitute the extent of the data available at this time; however, these figures are not sufficient to establish reliable trend forecasts, statistically viable attitudinal and preference-based visitor profiles, or even utilizable demographic data. Nonetheless, through what data has been collected and repeated field-observation, professional judgment, ROS management prescriptions, Forest Plan direction, and technical reports, the consequences of the alternatives on recreation opportunities and experiences may be predicted with a fair degree of certainty, but without substantial quantitative analysis.

Alternative 1 – No Action

Under this alternative, recreation opportunities in the analysis area would likely remain consistent with their present characteristics and anticipated future trends. Recreation would continue in the area regardless. Based on nationwide trends, recreation would increase over time.

Proposed Action

All proposed treatment units except numbers 10 and 11 fall within the *Roaded Natural* category. Proposed treatment unit numbers 10 and 11 both fall primarily within the *Rural* category. While *Roaded Modified*, *Semi-primitive Motorized*, and *Semi-primitive Non-Motorized* settings are also found within the analysis area, the majority of these areas are relatively distant from the proposed treatment units. The one exception to this involves unit 12, which lies approximately .1 miles from a *Semi-primitive Non-Motorized* area.

The majority of this project's analysis area and several proposed treatment units lie within Management Area 4B, *Habitat for One or More Management Indicator Species*. Under this prescription, recreation activities are to be managed so as not to conflict with the habitat needs of the selected indicator species; *Rural*, *Roaded Natural*, *Semi-primitive Motorized*, and *Semi-primitive Non-Motorized* opportunities are all compatible with this MAP.

Nine proposed treatment units (1-3, 5-9, 21) are situated primarily within Management Area 7E, *Wood Fiber Production and Utilization*. Directions for recreation management under this prescription are highly generalized, with the primary management emphasis being placed on wood-fiber and sawtimber production. *Rural*, *Roaded Natural*, *Semi-primitive Motorized*, and *Semi-primitive Non-Motorized* opportunities are all compatible with this MAP.

Four proposed treatment units (10-13) fall largely within Management Area 2B, *Rural and Roaded Natural Recreation*. Emphasis for recreation management in this MAP is placed on providing a variety of motorized and non-motorized recreation opportunities. Silvicultural management practices are to “promote and ensure enhancement of the visual resource” and management activities in general are to “maintain or improve the quality of recreation opportunities.” Management activities may dominate in these areas, however they are to “harmonize and blend with the natural setting” and be “compatible with recreation use.” *Rural and Roaded Natural* recreation opportunities are the primary ROS categories found within this Management Area.

Portions of both overstory removal unit #4 and clearcut unit #13 are within Management Area 1A, *Developed Recreation Sites*. Emphasis in this MAP is placed on managing for developed campgrounds, picnic areas, trailheads, etc., both existing and planned. Grazing is excluded from developed recreation sites, and tree stands are to be managed to “enhance visual quality and recreation opportunities on existing and proposed recreation sites.” While timber harvesting can occur in these areas, it is subject to a variety of conditions and mitigations. It should be noted that, while portions of these units are within developed recreation site prescriptions, they are *not* within the actual picnic areas or campgrounds themselves.

One change to the existing ROS designations will result from the Proposed Action. Areas currently classified as *Roaded Natural* where clearcutting and overstory removals are planned will move toward *Roaded Modified* following project implementation. These include the majority of the treatments units in the vicinity of the Ehlin Road, Barber Lake, Fallen Pines Road, and Sand Lake Road. (It should be noted that such a change is acceptable within the prescribed Management Areas and is typical for a timber harvest operation.) While clearcut unit 12 is situated adjacent to a *Semi-Primitive Non-Motorized* area, no change in ROS class is expected as a result of the proposed treatment there.

Short-term Effects

A variety of disruptions and impacts to recreation uses and experiences will result from the sights, sounds, and activities associated with timber harvesting, road construction, log truck hauling, etc. during actual project implementation. Displacement of recreationists and/or diminishment of the quality of recreation experiences will likely occur at the Barber Lake picnic/fishing area, the North Fork Campground, the Corner Mountain, Little Laramie, and Barber Lake trail systems, and popular dispersed campsites along NFSR 101 (Sand Lake Road). Some displacement of recreationists can also be expected during logging operations in less popular dispersed areas and campsites adjacent to or nearby treatment units. It may be reasonably anticipated that the majority of recreationists will seek out other areas of the Forest in which to recreate during logging operations, however, some off-Forest displacement is also likely. Impacts to recreation use and experiences in areas other than those within or adjacent to the project's treatment units should be minimal. Special use permittees should not experience any disruptions to their operations as a result of the implementation of the Proposed Action, nor should there be any impacts to lands and minerals management activities. Residents of the Summer Homes in the Barber Lake area will likely be subject to the sights and sounds associated with harvest operations in clearcut unit 13 in light of the proximity of this unit to the residences and may react negatively as a result.

Marked impacts to big game hunters in dispersed locations throughout the analysis area should be expected if logging operations take place during big game seasons. Hunting and hunting-related recreation activities are highly popular in the vicinities of Sand Lake Road, NFSR 329 (Fallen Pines Road), and NRSR 338 (Ehlin Road), and as such, any intensive logging operations that occur within these vicinities during big game seasons will displace and/or negatively impact the experience of hunters utilizing these areas. As a result, other locations within the analysis area unaffected by logging operations could see an increase in users as displaced hunters seek out more favorable hunting conditions, with the potential for crowding in some areas, especially around suitable dispersed campsites.

Timber harvest operations that take place during winter months will likely disrupt and displace both motorized and non-motorized recreationists. If Sand Lake Road and the Ehlin Road are plowed to accommodate log truck and timber harvest traffic, snowmobiling activities will be negatively impacted, as these are fairly popular routes, with the Sand Lake Road being a designated winter trail. Winter logging activities in the vicinities of the Little Laramie, Barber Lake, and Corner Mountain non-motorized trail systems will displace and/or negatively impact the recreational experiences of traditional users of the area, resulting in noticeably amplified usage of the only other designated ski trail systems on the Laramie District: Pole Mountain, Chimney Park, and Green Rock. (Both clearcut unit 11 and shelterwood cut unit 6 are less than 1/10th of a mile from existing system trails; clearcut unit 13, in the layout originally intended and published in the Draft Environmental Assessment, encompasses approximately ¼ mile of trail in the Corner Mountain trail system.)

Backcountry skiers utilizing non-system routes west of the North Fork Laramie River and routes north of the Barber Lake Road will also be displaced and/or negatively impacted with respect to their recreation experiences, with some potential for off-Forest displacement, as suitable terrain for backcountry skiing activities are limited on the District. Evidence of the sights and sounds associated with logging operations will be apparent from the Snowy Range Ski Area and could potentially negatively affect the experience of some patrons, though any displacement of skiers is not anticipated. Other winter special use permittees should not experience any significant disruptions to their operations as a result of the implementation of the Proposed Action.

Long-term Effects

Recreation experiences in forest/natural environments are closely tied to visual resource quality. In many cases—especially those having to do with the long-term impacts of intensive forest management activities, such as timber harvesting—both recreation opportunities and the experiences gained from them are impossible to distinguish from visual quality issues. As the Visual Quality Objectives (VQOs) relevant to the proposed action have been addressed in a separate section of this document, they will, for the most part, not be covered in this section. However, some overlap cannot be avoided due to the similarities of purpose between Recreation and Visual Resource management.

Existing scientific literature on the effects of past timber harvest on recreation resources generally offers five conclusions with respect to these issues (Gan & Miller 2001, Tarrant et al. 1999, English & Home 1996, Herrick & Rudis 1994, Jaakko Poyry Consulting 1994, Schroeder et al. 1993, Palmer et al. 1993, Cordell et al. 1990, Palmer 1990, Schweitzer et al. 1976).

- Forest recreationists typically prefer—when offered a choice—environs in which to recreate that are largely undisturbed by human activities.
- Negative impacts on the experiences of recreationists increase proportionate to the extent of human-induced disturbances, with the clearcutting method of timber harvest being the most negatively impacting.
- Over time, negative impacts from past timber harvests on the experiences of recreationists will typically diminish, dissolve, or in many cases become a positive influence on recreation opportunities and experiences.

-
- Recreationists are not affected uniformly by timber harvesting—long-term undesirable impacts, including those from clearcutting, will range from none at all to considerable, depending on a variety of user characteristics.
 - Mitigation measures intelligently employed to offset the visual effects of timber harvesting generally reduce negative impacts to recreation users and occasionally improve both recreation opportunities and experiences.

In light of these and other findings, it is impossible to determine the exact nature and extent of the long-term impacts of the Proposed Action on recreation; however, several general effects may be reasonably anticipated.

- Road construction bisecting the Little Laramie trails, planned clearcuts within or adjacent to popular dispersed recreation sites and trail systems (both designated and non-designated), and other treatment methods in dispersed recreation locations each will alter the appearance of the landscape to an extent sufficient to continue to negatively affect the experiences of some visitors who currently enjoy recreating in these areas for some time into the future. Exactly what percentage of visitors will be affected in this manner is subject to considerable debate and speculation, and exactly how long these visitors will remain affected will vary from one user to another (Gan & Miller 2001, Herrick & Rudis 1994, Palmer 1990).
- A small percentage of these negatively impacted individuals will find these changes to be very offensive and may choose not to recreate in these areas.
- Some users will not react negatively to the changes brought on by the Proposed Action and will not have their recreation experiences negatively impacted.
- Some users will likely find the changes beneficial to their recreation opportunities and experiences over the long term, as in cases where viewsheds, openings in otherwise dense forest stands, landscape diversities, and opportunities for cross-country travel (especially for winter recreationists, both motorized and non-motorized) are newly created (Palmer 1995, Jaakko Poyry Consulting 1994).
- Potential long-term impacts to recreationists will be greatest in the vicinities of Barber Lake and the North Fork Campground (i.e., clearcut units 10, 11, 12, and 13).
- Winter recreationists will likely have a greater potential to be negatively affected in the long-term due to the proximity of the treatment units to popular use areas and the lack of similar alternative areas and access points.

- The number of recreationists displaced and/or negatively impacted by the Proposed Action in the years to come after project implementation will likely constitute a small percentage of the total number of users typically found recreating within the analysis area. Again, exactly what percentage is not determinable; however, in light of the relatively small size of the treated acres as compared to the size of the analysis area, and the popularity of the numerous developed and dispersed recreation areas outside of and unaffected by the proposed treatment units, it is reasonable to assume that, with the mitigations proposed, the relative number of recreationists that could potentially experience lasting negative effects from this action will indeed be minimal.
- Logging has occurred in the past within and/or adjacent to the proposed treatment units as well as elsewhere within the analysis area, and consequently much of the landscape that is currently enjoyed by so many recreationists has, in fact, been considerably altered and generally does not constitute environs undisturbed by human activities.

Alternative 2 – No Clearcutting

The discussion above on the effects of timber harvest pertains to this alternative as well; however, the changes reflected in this alternative as compared to the Proposed Action will result in several different effects on recreation use.

- With clearcutting having been dropped in this alternative and it being the most offensive form of timber harvest to recreationists, the extent and duration of any long-term negative effects on recreation experiences will be considerably lessened.
- With units 10, 11, 12, and 13 having been removed completely in this alternative, overall negative impacts—both immediate and long term—will also be considerably lessened, as the Barber Lake and North Fork areas constitute heavily used developed and dispersed recreation areas. The elimination of new roads bisecting trails of the Little Laramie trail system that would have accompanied these treatments, coupled with the preservation of the existing landscape character of these areas, will undoubtedly minimize disruptions to recreation use, displacement of recreationists, and negative effects on recreation experiences when compared with the Proposed Action.
- With 197 less treated acres than the Proposed Action, overall negative impacts—both immediate and long term—to visitors recreating in the analysis area will again be reduced.
- Potential new opportunities for recreation and positive changes in recreation experiences that would have resulted from the Proposed Action will not be realized through this alternative.

Alternative 3 – No Specified Road Construction

Impacts resultant from this alternative will be greater than Alternative 2—with its planned clearcuts, greater number of treated acres, etc.—and somewhat less than the Proposed Action. The most significant difference between the Proposed Action and this alternative with respect to the effects on recreation pertain to the elimination in this alternative of the clearcuts and their associated roads that would have bisected the trails of the Little Laramie system and other non-system trails, as well as impacted the popular North Fork Campground. See Proposed Action for further discussion of this implication. Additionally, with slightly fewer treated and clearcut acres in general and no new road construction, it may be reasonably anticipated that both immediate and long-term negative effects on recreation use in the analysis area will be less than the Proposed Action, though the extent of this reduction—beyond the effects on the Little Laramie trails and the North Fork Campground—will likely be minimal.

CUMULATIVE EFFECTS

Past, present, and future management activities within and adjacent to the Silver Run Analysis Area were analyzed for cumulative effects on recreation resources. The analysis area and surrounding areas have been modified in the past by timber harvest, roads construction, grazing, water developments, dispersed recreation uses, and concentrated recreation uses at developed sites. Current trends indicate that recreation use in the Medicine Bow National Forest (and the analysis area) will continue to increase well into future, likely becoming an even greater focus of forest management. The cumulative effect that this phenomenon may have when viewed in light of the alternative proposals presented in this Environmental Assessment could involve the amplification of many, if not all, of the impacts of these actions on recreation opportunities and experiences in the manners discussed above. Greater numbers of recreationists affecting and being affected by the current proposed and any potential future timber harvest areas will almost certainly increase the effects—both positive and negative—of these activities on recreation resources.

Visual Resource

AFFECTED ENVIRONMENT

The Silver Run Analysis Area includes several characteristic landscapes of the Laramie District. The Silver Run Analysis Area encompasses a vast diversity of landscapes, ranging from open rangeland with sagebrush, grasses and forbs near Centennial, to forest landscapes consisting of lodgepole pine, Engelmann spruce, and subalpine fir, and scattered stands of aspen, Douglas fir, and limber pine. Mountain streams, lakes, alpine and subalpine openings, with meadows, rock outcrops, and krummholz stands, and white snow covered peaks of Snowy Range are also included in the analysis area.

The characteristic landscapes were visually modified by humans by such activities as logging and associated road building, mining, grazing, developed and dispersed recreation sites, ski slopes (Snowy Range Ski Area), and motorized and non-motorized trails for several decades. Natural events such as lightning-caused fires, winds, insects, and disease have also played a role in the natural visual changes of the landscapes. The Snowy Range Scenic Byway routes through the analysis area, as well as numerous Forest roads and trails. These travel routes offer visual viewing of the characteristic landscapes in foreground, middleground, and background zones.

Visual Quality Objectives

The Medicine Bow National Forest Inventoried Visual Quality Objectives (VQOs) map and the Medicine Bow Forest Plan adopted Visual Quality Objectives provide visual goals for management activities. Each visual quality objective prescribes a different degree of acceptable alteration of the landscape, based on the importance of aesthetics. The visual quality objectives identified on the inventoried VQO map for the Silver Run Analysis Area are retention, partial retention, and modification.

Retention, Partial Retention, Modification

Within a retention VQO, management activities are not visually evident. Activities may only repeat form, line, color, and texture that are frequently found in the characteristic landscape. Changes in their qualities of size, amount, intensity, direction, pattern, etc., should not be evident.

Within a partial retention VQO, management activities remain visually subordinate to the characteristic landscape. Activities may repeat form, line, color, and texture common to the characteristic landscape, but changes in their qualities of size, amount, intensity, direction, pattern, etc., remain visually subordinate to the characteristic landscape.

Within modification VQO, management activities may visually dominate the original characteristic landscape, however, activities of vegetative and landform alteration must borrow from naturally established form, line, color, or texture so completely and at such scale that its visual characteristics are those of natural occurrences within the surrounding area.

The adopted visual quality objective(s) is assigned to each Management Area Prescription. A grace period of one year to meet the visual quality objectives of retention and partial retention, and three years to meet modification visual quality objective are allowed after the completion of a project.

Table 21. Silver Run Visual Quality Objectives

Management Areas	Adopted Visual Quality Objectives
1A	Partial Retention/Modification
1B	Modification
2A	Partial Retention
2B	Partial Retention
3A	Partial Retention
4B	Modification
4D	Modification
5A	Modification
5B	Modification
7C	Partial Retention – foreground of arterial/collector roads and trails, Modification all other areas.
7E	Partial Retention – foreground of arterial/collector roads and trails, Modification all other areas.
9A	Partial Retention
10A	Retention
10C	Retention

ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

Under Alternative 1, there would be no management activities such as timber cutting, road building, and watershed improvements. Changes of the visual landscape would occur only through natural events such as fires caused by lightning or human, winds, insects, and disease. Forest visitors driving or riding off existing designated Forest roads and trails could cause visible resource damage.

Proposed Action

The Proposed Action would have timber harvest and associated road construction within the analysis area. The management activities would introduce some noticeable visual changes of the forest landscapes. Spruce/fir and lodgepole pine forests would be treated to maintain the forest health and sustainability. Removing undesirable and susceptible trees would minimize the spread of dwarf mistletoes and keep the spruce beetle and mountain pine beetle populations at endemic levels. The scenic quality of the forest landscapes within the Snowy Range area would be maintained and protected for future forest visitors.

Direct effects could occur when forest visitors find fresh cut stumps, slash and disturbed soil within the foreground of roads and trails. When viewed from the Snowy Range Scenic Byway, Snowy Range Ski Area, Centennial Ridge site, Forest roads and trails in the middleground and background zones, visitors would notice disturbed brown soil and slash found on clearcut and overstory removal units contrasting with the surrounding landscape. The visual impacts of the treated units would be minimized by the presence of surrounding landform, vegetative mosaics and peaks, and by designing and shaping units to blend with the surrounding landscape. Over time, the contrast would be gradually reduced through the establishment of new young trees, grasses, and forbs. Indirect effects could occur if visitors drive, hike, or bike off trails or roads to the sites and cause resource damage.

Alternative 2 – No Clearcutting

Alternative 2 would be similar to the Proposed Action except that there would no clearcutting. There would be less visual changes of the forest landscape than in Alternative 2 due to fewer proposed treated units and roads. There would be some noticeable visual changes in overstory removal units when viewed in the foreground, middleground, and background zones. Indirect and direct effects would be similar to the Proposed Action.

Alternative 3 – No Specified Road Construction

Alternative 3 would have no new specified road to be constructed. Visual changes would be slightly less than the Proposed Action but more than in Alternative 2. There would be less evidence of roads than the other action alternatives. Indirect and direct effects would be similar to the other action alternatives.

CUMULATIVE EFFECTS

Alternative 1 – No Action

Susceptible tree stands would be infested by spruce beetles and mountain pine beetles within and adjacent to the analysis area, and forest visitors may notice dead standing beetle killed trees near trails, roads, and recreation areas. About 30 percent of the lodgepole pine stands are infested by dwarf mistletoe that can spread through adjacent stands within the analysis area. Insects and disease could affect the scenery quality of scenic areas. Wildfires caused by lightning or human can leave some visible scars until new trees are established.

All Action Alternatives

Past and present human activities and natural events have occurred within and adjacent to the Silver Run Analysis Area, and have introduced visual changes of the characteristic landscapes within the Medicine Bow National Forest. Several past harvest units that have regenerated young trees are noticeable in the winter due to the snow covering up to the height of young trees but are less noticeable during summer. Associated projects such as slash treatment, soil and water projects, and road decommissioning would enhance scenic quality within the project area.

No cumulative effects to visual resources would result, as all action alternatives with visual resource mitigations would meet the Medicine Bow Forest Plan adopted visual quality objectives. All future management activities (including future winter sports parking areas) within and adjacent to the Silver Run Analysis Area are required to have visual resources evaluated as part of the project level planning to ensure that management activities will comply with the adopted visual quality objectives.

Range

AFFECTED ENVIRONMENT

Two active cattle allotments and two pastures of the vacant Snowy Range sheep allotment are within the analysis area. The active allotments are North Fork #511 and Centennial Ridge #503. The vacant sheep pastures are Libby Flats and Nelson Park. Approximately 70% of the proposed cutting units are in the North Fork #511 allotment, 16% in the Centennial Ridge #503, and 7% each in the two vacant sheep pastures. All proposed tree harvest sites within the Silver Run Analysis Area are classified as not capable and/or unsuitable for livestock grazing.

Currently, three term grazing permits for cattle grazing exist in the analysis area. T-K Ranch is permitted to graze 185 cow/calf pairs, and William Dalles is permitted 70 cow/calf pairs in the North Fork #511 allotment. Both permittees graze livestock from 6/26 to 9/30 each summer. Flying Horseshoe Ranch is permitted to graze 25 cow/calf pairs from 7/1 to 7/30 in the Centennial Ridge #503 allotment. The three permittees have grazed cattle on the allotments for many years. Permitted livestock seldom utilize the forested areas planned for harvest. Both sheep pastures have been vacant for at least the past 6 years.

Desired Condition

Most desired conditions for rangeland resources within the Silver Run Analysis Area are being attained or progress is moving toward attainment. A few site-specific areas need management emphasis to fully reach desired conditions as identified by the Forest Plan. The Forest Plan management emphasis in the analysis area is strongly weighted toward wildlife, recreation, and wood fiber needs. No rangeland management emphasis areas exist in the analysis area. It is expected that all harvested acres will become transitory rangeland and capable of being grazed by livestock for approximately 10-15 years.

Desired conditions for transitory rangeland sites created by this proposal are as follows:

Transitory rangeland sites: Early successional stages are prevalent with grass/forb/shrub types containing a variety of desirable native perennial species. Grass/forb/shrub vegetation is gradually replaced with tree seedlings/saplings. Invasive annual, exotic, and noxious plant species are very limited in species composition and density. Transitory rangeland is fully restocked and unsuitable for livestock use within 15 years of harvest. Structural range improvements are designed to benefit wildlife and livestock. For all areas capable of being grazed by livestock, forage utilization levels are as specified in Forest Plan general direction and standards/guidelines. Fair or better rangeland forage conditions exist. Deteriorated range sites are moving toward satisfactory status.

ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

From a rangeland management perspective, desired future conditions in the analysis area can be achieved and maintained through current management emphasis.

Proposed Action, Alternative 2, & Alternative 3

With regard to rangeland vegetation and livestock grazing operations in the Silver Run Analysis Area, the following rangeland resource or management problems will most likely be created as a result of implementing the Proposed Action:

Five proposed cutting units (OR2, OR3, OR4, OR5, and ITM6) in sections 8, 9 and 16 of T.16 N., R.78 W. are located near the ends of an existing fence or have fence within the units. The fence is needed for management of livestock, since it keeps permitted stock from drifting into the Little Laramie pasture of the North Fork allotment. To be effective in controlling livestock movements, the fence will need to be protected during harvest operations and extended once the cut units are harvested.

Noxious weed infestations are expected to increase in harvested areas. Previously harvested sites and roadsides in the analysis area have widely scattered, low to moderate level infestations of noxious weeds. It is not uncommon for disturbed sites in harvested areas to be invaded by noxious weeds. Noxious weeds known to occur in the analysis area and likely to show up in newly harvested sites are yellow toadflax, dalmation toadflax, spotted knapweed, musk and Canada thistle. Strong persistent efforts are critical to keeping noxious weeds from spreading beyond current levels and to keep new species from being introduced.

FOREST PLAN COMPLIANCE

Forest Plan general direction for rangeland resource management identifies 7 major compliance items. They are:

- Providing forage to meet livestock industry and wildlife needs,
- Removing livestock from pastures or allotments when allowable use standards are not being met,
- Managing grazing use through allowable use S&Gs,
- Achieving or maintaining satisfactory rangeland conditions,
- Utilizing “herbage left ungrazed” methods where developed,
- Treating of noxious farm weeds by priority; and,
- Designing structural range improvements to benefit wildlife and livestock.

All of the 7 general direction items apply to the rangeland sites within the analysis area. Full compliance with this direction is occurring at this time. Utilization standards (item 3) and satisfactory range status (item 4) are either being complied with or trend is toward full compliance.

Wildlife

AFFECTED ENVIRONMENT

A variety of field surveys and information review were conducted to assess the current and predicted conditions of wildlife species and their habitat, including: aerial photo interpretation, review of existing wildlife observation records, Canada lynx detection surveys, northern goshawk nest searches, walk-through species inventory, amphibian surveys, general habitat observations, as well as habitat modeling using HABCAP and ARCVIEW computer programs. Sources reviewed to help determine the presence of Threatened and Endangered Species (TES) habitat and historical occurrences of species included: 1996 Aerial photos, Forest Service Resource Information System (RIS) database, Wyoming Natural Diversity Database (WYNDD 1999, 2000, 2001), Laramie Ranger District maps of historical locations of wildlife, and the *Atlas of Birds, Mammals, Reptiles and Amphibians in Wyoming* (Wyoming Game and Fish Department 1999).

Habitat Diversity

Approximately 76% of the analysis area is conifer forest, 17 % is non-forested vegetation (such as willows, sagebrush, etc.), and 7% is rock-like, open water, or private land.

Forested areas are comprised of lodgepole pine (50%), spruce/fir (46%), aspen (4%), and Douglas fir/limber pine (less than 1%). Horizontal diversity is provided by the amount and distribution of various vegetative cover types, including non-forest, grass/forb, seedling shrub, pole size forest, mature forest, and late-successional forest. Using habitat structural stage information in the RIS database, the analysis area is estimated to have a high amount of horizontal diversity, and meets horizontal diversity standards of 30% listed on pages III-14 of the Forest Plan. This diversity is met in the following ways:

- Natural and man-made openings (habitat structural stages 1 and 2), including grasslands, seedling/shrublands, and riparian areas, comprise approximately 25% of the area.
- Pole size forests comprise approximately 20% of the analysis area.
- Mature forest comprises approximately 35% of the analysis area.
- Forest stands with multi-successional stages and late-seral development comprise approximately 12% of the analysis area.
- Rock, water, and related non-forested sites comprise 6% of the analysis area.

Approximately 77.5% of forested stands are considered vertically diverse, having two or more canopy layers. This condition is most typically represented by a single mature canopy of lodgepole pine, with some amount of seedlings or regeneration established underneath. Those stands that make up the highest quality vertical diversity have three or more developed canopies and represent 5.5% of the forested area. Given these figures, overall vertical diversity is estimated to be within Forest Plan standards.

Forest Plan standards require the maintenance of at least 10% of forested areas in old growth conditions, and 20% retained as old growth in wildlife emphasis management areas (4B). While most groups recognize the importance of old growth forest, definitions and/or identification of old growth varies across vegetation types, resource disciplines, geographic areas, public opinions, and scientific evaluation. Based on figures in the RIS database, it is estimated that we are meeting requirements for old growth retention across the analysis area. Calculations using old growth scorecard figures indicate that 20% of the analysis area meets old growth characteristics. This estimate is also supported by the large amount of forested roadless area and unharvested spruce/fir forest within the analysis area. In wildlife emphasis areas (4B), we are meeting old-growth retention standards (20% dfc across the watershed).

Field surveys of the area, including proposed units, found that forested stands have high numbers of snags within them. However, many of the stands dominated by lodgepole pine lack quality snags having a large diameter, wildlife cavities, and associated large down woody debris. This condition exists for a variety of natural or human-caused reasons, including: doghair lodgepole pine doesn't typically produce quality snags, historical high-grade selection harvest frequently removed the largest trees as well as those with heart-rot and disease, fire suppression and salvage removed opportunities for snag recruitment. Approximately 50% of the analysis area provides mature or later seral forest stages, which likely meet or exceed Forest Plan guidelines for snag retention. Stands that have been clearcut harvested prior to creation of the Forest Plan have few, if any, snags. An effort to provide large diameter surplus snags in newly proposed harvest units would benefit wildlife by increasing potential nest sites for cavity nesting species.

An Analysis of Landscape Structure for the Medicine Bow National Forest using G.I.S. (Baker 1994) indicates that overall, approximately 80% of the variation in forest cover types and age classes across the forest is due to past harvest activities, and approximately 20% of that variation is a result of environmental factors (such as fire disturbance). A draft summary of *Historic Variability for Upland Vegetation* (Dillon and Knight 2000) indicates that forests of the Medicine Bow National Forest are more fragmented now than prior to the advent of large scale timber harvesting and road building. The Silver Run Analysis Area does not represent this overall trend, because approximately 1/3 of the area is unroaded and within identified inventoried roadless areas and, thus, has had fewer impacts associated with mechanical harvest.

Examining the current RIS database, there are four large blocks of forest greater than 150 years old and relatively continuous within the analysis area. Over 5,500 acres of older forest dominates the northern part of the analysis area, ½ of which is within the Snowy Range Inventoried Roadless Area. These forests are relatively continuous and connected through older forested areas along riparian. The Libby Flats Inventoried Roadless Area contains two blocks of old forest, about 1,000 acres each. One is primarily within the Snowy Range Research Natural Area; another is along the Silver Run Creek corridor. Finally, another large block of older forest exists along Gold Run Creek, just south and outside of the Libby Flats roadless area. This block connects to the one in Silver Run Creek. However, it is substantially more perforated, as it exists outside of the roadless area and has been largely harvested.

ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

The No Action alternative will retain vertical diversity at its current levels and remain within Forest Plan standards and guidelines. Alternative 1 will retain grass/forb stages in their current abundance and continue to meet Forest Plan standards and guides.

Proposed Action, Alternative 2, & Alternative 3

Clearcut harvest and overstory removal will have impacts on vertical diversity, as these silvicultural treatments typically reduce forested stands to an even-aged canopy layer (regeneration), and minimize the potential successional development into spruce/fir forest. As a result, the Proposed Action, Alternative 3, and Alternative 2 will have minimal impacts to overall vertical diversity. These changes represent a maximum of approximately 2% reduction in vertical diversity across the analysis area, and remains well within Forest Plan standards and guidelines. Sanitation salvage harvest and shelterwood harvest generally do not have impacts on vertical diversity, as they treat only a percentage of an individual canopy layer and may open up the forest floor to promote seedling development.

The Proposed Action and Alternative 3 will increase the amount of forested stands in a grass/forb successional stage by approximately 1.6% and 1.2 % respectively, through clearcut harvest and overstory removal. This increase will provide temporary forage for deer and elk, and provide increased habitat for other species dependent on early seral conditions. This increase is consistent with desired conditions for vegetative diversity listed in the Forest Plan. Alternative 2 will retain grass/forb stages in their current abundance and continue to meet Forest Plan standards and guides.

The Proposed Action avoids all stands previously designated for old growth retention and continues to meet Forest Plan standards. All other alternatives impact fewer acres of forest with old growth characteristics. Thus, all alternatives retain adequate vegetation with old growth characteristics to maintain Forest Plan standards and guidelines.

All alternatives are designed to retain suitable numbers of snags to meet minimum Forest Plan standards (2 to 6 snags per 10 acres) in harvested areas. Snag retention and recruitment in unharvested areas will not be affected by the project proposal.

CUMULATIVE EFFECTS

In all action alternatives, most of the proposed harvest units are located outside of the larger blocks of connected older forest. Although proposed units 1, 2, 3, and 21 are within the large block on the northern portion of the analysis area, field verification indicates that these areas have been previously harvested (though not clearcut). They are made up of medium diameter lodgepole pine, and frequently lack quality snags and coarse woody debris. Proposed harvest within these units will not degrade from the overall connectivity or quality of the larger 5,500-acre block of older forest in this area. The primary proposed treatments that contribute to additional perforation are harvest units 17, 19, and 20. These three units represent a portion of the larger block of older forest along Gold Run Creek, which is also connected to the block in Silver Run Creek. A maximum of 42 acres of older forest would be removed from the larger 600-acre block.

Past harvest has impacted over 50% of the original block of older forest. These units are within the most continuous portion of the older forest along Gold Run Creek.

Species Diversity

Selection of Management Indicator Species

All Management Indicator Species (MIS) listed in the Forest Plan were reviewed to determine which species would be selected and further analyzed as project-specific MIS. Certain Forest MIS species were not further analyzed in this project (**Category A**). Pre-field review was adequate to determine that these species were not affected or are extremely unlikely to be affected by the project proposal, and were eliminated from further review. One of the following six reasons apply to those MIS species eliminated from further review, and is documented in table 22.

1. The project proposal is outside of the known range of the species and/or the species is not likely to occur.
2. There are no documented records of species occurrence, habitat is generally not provided, and the species is unlikely to be present in the project area.
3. Larger scale evaluations suggest that a strong and viable population of the species exists, and the project is expected to retain habitat in a condition which is suitable to occupancy in the analysis area and/or impacts are similar to (or less than) those analyzed through other MIS.
4. Habitat used by the species is different than that being disturbed by the project proposal. Effects/impacts are not expected to occur to individuals within known existing populations.
5. Disturbance to habitat or individuals is marginal, very small in size and/or length of time, thus unlikely to affect species viability.
6. Timing of the project proposal is such that no effects/impacts are expected.

Category B species are Forest MIS species as well as Region 2 Forest Service Sensitive Species or Federally Listed or Proposed Species. Impacts/Effects were addressed (or dismissed) in the biological evaluation or biological assessment portion of this analysis.

Category C species are analyzed in further detail within the wildlife specialist report. Measurable impacts to habitat are expected, and some estimates of local habitat, population and/or viability are available. Table 22 summarizes the full list of Management Indicator Species:

Table 22. Summary of Management Indicator Species Consideration

Species Common Name	Suitable habitat	Category of Analysis (see earlier description)	Remarks
Elk	Forest, shrublands, grasslands	Category C – Evaluated in wildlife specialist report.	
Mule Deer	Forest, shrublands, grasslands	Category C – Evaluated in wildlife specialist report.	
Bighorn Sheep	Shrublands, rock outcrops	A4 – Not Selected as an MIS	
Turkey	Deciduous and ponderosa pine forest	A1 – Not Selected as an MIS	
Bald Eagle	Generally near larger bodies of water	Category A4, addressed in Biological Assessment.	No Effect, habitat not impacted.
Peregrine Falcon	Cliff habitat nearby	Category A4 – Not Selected as an MIS	
Black-footed Ferret	Prairie-dog towns	Category A1 – Not Selected as an MIS	
Pine Marten	Mature conifer forest	Category B – Impacts analyzed in biological evaluation.	
Beaver	Riparian areas	Category A5 – Not Selected as an MIS	
Red-backed Vole	Coniferous forests with downed timber	Category A3 – Not Selected as an MIS	
Long-tailed Vole	Wet meadows, riparian, aspen, riparian shrub	Category A5 – Not Selected as an MIS	
Dwarf Shrew	Talus slopes	Category A5 – Not Selected as an MIS	
Western Jumping Mouse	Marshy areas and riparian shrub	Category A5 – Not Selected as an MIS	
Osprey	Near larger bodies of water	Category A5 – Not Selected as an MIS	
Goshawk	Mature forest with open understory, water nearby	Category B – Impacts analyzed in biological evaluation.	

Species Common Name	Suitable habitat	Category of Analysis (see earlier description)	Remarks
White-tailed Ptarmigan	High elevation areas	Category A4 – Not Selected as an MIS	
Sage Grouse	Sagebrush flats	Category A2 – Not Selected as an MIS	
Blue Grouse	Forested areas	Category A3 – Not Selected as an MIS	
Hairy Woodpecker	Aspen forests	Category A5 – Not Selected as an MIS	Aspen not being treated
Yellow-bellied Sapsucker	Migrant, low elevation woodlands	Category A5 – Not Selected as an MIS	
Lewis Woodpecker	Open ponderosa pine forests	Category A1 – Not Selected as an MIS	
White-crowned Sparrow	Dense thickets of willow, sagebrush, or subalpine fir in the mountains	Category A4 – Not Selected as an MIS	
Ruby-crowned Kinglet	Coniferous forests	Category A3– Not Selected as an MIS	
Yellow Warbler	Brushy stream-sides, willow	Category A4 – Not Selected as an MIS	
Cedar Waxwing	Open woodlands with berries	Category A5 – Not Selected as an MIS	
Sandhill Crane	Large wetlands	Category A1 – Not Selected as an MIS	

Highlights indicate those Forest MIS species selected to be analyzed in further detail either in the wildlife specialist report, the biological assessment (T&E), or the biological evaluation (sensitive).

Elk and Mule Deer

The proposed treatments occur on spring/summer/fall habitat for both deer and elk. While the analysis does contain winter range habitat, proposed treatments are outside of this habitat. Vegetation components such as grass/forb areas, forested hiding cover, and the amount of edge contrast are abundant in parts of the analysis area, are moderately well distributed, and provide overall moderate quality habitat. Habitat capability modeling, which is based on habitat structural stages, indicates that mule deer habitat is approximately 72% of the maximum capability, while modeled elk habitat is at approximately 46% of its capability. The low figure for elk habitat is misleading and under-represents the quality and amount of habitat because the analysis area is dominated by mid-seral or mature conifer forest. Approximately 25% of the analysis area is currently in an early seral condition comprised of grasslands, shrublands, riparian areas, and forest in seedling/sapling stages, which contributes greatly to its ability to support a substantial elk population.

Open road density (weighted based on the amount of travel on each road) is approximately 0.86 miles of road per square mile, which is within Forest Plan guidelines, but likely reduces the effectiveness of elk habitat in certain areas. Indeed, most of the analysis area is within 1 mile of an existing road, except for a small section (300 acres) along Silver Run Creek. Over 20 miles of existing roads are currently closed to motorized use to create additional elk habitat security. The majority of these road closures are within the North Fork of the Little Laramie River drainage (off the Sand Lake Road, FDR 101). Despite these road closures, motorized trespass using ATVs frequently occurs.

The local elk population is part of the Snowy Range Herd Unit as defined by the Wyoming Game and Fish Department. The project proposal resides within hunt areas 9 and 10. Population data available from the Wyoming Game And Fish Department (Guenzel 2003) suggests that the current population after the 2002-hunting season is approximately 5,950 elk and stable, which essentially meets their population objective of 6,000.

The local mule deer population is part of the Sheep Mountain Mule Deer Herd Unit. The project proposal resides within hunt areas 75 and 76. Population data available from Wyoming Game and Fish Department (Guenzel 2003) suggests that the current population after the 2002 hunting season is approximately 11,000, which is below the herd objective of 15,000. The population trend is stable. Population levels below objective are attributed to habitat conditions on many winter range areas on and off Forest land, where over-mature shrubs are known to have poor nutrition and low annual production. Severe winter conditions in 1992/1993 lowered the population significantly and it has been slowly recovering since.

ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

The No Action alternative will maintain current road densities and use, and will have no impacts to big game or their habitat.

Proposed Action, Alternative 2, & Alternative 3

The Proposed Action has minimal impacts on hiding cover across the analysis area, lowering it by approximately 2%; 60% of the forested area would continue to provide hiding cover and meet Forest Plan standards and guidelines. Treatments, including clearcuts, overstory removal, and individual tree selection, will convert dense forested stands with suitable hiding cover (as determined by habitat structural stage ratings) to more open stands. All remaining alternatives will have fewer impacts than the Proposed Action.

A maximum of 241 acres of clearcut timber harvest would occur in the Proposed Action, less in other action alternatives. These changes will set back forested habitat to grass/forb and seedling/sapling habitat structural stages, and amount to a small (1%) temporary increase in available deer and elk forage. Removal of the forest canopy in ITM and overstory removal harvest treatments will show small additional growth of grasses and forbs on a previously shaded forest floor. Overall, these benefits will last 15 to 40 years, as lodgepole pine regenerates and eventually dominates the site.

Road construction, reconstruction, or temporary construction in the various action alternatives will have minimal impacts to deer and elk populations or habitat. During construction and use, big game may be temporarily displaced from the immediate area of the road location. However, after harvest, all new roads will be closed to public motorized use, and temporary roads eliminated. The small amount of roads created and their projected low levels of human use minimize expected impacts to big game.

Pine Marten

The analysis area has a modeled habitat capability value of 49%, which meets Forest Plan standards and guidelines. Over 14,000 acres within the analysis area provides moderate to high quality habitat. This value is due to the high amount of mature spruce/fir forest types in the higher elevations of the analysis area. The area proposed for treatment provides moderate to low quality marten habitat because the dominant cover type is lodgepole pine. Large blocks of mature spruce/fir forest, which are typically found at higher elevations and more moist sites than the treatment areas, provide quality habitat because of characteristics such as large live trees, snags, structure close to the ground, closed canopies, multi-storied stands, coarse woody debris, and abundant squirrel middens. Lodgepole pine stands do not commonly provide such conditions because of the more frequent fire return intervals, drier site conditions, and past management practices which minimize down woody debris and understory development.

Lodgepole pine stands with structural stages 4B, 4C, and 5 are considered moderate to good pine marten habitat in the regional HABCAP model because of the large bole size, the potential to produce cavities and den sites, and the potential for substantial snags and down wood to form over time on the forest floor. Some portions of the analysis area have had widespread harvest and associated road construction, which impacts the distribution of quality pine marten habitat.

There are several records of marten in the Wyoming Natural Diversity Database in the vicinity of the analysis area, and near or within the stands proposed for harvest. In addition, project related field surveys noted the presence of pine marten. *The Atlas of Birds, Mammals, Reptiles, and Amphibians in Wyoming* (WGFD 1999) lists marten abundance as uncommon, and primarily occupying mature spruce/fir timber. *Furbearers of Wyoming* (Crowe 1986) suggests that marten populations, although prone to fluctuations, are secure throughout their range and were stable at the time. A recent analysis compiled by the USFS Rocky Mountain Regional Office listed pine marten abundance as uncommon, population trend in the region as unknown, distribution in the region as patchy, and wide distribution outside of Region 2. They conclude that marten is widely distributed through the upper-elevation forests of Region 2, and is comparatively abundant at local scales where large amounts of quality habitat remain. Personal conversations with local researchers (Buskirk 2002 and O'Doherty 2002) provided information consistent with the above.

Based on average home range sizes of martens in southern Wyoming (O'Doherty 1997) and the distribution of suitable habitat, the Silver Run Analysis Area supports up to 10 separate marten home ranges. This estimate assumes that the most likely occupied home ranges have large blocks of connected habitat (600 acres or more) with habitat structural stages 4B, 4C, or 5.

ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

The No Action alternative will maintain area in current state, and will have no impacts to pine marten or their habitat.

Proposed Action, Alternative 2, & Alternative 3

Most of the proposed commercial timber harvest units are in lower quality pine marten habitat made up of mature lodgepole pine. Habitat capability modeling indicates that all action alternatives decrease the existing marten habitat in the analysis area up to approximately 2.5%, but to varying degrees. The Proposed Action has the biggest impact on marten and their habitat because the dominant silvicultural treatment is clearcutting (241 acres), which temporarily converts suitable habitat to unsuitable conditions. Marten will avoid hunting within and crossing clearcut areas until adequate regeneration has been re-established. Harvest Units 1, 2, 3, 4, 5, 6, 8, 9, and 21 have a impact on one estimated marten home range, while harvest in Units 17, 19, and 20 has a moderate impact on another marten home range (42 acres impacted).

These impacts occur similarly in Alternative 3, which eliminates only those stands needing road construction. Alternative 2, which eliminates all clearcut harvest units, has the least impact of all action alternatives to marten and their habitat. Although treatment areas in Alternative 2 may or may not continue to provide marten foraging opportunities after harvest, they will continue to provide travel cover between suitable foraging areas. Emphasis on salvage, overstory removal, and commercial thinning may continue to detract from a forested stand's value as marten habitat by removing older trees, green snags, and damaging the large woody debris on the forest floor. Comparing the amount of habitat impacted by the proposal (2.5%) with the amount of existing habitat (49%), habitat capability modeling indicates that all alternatives retain marten habitat in suitable quantities and distribution to continue to support a viable marten population, and are in compliance with Forest Plan standards and guidelines.

All action alternatives continue a trend of perforating marten habitat comprised of mature or late seral lodgepole pine. Past timber harvest has modified a substantial amount of this type of marten habitat across the Snowy Range. Marten habitat provided by lodgepole pine forests likely is in smaller patches than existed 50 years ago, is somewhat discontinuous, and is perforated by timber harvest treatments and roads (Dillon et al. 2000, Baker 1994, Reed et al. 1995).

Northern Goshawk

The project area contains suitable habitat for goshawk nesting, fledging, and foraging in the vicinity of the proposed treatments. Three recently active nests and post-fledging family areas have been identified but are outside of treatment areas. USFS Region 2 evaluations of the goshawk as a sensitive species found that goshawks readily disperse throughout habitat, and that habitat trends are stable in the Region. These sensitive species evaluations also discuss the Medicine Bow National Forest as experiencing declines in habitat quantity and quality from previous harvest activities. Within the analysis area, past timber harvest in mature lodgepole pine stands has likely reduced the overall amount of available nesting and cover habitat; however, such habitat is still retained throughout the analysis area.

Habitat capability modeling for goshawk indicates that approximately 58% of the analysis area is providing suitable foraging opportunities through areas of early seral forest, low tree density, riparian, and shrublands. Approximately 51% of the analysis area is providing suitable cover habitat through mature forest with large diameter trees and a moderate to closed canopy. The overall habitat capability index value suggests that 54% of the analysis area currently provides for goshawk needs. Actual road density of 2.3 miles of road per square mile in the analysis area likely reduces the effectiveness and availability of habitat in some areas. Pre-commercial thinning, first-step shelterwood treatments, and other silvicultural practices that promote faster growing trees and limit the amount of understory have offset some amount of the loss of cover habitat that may have resulted from previous clearcut methods of timber harvest. Foraging values are also likely improved by the increased amount of forest in early-seral stages. Based on these figures and above considerations, goshawk habitat capability meets Forest Plan standards and guidelines.

The analysis area is estimated to contain approximately 8 goshawk territories, based on the presence and location of mature lodgepole pine interspersed with riparian areas. Two of those territories have been confirmed to be active in the past, and nests have been located. A query of WYNDD, as well as field surveys using goshawk calls in probable habitat, did not locate any additional nests or individuals in vicinity of the proposed treatments. *Wyoming Atlas of Birds, mammals, etc.* (Wyoming Game and Fish Department 1999) indicates that goshawks are a common resident. Recent petitions to the USFWS to list goshawk as a threatened species found that listing was not warranted.

ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

The No Action alternative will maintain area in current state and will have no impacts to northern goshawk or their habitat.

Proposed Action, Alternative 2, & Alternative 3

Units 4, 5, 6, and 10 occur within $\frac{1}{4}$ mile of known nest sites and within one identified goshawk territory. Activity within these stands could disturb nesting individuals, if conducted March 1 through August 15, because of their proximity to the nest. All harvest units have been designed to avoid known nest sites. Harvest within 645 feet of known nest sites should be avoided, as it may change stand vegetation characteristics within a 30-acre nesting area and could render the nest area as unsuitable. As a precautionary measure, 3 additional reserve nesting areas of 30 acres each have been designated in the vicinity and retained (will not be harvested), in order to ensure opportunities for future nest development.

All mechanized and/or foot travel activities related to Units 4, 5, 6, and 10 should occur before March 1 or after August 15 to protect known goshawk nesting areas. These activities include sale layout, cruising, harvest, road maintenance, commercial road use (log haul), road construction, road decommissioning, and temporary road development within $\frac{1}{4}$ mile of identified nests.

Thirty-acre nesting areas identified around active nests will remain in their current vegetative condition, thus providing a secure environment and stable landscape for continued annual nesting. Three 30-acre reserve areas containing suitable nesting habitat have been identified within the estimated goshawk territory. These areas will be retained in their current vegetative condition, provide additional nesting habitat within the post-fledging area, protect alternate nest sites which may not yet be identified, and provide returning goshawks with a wider range of options to avoid unforeseen project related disturbances. It is estimated by the District Biologist that a 0.25-mile seasonal restriction on activities (including timber harvest related sale layout and road traffic) is adequate to minimize disturbance within active nest areas, and is consistent with protection measures discussed in *Management Recommendations for the Northern Goshawk in the Southwestern United States* (Reynolds et al. 1992).

Habitat capability modeling indicates that forage values will increase by approximately 2%, and cover values will decrease by approximately 2% as a result of proposed clearcuts, overstory removal, and shelterwood harvest. Proposed activities outside of the nesting area and within fledging and foraging areas may be beneficial to goshawk, in that they will move stands toward a less dense understory and improve hunting opportunities and prey availability for goshawk. The overall habitat capability index will remain the same (54%), indicating a minor shift in habitat functions, but overall providing the same overall needs for goshawk. These habitat changes will remain within Forest Plan standards and guides and retain a viable goshawk population.

Cumulative impacts may be present across the watershed, in that late seral lodgepole pine stands with large diameter trees and little understory (nesting habitat) have typically been harvested in areas managed for timber production. The likely impacts from the action alternatives continue this trend. The regular practice of commercial thinning and pre-commercial thinning in lodgepole pine stands has likely offset some loss of quality nesting habitat and improved some areas as foraging habitat. Overall, existing goshawk nesting habitat is expected to be adequate to support viable and healthy populations.

Neotropical Migratory Birds

All alternatives are expected to benefit habitat for some species, and have negative impacts for other species. Overall impacts are expected to be negligible, as all habitat types are retained across the analysis area and the forest in large quantities.

Roads and Transportation

An analysis of the current conditions of roads and their impacts to wildlife and habitat was conducted. In summary, there are approximately 113 miles of existing road, many of which are closed, or get very little regular use. When adjusting road density for estimated use, there are approximately 0.76 miles of road per square mile, which is within Forest Plan standards and guidelines. Habitat for elk and mule deer is adequate despite the large number of roads, because of substantial hiding cover, two large unroaded areas, limited traffic on many of the roads, and abundant forage opportunities (25% of the analysis area). Negative effects of existing roads likely include regular human disturbance to birds and other wildlife species dependent on riparian areas (many are roaded or ATV accessible), increased winter predation on snowshoe hare (related to snow compaction by snowmobiles), a decrease in large standing dead snags and cavities (firewood removal), and temporary disturbance to wildlife during timber harvest, hunting season, and recreational holidays. The additive effect of these disturbances to wildlife has not been locally quantified, but the Medicine Bow National Forest Roads Analysis (2001) suggests that these impacts are not substantial at a Forest level. There is only one small block of land in the analysis area (along Silver Run Creek, 300 acres) that is further than one mile away from existing roads and trails, which makes it more likely to act as a refuge for species sensitive to human disturbance. This area is not affected by the project proposal.

COMPLIANCE WITH FOREST PLAN

As discussed throughout the document, all alternatives are in compliance with applicable Forest Plan standards and guides related to wildlife and wildlife habitat.

Forest Service Sensitive Species

It is Forest Service policy to protect the habitat of species listed as Forest Service Region 2 Sensitive Species (Rocky Mountain Region) from adverse modification or destruction, as well as to protect individual organisms from harm or harassment as appropriate (FSM 2670.3). Biological Evaluations shall be prepared for each project authorized, funded, or conducted on National Forest land to determine the possible effects the proposed activity may have on sensitive species (FSM 2672.43). The Biological Evaluation process is intended to conduct and document those activities necessary to ensure management actions will not likely jeopardize the continued existence of the species.

All species on the Rocky Mountain Regional Sensitive Species List were reviewed. A number of species were eliminated from further review because the pre-field review determined that risk to these sensitive species or their habitat is negligible. Habitat for these species is not present, or is not affected by the project proposal. Table 23 summarizes those species that potentially could be affected by the project proposal due to presence of habitat and/or individuals of the species may be in the project area. All remaining Region 2 sensitive species were eliminated from review by earlier Forest Service processes that found that their distribution is such that they are not affected by projects on the Medicine Bow National Forest.

Table 23. Wildlife Sensitive Species Likely to Occur, or Habitat Potentially Affected by Proposed Action

Species Common Name/ Scientific Name	Suitable Habitat	Species Present	Determination of Impacts for the Federal Action
Marten/ <u><i>Martes americana</i></u>	Conifer forest	Known to occur	May adversely impact individuals, but is not likely to result in a loss of viability on the planning area nor cause a trend toward federal listing or a loss of species viability range-wide.
Northern goshawk/ <u><i>Accipiter gentilis</i></u>	Conifer forest	Known to occur	May adversely impact individuals, but is not likely to result in a loss of viability on the planning area nor cause a trend toward federal listing or a loss of species viability range-wide.
Boreal owl/ <u><i>Aegolius funereus</i></u>	Spruce-fir	Known to occur in vicinity	May adversely impact individuals, but is not likely to result in a loss of viability on the planning area nor cause a trend toward federal listing or a loss of species viability range-wide.

Species Common Name/ Scientific Name	Suitable Habitat	Species Present	Determination of Impacts for the Federal Action
Three-toed woodpecker/ <i>Picoides tridactylus</i>	Conifer snags	Known to occur	May adversely impact individuals, but is not likely to result in a loss of viability on the planning area nor cause a trend toward federal listing or a loss of species viability range-wide.

The effects of the alternatives on pine marten and northern goshawk were discussed earlier under the MIS portion of this report. This analysis determined that the action alternatives may impact individuals of these two species, but is not likely to cause a trend toward federal listing.

Boreal Owl

Primary habitat for boreal owls is in the spruce/fir forests within the analysis area, generally located west and at higher elevations than the treatment areas. 8,500 acres of large diameter spruce fir forests make up approximately 30% of the analysis area, and provide ample amount of primary habitat for boreal owl. Large diameter lodgepole pine adds an additional 13,000 acres of secondary foraging habitat.

ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

The No Action alternative will maintain area in current state and will have no impacts to boreal owls or their habitat.

Proposed Action, Alternative 2, & Alternative 3

Direct Impacts – All action alternatives that harvest in Units 17, 19, and 20 will have direct impacts on boreal owls and/or their habitat (32 acres), as these stands make up a probable territory with suitable nesting habitat and quality foraging. Removal of large diameter trees, snags, and associated cavities would occur through commercial harvest as well as for safety measures (as related to OSHA safety standards). Removal of these features could cause direct mortality to nesting individuals, but more likely will reduce the area’s effectiveness as nesting habitat. Since boreal owls use different nesting cavities each year, the potential to provide for future nest sites will be diminished.

Over decades or centuries, it is possible that portions of the analysis area would succeed to forested areas where spruce/fir is more dominant than now, and larger blocks of suitable habitat for boreal owls could develop. All action alternatives set back this successional progression and maintain conditions more favorable to lodgepole pine. However, since only a small amount of acreage is proposed for harvest (less than 1% of the analysis area), this indirect impact is estimated to be minimal.

It is currently not known what effects past management has had on boreal owl populations. Current studies are underway to evaluate population trends, patterns of habitat use, and capability of boreal owls to disperse across large areas of unsuitable habitat. At a Forest and watershed level, habitat for boreal owls is being retained through retention of late-seral spruce/fir stands at higher elevations. The action alternatives do not impact late-seral spruce/fir stands, and thus will maintain boreal owl populations (on the Medicine Bow NF) at their current level and is unlikely to contribute additional cumulative impacts.

Implementation of the action alternatives may adversely impact individual boreal owls, but are not likely to result in a loss of viability on the planning area nor cause a trend toward federal listing or a loss of species viability range-wide.

Three-toed Woodpecker

The project area currently provides a moderately large amount of quality habitat for the three-toed woodpecker in the form of mature spruce/fir and lodgepole pine forests (approximately 11,500 acres). Habitat capability modeling indicates that the analysis area is providing habitat at 44% of its capability. Quality habitat is dispersed throughout the analysis area in both lodgepole pine and spruce/fir forests. The analysis area lacks one important component of foraging habitat, recent fire-killed trees and snags. A history of fire suppression, timber harvest, removal of hazardous snags, and firewood gathering has likely reduced the amount and quality of habitat available for this species within the analysis area. The Medicine Bow National Forest is estimated to provide a large amount of quality habitat (approximately 205,000 acres) across the forest.

ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

The No Action alternative will maintain area in current state and will have no impacts to Three-toed woodpecker or their habitat.

Proposed Action, Alternative 2, & Alternative 3

All action alternatives impact three-toed woodpeckers and/or their habitat. Almost all harvest units occur within modeled habitat for a total of 427 acres, impacting approximately 3% of identified habitat. The Proposed Action has the highest projected impact, as a larger portion of harvest units have a clearcut prescription. HABCAP modeling indicates a maximum of 2% decrease in habitat capability, assuming all treated areas would no longer be suitable habitat. The harvest areas are generally located in smaller, less continuous blocks of habitat, and retain those larger blocks found west of the treatment areas. Because three-toed woodpecker habitat is abundant across the analysis area, the area will remain within Forest Plan standards and guidelines and continue to provide a moderate amount of habitat across the watershed.

Cumulative impacts across the analysis area include a reduced amount of late-seral lodgepole pine from past timber harvest, and a reduced amount of snags because of fire suppression and timber harvest activities. The action alternatives generally continue this trend by treating forested stands in later stages of seral development. However, the small overall acreage of habitat proposed for treatment, and other areas of quality habitat across the forest minimize this projects overall contribution towards cumulative habitat decline.

All action alternatives may adversely impact individual three-toed woodpeckers and/or their habitat, but are not likely to result in a loss of viability on the planning area nor cause a trend toward federal listing or a loss of species viability range-wide.

Federally Listed Threatened, Endangered, or Proposed Wildlife Species

The Endangered Species Act of 1973 requires Federal agencies to “ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardized the continued existence of any listed species or result in the destruction or adverse modification of critical habitat of such species.” Section 7(c)(1) of the Act requires a Biological Assessment be performed if a listed species or critical habitat may be present in the action area. One of the purposes of the BA is to help make the determination of whether the proposed action is “likely to adversely affect” listed species and critical habitat. If listed species are found in a project area, consultation with the US Fish and Wildlife Service (USFWS) shall be met in accordance with the Endangered Species Act (Public Law 93-205) and FSM 2671.45. Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219.17).

A list of threatened, endangered, proposed (TEP), as well as candidate species that may occur within the Laramie Ranger District was provided by the USFWS in January 2003. These species will be reviewed in the following sections of this document and biological determinations made by the US Forest Service (USFS) biologist. As necessary, consultation will occur with the USFWS where the proposed project “May Affect” listed species or their habitat. USFS “Region 2 Sensitive Species,” which includes some of the USFWS “Candidate” species, was addressed earlier in this report.

Table 24. Documented Occurrences of Federally Listed Species within the Project Treatment Areas

Species	Location	Description	Year
None Documented			

Table 25. Federally Listed or Proposed Species Possibly Present or within the Area of Effect

Species	Status	Distribution	Habitat and Presence	Analysis of Effects
Canada Lynx (<i>Lynx canadensis</i>)	Threatened	Resident in spruce/fir forest types. Most likely to occur within established Lynx Analysis Units (LAUs).	Project proposal is within two LAUs. French/Upper Douglas LAU, and Northeast Snowy Range LAU. No documented records of lynx present in those LAUs, but habitat is considered suitable to support resident lynx.	May affect, not likely to adversely affect (For details, see Effects Analysis and Determination later in the document.)

Table 26. Federally Listed or Proposed Species Considered, but Eliminated after Pre-field Review Based on Absence of Suitable Habitat or No Project Disturbance

Species	Status	Distribution	Habitat and Presence	Determination
Black-footed Ferret (<i>Mustela nigripes</i>)	Endangered	Potential resident in prairie dog colonies.	Outside of known range. Suitable habitat not present.	No Effect
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Threatened	Nesting, winter resident, migrant, usually found near large bodies of water.	Nesting and winter roosting habitat is not present within project treatment area. Use of area is limited to occasional fly-overs. Project treatments will have no effects on individuals or occupied habitat.	No Effect
Mountain Plover (<i>Charadrius montanus</i>)	Proposed Threatened	Grasslands – Statewide	Suitable habitat not present.	Not likely to jeopardize
Preble's Meadow Jumping Mouse (<i>Zapus hudsonius preblei</i>)	Threatened	Riparian habitats east of Laramie Mountain Range.	Outside of known range. Suitable habitat not present.	No Effect
Ute Ladies' Tresses (<i>Spiranthes diluvialis</i>)	Threatened	Suitable habitat below 7000 feet.	Outside of known range. Suitable habitat not present.	No Effect
Whooping Crane (<i>Grus americana</i>)	Experimental, non-essential population in Western Wyoming	Resident in breeding season; western Wyoming.	Outside of known range. Suitable habitat not present.	No Effect

Species	Status	Distribution	Habitat and Presence	Determination
Wyoming Toad (<i>Bufo baxteri</i>)	Endangered	Resident in Laramie River Valley	Outside of known range. Suitable habitat not present.	No Effect
Additional species dependent upon Platte River water		Lower Platte River drainage	Project activities will have no impact or depletion to Platte River water supply. Species not present in project area.	No Effect

Canada Lynx

Existing records show that lynx are rare at the southernmost extensions of its range in Wyoming and Colorado, both historically and at present, and that populations that occur in this area are disjunct and isolated in distribution (Koehler and Aubry 1994). It is possible that existing records represent short-term residents or individuals wandering and dispersing, rather than reproductively stable populations. Koehler and Aubry (1994) suggest that lynx conservation efforts may best be directed at populations occurring in northeastern Washington, northern Idaho, and western Montana.

In 1998, a cooperative effort between the Colorado Division of Wildlife (CDOW), the USFS, the USFWS, the Bureau of Land Management (BLM), and the National Park Service (NPS) developed a draft reintroduction conservation strategy for the Canada lynx. During 1999 and 2000, 96 lynx were introduced in Colorado. Thirty-two more lynx were released in 2003. All lynx were introduced into southwestern Colorado.

There are four records for Canada lynx on the Medicine Bow National Forest contained in the Wyoming Natural Diversity Database (WYNDD), three of which are from the Snowy Range. There are two verified records from 1856 in the Turpin Reservoir and Stillwater Park areas, approximately 11 miles northwest of the treatment areas, and a third, unverified observation approximately 14 miles north of the treatment area in 1987. The fourth record is one adult trapped in the south end of Pole Mountain in 1963. None of these are within the analysis area or within the Lynx Analysis Units where management is being considered. Three additional sightings have also been reported but are unconfirmed and/or related to the lynx reintroduction in Colorado. These sightings are not found in the WYNDD database. They include one observation on Pole Mountain in 1999, thought to be one of the animals from the Colorado reintroduction, which was eventually killed in Nebraska, and one observation near the town of Laramie, Wyoming in 2000. This animal was one of the Colorado reintroductions, was captured through a tranquilizer, and was returned to a Colorado location. The third observation was a reported lynx sighting by the public in the vicinity of Sheep Mountain in 2001. This sighting has not been confirmed as a Canada lynx.

Lynx hair patch surveys, in conjunction with the National Lynx Survey, were performed in potential lynx denning habitat for three consecutive years (2000, 2001, 2002). The survey grid represents 200 square miles of lynx habitat on the Medicine Bow National Forest, Snowy Range area. Eight of the 25 transects are within the Northeast Snowy Range LAU, 5 of the 25 transects are within or adjacent to the French/Upper Douglas LAU, and four of the 24 transects are within the Silver Run Analysis Area. Results from the surveys revealed samples from 2 mountain lions and 1 black bear in 2000, 1 coyote, 1 bobcat, and 1 ungulate in 2001, and 1 bobcat, 2 coyotes, and 1 domestic cow in 2002. While these results do not eliminate the possibility of lynx presence, they do support the understanding that the Snowy Range is most likely marginal in its ability to support a resident lynx population, because it is geographically separated from higher quality habitat and it is dominated by dry-site lodgepole pine stands with little understory.

In order to evaluate current conditions and changes to lynx habitat over time, analysis of the amount and condition of specific habitat types is necessary. In order to ensure compliance with the LCAS, the USFWS and the USFS in the Rocky Mountain Region have agreed to evaluate habitat conditions and changes by evaluating the amount of winter forage habitat, denning habitat, other habitat, unsuitable habitat, and non-habitat within LAUs. The USFS has set regional standards to query our vegetation database, and determine which forested units provide which types of habitat. Tables 27 and 28 below show the types and amounts of each habitat within LAUs affected by this project proposal. Note: Some habitat is classified as both winter forage as well as denning habitat. Thus, adding up various habitat types will not equal 100% of total lynx habitat.

Table 27. Lynx Habitat in Northeast Snowy Range LAU – 54,794 acres

Lynx Habitat Description	Acres of Habitat within LAU	Percent of All <u>Lynx</u> Habitat w/in LAU
Winter forage	22,845	49.43%
Denning	17,119	37.04%
Other	20,130	43.56%
Unsuitable	1,042	2.25%
Total lynx habitat	46,214	
Non-habitat	8,580	18.57%

Table 28. Lynx Habitat in French/Upper Douglas LAU – 57,860 acres

Lynx Habitat Description	Acres of Habitat within LAU	Percent of All Lynx Habitat w/in LAU
Winter forage	18,284	35.65%
Denning	12,657	24.68%
Other	28,994	56.54%
Unsuitable	2,396	4.67%
Total lynx habitat	51,282	
Non-habitat	6,577	12.83%

ENVIRONMENTAL CONSEQUENCES

Alternative 1 – No Action

The No Action alternative will maintain area in current state and will have no impacts to Canada lynx or their habitat.

Proposed Action, Alternative 2, & Alternative 3

The Proposed Action is unlikely to have any direct effect on mortality or displacement of an individual lynx. Less than 50 acres of the Proposed Action affect denning and/or winter foraging habitat (primary habitat) across two separate lynx analysis units (over 100,000 acres), making the odds of an encounter with lynx or occupied lynx habitat very small. Human use in the area will essentially stay the same, with a temporary increase in local log truck traffic during periods of log haul.

In the Northeastern Snowy Range LAU, seven acres of denning habitat would be harvested and made unsuitable, which represents a fraction (0.04%) of all denning habitat in the LAU. Since suitable denning habitat currently makes up more than 37 percent of the LAU, there would be virtually no change in potential denning areas for resident lynx. Retention standards for denning habitat in the LCAS would continue to be fully met.

Twenty-two acres of winter forage habitat would be harvested and made unsuitable, which represents a small fraction (0.1%) of winter forage habitat within the Northeastern Snowy Range LAU. Since suitable winter forage habitat currently makes up almost half of the LAU (49%), there will be no significant direct effects on winter foraging habitat. Retention standards for winter forage habitat in the LCAS would continue to be fully met.

Unsuitable habitat within the Northeastern Snowy Range LAU will increase by a maximum of 297 acres, primarily from timber harvest in “other habitat.” Overall, the total amount of lynx habitat in unsuitable condition and within the LAU would be 2.9%, and remains well within the LCAS standards.

In the French/Upper Douglas LAU, 13 acres of denning habitat would be harvested and made unsuitable, which represents a fraction (0.1%) of all denning habitat in the LAU. Since suitable denning habitat currently makes up almost 25 percent of the LAU, there would be virtually no change in potential denning areas for resident lynx. Retention standards for denning habitat in the LCAS would continue to be fully met.

Twenty-one acres of winter forage habitat would be harvested and made unsuitable, which represents a small fraction (0.1%) of winter forage habitat within the French/Upper Douglas LAU. Since suitable winter forage habitat currently makes up over 35% of the LAU, there will be no significant direct effects on winter foraging habitat. Retention standards for winter forage habitat in the LCAS would continue to be fully met.

Unsuitable habitat within the French/Upper Douglas LAU will increase by a maximum of 81 acres, primarily from timber harvest in “other habitat.” Overall, the total amount of lynx habitat in unsuitable condition and within the LAU is 4.85%, and remains well within the LCAS standards.

Human use patterns, and/or the creation of roads or trails related to this project will have minimal or no impacts on Canada lynx. The maximum amount of additional roads in the analysis area is 2.9 miles, which includes 1.4 miles of new construction and 1.5 miles of temporary road construction. New roads are located in areas outside of denning habitat, will be restricted from snowmobile use, and will be closed to motorized traffic in the summer to protect other wildlife resources. Temporary roads will be obliterated after project completion, and will not become an established part of the existing road or trail system. An additional 1.2 miles of existing roads would be reconstructed (improved and maintained) in order to allow safe log haul. Public levels of motorized access (as well as current restrictions) on these existing reconstructed roads will remain the same as it is today.

All effects discussed above are considered short-term regarding their impacts to lynx and their habitat. Since a minimal amount of habitat is being disturbed compared to the overall available habitat within each LAU, effects to Canada lynx are most likely limited to the temporary displacement of an individual from a small portion of its habitat during and immediately following harvest. Timber harvest units may temporarily be avoided by an individual lynx because of human presence during harvest, decreased presence of snowshoe hare, and reduced travel cover for several years immediately following harvest. As forest stands regenerate in a period of 5 to 15 years, the prey base such as red squirrels and snowshoe hare will return to the site from adjacent areas and provide suitable lynx summer foraging habitat. For a period between 15 and 40 years after harvest, the stand may provide suitable winter foraging habitat for lynx as forest regeneration exceeds the height of the winter snow depth and thus accommodates snowshoe hare year-round. Eventually, treated areas will return to a mature forest condition, providing similar lynx habitat as exists today.

There are no long-term effects associated with this project. Forested stands will return to a forested condition and provide lynx habitat in various current forms. Human use patterns such as snowmobile access and newly open roads will not change under this project proposal.

CUMULATIVE EFFECTS

This section addresses future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological assessment. The Snowy Range LAU contains only one parcel of non-Forest Service land (77 acres). We are not aware of any actions reasonably certain to occur there. Mining activity has occurred on the land in the past and may occur again in the future. The area remains forested. As a result, there are no known cumulative effects to lynx in the Eastern Snowy Range LAU.

The French/Upper Douglas LAU contains approximately 120 acres of non-Forest Service land. Located near the Rob Roy Reservoir, this private land is part of a patented mining claim called the Rambler. Reasonably certain actions to occur include active gold mining, addition to and construction of residences on site, a small amount of human presence year-round, and snowmobile use on site during the winter. These foreseeable actions should have an immeasurable cumulative effect on lynx for the following reasons. The area is dominated by continuous, small diameter lodgepole pine suitable primarily as summer foraging habitat. Snowmobile use already occurs on groomed trails through the private section and on Forest Service lands in the vicinity. The small area (120 acres) is the only private land in the LAU and represents a small fraction of the LAU. Any effects caused by actions on this small parcel are unlikely to affect the overall conditions of the LAU. Any lynx that may currently inhabit the area will experience no changes in condition since these uses are already occurring on site.

It is my determination that the proposed project and all action alternatives “*May affect*, and are *not likely to adversely affect*” Canada lynx. Effects are limited, based on the following information, which was addressed previously.

- Minimal amounts of habitat are being disturbed within the LAUs.
- The project proposal complies with all standards and guidelines in the LCAS.
- Human use, specifically snow compaction, will not be measurably altered by the project proposal.
- Evidence of weak presence of the species within the analysis area is based on lack of historical occurrences, recent sampling with negative findings, and the geographically isolated nature of quality habitat.
- The species is unlikely to inhabit the specific treatment sites.
- Effects of the project proposal are short-term, and minimal in size compared to available habitat.

In accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), this project was submitted for formal consultation with the US Fish and Wildlife Service. The final Biological Opinion, received on October 23, 2003, confirmed the determination. It was also determined that all alternatives would have no effect on remaining federally threatened or endangered species, and is not likely to jeopardize the continued existence of any wildlife species proposed for federal listing.

Economic Efficiency

The Silver Run Analysis Area is situated on the Laramie Ranger District of the Medicine Bow-Routt National Forests, in the Snowy Range, Albany and Carbon Counties, Wyoming. Situated almost entirely in Albany County, the communities of Centennial and Laramie are most likely to be directly affected by the project activities, because of their proximity to the project area, and are the focus of the following social and economic analysis. Some residents of these communities depend upon a variety of forest resource-related activities, and access to resources, for their economic livelihood. These forest resource-related activities include: water diversions, wood products, mining, hunting and outfitter guiding, grazing, and tourism activities. Some residents who live around the project area may also consider the forest resources and access an important part of their quality of life.

ENVIRONMENTAL CONSEQUENCES

The following analysis highlights both social and economic issues, and potential impacts, to the greatest degree possible. In some cases, quantitative measures have been used, but in most cases, the discussion is qualitative.

Financial Efficiency

Financial efficiency is a comparison of those costs and benefits that can be quantified in terms of actual dollars spent or received within the project area. When considering quantitative issues, financial efficiency analysis offers a consistent measure in dollars for comparison of alternatives. This type of analysis does not account for non-market benefits, opportunity costs, individual values, or other values, benefits, and costs that are not easily quantifiable. This is not to imply that such values are not significant or important--but to recognize that non-market values are difficult to represent with appropriate dollar figures. The values not included in this part of the analysis are often at the center of disagreements and the interest people have in forest resource projects. Therefore, financial efficiency should not be viewed as a complete answer, but as one tool decision makers use to gain information about resources, alternatives, and trade-offs between costs and benefits.

The main criteria used in assessing economic efficiency is Present Net Value (PNV), which is defined as the value of discounted benefits, minus discounted costs. A PNV analysis includes all outputs, including timber, grazing, and recreation, to which a monetary value is assigned. The monetary values include both market and non-market values. In addition, a financial efficiency analysis is completed to determine the financial returns of each alternative. A financial efficiency analysis is the PNV of Federal revenues and costs.

Present Net Value (PNV) is an economic measure that accounts for all current and future costs and benefits, within the treated units, in a single dollar figure. Future costs and benefits are estimated and discounted into today's dollars, and added to the current project costs and benefits. The result is a figure that can be compared across alternatives, representing the total financial impact over the life of the project. Because a dollar is worth more now than it would be in the future, (would you rather have a dollar now, or a dollar in 50 years?) discounted costs and benefits are small figures. For example, a benefit of \$1,000,000 in 100 years is worth about \$20,000 today, using the standard government discount rate of four percent.

For the Silver Run analysis, the output level of nonmarket goods (e.g., recreation, hunting, water production) is not expected to change in any of the alternatives. In addition, there are no non-Forest Service costs associated with this project. Thus, for all alternatives, the economic efficiency analysis is the same as the financial efficiency analysis. All costs, timing of the activities, and outputs were developed by the specialists on the interdisciplinary team.

Table 29 displays the PNV and benefit/cost ratio for each Silver Run alternative. All monetary values are expressed in constant dollars, with no allowance for inflation. A 4% discount rate was used over a 42-year period (2003-2046). A 42-year period was used because this is the timeframe for the activities, and outputs proposed by the alternatives. The reduction of PNV in any alternative, as compared to the most efficient solution, is the economic trade-off, or opportunity cost, of achieving that alternative.

Table 29. Economic Efficiency by Alternative (in Thousands of Dollars)

	Alternative 1 No Action	Proposed Action	Alternative 2	Alternative 3
Present Net Value	N/A	\$474,208	\$221,339	\$346,224
Benefit/Cost Ratio	N/A	1.87	1.77	1.96

Source: Quicksilver Economic Analysis

Economic Efficiency

Economic efficiency compares costs and benefits of resources, quantifiable or not. This measure considers positive and negative resource externalities, passive uses, non-consumptive use, and opportunity costs at various scales. An economic efficiency analysis includes national, as well as local issues and concerns. Many of these benefits and costs are not valued through the market or exchange of money, and can be difficult to quantify or summarize. Often, the same impact may be considered a cost to some and a benefit to other, depending on individual values. Economic efficiency is another tool used in the decision making process to gain full information about a project, both quantitative and qualitative, and differences between alternatives.

Alternative 1 – No Action

Since no costs or outputs are associated with the No Action alternative, the PNV is zero and the benefit/cost ratio is not applicable.

Proposed Action and Action Alternatives

Table 29 indicates that all of the action alternatives have a positive PNV and benefit/cost ratio greater than 1, and are therefore economically efficient. The Proposed Action has the highest PNV because it has the highest amount of commercial, harvest volume.

When evaluating trade-offs, the use of economic efficiency measures is one tool used by the decision maker. Many things cannot be easily quantified with a monetary value, such as effects to wildlife, forest health, plant diversity, etc. The decision maker takes these and many other factors into account in making the decision.

CUMULATIVE EFFECTS

There are many elements that influence and affect local economies. Population growth, economic growth, and economic diversity and dependency of individual counties and communities all affect local economies. Due to the relatively small scope of this project, it is not expected to add any existing cumulative effect to the local economy.

Distribution Analysis

Distribution analysis is not concerned with costs and benefits directly, or with direct values of resources, but with the equity in which resources are distributed. In essence, it is the balancing of local, regional, and national uses. By identifying local impacts and being aware of national values, decision makers can balance the benefits and costs among geographical, political, social, ethnic, and economic sectors of society. In this project area analysis, the distribution impact is considered from several perspectives, impacts of employment and income by alternative, and environmental justice.

Employment and Income

In general, the impact of this project will have little impact, positive or negative, to the local economy of Albany County. There will be little overall change in terms of economic activity. Under any of the other alternatives, the situation is similar; the total impact to the local economy of any alternative will be minimal to forest resource-related industries.

Environmental Justice

A specific consideration of equity and fairness in resource decision-making is encompassed in the issue of environmental justice. As in Executive Order 12898 (Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations), all Federal actions will consider potentially disproportionate effects on minority or low-income communities. Consideration of environmental justice issues should be highlighted for decision makers. Potential impacts or changes to low-income or minority community in the project area due to the Proposed Action should be considered. Where possible, measures should be taken to avoid impact to these communities or mitigate the adverse effects.

Within the project area, there are no communities with significant low-income or minority populations, so specific actions to address environmental justice concerns were not implemented for this project.

Tribal Consultation

The appropriate Native American tribes were contacted during scoping for the proposal. No known Native American cultural sites, sacred sites, or burials are within the proposed areas of potential direct effect.

Unavoidable Adverse Effects

The application of the Forest Plan Standards and Guidelines and the listed mitigation measures will limit the extent and duration of any adverse environmental effects due to this project. However, it is impossible to avoid all potential impacts completely. Refer to the discussion of Environmental Consequences for each resource for the disclosure of all environmental effects.

Short-term Uses and Long-term Productivity

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

Short-term uses are those expected to occur on the Forest during the next ten years. These include, but are not limited to, recreation use, grazing, mineral development, timber harvest, and prescribed burning. Long-term productivity refers to the capability of the land to provide resource outputs beyond the ten-year period.

The minimum management requirement established by regulation (36 CFR 219.27) provides for the maintenance of long-term productivity of the land. Minimum management requirements prescribed by the Forest Plan Standards and Guidelines will be met under all alternatives. Minimum requirements assure that long-term productivity of the land will not be impaired by any of the short-term uses that are proposed by this project.

Irreversible and Irrecoverable Commitments of Resources

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

There are no identifiable commitments of resources for this proposed action that are irrecoverable or irreversible, as determined by the Interdisciplinary Team.

Other Required Disclosures ---

The Proposed Action complies with other laws and regulations such as the Clean Water Act, Endangered Species Act, and the National Historic Preservation Act. There will be no adverse effects on any threatened or endangered species or on cultural resources. The best management practices will be applied to meet state water quality standards.

This proposal has been compared to the selected alternative (D FEIS) of the Medicine Bow National Forest Plan Revision, which was approved on December 27, 2003. The analysis found that this decision is consistent with management area direction and standards and guidelines of the Revision (see project record).

CONSULTATION AND COORDINATION

The Forest Service consulted the following individuals, Federal, state and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment:

ID TEAM MEMBERS:		
<u>NAME/EXPERIENCE (YRS.)</u>	<u>RESOURCE AREA</u>	<u>PROFESSIONAL EDUCATION</u>
Terry DeLay (19)	Project Leader, Silviculture	BS Natural Resource Mgmt
Steve Mottus (25)	GIS	BS Agriculture BS Forest Mgmt
Steve Kozlowski (14)	Wildlife	BS Wildlife Biology
Carol Purchase (15)	Hydrology	BS Botany MS Forest Hydrology
Todd Allison (4)	Fisheries	BS Wildlife Biology, Aquatics
Dean Lebeda (20)	Engineering	
Deana Wood (20)	Archeology	BS Geology MA Am. Studies, Archaeology
Jeff Tupala (15)	Visual Resources	BS Forestry MLA Landscape Architecture
George Wiggins (37)	Range	BS Forest-Range Mgmt
Jeff Wallace (28)	Recreation	MSF Science Forest Mgmt
Jim Barott (15)	Soils	BS Recreation Resource Mgmt & Soil Science
John Proctor (8)	Botany	BS Biology
Paul Blackman (5)	Recreation	MS Recreation

Individuals

Bill Baker	Willis Jensen	Mark Jenkins, Outside Magazine
Mary Schramm Coberly	Robert Knourek	Josh Thompson
Bob Cook	Jon S LaPlante	Liddia Freouf
Ralph Espach	Edwin H. Loeffler	Sigrid Mayer
Jeffrey Foster	Edward Lonsdale	Joy Owen
Wendell Funk	James D. Shaw	Melanie Arnett
Cecily & Robert Goldie	Alfred Tennant	Thomas & Peggy LaPoint
Mrs. Fred Goranson	Diane & Bob Thomas	Rodney Parlee
Robert & Virginia Guenzel	Eric Wagner	Richard Conn
Dorothy Hitchcock	Steve Yeoman	Kristen Belko
Polly & Dan Birdsall	Charles & Anita Beach	Holly Garner
Lilias Jones Jarding	Bart Geerts	Angelina Korzhova
Kenneth & Betty Milford	Richard Sprecher	Lesley Wischmann
Richard Adams	Jack Clinton	Ted Zukowski
Edward Sherline	John Marno	John Spezia
Danette Jarzab	Richard Balzer	Keith Rittle
Julene Bair	Garth Massey	Trude Eidhammer
Bern Hinckley	Barbara Rugotzke	Mary Forrester
Tora Woyciechowicz	Mac Blewer, Red Desert Audobon	Mary Katherman
Bob Strayer	Mike Stoesz & family	Linda Taylor & Murry Self
Debbie Mathew	David Nelson	Teresa Ukrainetz
Kate Inman	Laurie Milford, Zone 4	Margaret & Robert Laybourn
Patricia Dowd	Ed Large	William McIntyre & family
Marilyn Sprinkle		

Agencies/Organizations

Biodiversity Conservation Alliance	WY Game & Fish
WY State Geological Survey	WY State Forestry Division
Intermountain Forest Industry Assn	Snowy Range Back Country Horsemen
Centennial Sewer & Water District	Wind River Multiple Use Advocates
Louisiana Pacific	WY State Historic Preservation Office
Ancient Forest Rescue	Rocky Mountain Research Station
Republic Womens Club	

Appendix A - Watershed Rehabilitation Projects

Problem Areas - Several streams have adjoining disturbed areas that can be corrected with small investments of machine and personnel time. These areas were discovered during stream surveys in the 1997 and 2002 field season.

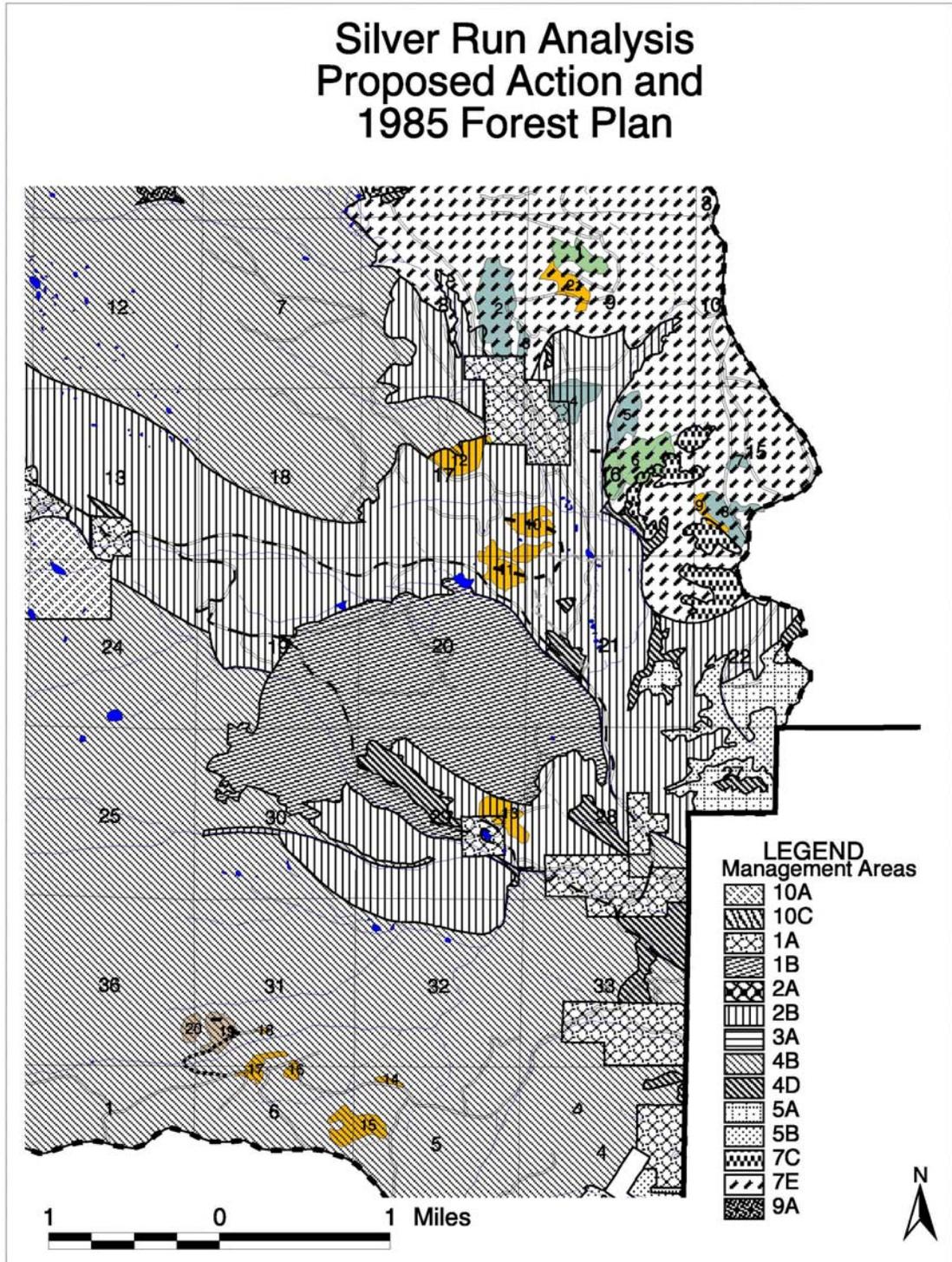
- Nash Fork Creek at the Snowy Range Ski Area – Various connected disturbed areas within the ski area contribute sediment during snowmelt. Develop an erosion control plan for entire streamside area, with emphasis on revegetating disturbed areas.
- Nash Fork Creek/old Brooklyn Lodge bridge – Old, unused wooden bridge abutments are deteriorating and creating a sediment source. Pull back abutments from stream & reconfigure banks, and revegetate.
- Gold Run Creek immediately below the FDR338.G crossing – Mining spoils are piled next to creek, and contribute sediment during high flows. Use backhoe to draw back piles from stream edge, and revegetate. Mining claim must be abandoned in order to accomplish.
- Libby Creek at old Barber Lake Ski Area road crossing – Old crossing is contributing sediment during high flow events. Reconfigure with backhoe and revegetate.
- North Fork Little Laramie dispersed camping & access road – Dispersed sites across from the North Fork Campground are acting as connected disturbed areas. Block ATV access from streamside areas and revegetate where possible. Water bar low-grade road on west side of river, where appropriate.
- FDR330 crossing at N. Fork Little Laramie tributary (NW ¼ sect. 17, T16N, R78W) – Road surface flow being contributed to stream. Water bar as needed.
- Remove old log corduroy crossing on skid trail just above first culvert on NFSR 330.
- The Forest Road 338 will be repaired where it crosses a tributary of Gold Run Creek (NE corner, Sec. 6, T.15N. R.78W.) due to soil erosion problems. Forest Road 338G will be repaired near the vicinity of the crossing of Gold Run Creek for the same reason. See the Fisheries Report for a further explanation on repairing the road.

Appendix B – Management Area Maps & Unit Table

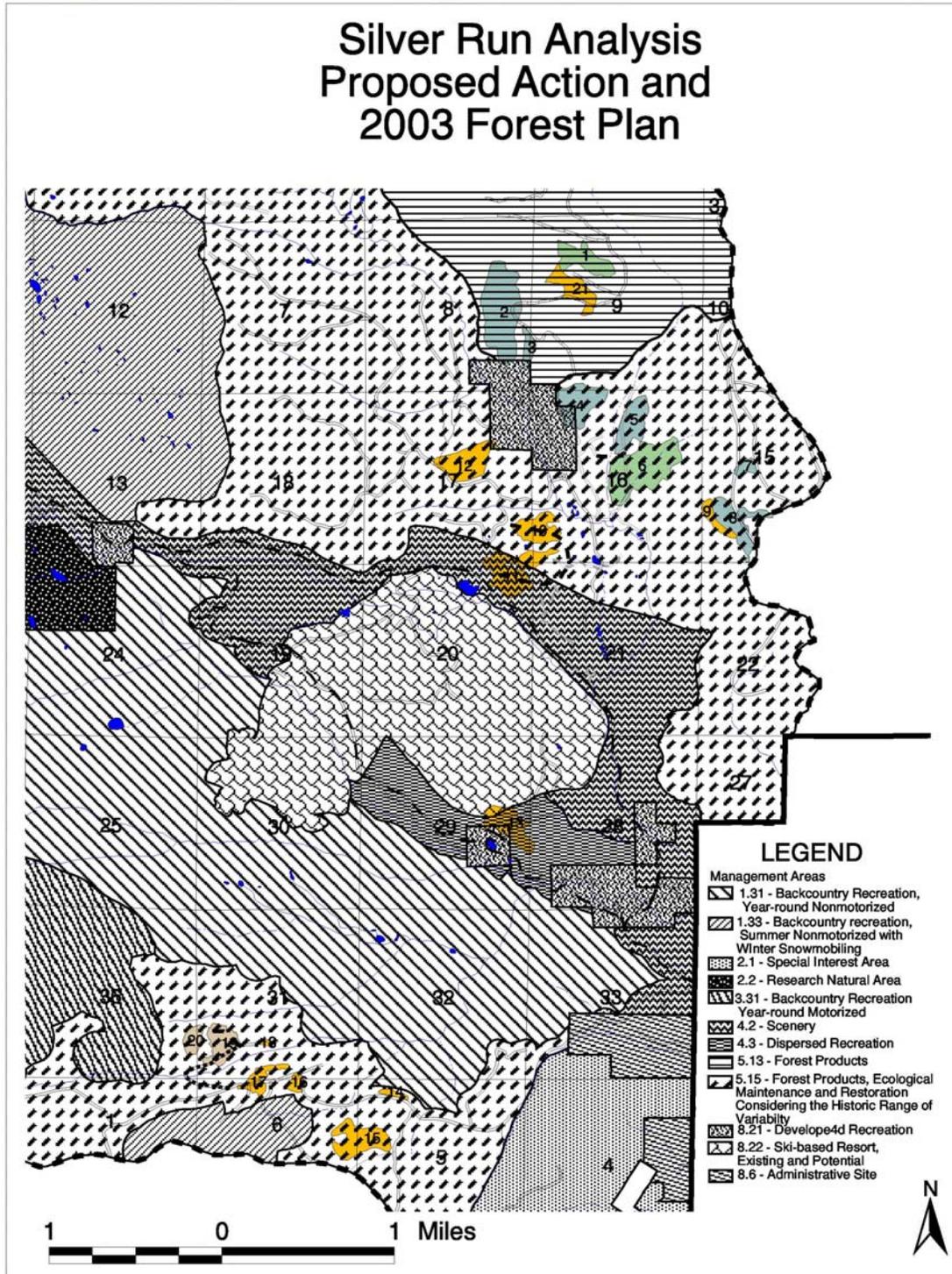
Silver Run Proposed Treatment Units

Unit #	Proposed Silvicultural Treatment	Estimated Acres
1	Shelterwood – Seed Cut	24
2	Overstory Removal	65
3	Overstory Removal	7
4	Overstory Removal	33
5	Overstory Removal	24
6	Shelterwood – Seed Cut	61
7	Overstory Removal	5
8	Overstory Removal	27
9	Clearcut	9
10	Clearcut	22
11	Clearcut	38
12	Clearcut	31
13	Clearcut	26
14	Clearcut	3
15	Clearcut	30
16	Clearcut	5
17	Clearcut	12
18	Clearcut	1
19	Sanitation/Salvage	21
20	Sanitation/Salvage	9
21	Clearcut	20

Proposed Action and 1985 Forest Plan Management Areas



Proposed Action and 2003 Forest Plan Management Areas



Appendix C - Response to Public Comment

During the initial scoping period, 32 comments were received from individuals and organizations, Federal, State and local agencies (*see Draft EA, Consultation and Coordination, p. 117*). The Interdisciplinary Team reviewed the comments and identified significant issues to be analyzed in depth in the environmental analysis. Significant issues were defined as those directly or indirectly caused by implementing or not implementing the Proposed Action. The issues that were not significant or which had been covered by prior environmental review were identified and eliminated from detailed study, narrowing the discussion to be analyzed in depth in the EA (*see DEA, Alternatives Considered but Eliminated from Detailed Study, p. 35*). Additional alternatives or mitigation measures to address these significant issues were developed.

The following section responds to ***substantive** comments received during the 30-day Draft EA review period. Sixty-one comment letters were received. ***Definition of substantive comments – Comments that are within the scope of the proposed action, are specific to the proposed action, have a direct relationship to the proposed action and include supporting reasons for the Responsible Official to consider. Comments not meeting this definition were not addressed in this section.**

Comments pertinent to the same subject have been grouped into categories. Many of the comments received were previously identified during the scoping period and addressed in the Draft EA; therefore, the response to these comments will be brief and will reference the chapter or section of the Draft EA that supports the agency's position. As previously documented in the Draft EA on page 36, excerpts of specialist reports were used to compile the EA. Specialist reports in their entirety are part of the official Project Record. Where noted, the response to comments refers to the full, unabbreviated specialist reports on file at the District office.

Letter #	Commenter	Letter #	Commenter
1	Mark Jenkins, Outside Magazine	31	Keith Rittle
2	Josh Thompson	32	Julene Bair
3	Liddia Freouf	33	Garth Massey
4	Wendell Funk	34	Trude Eidhammer
5	Sigrid Mayer	35	John Russell
6	Joy Owen	36	Bern Hinckley
7	Wyoming G & F	37	T Murphy
8	Melanie Arnett	38	William Baker
9	Thomas & Peggy LaPoint	39	Barbara Rugotzke
10	Rodney Parlee	40	Mary Forrester
11	Richard Conn	41	Tora Woyciechowicz
12	Kristen Belko	42	Mac Blewer, Red Desert Audubon
13	Mary Ann Stout	43	Mary Katherman
14	Polly & Dan Birdsall	44	Bob Strayer
15	Charles & Anita Beach	45	Mike Stoesz & family
16	Holly Garner	46	Linda Taylor & Mary Self
17	Lilias Jones Jarding	47	WY G&F (duplicate)
18	Bart Geerts	48	Debbie Mathew
19	Angelina Korzhova	49	David Nelson
20	Kenneth & Betty Milford	50	Teresa Ukrainetz
21	Richard Sprecher	51	John Hanks
22	Lesley Wischmann	52	Kate Inman
23	Richard Adams	53	Laurie Milford, Zone 4
24	Jack Clinton	54	Jeremy Nichols, Biodiversity Conservation Alliance
25	Ted Zukoski	55	Margaret & Robert Laybourn
26	Edward Sherline	56	Patricia Dowd
27	John Marno	57	Ed Large
28	John Spezia	58	William McIntyre & family
29	Danette Jarzab	59	Marilyn Sprinkle
30	Richard Balzer	60	Chad Doverspike
		61	Republican Womens Club

Recreation

<p>Comment #1</p>	<p>Impacts to Area Recreation Use & Quality of Life The forests along Highway 130 outside of Centennial are extremely valuable in their natural state. They are extremely popular for people and wildlife alike because logging and road building have not heavily impacted them. These forests are also important to the quality of life in communities in and around the Snowy Range. (Letters #2, 3, 6, 10, 11, 14, 15, 16, 17, 20, 22, 24, 25, 28, 29, 32, 34, 39, 44, 52, 54, 55, & 56)</p> <p>These forests provide invaluable opportunities for camping, hiking, biking, skiing, snowshoeing, hunting, wildlife viewing and other recreational activities. The Silver Run Timber Sale would impair the ability of people to enjoy these activities by logging and building roads near trails, developed recreation sites, and dispersed recreation areas. (Letters #2, 3, 5, 6, 10, 11, 12, 14, 15, 24, 25, 27, 29, 33, 34, 38, 39, 40, 42, 43, 45, 46, 52, 55, & 56)</p> <p>This sale will have a highly negative impact on recreational opportunities...in the timber sale area. (Letters #9, 14, 26, 40, 41, 42, 46, 48, 55, & 59)</p> <p>Cancel the timber sale because of the irreversible impacts the timber sale will have upon recreational opportunities...in the timber sale area. (Letters #3, 6, 10, 11, 15, 22, 24, 25, 29, 31, 34, 44, 52, & 56)</p> <p>The assessment of impacts to dispersed recreation seems to ignore the fact that the proposed action, although seemingly small, will impact areas of great recreational importance and value and potentially destroy many people’s recreational opportunities. (Letter #54)</p> <p>Logging the Silver Run area makes zero sense. You could not have picked a worse spot and will only harden opposition to logging in general – this is a real red flag for recreation uses. (Letter #58)</p> <p>Given that clearcuts take at least 80 years to grow back (although this figure varies depending on aspect, precipitation, and other factors) and roads take even longer to be restored to a natural condition, we cannot fathom how clearcutting and road building poses only “temporary” or “short-term” recreation impacts. (Letter #54)</p> <p>Current plans that include clearcutting would have immediate and long-term negative impacts on the area’s ...recreational resources. (Letters #17 & 46)</p>
--------------------------	---

Response: Beginning on p.8-9 of the Draft Environmental Assessment (DEA), there is recognition of the importance of the Snowy Range Highway corridor (Wyoming Hwy. 130) and the Silver Run area is to year-round recreation use on this portion of the Forest. As shown on p.18 of the DEA, Clearcutting, Aesthetics, and New Roads were identified as Significant Issues associated with the Silver Run Analysis Area. Alternatives 2 and 3 (DEA pp.23-27) were designed to directly address these concerns. As displayed on Map 2 on p.7 and later discussed on pp.38-40 of the DEA, approximately 57% or 17,674 acres of the 31,000-acre analysis area is within four inventoried roadless areas (IRAs). Existing IRA's would be unaffected; there are no harvest units or associated road construction proposed for the IRAs under this proposal.

Logging has occurred in the past within and/or adjacent to the proposed treatment units as well as elsewhere within the analysis area, and consequently much of the landscape that is currently enjoyed by so many recreationists has, in fact, been considerably altered and generally does not constitute environs undisturbed by human activities. Situated almost entirely in management areas (7E, 2B, and 4B) that contain suitable forest lands that contribute to the Forest's allowable sale quantity, treatments under the proposal would occur in areas where there has been previous harvest and existing road system. The proposal would affect less than 2% of the entire analysis area. Mitigation and Monitoring measures listed on pp.28-31 of the DEA are proven means of lessening impacts of the proposal to other resource areas such as recreation.

Potential long-term impacts to recreationists will be greatest in the vicinities of Barber Lake and the North Fork Campground (i.e., Clearcut units 10, 11, 12, and 13). Winter recreationists will likely have a greater potential to be negatively affected in the long-term due to the proximity of the treatment units to popular use areas and the lack of similar alternative areas and access points. A small percentage of these negatively impacted individuals will find these changes to be very offensive and may choose not to recreate in these areas.

Some users will not react negatively to the changes brought on by the Proposed Action and will not have their recreation experiences negatively impacted. Some users will likely find the changes beneficial to their recreation opportunities and experiences over the long term, as in cases where viewsheds, openings in otherwise dense forest stands, landscape diversities, and opportunities for cross-country travel (especially for winter recreationists, both motorized and non-motorized) are newly created.

It needs to be pointed out that most of the cross-country ski trail system in the Silver Run area is on old logging roads and passes through areas that have had past harvest. Other cross-country ski trail systems on the western portion of the Forest out of Saratoga and Encampment are also situated on closed logging roads. Both of these trail systems pass through areas of recent timber harvest-- including clearcut units. Most skiers enjoy the variety created by the new openings in the forest, the trails are sunnier, there are more views of the surrounding country, and you are not just continually skiing through a solid unbroken forest. Also for those of us who ski these trails year after year, it gives one the opportunity to observe the regeneration and re-growth of the Forest over time.

The number of recreationists displaced and/or negatively impacted by the Proposed Action in the years to come after project implementation will likely constitute a small percentage of the total number of users typically found recreating within the analysis area. Again, exactly what percentage is not determinable; however, in light of the relatively small size of the treated acres as compared to the size of the analysis area, and the popularity of the numerous developed and dispersed recreation areas outside of and unaffected by the proposed treatment units, it is reasonable to assume that, with the mitigations proposed, the relative number of recreationists that could potentially experience lasting negative effects from this action will indeed be minimal.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.80-87. Project Record *Recreation, Visual Resources, & Silviculture and Timber Reports.*

Changes to FEA: Based on these and other comments, the Recreation Report has been re-written and additional analysis has been conducted to better disclose both the short-term and long-term effects of the proposal to the area’s recreation and visual resources. The Recreation portion of the Environmental Consequences section of the Final Environmental Assessment (FEA) has been revised to include this additional analysis and discussion. Based on this and a review by the project’s Landscape Architect, additional mitigation measures have been added to the FEA to assure the cleanup of logging slash along area roads and to lessen conflicts between the proposal and area recreation use.

Comment #2	<p>Proximity of Timber Sale to Area Recreation Sites and Trails The DEA fails to provide information regarding the proximity of the proposed treatments to travelways, hiking trails, and other developed recreation areas. This omission raises substantial questions over whether the impacts of timber harvesting and road building to major travelways, hiking trails, and developed recreation facilities will be significant and fails to adequately inform the public of the potentially significant impacts to recreational resources, indicating an EIS is necessary. (Letter #54)</p> <p>While I am not opposed to logging, I am opposed to the Silver Run Timber Sale in its current form because it fails to protect recreational opportunities for the self-propelled skier...I have seen planned cutting areas east of the Sand Lake Road that will devastate both marked and traditional ski trails. It appears that a clearcut is planned on either side of the Arlington Pack Trail. This historic trail went from Centennial to Arlington and has great potential for a self-propelled recreation trail. But instead of conserving a green belt along the trail, there will be a clear cut... there are fewer than 10 miles of marked ski trails in the North Fork/Libby Creek drainage and this timber sale will seriously degrade most of them. (Letter #23)</p>
-------------------	---

The proposed new road in Sections 16,17, 20, and 21 seems like it would cut off a segment of the Lodgepole Loop Trail in the Little Laramie Trail System. Additionally, the south clearcut in this area would contact the same part of the trail and seriously degrade the visual quality of this recreational activity. The southeast end of the clearcut in Sections 28 and 29 will eliminate the west end of the Camp Loop Trail in the Corner Mountain Trails System. We find it difficult to believe that such impacts are in line with the FS's desired future condition for the area and that such impacts will maintain and protect recreational opportunities within the timber sale area. Finally, it does appear as if clearcuts in Sections 8, 16, and 29 may extend into MAP 1A, Developed Recreation Sites.

(Letter 54)

The Little Laramie trails already seem overlogged, and the old roads off the Sand Lake Road lead to many old clearcuts which have never filled back in, and are now just barren areas with large piles of old trunks and branches in them. Please don't subject the rest of the area to the same treatment (especially the beautiful North Fork trail and others). So many areas in the Little Laramie Trails area are choked with old cut-down logs already. (Letter #30)

The proposed treatment in CC 13 overlaps part of an existing trail, the Camp Loop of the Corner Mountain System. This unit also extends into (or is adjacent to) the existing Developed Recreation Site around Barber Lake. The proposed treatment in Unit CC 11 comes very close to part of the Lodgepole Loop Trail of the Little Laramie System, and the proposed new road accessing this unit will cross this trail in two places. It is not clear what will occur if a portion of an established trail is obliterated, as will be the case in CC Unit 13. Will it be rebuilt, relocated, or abandoned? (Letter 49)

Response: See responses to **Recreation Comment #1**. While each Management Area Prescription (MAP) provides direction for recreation management, several MAPs emphasize recreation over other resource concentrations. Several such MAPs are found within this project's analysis area including: 1A (Developed Recreation Sites), 1B (Winter Sports Site), 2A (Semi-primitive Motorized Recreation), 2B (Rural and Roded Natural Recreation), and 3A (Semi-primitive Non-motorized Recreation). These Management Areas reflect past activities and conditions on the Forest, as well as current uses and desired future conditions.

Four proposed treatment units (10-13) fall largely within Management Area 2B, Rural and Roded Natural Recreation. Emphasis for recreation management in this MAP is placed on providing a variety of motorized and non-motorized recreation opportunities. Silvicultural management practices are to "promote and ensure enhancement of the visual resource" and management activities in general are to "maintain or improve the quality of recreation opportunities." Management activities may dominate in these areas, however they are to "harmonize and blend with the natural setting" and be "compatible with recreation use." Rural and Roded Natural recreation opportunities are the primary ROS categories found within this Management Area.

Small portions of both Overstory Removal unit #4 and Clearcut unit #13 are within Management Area 1A, Developed Recreation Sites. Emphasis in this MAP is placed on managing for developed campgrounds, picnic areas, trailheads, etc., both existing and planned. Grazing is excluded from developed recreation sites, and tree stands are to be managed to “enhance visual quality and recreation opportunities on existing and proposed recreation sites.” While timber harvesting can occur in these areas, it is subject to a variety of conditions and mitigations. It should be noted that, while portions of these units are within developed recreation site prescriptions, they are not within the actual picnic areas or campgrounds themselves. The remaining proposed units are within non-recreation emphasis MAPs.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.80-87. **Project Record** *Recreation & Visual Resources and Specialist Reports*.

Changes to FEA: Based on these and other comments, the *Recreation Report* has been re-written and additional analysis has been conducted to better disclose both the short and long-term effects of the proposal to the area’s recreation and visual resources. The Recreation portion of the *Environmental Consequences* section of the FEA has been revised to include this additional analysis and discussion. Based on this and a review by the project’s Landscape Architect, additional mitigation measures have been added to the FEA to assure the cleanup of logging slash along area roads and to lessen conflicts between the proposal and area recreation use.

Comment #3

Impacts to ROS Classes Impacts are not stated in terms of how ROS classes will be impacted and there is no assessment as to whether the ROS classes will be maintained or protected. (Letter #54)

Response: See responses to **Recreation Comments #1 & #2**. The Recreation Opportunity Spectrum (ROS) is a planning system utilized by land managers to classify areas according to the types of recreation opportunities available therein. The majority of the area surrounding the Snowy Range Scenic Byway is classified as Rural. This setting reflects areas that are often culturally modified and where the natural environment has been substantially modified. Contact frequency between other users may be moderate to high, and structures are readily apparent. Scattered throughout the analysis area are Roaded Natural areas, which are characterized by a predominantly natural-appearing environment as viewed from sensitive roads and trails, with moderate evidence of the sights and sounds of people. Contact between visitors is low to moderate on trails and moderate to high on roads.

All proposed treatment units under the Proposed Action, except two, fall within the Roaded Natural category. Proposed treatment units 10 and 11 both fall primarily within the Rural category. While Roaded Modified, Semi-primitive Motorized, and Semi-primitive Non-Motorized settings are also found within the analysis area, the majority of these areas are relatively distant from the proposed treatment units. The one exception to this involves unit 12, which lies approximately .1 miles from a Semi-primitive Non-Motorized area.

One change to the existing ROS designations will result from the Proposed Action. Areas currently classified as Roded Natural where clearcutting and overstory removals are planned will move toward Roded Modified following project implementation. These include the majority of the treatments units in the vicinity of the Ehlin Road, Barber Lake, Fallen Pines Road, and Sand Lake Road. Such a change is acceptable within the prescribed Management Areas and is typical for a timber harvest operation. While Clearcut unit 12 is situated adjacent to a Semi-Primitive Non-Motorized area, no change in ROS class is expected as a result of the proposed treatment there.

DEA/Project Record: *DEA Summary p.3, Background pp.5-7, Purpose & Need for Action pp.8-18, Comparison of Alternatives, Including the Proposed Action pp.19-35, Environmental Consequences pp.80-87. Project Record Recreation & Visual Resources and Specialist Reports.*

Changes to FEA: Based on this and other comments, the *Recreation Report* has been re-written and additional analysis has been conducted to better disclose both the short and long-term effects of the proposal to the area’s recreation and visual resources—including a discussion on impacts to ROS. The Recreation portion of the *Environmental Consequences* section of the FEA has been revised to include this additional analysis and discussion.

Comment #4	<p>Backcountry Skiing Corner Mountain and Barber Lake are marked backcountry ski trails. Silver Run Creek is a wonderful true wilderness ski area, without trail markings. These areas are not replaceable. Happy Jack is very groomed and heavily used. The top end of #130 is being overrun with snowmobiles. All we backcountry skiers have is the south side of #130 – and that is where this timber cut and road building will occur. (Letter #50)</p> <p>I thought the FS was making an effort to reserve some backcountry areas in the Snowies for cross-country skiers. If the Silver Run area is cut then it will eliminate the most cherished of the few remaining backcountry-no snowmobile areas in the Snowies. (Letters #26 & 53)</p>
-------------------	--

Response: See responses to **Recreation Comments #1, #2, & #3.** Under the Proposed Action an estimated 107 acres of harvest treatment or approximately 23% of the entire proposal of 473 acres is situated south of Highway 130. Backcountry skiers utilizing non-system routes west of the North Fork Laramie River and routes north of the Barber Lake Road could be displaced and/or negatively impacted with respect to their recreation experiences by logging activities, with some potential for off-Forest displacement, as suitable terrain for backcountry skiing activities are limited on the District. A small percentage of these negatively impacted individuals will find these changes to be very offensive and may choose not to recreate in these areas. Some users will not react negatively to the changes brought on by the Proposed Action and will not have their recreation experiences negatively impacted.

DEA/Project Record: *DEA Summary p.3, Background pp.5-7, Purpose & Need for Action pp.8-18, Comparison of Alternatives, Including the Proposed Action pp.19-35, Environmental Consequences pp.80-87. Project Record Recreation & Visual Resources and Specialist Reports.*

Changes to FEA: Based on these and other comments, the *Recreation Report* has been re-written and additional analysis has been conducted to better disclose both the short and long-term effects of the proposal to the area’s recreation and visual resources—including a discussion on impacts to ROS. The Recreation portion of the *Environmental Consequences* section of the FEA has been revised to include this additional analysis and discussion.

Comment #5	<p>Cumulative Impacts to Recreation While the DEA presents general information regarding cumulative impacts, the discussion lacks any specific disclosure of where these impacts have occurred, to what extent they have occurred, and fails to disclose whether the impacts of these activities are relatively noticeable or not. Given this lack of information, it is difficult, if not impossible, to understand the potentially significant impacts of the Silver Run timber sale to recreation, visual, and other resources, indicating substantial questions exist over whether the timber sale poses significant impacts or not and an EIS is necessary to adequately document the impacts of the Silver Run timber sale. (Letter #54)</p>
-------------------	---

Response: See responses to **Recreation Comments #1, #2, #3, & #4.** Past, present, and future management activities within and adjacent to the Silver Run Analysis Area were analyzed for cumulative effects on recreation resources. The analysis area and surrounding areas have been modified in the past by timber harvest, roads construction, grazing, water developments, dispersed recreation uses, and concentrated recreation uses at developed sites. Current trends indicate that recreation use in the Medicine Bow National Forest (and the analysis area) will continue to increase well into future, likely leading to an increase in future conflicts between this use and forest management.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.80-87. **Project Record** *Recreation & Visual Resources and Specialist Reports.*

Changes to FEA: Based on this and other comments, the *Recreation Report* has been re-written and additional analysis has been conducted to better disclose both the short and long-term effects of the proposal to the area’s recreation and visual resources—including a discussion on impacts to ROS. The Recreation portion of the *Environmental Consequences* section of the FEA has been revised to include this additional analysis and discussion.

Scenic Resources

Comment #6	<p>Snowy Range Scenic Byway It seems that one of the proposed clearcuts will come right up to the Snowy Range Scenic Byway. We seriously question whether this proposed unit will adequately protect the scenic qualities of the “Scenic Byway.” Although the FS may be proposing a vegetative “buffer strip,” the DEA fails to disclose whether such a strip will actually be emplaced, how large the buffer will be, and whether this will be adequate to protect the scenic byway. (Letter #54)</p>
-------------------	---

Response: See responses to **Recreation Comments #1, #2, #3, #4, & #5.** The scale of Maps 3 and 5 on pp.22 and 27 of the DEA makes it difficult to determine the distance of the unit (#11) from Highway 130. The unit in question is in fact situated on the ridge above the highway and is screened from view by the terrain.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.80-87. **Project Record** *Visual Resources Specialist Report.*

Changes to FEA: Based on this and other comments, a buffer of 200 feet between the edge of Snowy Range Scenic Byway (Highway 130) and Barber Lake Road (NFSR 351) and clearcut units 11 and 13 will be added to the mitigation measures for Scenic Resources in the FEA.

Comment #7	<p>Visual Quality Objectives The DEA states, “Visual Quality Objective of modification is allowed in management area prescription 4B and 7E.” DEA, p. 82. Yet, according to the DEA, modification is only allowed in MAP 7E outside of the foreground of arterial/collector roads and trails.” DEA, p. 85. The DEA seems to be misleading people and this must be addressed in an EIS. (Letter #54)</p> <p>Given that clearcuts take at least 80 years to grow back (although this figure varies depending on aspect, precipitation, and other factors) and roads take even longer to be restored to a natural condition, we cannot fathom how clearcutting and road building do not degrade visual quality. (Letter #54)</p> <p>Current plans that include clearcutting would have immediate and long-term negative impacts on the area’s ...resources. ...viewsheds can only be impacted to a relatively limited extent before the resource becomes destroyed for all practical purposes. (Letters #17 & 46)</p>
-------------------	---

Response: See response to **Scenic Resources Comment #6.** The adopted visual quality objectives (VQOs) for MA 7E are partial retention VQO in the foreground of arterial and collector roads and primary trails and modification VQO on all other areas.

Clearcut units are to be designed to blend with the surrounding forest landscape. Clearcut prescription would be used only on lodgepole pine and aspen stands that would re-establish after harvest. Temporary roads would be obliterated and rehabilitated to blend with the surrounding. There would be a short-term impact of visual quality from clearcutting and associated road building, but in the long term, would provide healthy green vegetation that benefits scenery for future generations.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.80-87. Project Record *Visual Resources Specialist Report*.

Changes to FEA: Based on this and other comments, the *Recreation Report* has been re-written and additional analysis has been conducted to better disclose both the short and long-term effects of the proposal to the area’s recreation and visual resources—including a discussion on impacts to VQO. The Recreation portion of the *Environmental Consequences* section of the FEA has been revised to include this additional analysis and discussion.

Comment #8	Natural Appearing Landscape Although the FS asserts that, “Management activities are to reflect the natural appearing landscape in form and texture and are not to reduce the recreation experience” (DEA, p. 82), it seems that recreation experiences will actually be reduced.. (Letter #54)
-------------------	--

Response: Management activities in areas that emphasize semi-primitive setting are to reflect natural appearing landscape and are not to reduce recreation experiences. There would be no treatments in management area prescriptions 2A and 3A that emphasize on maintaining the recreation experiences in the semi-primitive setting. Natural appearing landscape is a result of both direct and indirect human activities. Most of the treatments would occur in management area prescription 4B with modification VQO, which allows management activities to dominate the area, but should blend with the surrounding; 7E which also has modification VQO similar to 4B, except that the foreground of arterial/collector roads and primary trails management activities must meet partial retention VQO and be subordinated to the surrounding landscape; and, 2B which has partial retention VQO. Recreation experience would move more towards Roded Modified ROS in 4B and 7E and 2B where timber would be harvested.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.80-87. Project Record *Visual Resources Specialist Report*.

Changes to FEA: No changes were made to the FEA based on these comments.

Wildlife

Comment #9	<p>Timber Sale Impacts This sale will have a highly negative impact on...wildlife in the timber sale area. (Letters #9, 14, 26, 40, 41, 42, 46, 48, 55, & 59)</p> <p>Cancel the timber sale because of the irreversible impacts the timber sale will have upon...wildlife in the timber sale area. (Letters #3, 6, 10, 11, 15, 22, 24, 25, 29, 31, 34, 44, 52, & 56)</p>
-------------------	---

Response: The impacts to wildlife and wildlife habitat has been analyzed and determined to be within Forest Plan Standards and Guidelines. The project will affect a minor amount of available habitat and individuals of particular wildlife species. Similar habitats remain in abundance across the planning area.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.91-110, *Environmental Consequences* pp.36-115. **Project Record** *Wildlife BA/BE* pp.6-53.

Changes to FEA: No changes were made to the FEA based on these comments.

Comment #10	<p>Cumulative Impacts to Wildlife These forests also provide invaluable wildlife habitat. The Snowy Range has already been extensively logged and an extensive road system has been emplaced. This has significantly impacted many wildlife species...The Silver Run Timber Sale, through more clearcutting and road building, would add to these devastating cumulative impacts. (Letters #2, 3, 6, 8, 9, 10, 11, 12, 14, 15, 17, 24, 25, 29, 33, 34, 39, 44, 46, 48, 52, & 56)</p> <p>Current plans that include clearcutting would have immediate and long-term negative impacts on the area’s wildlife resources. Wildlife can only be displaced so often. (Letters 17 & 46)</p> <p>Clearly, if the FS is to complete an adequate analysis and assessment of the impacts of the Silver Run timber sale, the indirect impacts of road edges, extending into the depth-of-edge influence as defined by Reed et al. (1996). (Letter #54)</p> <p>While the DEA presents general information regarding cumulative impacts, the discussion lacks any specific disclosure of where these impacts have occurred, to what extent they have occurred, and fails to disclose whether the impacts of these activities are relatively noticeable or not. Given this lack of information, it is difficult, if not impossible, to understand the potentially significant impacts of the Silver Run timber sale to recreation, visual, and other resources, indicating substantial questions exist over whether the timber sale poses significant impacts or not and an EIS is necessary to adequately document the impacts of the Silver Run timber sale. (Letter #54)</p>
--------------------	--

Response: Existing cumulative impacts related to wildlife were measured and evaluated in a variety of ways documented throughout the WL/BA/BE report and summarized in the DEA. These include measures of vegetation diversity such as forested areas in early seral stages due to past timber harvest, amount and distribution of late-seral forest, identification of large blocks of mature forest, areas of forest fragmentation, road density, amount of unroaded areas, and measures of habitat capability for various wildlife species. In addition, working maps reside at the district office and in project files, which portray a visual overview of the area and the factors mentioned above. Together, these attributes indicate that overall cumulative impacts are within the ranges originally decided on during the Forest Planning Process, and will remain within those standards after implementation.

Clearcutting in lodgepole pine forest simulates a stand replacement disturbance and may have temporary disturbances to wildlife. Stand replacement events such as fire or insect invasion were historically common across the Southern Rocky Mountain Landscape and thus, wildlife species present in these areas today are adapted to a diverse and changing landscape. By maintaining an adequate distribution and abundance of forest types, tree sizes, stand ages, and stand sizes across the watershed, habitat is provided to maintain the presence for all species. The WL/BA/BE report and the DEA evaluated the presence of these habitat characteristics and found them adequate to support a continuing population of the species present.

The effects of roads were considered using road density, the location of the roads, and an assumed zone of influence to wildlife along road edges. (pg 19, WL/BA/BE). To identify areas particularly important to wildlife species sensitive to road disturbances, a map was constructed (which resides in the district files) buffering all existing roads up to one mile. This exercise identified those areas unaffected by existing roads and ensured that the project proposal avoided these areas.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.91-110. *Project Record Wildlife BA/BE* pp.6-9, 12-19, 31-33, 34, & 42-52.

Changes to FEA: No changes were made to the FEA based on these comments.

Comment #11	Interior Forest What needs to be preserved is interior forest for those species which require it, such as the pine marten and brown creeper. (Letter #40)
--------------------	--

Response: The presence and distribution of late-seral forest (interior) was analyzed in the WL/BA/BE sections for Old Growth Forest (pg 8 and 9) Fragmentation (9-11), and Pine Marten (14-15). This analysis includes the identification of four large blocks of old and continuous forest within the analysis area and how the project impacts these areas.

The brown creeper is neither a USFS Region 2 sensitive species nor is it a management indicator species and thus was indirectly addressed using the MIS concept. The overriding concept behind addressing selected management indicator species (marten) is that impacts to other species using similar habitat (brown creeper) are indirectly addressed and that the biologist used professional judgment to determine that impacts to brown creeper are similar to or less than those to marten.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.89-110. *Project Record Wildlife BA/BE* pp.8-11 & 14-15.

Changes to FEA: No changes were made to the FEA based on these comments.

Comment #12	<p>Sensitive Species Without reliable population data for sensitive species – and without reliable estimates of how many individuals might be impacted – reviewers cannot understand the significance of the impacts posed by the alternatives considered in the DEA. (Letter #54)</p> <p>We request the FS fully explain why other sensitive species were not addressed in the DEA and we further request that the agency fully address the potentially significant impacts of the Silver Run timber sale to pygmy shrew, olive-sided flycatcher, and fisher. (Letter #54)</p>
--------------------	--

Response: The biological evaluation addresses in detail, impacts to sensitive species including marten, goshawk, boreal owl, three-toed woodpecker, wood frog, and boreal toad. For marten, goshawk, and boreal owl, a combination of observation data, species home range size, and preferred habitat characteristics were used to estimate the number and location of individual territories within the analysis area. With this information, it was possible to estimate the number of likely occupied home ranges that would be impacted and how severe those impacts would be. Recommendations were made to avoid particular harvest units with the highest potential to affect these species.

Since population data is more difficult to extrapolate regarding woodpeckers and amphibians, observation data, habitat availability, and projected habitat impacts were deemed adequate to analyze projected impacts to the species.

All remaining sensitive species were eliminated from detailed analysis because the pre-field review determined the project would have no measurable impact on the species for a variety of reasons. Documentation of this exercise resides in Table 2 (page 38-41) of the WL/BA/BE. Specifically, pygmy shrew was eliminated from detailed analysis because the project avoids disturbance to wetlands, Olive-sided flycatcher was eliminated from detailed analysis because there are no records of them in the area, and their preferred habitat (snags adjacent to openings) are minimally affected or unaffected by the project proposal. Fisher was eliminated from detailed analysis because they are not known to inhabit the area.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.100-103. *Project Record Wildlife BA/BE* pp.37-52.

Changes to FEA: No changes were made to the FEA based on these comments.

Comment #13	<p>MIS By failing to disclose the presence and analyze impacts to MIS that exist in the project area, the MBNF and the decision maker cannot possibly be adequately informed of the impacts of the Silver Run timber sale to native species and the MIS in question and cannot possibly make a reasoned decision. (Letter #54)</p> <p>Furthermore, the FS has failed to present or cite any habitat and population trend data for management indicator species. The DEA fails to disclose any population trend data for northern goshawk and pine marten and fails to determine any relationship between these population trends and habitat changes. (Letter #54)</p>
--------------------	---

Response: Those MIS whose habitat was clearly affected by the project were analyzed in detail on pages 12 through 18 of the WL/BA/BE. All MIS were reviewed on pages 11-12. For many species the biologist determined that no analysis beyond the pre-field review was necessary to determine minimal or no impacts from the project proposal. In general, species were dismissed from additional detailed analysis because their habitat was wholly unaffected, negative effects are unlikely or negligible, and/or the species resides in similar habitat to other MIS. Additional population trend information has been included for selected MIS as part of the project record.

Wildlife biologists on the Medicine Bow National Forest predict that the Forest-wide population trends of northern goshawk are stable and constitute a viable population for the following reasons. There are more than 300 identified nests on the Forest, based on past survey information since the mid-1990's. 290 have been identified on the Brush Creek-Hayden Ranger District, 17 on the Laramie Ranger District, and 25 on the Laramie Peak Unit of the Douglas Ranger District. Identified nests included both active and inactive nests. It is estimated that many more nests are present, based on the presence of suitable nesting and foraging habitat and that summer field crews commonly detect goshawk foraging or nesting. Specific goshawk surveys conducted in nesting habitat (to mitigate project proposals) often find active goshawk present. The annual survey of 15 to 60 known nests across the Forest show a range of occupancy from 15% to 34%.

The Wyoming Game and Fish Department allows the legal take of goshawk under specific permitted conditions, and these permits are known to be issued and collection occurring for areas of the Medicine Bow National Forest. In 1998, the US Fish and Wildlife Service determined that federal listing of the goshawk was not warranted because they found no evidence of a declining population trend. This finding was based on habitat and population information supplied in part by the US Forest Service including the Medicine Bow/Routt National Forests.

Administrative measures are in place to protect goshawk habitat including the Forest Plan Standard of "maintaining habitat at 40 percent or more of potential," and "no activities shall be allowed within ¼ mile of an active goshawk nest... from March 1 to July 31 if they would cause nesting failure or abandonment." Forest-wide habitat capability modeling conducted for past Medicine Bow Monitoring and Evaluation Reports indicate that "... (goshawk) are being provided habitat with at least forty percent or more of potential capability... which is considered adequate to provide habitat to sustain viable populations of the species."

As discussed in the BA/BE/Wildlife specialist report, the analysis area is estimated to contain approximately 8 goshawk territories, one of which is potentially affected by the project proposal. Protection measures have been put in place around the two known nest sites in an effort to eliminate negative effects to future nesting. These measures include avoidance of all habitat disturbance within a 650 foot radius of known nests, identification and avoidance of 3 reserve nesting areas (30 acres each), and seasonal restrictions on project activities within ¼ mile of known nest sites (March 1 through August 15st or longer). Furthermore, habitat modeling in the analysis area indicates that the overall habitat capability index will remain at 54%, thus providing the same overall habitat conditions for goshawk with a 2% increase in foraging, and a 2% decrease in nesting habitat. These habitat changes will remain within Forest Plan standards and guides and retain a viable goshawk population. As a result of examining the Forest-wide information and the expected local impacts to individuals, it is reasonable to conclude that the Silver Run project proposal will have minimal to no negative effects to the Forest-wide trend for goshawk.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.89-110. *Project Record Wildlife BA/BE* pp.11-18.

Changes to FEA: Base on these comments, additional discussion has been included in the Wildlife portion of the *Environmental Consequences* section of the FEA concerning the rationale for MIS selection and analysis.

Comment #14	Use of HABCAP Although the FS states that HABCAP alone cannot enable the FS to accurately assess impacts to native species, the 1985 MBNF Forest Plan relies heavily, if not entirely, on the HABCAP model to ensure the viability of native species. We request the FS better explain how HABCAP was used to assess impacts, especially in light of the documented habitat declines for pine marten and northern goshawk, and explain how HABCAP values relate to the documented habitat declines. (Letter #54)
--------------------	---

Response: The HABCAP values generated indicate a weighted percent of functioning habitat compared to an ideal situation where 100% of the analysis area is optimum habitat. As result, generated HAPCAP figures are usually lower than the existing condition because a portion of the analysis area is naturally in a different habitat type than needed by the species. One example includes grasslands, shrublands, and meadows, which naturally do not contribute to pine marten habitat. Those acreages are considered when calculating total capable habitat and thus, when using HABCAP, the modeled result of actual habitat will be less than 100% of capable habitat even if all forested stands are in ideal condition for the species. Therefore, while habitat modeling is useful in showing the scale of habitat changes for the proposed project within the analysis area, additional information such as the capability of the landscape, human disturbances, presence of individuals of the species, and habitat availability across the forest should be considered to evaluate the significance of projected impacts on individuals and the species. This type of information is documented for each of the MIS in the WL/BA/BE report.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.89-110. **Project Record** *Wildlife BA/BE* pp.11-18.

Changes to FEA: No changes were made to the FEA based on these comments.

Comment #15	<p>Coarse-Woody Debris In terms of coarse-woody debris requirements, we are very concerned that the Silver Run timber sale will not leave sufficient coarse woody debris for wildlife and for forest health. (Letter #54)</p> <p>Given that the Silver Run Analysis Area receives a higher amount of recreational use than other areas, we are also concerned that the area may experience higher levels of firewood gathering. This could be adversely impacting the availability of snags and down woody debris and consequently the availability of habitat for many species of wildlife dependent upon such habitat, such as three-toed woodpecker, boreal owl, red-backed vole, pine marten, and others. The FS must fully address the potentially significant impacts of firewood gathering in an EIS to ensure the Silver Run timber sale does not jeopardize populations of native wildlife species. (Letter #54)</p>
--------------------	--

Response: Forest Plan requirements for coarse woody debris will be met within project harvest areas through slash and snag retention standards. The effects of firewood gathering are outside the scope of this analysis.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.89-110. **Project Record** *Wildlife BA/BE*

Changes to FEA: No changes were made to the FEA based on these comments.

Comment #16	<p>Snags The DEAs analysis and assessment of the Silver Run timber sale to snags is entirely lacking. In fact, the DEA seems to entirely overlook the potentially significant impacts of the Silver Run timber sale to snags. (Letter #54)</p> <p>The FS must fully address the potentially significant impacts of firewood gathering in an EIS (as it pertains to snags) to ensure the Silver Run timber sale does not jeopardize populations of native wildlife species. (Letter #54)</p> <p>The reasons cited for timber harvest, i.e., reducing dwarf mistletoe and beetle infestation are important primarily when one considers a forest as a tree farm. Dead trees are much needed for soil regeneration and wildlife habitat. (Letter #40)</p>
--------------------	---

Response: Page 9 of the WL/BA/BE addresses the frequency and quality of snags in both the harvest units and throughout the analysis area. Silvicultural prescriptions are designed to retain a minimum of 4 to 6 snags per 10 acres as directed in the Forest Plan.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.89-110. **Project Record** *Wildlife BA/BE*

Changes to FEA: No changes were made to the FEA based on these comments.

Comment #17	<p>Fragmentation While the FS is proposing to restore natural patch size and characteristic landscapes, it seems that the agency really has no idea what actually constitutes natural patch size or a characteristic landscape. The FS seems to be making unsupported assumptions, making it highly uncertain that fragmentation will be adequately mitigated by the Silver Run timber sale and the purpose and need actually achieved. At the least, a high level of scientific controversy exists, indicating an EIS is required for the Silver Run timber sale. We also request the FS disclose its methodology in assessing the impacts of fragmentation in the Silver Run timber sale area and the impacts of the timber sale. (Letter #54)</p> <p>The proposed sale will increase the amount of forest near roads and the amount of edge-affected habitat...already at excessive levels in the Snowy Range. (Letters #38 & 40)</p>
--------------------	---

Response: See responses to **Wildlife Comments #9, #10, #11, #12, #13, #14, #15, & #16.** Discussed on pp.8-16 of the DEA, managing the vegetation to better reflect the Characteristic Landscape was identified as one of the primary resource needs in the Silver Run area. The project proposal was designed to minimize additional fragmentation by placing proposed units within or adjacent to previous harvest activity. A discussion of the proposal on habitat fragmentation or more appropriately habitat perforation can be found on pp. 89-92 of the DEA. As discussed in this section, habitat connectivity will be maintained and minimally affected by the proposal. The effects of the project proposal on habitat perforation are addressed in greater detail within the WL/BA/BE pp.9-11 in the Project Record.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.89-110. **Project Record** *Wildlife BA/BE* pp.9-11.

Changes to FEA: No changes were made to the FEA based on these comments.

Economics

Comment #18	<p>Uneconomical Proposal Economically it does not make sense, since thousands of people spend a lot more money to enjoy the area than the value of the timber sale. (Letters #18, 19, & 57)</p> <p>This area provides valuable recreational opportunities to the people of southern Wyoming that is more important than the money that could be made by destroying parts of the forest. (Letters #8, 39, 41, & 54)</p> <p>Sustaining the natural environment and the ecosystem it nurtures is of far greater importance than the promotion of economic development. (Letter #4)</p> <p>Understandably, you hope to provide work for local timber workers by offering this sale; however, you need to consider the economic impact of diminished tourism as a result of more ugly clearcuts, which make many forms of recreation less attractive. (Letter #40)</p> <p>Most of the Snowy Range has been clearcut and logged to death. It's time to stop this single-minded use of the Snowy Range and leave some room for other uses. The recreational uses generate far more economic results than timber, recreational uses will last forever, in other words, they are sustainable. (Letters #28 & 32)</p>
--------------------	--

Response: See response to **Recreation Comment #1**. As displayed on Table 29 Economic Efficiency by Alternative on p.112 and discussed on pp.111-113 of the Economics portion of the *Environmental Consequences* section of the DEA, all the action alternatives have a positive Present Net Value and Benefit/Cost Ratio and are therefore economically efficient. Though this is the case, many of the benefits and costs associated with the Alternatives are difficult to quantify with a monetary value (i.e., forest health, non-game wildlife, etc.). When evaluating trade-offs, the use of economic efficiency measures is **one** tool used by the decision maker to take in account in deciding the preferred alternative to implement in the Silver Run Analysis Area.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.36-115. *Project Record Silviculture and Timber Report*.

Changes to FEA: No changes were made to the FEA based on these comments.

Vegetation/Treatment

Comment #19	<p>Appropriateness of Logging Logging cannot be the first priority or even an equal priority to the tourism, recreational, and habitat-protection opportunities afforded by the best use of our public lands. (Letters #33 & 36)</p> <p>Ecologically, it makes no sense. I am appalled that in the 21st century the NFS even considers logging a very scenic yet marginally productive piece of forest. (Letters #18, 19, & 57)</p> <p>It remains unclear throughout if the proposed action is mainly designed to promote Forest Health, or if it is mostly intended to provide a Flow of Timber. (Letter #5)</p> <p>I really hope you can see another way to “protect the health of the Bow” than logging in this area. I have a hard time picturing this section as a necessary cut for the forest ecology, and it is a horrid choice from the standpoint of aesthetics and recreation. (Letter #21)</p> <p>The proposed sale will lead to a decline in forest health by increasing the amount of forest near roads...already at excessive levels in the Snowy Range. (Letters #38 & 40)</p> <p>Isn't drought as much, or more, a factor in tree mortality than disease or insects? Are we not overly concerned with tree mortality? Forests have existed for eons. (Letter #4)</p>
--------------------	---

Response: See responses to **Recreation Comment #1, Economics Comment #18, and Vegetation/Treatment Comment #21.** The Purpose and Need for the proposal is discussed beginning on p.3 of the DEA under the Summary section. A more detailed discussion is contained on pp.5-15 of the DEA comments are beyond the scope of this project specific analysis. Table 8 on p.33 of the DEA displays how each alternative addresses the Purpose and Need for the proposal. As pointed out on p.5 of the DEA, the Forest Service has the responsibility of implementing the Forest Plan by completing analysis and evaluation of site-specific projects. The intent of the Forest Plan is to manage National Forest System lands for multiple-use and not for any single purpose-- such as recreation or for just timber harvest.

As pointed out on p.13 of the DEA, there are approximately 13,400 acres or 44% of the entire Silver Run Analysis Area that meets the National standard for being capable and suitable for timber management. Disclosed on pp.10-11 of the DEA, beginning with the logging the Silver Run area has experienced almost continuous logging activity since the 1860's. It is interesting that even with over a hundred years of logging, including eight different timber sales in the area over the last 28 years, the commenter still considers the area very scenic. All action alternatives were found to be consistent with the Forest Plan standards and guidelines for all resource areas as long as recommended mitigation and monitoring is effectively implemented (pp.28-31 DEA).

New specified road construction was identified as a significant issue on p.18 of DEA. Alternative 3, which has no new specified road construction (DEA pp.26-27), was specifically designed to address this significant issue and concern. The Forest Plan requires that all new roads that are constructed or (currently closed) roads reconstructed for timber sales be physically closed following completion of the project. Due to this, it is anticipated that there will no net gain in the amount of forest near roads.

Alluded to on p.12 of the DEA, beetle outbreaks are cyclic like drought. The lack of water brought about by drought conditions puts trees under more stress reducing their production of sap. As discussed in the DEA on p.64, sap is the tree’s main defense against beetle attack. Due to this, it can be reasonably assumed that drought does make trees more susceptible to beetle attack and that it can lead to an increase in beetle intensity and subsequent tree mortality.

Dwarf mistletoe on the other hand being a parasitic plant that feeds off the tree’s water and food tubes in the cambium would most likely be equally negatively affected by drought. In weakening the tree further to beetle attack, interesting enough the mistletoe sets up it own demise. Once the trees has been successfully attacked and killed by the beetles and associated blue stain fungus, the mistletoe also dies along with its host!

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.36-115. **Project Record** *Silviculture and Timber Report*.

Changes to FEA: Based on these comments additional language has been added to the action alternatives descriptions in the FEA stating the intention to close all temporary roads, along with all new specified roads that are constructed or (currently closed) reconstructed for timber sale following completion of the project.

Comment #20	<p>Forest Re-growth When regrowth in the Snowies takes over one hundred years, how can you justify cutting out a chunk of the forest for mere money? The next four generations will have to live with this short-sightedness. (Letter #1)</p> <p>The preferred alternative does not take into consideration cumulative effects of additional harvest on previous clearcuts. This part of the forest has already been rather heavily cut, as can be seen from aerial photos. Prior to timber sales the FS should present evidence that trees in earlier clearcut areas similar to those proposed for harvest have shown sustainable regrowth, as measured by site indices. (Letter #40)</p>
--------------------	---

Response: See response to **Vegetation/Treatment Comment #19**. As alluded to on p.11 and later discussed in more detail on pp.66-68 of the DEA, past regeneration harvests such as clearcutting have been a resounding success in regenerating new lodgepole pine and aspen stands in the vicinity. The growth and density of regeneration has required that precommercial thinning be conducted on many of these stands. Resource Information System (RIS) database and on-site field observations by the Project Silviculturist indicate that past regeneration harvests in the vicinity have regenerated to fully stocked stands. It is the professional opinion of the Project’s Certified (Region 2) Silviculturist that there should be no problems in obtaining natural regeneration to meet the NFMA standard within five years of any proposed regeneration harvest.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.36-115. **Project Record** *Silviculture and Timber Report*.

Changes to FEA: No changes were made to the FEA based on these comments.

Comment #21	<p>Dwarf Mistletoe It seems strange that only 50 years later we should have to resort to massive logging and cutting to combat this dwarf mistletoe (“a major effect of...logging and subsequent cutting until around 1950” p.11) in order the preserve forest health. Apparently we are not worried what the unexpected consequences of such forest clearances of millions of board feet might be, 50 years from now. (Letter #5)</p> <p>The DEA entirely fails to disclose the beneficial impacts of not suppressing and/or controlling dwarf mistletoe. While the FS may believe that the beneficial impacts of controlling and/or suppressing dwarf mistletoe far outweigh the beneficial impacts of leaving dwarf mistletoe alone, we have not come across any information or analysis suggesting this to be true. (Letter #54)</p>
--------------------	---

Response: See responses to **Recreation Comment #1 and Vegetation/Treatment Comment #19 and #20**. As pointed out beginning on p.11 of the DEA, dwarf mistletoe is a parasitic plant that infects a high percentage of the lodgepole pine stands (84%) which is the dominant forest type within the analysis area. Mistletoe deforms and weakens trees making them more susceptible to other diseases and insects—such as mountain pine beetle. All of the proposed silvicultural treatments under the action alternatives (p.20 DEA) are designed to reduce or minimize the presence of mistletoe to maintain improve tree growth and health in treated and adjacent stands.

As stated on p.73 of the Vegetation portion of the *Environmental Consequences* section of the DEA, in discussing the implications of the No Action alternative, it is recognized there is no threat of ecological collapse or loss of ecological function from dwarf mistletoe and other disturbance agents. The forests of the Central Rocky Mountains and Silver Run vicinity have proven resilient if not dependent on these natural agents and associated disturbance cycles (Alexander 1981). Natural agents such as mistletoe only become problematic when they threaten the uses we manage forests for. As previously stated under the Forest Plan most of the proposal is within a 7E management area that emphasizes timber management. All the commercial vegetation treatments under the proposal are situated within stands that have been classified as being suitable for timber production and management thus contribute towards the Forests overall allowable sale quantity (ASQ).

As displayed on p.67 of the DEA, there is an estimated 24,700 acres that are forested, or approximately 80% of the analysis area. Of this amount (p.67 DEA) approximately 13,400 acres are classified as being suitable for timber management. The remaining 11,300 forested acres that are classified as being unsuitable for timber management, including much of the inventoried roadless areas and Research Natural Area, would be areas where dwarf mistletoe and other natural agents are currently allowed to progress unchecked. There will still be an estimated 11,694 acres of suitable forest with commercial volume that will be present in the Silver Run Analysis Area following the completion of this proposal. Dominated by mostly lodgepole pine, much of this acreage currently has and will continue to have dwarf mistletoe after proposed treatments.

DEA/Project Record: *DEA Summary p.3, Background pp.5-7, Purpose & Need for Action pp.8-18, Comparison of Alternatives, Including the Proposed Action pp.19-35, Environmental Consequences pp.36-115. Project Record Silviculture and Timber Report.*

Changes to FEA: No changes were made to the FEA based on these comments.

Comment #22	Horse Logging Has anyone considered putting the sale up for “Horse loggers only?” They still would be running chainsaws all day, within a mile of many residential sites, but would perhaps offer conscious alternative to the usual practices witnessed of many commercial logging operations. (Letter #27)
--------------------	---

Response: See response to **Vegetation/Treatment Comment #19**. An analysis of the Silver Run alternatives found there were no overriding resource reasons to restrict or prohibit conventional logging operations and require horse logging. The size of the proposal would make it very prohibitive for a horse logging operation to be able to handle the amount of volume and/or afford the sale contract. As has happened on other timber sales, the purchaser of the sale has both the option and discretion to subcontract with a potential horse logger in specific sale harvest units.

As displayed by Map 3 on p.22 of the DEA, most of the timber sale proposal is concentrated in the northern portion of the area where the existing road system was constructed for and by past timber sales. The closest “residential” area is in the extreme eastern portion of the analysis area along the Forest Boundary. As shown by the map there is only one harvest unit within a mile of the Forest Boundary, with the remainder of the units 2 to 3 miles or more away from the Boundary. Based on past experience it would be anticipated that any logging activity would be very localized and short-term.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.36-115. **Project Record** *Silviculture and Timber Report*.

Changes to FEA: No changes were made to the FEA based on these comments.

Comment #23	<p>Use of Clearcutting Scientific wisdom has clearly illustrated the devastation wreaked by clear cutting, especially along riparian zones; this methodology needs to be eliminated altogether, especially when we consider how very slowly trees grows at the high elevation and dry conditions of the Medicine Bow/Snowy Range area. (Letter #48)</p> <p>Current plans that include clearcutting would have immediate and long-term negative impacts on the area’s wildlife, water, timber, and recreational resources. Wildlife can only be displaced so often, watersheds can only suffer so much runoff, and viewsheds can only be impacted to a relatively limited extent before the resource becomes destroyed for all practical purposes. (Letters #17 & 46)</p> <p>In the case of the Silver Run timber sale, the FS and the DEA do not explain whether or not clearcutting is in fact the optimum method. There is no discussion as to whether clearcutting will be carried out in a manner consistent with the protection of soil, watershed, fish, wildlife, recreation, and esthetic resources, as well as the regeneration of the timber resource. An EIS must fully address whether clearcutting is the optimum method of timber harvest. If clearcutting is determined to be the optimum method, we request the FS fully explain how clearcutting is optimum in light of the documented adverse impacts to soil, watershed, fish, wildlife, recreation, and esthetic resources. (Letter #54)</p>
--------------------	---

Response: See response to **Vegetation/Treatment Comment #19 and #20.**

Clearcutting was identified as a significant issue on p.18 of the DEA. With no clearcut treatments, Alternative 2 was specifically designed to address this significant issue and concern. There are areas on the Snowy Range portion of the Forest predominantly at higher elevations (i.e. >10,000’ Upper French Creek/Libby Flats) where clearcuts done as recently as the 1970’s in stands dominated by spruce-fir have been slow to recover. Displayed on Table 8 on pp.32-34 of the DEA, only 197 acres or approximately 42% of the entire harvest proposed is clearcut under the Proposed Action. As stated on p.20 of the DEA, all clearcutting under the proposal is within stands dominated by lodgepole pine and/or aspen below 10,000 feet in elevation. All stands dominated by spruce-fir will be treated under partial cut methods such as shelterwood.

As alluded to on p.11 and later discussed in more detail on pp.66-68 of the DEA, past regeneration harvests such as clearcutting have been a resounding success in regenerating new lodgepole pine and aspen stands in the vicinity. The growth and density of regeneration has required that precommercial thinning be conducted on many of these stands. Resource Information System (RIS) database and on-site field observations by the Project Silviculturist indicate that past regeneration harvests in the vicinity have regenerated to fully stocked stands. It is the professional opinion of the Project's Certified (Region 2) Silviculturist that there should be no problems in obtaining natural regeneration to meet the NFMA standard within five years of any proposed regeneration harvest.

DEA/Project Record: *DEA Summary p.3, Background pp.5-7, Purpose & Need for Action pp.8-18, Comparison of Alternatives, Including the Proposed Action pp.19-35, Environmental Consequences pp.36-115. Project Record Silviculture and Timber Report.*

Changes to FEA: No changes were made to the FEA based on these comments.

Alternatives

Comment #24	<p>Recommended Changes to the Proposal Why not combine the best of both (alternatives 2 &3) as outlined:</p> <table style="margin-left: 40px;"> <thead> <tr> <th></th> <th style="text-align: center;"># of units</th> <th style="text-align: center;">Acres Treated</th> </tr> </thead> <tbody> <tr> <td>Clearcut</td> <td style="text-align: center;">6</td> <td style="text-align: center;">70</td> </tr> <tr> <td>Overstory Removal</td> <td style="text-align: center;">5</td> <td style="text-align: center;">150</td> </tr> <tr> <td>Sanitation/Salvage</td> <td style="text-align: center;">2</td> <td style="text-align: center;">30</td> </tr> <tr> <td>Shelterwood/Seed Cut</td> <td style="text-align: center;">2</td> <td style="text-align: center;">60</td> </tr> <tr> <td>TOTAL</td> <td style="text-align: center;">15</td> <td style="text-align: center;">310</td> </tr> </tbody> </table> <p>No new road construction. Temp road construction not to exceed one mile. This alternative significantly reduces clearcutting and road building yet treats 66% of the acres of the proposed action. A big plus for the environment. (Letter #4)</p> <p>Recommend 1) Include a statement asserting that any damage or obliteration of an existing recreational trail by a treatment activity will be restored or relocated by the FS to maintain its function. 2) Reconsider the specification of the section of CC 13 that would obliterate part of the Camp Loop Trail to Sanitation/Salvage. 3) Impose a buffer of 31-meters (100 feet), similar to that for kettle ponds and riparian vegetation along existing recreational trails. This buffer could have the Sanitation/Salvage treatment designation. 4) Consider altering the new road through CC Unit 11 so that it comes in from FR 330A rather than continuing on from CC Unit 10. This would eliminate the disruption of the Lodgepole Loop Trail. 5) If 4 is not feasible because of the terrain, change the designation of this road to temporary, and obliterate it after the treatment. Maintaining the road, even though it is closed, will invite trespass by ATVs. (Letter 4)</p>		# of units	Acres Treated	Clearcut	6	70	Overstory Removal	5	150	Sanitation/Salvage	2	30	Shelterwood/Seed Cut	2	60	TOTAL	15	310
	# of units	Acres Treated																	
Clearcut	6	70																	
Overstory Removal	5	150																	
Sanitation/Salvage	2	30																	
Shelterwood/Seed Cut	2	60																	
TOTAL	15	310																	

Response: Descriptions and a comparison of the various Silver Run alternatives can be found on pp.19-35 of the DEA.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.36-115. **Project Record** *All Resource Specialist Reports*.

Changes to FEA: Based on these and other comments, consideration will be given to changes in project design under the final Silver Run decision.

Comment #25	<p>Alternative 1 – No Action Most of the Snowy Range has been clearcut and logged to death. It’s time to stop this single-minded use of the Snowy Range and leave some room for other uses. The recreational uses generate far more economic results than timber, recreational uses will last forever, in other words, they are sustainable. Once the trees are clearcut there is no more benefit, only degradation, erosion and loss of wildlife habitat. The No Action alternative is actually action when you consider the recreational and preservation aspect of its potential. (Letters #28 & 32)</p>
--------------------	--

Response: See responses to **Recreation Comment #1, Economics Comment #18, and Vegetation/Treatment Comments #19, #20, #21, & #22**. Descriptions and a comparison of the various Silver Run alternatives including Alternative 1 No Action can be found on pp.19-35 of the DEA. Discussion and analysis pertaining to the effects of each alternative on each specific resource area can be found in the *Environmental Consequences* section of the DEA on pp.36-115.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.36-115. **Project Record** *All Resource Specialist Reports*.

Changes to FEA: No changes were made to the FEA based on these comments.

Watershed/Soil Impacts

Comment #26	Clearcutting Current plans that include clearcutting would have immediate and long-term negative impacts on the area's ... water resources. ... watersheds can only suffer so much runoff... before the resource becomes destroyed for all practical purposes. (Letters #17 & 46)
--------------------	--

Response: Existing water yields are low for the watersheds in this area. Water yield is estimated by calculating Equivalent Clearcut Acres (ECA); ECAs for the Proposed Action would increase 0.7% to 4.3%, resulting in cumulative ECAs of 1.6% to 17.5% (Table 14 p.53 DEA). Water yields are not considered to be significant until approximately 25% of the forested basal area (estimated using ECA) on the watershed has been removed (FSH 2509.11.1). The streams in this area have stable stream channels and can withstand water yield increases of this size without adverse effects on stream channels or increases in fine sediment.

While fine sediment delivery to stream channels will increase locally for several years where road construction and reconstruction affects stream crossings, road erosion would decrease over the long term as the road reconstruction would reduce sediment from NFSR 338 and 338.G. Watershed restoration activities would also reduce erosion in the watershed. Roads would be designed using current standards, which minimize erosion from roads.

DEA/Project Record: *DEA Summary p.3, Background pp.5-7, Purpose & Need for Action pp.8-18, Comparison of Alternatives, Including the Proposed Action pp.19-35, Environmental Consequences pp.44-63. Project Record Fisheries, Aquatics, and Watershed Specialist Report.*

Changes to FEA: No changes were made to the FEA based on these comments.

Comment #27	Road Reconstruction It is unclear ... whether or not the beneficial impacts of road reconstruction will actually offset the negative impacts of road reconstruction. The DEA fails to describe what "temporary" means in terms of the increase in fine sediment into nearby creeks and at stream crossings. (Letter #54)
--------------------	---

Response: Sediment production from road construction and reconstruction is highest during the first several rainfall events, and then decreases as newly disturbed surfaces become armored. A study in Idaho found that the majority of sediment production occurred in the first two years after road construction. This study also found that straw mulch and erosion control mats reduced sediment production by more than 80% (Burroughs, 1990).

While a detailed study would be needed to determine volumes of sediment produced by road construction versus sediment decreased by road reconstruction, this project would decrease existing long-term sediment delivery from NFSR 338 and 338.G. As new road construction has only one stream crossing and would be designed to minimize erosion, it is probable that long-term sediment production from roads would be reduced in the watershed. An erosion control plan for each culvert replacement or installation is listed as a mitigation measure, to minimize sediment from road construction and reconstruction activities.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.44-63. *Project Record Fisheries, Aquatics, and Watershed Specialist Report.*

Changes to FEA: Based on this comment, “temporary” has been clarified as meaning from one to three years in the Watershed, Fisheries, and Aquatics portion of the *Environmental Consequences* section of the FEA.

Comment #28	Impacts of Existing Road Edges Clearly, if the FS is to complete an adequate analysis and assessment of the impacts of the Silver Run timber sale, the indirect impacts of road edges, extending into the depth-of-edge influence as defined by Reed et al. (1996), and the cumulative impacts of existing road edges to soils and watersheds must be considered. (Letter #54)
--------------------	---

Response: As stated on page 45 of the DEA, Forest roads are estimated to contribute 85% to 90% of the sediment reaching streams in disturbed forest lands (Burroughs, 1990). The cumulative effects analysis of existing roads included: field stream surveys, road density, and the proximity of roads to stream channels. These effects were discussed in the DEA on pages 45-46 and 53-55.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.44-63. *Project Record Fisheries, Aquatics, and Watershed Specialist Report*

Changes to FEA: No changes were made to the FEA based on these comments.

Comment #29	Riparian Buffers The FS is proposing to implement 100 foot buffers around glacial ponds and lakes (DEA, p. 29). Where is the scientific basis for implementing this buffer? Does the FS have monitoring data to suggest such a buffer adequately protects these unique features, including their soils, riparian vegetation, and hydrology? How does edge effect impact glacial ponds and lakes? (Letter #54)
--------------------	--

Response: Riparian forest buffers have been shown to be effective in maintaining stream and aquatic ecosystem processes (Welsch 1991). The 100-foot buffer exceeds the recommendations given in Welsch 1991. The 100 foot buffer width would maintain shade, leaf fall input and other environmental factors around the ponds. As disclosed in the DEA on p. 49, the timber harvest in the kettle ponds area, outside of the 100-foot buffer, may increase water runoff and sunlight, which could increase aquatic vegetation as well as the amount of water and length of time the ponds hold water.

As no equipment would be allowed in the ponds or dry depressions, the soils in these glacial features would not be affected by the proposed activities. Soils surrounding the kettle ponds are map unit number 108, a very stony loam. This soil has a moderate potential for compaction (p. 42 DEA and soils coverage in forest GIS database). The skid trails located outside of the 100-foot buffer would be compacted, but are not expected to intercept sub surface groundwater or otherwise effect the glacial depressions. The impacts to soil are expected to be within the 15% Region 2 Standards and Guidelines (DEA p. 43).

BMPs will be monitored for this project, including the specific BMPs for the timber harvest around the glacial depressions. This monitoring will determine the effectiveness of the BMPs in protecting the glacial depressions.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.44-63. **Project Record** *Fisheries, Aquatics, and Watershed Specialist Report*

Changes to FEA: No changes were made to the FEA based on these comments.

Comment #30	BMP Effectiveness While the FS claims that BMPs will effectively protect watersheds and soils, there is no information or analysis presented that supports the effectiveness of these mitigation measures in protecting watersheds and soils. (Letter #54)
--------------------	---

Response: Direct, indirect, and cumulative effects to watershed and soils are described in the DEA, with more detail available in the specialists’ reports in the project record.

The Watershed Conservation Practices (WCP) Handbook contains proven practices to protect soil, aquatic, and riparian systems. If used properly, they meet or exceed State Best Management Practices (FSH 2509.25). The WCP as well as site-specific mitigations have been incorporated into project design. In 2000, a review of Best Management Practices was conducted on the nearby Routt National Forest on a timber salvage operation by the State of Colorado. This review found that the planning, as well as implementation of BMPs and mitigation measures, were effectively implemented and consistent with the Clean Water Act. The summary letter from the Colorado Water Quality Division is in the project file.

The DEIS states that BMPs will be monitored to ensure effectiveness, and if not effective the operation will be halted until sufficient BMPs are designed and implemented.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.44-63. **Project Record** *Fisheries, Aquatics, and Watershed Specialist Report*

Changes to FEA: Based on this comment, additional discussion has been included before the *Soils* mitigation section of the FEA stating, “ The Watershed Conservation Practices (WCP) Handbook (FSH 2509.25) provides the Standards as well as the Guidelines or Design Criteria for the Forest Plan. Mandatory Best Management Practices per 33 CFR 323.4 (a)(6) to meet the requirements of the Clean Water Act will be implemented, with the following specific mitigations to protect the soil, water, and riparian resources during project implementation.”

Comment #31	NPDES Permit The fact that the FS has not obtained or indicated it intends to obtain a NPDES permit for the road construction proposed under the Silver Run timber sale strongly indicates that the timber sale threatens to violate a federal law – the Clean Water Act. (Letter #54)
--------------------	---

Response: Stormwater Discharge Permits are required for all activities that disturb over 1 acre of ground. However, there is an exemption for non-point silvicultural activities (40CFR 122.3e). The definition of non-point silvicultural activities includes road construction and maintenance (40CFR122.27b). The DEA does state that culvert installations or removals would be evaluated to determine if a state turbidity waiver is necessary (p.28 DEA). In addition, these projects will be evaluated to determine if a 404 permit from the COE is necessary, and a permit obtained as needed prior to project implementation.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.44-63. **Project Record** *Fisheries, Aquatics, and Watershed Specialist Report*

Changes to FEA: No changes were made to the FEA based on these comments.

Comment #32	Increase Sediment The proposed harvests are close to the North Fork of the Little Laramie River, as well as some of its tributaries. We are concerned about the effects of increased sediment upon these riparian areas. (Letter #40)
--------------------	--

Response: All streams and riparian areas would be buffered by a minimum of 100 feet. This buffer is adequate to filter out sediment from timber harvest activities (Welsch 1990). As stated in the EA, the road construction and reconstruction activities would temporarily (from 1 to 3 years) increase sediment, however the road reconstruction would reduce sediment delivery from NFSR 338 and 338G, which would result in a long-term reduction in fine sediment in the creeks in the area.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.44-63. **Project Record** *Fisheries, Aquatics, and Watershed Specialist Report*

Changes to FEA: No changes were made to the FEA based on these comments.

<p>Comment #33</p>	<p>Requests More Research The Republican Women’s Club officially, and for public record, requests research and baseline studies be initiated on all aspects of dense forest snowmelt hydrology. We call on NEPA Section 101, to assist this research with all practicable means and technical assistance, including financial, and the changes in policy to protect and maintain the water productivity of dense forest snowmelt hydrology...We also request long-term studies. Adequate time must be allowed in forest research, because literature is full of examples of forests showing a response 100 years after an event... We ask that there be no action involving dense forest snowmelt hydrology until research data and baseline studies have been completed. (Letter #61)</p>
---------------------------	---

Response: Numerous studies have measured the hydrologic response to timber harvest. The Rocky Mountains in Wyoming and Colorado have had two long-term studies: on the Fraser Creek Experimental Watershed in Colorado, and the Coon Creek Watershed near Hog Park Reservoir west of Encampment, Wyoming. Both studies measured increases in streamflow following timber harvest. The Fraser study measured an average increase in total streamflow volume of 40% over the 28 years following harvesting 40% of the watershed (Troendle and King 1985). The Coon Creek project harvested 24% of the watershed and measured an average increase in streamflow of 17% in the five years following timber harvest. Both studies measured increased duration of spring peak flows and no significant change in summer low flows (Troendle et al. 1998). A recent publication summarizes the large amount of research on this subject – Forests and Water: a State of the Art Review for Colorado by Lee Macdonald and John Stednick (2003). This publication is available on the Internet at:
<http://cwrrri.colostate.edu/pubs/series/completionreport/cr196.pdf>

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.44-63. **Project Record** *Fisheries, Aquatics, and Watershed Specialist Report*

Changes to FEA: No changes were made to the FEA based on these comments.

Roads

Comment #34	New Roads Building roads encourages more human impact as motorized recreational vehicles continue to seek adventures into remote wild lands. (Letter #48)
--------------------	--

Response: See **Vegetation/Treatment Comment #19**. New specified road construction was identified as a significant issue on p.18 of DEA. Alternative 3, which has no new specified road construction (DEA pp.26-27), was specifically designed to address this significant issue and concern. The Forest Plan requires that all new roads that are constructed or (currently closed) roads reconstructed for timber sales be physically closed to motorized use following completion of the project. Due to this, it is anticipated that there will no net gain in the amount of existing open roads and no increase in motorized access to unroaded areas in the project area as a result of implementing the proposal.

DEA/Project Record: *DEA Summary p.3, Background pp.5-7, Purpose & Need for Action pp.8-18, Comparison of Alternatives, Including the Proposed Action pp.19-35, Environmental Consequences pp.36-115. Project Record Roads Analysis Report.*

Changes to FEA: No changes were made to the FEA based on these comments.

Comment #35	Road Closures The road closures on page 118 are good but why not include FR338 and 338G? The more roads closed, the better protected the natural environment. (Letter #4)
--------------------	--

Response: No existing open Forest System roads are proposed to be closed under this proposal. The Watershed Rehabilitation projects listed on p.118 of the DEA involve proposals to remove man made obstructions (log bridges) within area stream courses, along with proposals to reduce erosion and stream sediment along the existing road system. The Ehlin Road NFSR 338 provides the major north to south access across the Forest from the Snowy Range Highway to NFSR 500 French Creek Road by Rob Roy Reservoir. NFSR 338.G is a dead-end gated road off NFSR 338. Partial harvest treatments proposed for units off NFSR 338.G will require future treatments, thus facilitating the need to keep this road system in place for future timber sale entries.

The Phase II analysis for the 2000 Medicine Bow Travel Management decision is scheduled to begin for the Snowy Range portion of the Forest including the Silver Run area during 2004. The purpose of this comprehensive analysis will be to identify what portions of the existing road system will remain in place and what roads should be closed to address resource concerns. It is anticipated that the work and analysis completed for the Silver Run Road Analysis report will be used as part of this effort.

DEA/Project Record: *DEA Summary p.3, Background pp.5-7, Purpose & Need for Action pp.8-18, Comparison of Alternatives, Including the Proposed Action pp.19-35, Environmental Consequences pp.36-115. Project Record Roads Analysis Report.*

Changes to FEA: No changes were made to the FEA based on these comments.

Inadequate Public Notice and Analysis

Comment #36	<p>Inadequate Public Notice Given the potential to significantly impact an area that is immensely popular and so widely valued, especially among the Laramie and Centennial communities, the FS should have made more of an effort to notify citizens living in these communities.</p> <p>When determining whether a public meeting is appropriate the FS must fully consider “whether there is substantial environmental controversy concerning the proposed action or substantial interest in holding the hearing.” BCA’s request for a public meeting was firmly founded on these regulations and was not arbitrary. (Letter #54)</p>
--------------------	---

Response: BCA’s request for a “last minute” public meeting or as they describe it “hearing” on the Silver Run proposal is unfounded. As demonstrated under the *Public Involvement* section of the DEA on pp.17-18, the public has been adequately involved in the Silver Run Analysis process. Public scoping on the Silver Run Timber Sale proposal originally occurred in 1997. Since that time it has been listed on the Forest’s Schedule of Proposed Actions. As shown by the public comments received on the DEA, the significant issues identified on p.18 of the DEA (Clearcutting, Aesthetics/Visual Quality, and New Roads) that were developed from the 1997 Silver Run scoping effort remain the major public concerns for the area six to seven years later. A legal ad disclosing the availability of the Silver Run DEA was published in the Laramie Boomerang newspaper. The document has also been available for viewing and/or downloading by interested parties off Forests/Grassland website.

As displayed on Table 9 on p.36 of the DEA, the Rainbow Valley Hazardous Fuels Analysis proposal is currently being implemented in the eastern portion of the Silver Run Analysis Area. Completed in August 2002, this analysis included a cumulative effects analysis of both the fuels proposal and the (future) Silver Run Timber Sale Proposed Action. The Rainbow Valley FEA listed the Silver Run Timber Sale as a foreseeable future project in the same analysis area along with the predicted (at that time) harvest treatment acreages. A half day long public meeting held for the Rainbow Valley proposal in Laramie during April 2001 had only four public participants and no participation by representatives from BCA.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.36-115. **Project Record** *All Resource Specialist Reports*.

Changes to FEA: No changes were made to the FEA based on these comments.

Comment #37	<p>Need for an EIS There exists substantial question over whether the Silver Run timber sale will have a significant impact on the human environment. In terms of both context and intensity, all indications are that an EIS is necessary to adequately address the potentially significant impacts of the Silver Run timber sale. At the least, the FS must revise the Silver Run DEA to ensure an adequate analysis and assessment of the environmental impacts of the Silver Run timber sale.</p> <p>Context: Given that the Silver Run timber sale is unique, especially in the context of the rest of the MBNF, and that the Silver Run timber sale will admittedly adversely impact the unique recreation experiences and opportunities within the timber sale area, the impacts of the timber sale are significant. Therefore, an EIS is required for the proposed Silver Run timber sale.</p> <p>Controversy: A significant level of controversy exists over the impacts of the timber sale to recreational opportunities in the Silver Run area, to visual quality, to wildlife and wildlife habitat, and also to watershed and soil health in the timber sale area.</p> <p>Uncertainty: ...to the impacts of the timber sale to rare and imperiled species of wildlife, to management indicator species, to water quality, to soil health, to recreation experiences and opportunities, and to forest vegetation in general are highly uncertain.</p> <p>Potential Violation of Federal Law: The Silver Run timber sale threatens to violate federal laws regarding the management of the MBNF, regarding protection of water quality and watershed health, and regarding the protection of threatened and endangered species, strongly indicating an EIS is required for the Silver Run timber sale. (Letter #54)</p>
--------------------	--

Response: The Silver Run DEA was written, based on the effects analysis of the alternatives and public input on the proposal. At this point in time it is usually known whether or not the proposed action may have a significant effect on the quality of the human environment. If, however, new information relating to the environmental impacts of the proposed action comes to the attention of the responsible official, the information will be reviewed carefully. CEQ regulation Sec. 1501.4 (c) states, “Based on the environmental assessment make its determination whether to prepare and environmental impact statement,” and “(e) Prepare a finding of no significant impact, if the agency determines on the basis of the environmental assessment not to prepare a statement.” As shown by the discussions under all the various resource areas within the Environmental Consequences section of the DEA on pp.36-115, all the action alternatives were found to be consistent with the Medicine Bow Forest Plan and all existing laws and regulations.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.36-115. Project Record *All Resource Specialist Reports*.

Changes to FEA: No changes were made to the FEA based on these comments.

Comment #38	Violation of NEPA All alternatives except no action actively violate NEPA and all regulations quoted...Indeed the definitions of irretrievable and irreversible do apply to a very identifiable resource: water. Water from dense forest snowmelt hydrology/soil – rock interface collection...Loss of the dense forest snowmelt hydrology is immediate loss of water, which is irreversible and irretrievable...(letter #61)
--------------------	--

Response: See responses to **Watershed/Soil Impacts Comment #33 and Inadequate Level of Analysis Comment #37.**

DEA/Project Record: *DEA Summary p.3, Background pp.5-7, Purpose & Need for Action pp.8-18, Comparison of Alternatives, Including the Proposed Action pp.19-35, Environmental Consequences pp.36-115. Project Record All Resource Specialist Reports.*

Changes to FEA: No changes were made to the FEA based on these comments.

Forest Plan

Comment #39	Management Area Prescriptions Although the DEA generally describes that particular MAPs exist and generally discloses their location, there is no specific information regarding their actual location in relation to the proposed treatments. Given this lack of information, it is impossible to understand the potentially significant impacts of the Silver Run timber sale to the various MAPs and difficult to understand whether the timber sale will comply with Forest Plan direction. This raises substantial questions over whether or not the Silver Run timber sale poses significant impacts to the human environment and whether or not the timber sale threatens a violation of the Forest Plan and consequently the National Forest Management Act (16 USC § 1604(i), thereby requiring preparation of an EIS. (Letter #54)
--------------------	---

Response: See responses to **Recreation Comment #1, #2, #3, & #5.** Forest Plan and management direction and acreages for the Silver Run Analysis were described and displayed on pp.13-14 of the DEA. On pp.17, 19, 23, & 26 of the DEA, it states the proposal is predominantly in the 7E (Wood Fiber Production & Utilization) management area with a small amount within 4B (Habitat for One or More MIS). Though this statement is true, it should have clarified that there are units under all the action alternatives that fall within the 2B (Rural and Roaded Natural Recreation) and a very small amount that is with the 1A (Developed Recreation) management areas also.

DEA/Project Record: *DEA Summary p.3, Background pp.5-7, Purpose & Need for Action pp.8-18, Comparison of Alternatives, Including the Proposed Action pp.19-35, Environmental Consequences pp.36-115. Project Record All Resource Specialist Reports.*

Changes to FEA/Project Record: Based on this and other comments, additional information and analysis have been added to the FEA and Project Record to clarify what management areas are affected by the action alternatives. A map of management areas and the proposed action units has also been added to Appendix B of the FEA. The *Recreation Report* has been re-written and additional analysis has been conducted to better disclose both the short and long-term effects of the proposal to the area’s recreation and visual resources. The Recreation portion of the *Environmental Consequences* section of the FEA has been revised to include this additional analysis and discussion.

Comment #40	Percent of acres as to MAPs: species habitat 39%, natural recreation 17%, wood production 9%. Is management being misallocated? (Letter #4)
--------------------	--

Response: See response to **Forest Plan Comment #39**. The management area allocation for the Silver Run Analysis area has been in place since the current Forest Plan was enacted in 1985.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.36-115. Project Record *All Resource Specialist Reports*.

Changes to FEA: Based on this and other comments, additional information and analysis have been added to the FEA and Project Record to clarify what management areas are affected by the action alternatives. A map of management areas and the proposed action units has also been added to Appendix B of the FEA.

Beyond the Scope

Comment #41	We request the FS fully address the potentially significant cumulative impacts of the expansion of this (Snowy Range) ski area and ensure that cumulatively, the Silver Run Timber Sale will not pose significant impacts to the human environment. (Letter #54)
	The DEA is silent with regards to the potentially significant impacts of motorized winter recreation. These potentially significant impacts stem from increased snowmobile use, more widespread snowmobile use, and traffic and congestion along Highway 130. The FS must fully address in an EIS these potentially significant cumulative impacts to ensure that cumulatively, the Silver Run Timber Sale will not pose significant impacts to the human environment and not jeopardize wildlife, wildlife habitat, air quality, and soil and watershed resources. (Letter #54)
	Additionally, we are concerned that trail construction and/or reconstruction may occur in the analysis area, also posing potentially significant cumulative impacts. The FS must address the potentially significant impacts of future recreational developments in an EIS. (Letter #54)

Response: These comments are beyond the scope of this project-specific analysis. The DEA listed Foreseeable Future Projects on p.36. All future projects proposed for the Silver Run area will require additional environmental analysis and documentation.

DEA/Project Record: *DEA Summary* p.3, *Background* pp.5-7, *Purpose & Need for Action* pp.8-18, *Comparison of Alternatives, Including the Proposed Action* pp.19-35, *Environmental Consequences* pp.36-115. **Project Record** *All Resource Specialist Reports*.

Changes to FEA: No changes were made to the FEA based on these comments.

LITERATURE CITED

- Alexander, Robert R., 1986, *Silviculture Systems and Cutting Methods for Old Growth Lodgepole Pine Forest in the Central Rocky Mountains*, USDA, Forest Service, Rocky Mountain Forest and Range Experiment Station, Ft. Collins, CO.
- Alexander, Robert R., 1987, *Ecology, Silviculture and Management of the Engelmann Spruce-Sub-alpine Fir Type in the Central and Southern Rocky Mountains*, USDA, Forest Service, Rocky Mountain Forest and Range Experiment Station, Ft. Collins, CO.
- Alexander, Robert R., and Carleton B. Edminster, 1981, *Management of Lodgepole in the Central Rocky Mountains*, USDA, Forest Service Research Paper RM-229, Rocky Mountain Forest and Range Experiment Station, Ft. Collins, CO.
- Amman, Gene D. 1988, *Why Partial Cutting in Lodgepole Pine Stands Reduces Losses to Mountain Pine Beetle*, Research Paper, USDA, Forest Service, Ogden, UT.
- Amman, Gene D., Mark D. McGregor, and Robert E. Dolph, Jr., 1989, *Forest and Disease Leaflet 2, Mountain Pine Beetle*, USDA, Forest Service, Washington D.C.
- Amman, Gene D., Mark McGregor, Donn B Cahill, and William H. Klein, 1977, *Guidelines for Reducing Losses of Lodgepole Pine to the Mountain Pine Beetle in Unmanaged Stands in the Rocky Mountains*, USDA, Forest Service, General Technical Report INT-36.
- Baker, W. L., 1994, *Landscape structure measurements for watersheds in the Medicine Bow National Forest using GIS analysis*, Final report prepared for challenge cost-share agreement between University of Wyoming and Medicine Bow-Routt National Forest, 114pp.
- Barott, James, 2003, *Field notes for the Silver Run Timber Sale*.
- Behnke, R. J., 1992, *Native Trout of Western North America*, Published by the American Fisheries Society, 5410 Grosvenor Lane, Suite 110, Bethesda, MD, 20814, p. 88.
- Burroughs, 1990, *Predicting Onsite Sediment Yield From Forest Roads*, In: *Erosion Control: Technology in Transition*, Proceedings of Conference XXI, International Erosion Control Assoc., February 1990, Washington, DC.
- Buskirk, S. W., 2002, *Personal communications regarding marten habitat use, distribution, and population trends in the snowy range*.
- Cerovski, A., M. et al., 2001, *Wyoming Bird Conservation Plan, Version 1.0*, Wyoming Partners In Flight, Wyoming Game and Fish Department, Lander, WY.
- Cordell, H. K., J. C. Bergstrom, L. A. Hartmann, and D. B. K. English, 1990, *An analysis of the outdoor recreation and wilderness situation in the United States: 1989-2040*, USDA Forest Service, Gen. Tech. Rep. RM-189, Fort Collins, CO: Forest Service Rocky Mountain Forest and Range Experiment Station.

-
- Crowe, D. M., 1986, Furbearers of Wyoming, Wyoming Game and Fish Department, 74 pp.
- Dillon G. K. and D. H. Knight, 2000, Draft: historic variability for upland vegetation in the Medicine Bow National Forest, Wyoming, Prepared under agreement between USFS and University of Wyoming, 124p.
- Dolbeer, R. A., and W. R. Clark, 1975, Population ecology of snowshoe hares in the central Rocky Mountains, *Journal of Wildlife Management* 24:52-60.
- English, D. and A. Home, 1996, Estimating recreation visitation response to forest management alternatives in the Columbia River basin, *Journal of Applied Recreation Research* 21(4): 313-334.
- ESA 1973, The Endangered Species Act of 1973, as Amended through the 100th Congress, Published by the USDI Fish and Wildlife Service, Washington, D.C., in 1988.
- Gan, J. and J. Miller, 2001, In the eye of the beholders: public views on the aesthetic value of pine stands regenerated by different methods, *Forest Landowner*, March/April 2001, 16-21.
- Gloss, D., 2002, Water Yield Analysis, Medicine Bow National Forest Proposed Revised Land and Resource Management Plan, Appendix B.
- Guenzel, R., 2003, Personal communication regarding herd objectives, habitat use by big game species, and local issues, Wyoming Game and Fish Department Wildlife Biologist, Laramie Region.
- Herrick, T. A. and V. A. Rudis, 1994, Visitor preference for forest scenery in the Ouachita National Forest, In Baker, Proceedings of the symposium on ecosystem management research in the Ouachita mountains: pretreatment conditions and preliminary findings, USDA Forest Service, Gen. Tech. Rep. SO-112, New Orleans, LA: Southern Forest Experiment Station, 212-222.
- Holsten, E. H., R. W. Their, A. S. Munson, and K. E. Gibson, revised 1999, Forest Insect and Disease Leaflet 127, The Spruce Beetle, USDA, Forest Service, Washington D.C.
- IWWI 1996-1999, Inland West Watershed Initiative database, contained on computer network of Medicine Bow-Routt National Forest.
- Jaakko Poyry Consulting, Inc., 1994, Final Environmental Impact Statement Study on Timber Harvesting and Forest Management in Minnesota (GEIS), MN Environmental Quality Board, St. Paul, MN.
- Karlen, D. L. et al., 1997, Soil Quality: A Concept, Definition and Framework for Evaluation, *Soil Science Society of America Journal*, 61:4-10.
- Kent, Larry, 2001, Silviculture Report – Bark Beetle Analysis FEIS, USDA, Forest Service, Specialist Report, Steamboat Springs, CO.

- Koehler, G. M., K. B. Aubry, 1994, Lynx, In: L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, L. J. Lyon, and W. J. Zielinski, eds, The scientific basis for conserving forest carnivores: American marten, fisher, lynx, and wolverine in the western United States, General Technical Report RM-254, USDA, Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO:
- Kozlowski, S. 2003, Personal Communication, U.S. Forest Service Wildlife Biologist, Laramie Ranger District, Medicine Bow-Routt National Forests, Laramie, Wyoming.
- Livo, L. J., 1998, Identification guide to montane amphibians of the southern Rocky Mountains, Colorado Division of Wildlife, p. 25.
- Lotan, James E., David A. Perry, 1983, Ecology and Regeneration of Lodgepole Pine, USDA, Forest Service, Agriculture Handbook 606
- Marston, R. and D. Clarendon, 1988, Land Systems Inventory of the Medicine Bow Mountains and Sierra Madre, MBNF 88-01, Medicine Bow NF, Wyoming.
- Marvel, Christopher C., 1988, Creating Better Looking National Forests Using Natural-Appearing Cutting Patterns, Western Journal of Applied forestry, Vol. 3, No. 4.
- McDonald, T. and B. Stokes, 1997, Visual Quality Assessment of Alternative Silvicultural Practices in Upland Hardwood Management, Proceedings, Council on Forest Engineering, #20, 165-169.
- NFMA 36 CFR, National Forest Management Act, 36 Code of Federal Regulations.
- NWI 1990, National Wetlands Inventory, U.S. Fish and Wildlife Service 1991, National Wetland Inventory maps of wetland occurrence on 7.5 minute quadrangle maps for Wyoming, including the Medicine Bow National Forest.
- O'Doherty, E. C., 2002, Personal communications regarding marten habitat use, distribution, and population trends in the Snowy Range.
- O'Doherty, E. C., L. F. Ruggiero, and S. E. Henry, 1997, Home-range size and fidelity of American martens in the Rocky Mountains of southern Wyoming, In: Martes: taxonomy, ecology, techniques, and management, G. Proulx, H. N. Bryant, and P. M. Woodward, editors, 1997.
- Page, L. M. and B. M. Burr, 1991, Freshwater Fishes, Petersen Field Guides, Published by Houghton Mifflin Company, 215 Park Avenue South, New York, NY, 10003, Pp: 53 and 104.
- Palmer, J. F., 1990, Aesthetics of the northern hardwood forest: influence of season and time since harvest, In More, Donnelly, Graefe, and Vaske (eds.) Proceedings of the 1990 Northeastern Recreation Researchers Symposium, USDA Forest Service, Gen. Tech. Rep. NE-145, Radnor, PA: Northeastern Forest Experiment Station.
- Palmer, J. F., S. Shannon, M. A. Harrilchak, P. Gobster, and T. Kokx, 1995, Aesthetics of clearcutting alternatives in the White Mountain National Forest, Journal of Forestry 93 (5): 37-42.

-
- Palmer, J. F., S. Shannon, M. A. Harrilchak, P. Gobster, and T. Kokx, 1993, Long term visual effects of alternative clearcutting intensities and patterns, In Vander Stoep (ed.) Proceedings of the 1993 Northeastern Recreation Researchers Symposium, USDA Forest Service, Gen. Tech. Rep. NE-185, Radnor, PA: Northeastern Forest Experiment Station.
- Purchase, 2003a, Wetlands Map of the Silver Run Analysis Area, data from the National Wetlands Inventory electronic dataset located in the MBR GIS database. Map developed on 7/11/03.
- Purchase, 2003b, Equivalent Clearcut Calculations for the Silver Run Project, July 2003.
- Reed, R. A., J. Johnson-Barnard and W. L. Baker, 1995, Fragmentation of a forested Rocky Mountain landscape, 1950-1993, *Biological Conservation* 75 (1996), pp. 267-277.
- Reynolds, R. T., R. T. Graham, M. H. Reiser, R. L. Bassett, P. L. Kennedy, D. A. Boyce, G. Goodwin, R. Smith, and E. L. Fisher, 1992, Management recommendations for the northern goshawk in the southwestern United States, General Technical Report RM-217, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO, 90 pp.
- Rogers, Brad, 2001, Informal Technical Support on listed species for the Medicine Bow National Forest, Personal communication, 5/25/2001 between Brad Rogers, Wildlife Biologist, USDI Fish and Wildlife Service, Ecological Services Office, Cheyenne, Wyoming and David Austin, Wildlife Biologist, USDA Forest Service, Medicine Bow-Routt National Forests, Parks Ranger District, Walden, Colorado.
- Rosgen, D., 1996, Applied River Morphology, Wildland Hydrology, Pagosa Springs, CO.
- Ruediger, Bill, et al., 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 p.
- Ruggiero, L. F., K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires, 1999, Ecology and conservation of lynx in the United States, USDA, Forest Service General Technical Report RMRS-GTR-30WWW, 480 p.
- Ruggiero, L. F., K. B. Aubry, S. W. Buskirk, L. J. Lyon, and W. J. Zielinski, eds, 1994, The scientific basis for conserving forest carnivores: American marten, fisher, lynx, and wolverine in the western United States, USDA, Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO, General Technical Report RM-254, 184 p.
- Schaupp, Bill, 2001, Entomology Report – Bark Beetle Analysis FEIS, USDA, Forest Service, Specialist Report, Steamboat Springs, CO.
- Schmid, J. M., and Mata, S.A., 1996, Natural Variability of Specific Forest Insect Populations and Their Associated Effects in Colorado, General Technical Report RM-GTR-275, USDA, Forest Service, Rocky Mountain Forest and Range Experiment Station, Ft. Collins, CO.

- Schroeder, H. W., P. Gobster, and R. Frid, 1993, Visual quality of human-made clearings in central Michigan conifers, USDA Forest Service, Res. Pap. NC-313, St. Paul, MN: North Central Forest Experiment Station.
- Schweitzer, D. L., J. R. Ullrich, and R. E. Benson, 1976, Esthetic evaluation of timber harvesting in the Northern Rockies—a progress report, USDA Forest Service, Res. Note INT-203, Ogden, UT: Intermountain Forest and Range Experiment Station.
- Snook, 2000a, Silver Run Analysis Area Roads Analysis - Aquatics Hydrology, March 23, 2000, Brush Creek/Hayden District Files.
- Snook, 2000b, Silver Run Analysis Area Existing Condition: Hydrology/Water Resources, March 23, 2000, Brush Creek/Hayden District Files.
- Snook, E., 1997, Silver Run Analysis Area - Field survey notes and channel stability field evaluation forms, On file: Water Resources, USDA, Forest Service, Brush Creek-Hayden Ranger District, Saratoga, WY.
- Snook, E., and T. John, 2001, Rainbow Valley Analysis Area, Hydrology/Water Resources Specialist Report, 7/28/2001, Brush Creek/Hayden District Files.
- Squires, John R. and Leonard F. Ruggerio, 1996, Nest-site preference of northern goshawks in south-central Wyoming, *Journal of Wildlife Management* 60(1): 170-177.
- Stebbins, R. C., 1985, *Western Reptiles and Amphibians*, Petersen Field Guides, Published by Houghton Mifflin Company, 215 Park Avenue South, New York, NY, Pp: 34, 70 and 83.
- Tarrant, M. A., E. Smith, and H. K. Cordell, 1999, Recreation visitor preferences for and perceptions of outdoor recreation setting attributes, In: Cordell, Betz, Carter, and Bowker, *Outdoor recreation in American life: a national assessment of demand and supply trends*, Champaign, IL: Sagamore Publishing: 412-431.
- Tinker D. B., C. A. Resor, G. P. Beauvais, K. F. Kipfmüller, C. I. Fernandes, and W. L. Baker, 1997, Watershed analysis of forest fragmentation by clearcuts and roads in a Wyoming forest, *Landscape Ecology* 13: 149-165.
- Troendle, C. A. and R. M. King, 1985, The Effects Of Timber Harvest On The Fool Creek Watershed, 30 Years Later, *Water Resources Research* 21(12): 1915-1922.
- Troendle, C. A., M. S. Wilcox, G. S. Bevenger, and L. S. Porth, 1998, The Coon Creek Water Yield Augmentation Project: Implementation of Research Technology, Presented at The Science of Managing Forests to Sustain Water Resources, November 1998.
- USDA Forest Service, 1973, Handbook #434, National Forest Landscape Management, Volume 1, Washington, DC.
- USDA Forest Service, 1974, Handbook # 462, National Forest Landscape Management, Volume 2, Chapter 1, Washington DC.
- USDA Forest Service, 1980, Handbook #559, National Forest Landscape Management, Volume 2, Chapter 5, Washington, DC.

-
- USDA Forest Service, 1985, Medicine Bow National Forest and Thunder Basin National Grassland Land and Resource Management Plan and Final Environmental Impact Statement, Rocky Mountain Region (R-2) Medicine Bow-Routt National Forests, Laramie, Wyoming.
- USDA Forest Service, 1989, Soil Survey of the Medicine Bow National Forest, Wyoming (Draft), Medicine Bow Mountains and Sierra Madre Mountain Areas.
- USDA Forest Service, 1992, Soil Management Handbook, Chapter Two (FSH 2509.18, R-2 Suppl.).
- USDA Forest Service, 1994, HABCAP 3.02 and PCHABCAP Habitat Capability Model Documentation and Users Guide, Rocky Mountain Regional Office, Lakewood, CO.
- USDA Forest Service, 1994, Rocky Mountain Regional Endangered, Threatened, and Sensitive Species List, USDA, Forest Service, Rocky Mountain Region 2, Lakewood, Colorado, 3/1994.
- USDA Forest Service, 1995, Handbook # 701, Landscape Aesthetics - A Handbook for Scenery Management, Washington, DC.
- USDA Forest Service, 1999, Forest Service Handbook 2509.25, Watershed Conservation Practices Handbook, Region 2 Amendment No. 2509.25-99-1, March 22, 1999.
- USDA Forest Service, 2001, Project Guidance for Management Indicator Species, Rocky Mountain Region (2), Directive letter, 2/2001, Region 2 Regional Office, Lakewood, Colorado.
- USDA Forest Service, 2002, Proposed revised land and resource management plan for the Medicine Bow National Forest.
- USDA Forest Service, 2002, Sensitive species evaluations conducted for draft revision of USFS Region 2 Sensitive Species List.
- USDA Forest Service, Forest Service Manual 2670, Direction on Federally Listed Threatened and Endangered Species Management, USDA, Forest Service, Washington, DC. Also cited are Code of Federal Regulations 36, 40, 50.
- USDI FWS 2001, List of Threatened and Endangered Species for the Medicine Bow National Forest, Thunder Basin National Grassland, developed by the Cheyenne Field Office, FWS, April 2001.
- USDI FWS and NMFS, 1998, Consultation Handbook, Procedures for Conducting Consultation and Conference Activities under Section 7 of the Endangered Species Act, USDI Fish and Wildlife Service, National Marine Fisheries Service, US Government Printing Office, Washington, DC.
- von Ahlefeldt, J. P. and C. Speas, 1996, Biophysical and historical aspects of species and ecosystems of the Medicine Bow National Forest, Specialist Report, Medicine Bow-Routt National Forest, Laramie, WY.
- Welsch, 1991, Riparian Forest Buffers Function and Design for Protection and Enhancement of Water Resources, USDA, Forest Service, Northeastern Area, NA-PR-07-91.

- Wemple, B. C., J. A Jones and G. E. Grant, 1996, Channel Network Extension by Logging Roads in Two Basins, Western Cascades, OR, Water Resources Bulletin, Vol. 32, No. 6.
- WGFD, 1987, A fisheries survey of the Little Snake River drainage, Carbon County, Wyoming, Project Number 5086-01-8505, Written by Melvin Oberholtzer, Wyoming Game and Fish Department, 110 pp.
- WGFD, 1990, Current status of Colorado River cutthroat trout in the Little Snake River enclave, Project Number 5090-28-8501, Written by Melvin Oberholtzer, Wyoming Game and Fish Department, 50 pp.
- WGFD, 1999, Atlas of birds, mammals, reptiles and amphibians in Wyoming, Wyoming Game and Fish Department, 190 pp.
- WGFD, 2000, Annual big game herd unit reports, Laramie Region, Cheyenne, WY.
- WNDD, 1999, 2000, 2001, 2002, Known occurrences of animals and plants – threatened, endangered, forest sensitive, and otherwise of concern, University of Wyoming, 319pp.
- WNDD, 1999/2000, Wyoming Natural Heritage Program Database query for species information in and surrounding the Project Area by David Austin and Steve Mottus (GIS) on 5/4/2001.
- WYDEQ, 1997, Silviculture Best Management Practices – Wyoming Non-point Source Management Plan, Wyoming Department of Environmental Quality, Cheyenne, WY.
- WYDEQ, 2001, Water Quality Rules and Regulations, Chapter 1, Wyoming Surface Water Standards, Wyoming Department of Environmental Quality, Cheyenne, WY.
- WYDEQ, 2002, Wyoming’s Draft 2002 305(b) State Water Quality Assessment Report and Draft 2002 303(d) List of Waters Requiring TMDLs, Wyoming Department of Environmental Quality, Cheyenne, WY.
- WYDEQ, 2003, Silviculture Best Management Practices - Wyoming Non-point Source Management Plan, Draft April 2003, Wyoming Department of Environmental Quality, Cheyenne, WY.