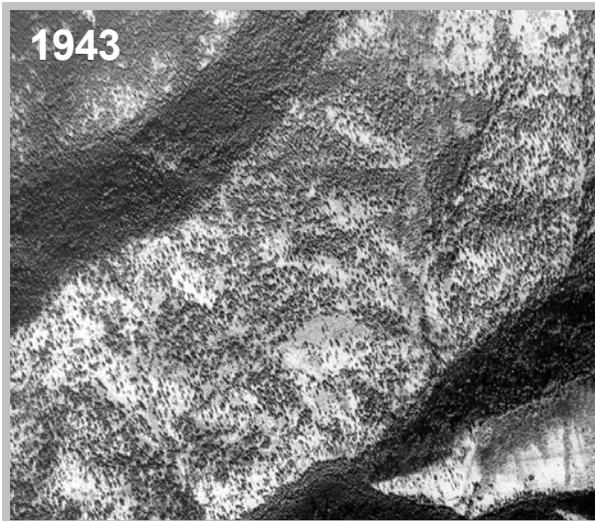


Quartzite Watershed Management

In the winter of 1998/99, the Colville National Forest completed a detailed ecosystem analysis for the Quartzite Watershed. The analysis looked at the differences between present conditions and past conditions for a variety of ecosystem components (erosion processes, hydrology, vegetation, stream channels, water quality, species and habitats, and human uses). Significant changes from past conditions were identified, and their causes and effects on ecosystem processes were determined.

The analysis showed that the overriding cause for most ecosystem change is fire suppression. The effect of which is manifested in many forms, from dense forests, to shifts in tree species, to changes in wildlife habitat. The effect on ecosystem processes is less evident, but it is easy to see that today the ecosystem is storing much more energy than it did in the past.



Aerial photos from 1943 show a landscape characterized by open forests of large diameter trees; the result of frequent low intensity fire. These old images help illustrate the point that landscapes are dynamic and fire disturbance is an integral ecosystem process that helps balance other processes like photosynthesis.

It is also evident that if one type of disturbance is suppressed, another type will replace it. Over the past 20 years, many large diameter trees have succumbed to root disease. Others are falling prey to more recent infestations of Douglas-fir bark beetle.



Another critical finding shows that native wildlife adapted to fire and the resulting range of habitat patterns over the past thousands of years. A long history of ecological studies already indicates the strong association between disturbance processes and species survival. Ecological processes, such as hydrologic and nutrient cycles, also are adapted to disturbance.

The Quartzite Watershed is a dynamic landscape. The Quartzite Watershed Management Project recognizes this and proposes to apply the knowledge we have acquired by approximating historical disturbance events through management practices.

Quartzite Watershed Management Project Draft Environmental Impact Statement

June, 2002

Summary

Chapter 1: Purpose and Need for Action

The Colville National Forest is proposing watershed management activities that are designed to improve ecosystem integrity. They include vegetation management, riparian/wetland management, and road management activities.

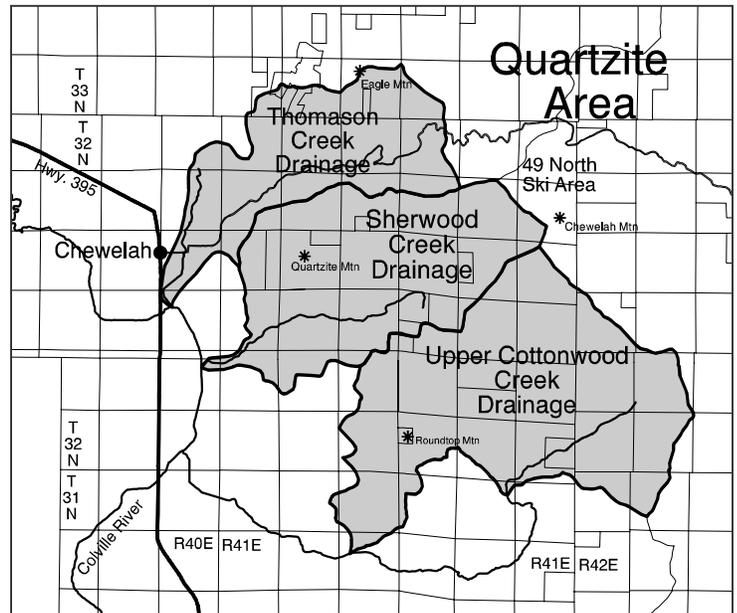
Project Overview

The 1.1 million-acre Colville National Forest is located in the northeast corner of Washington State. One of four districts on the Forest, the Three Rivers Ranger District administers 483,000 acres, and is situated in the center of the Colville National Forest. The Quartzite analysis area is located on the southeast side of the Colville River Basin, directly east of the town of Chewelah, Washington. It occupies a relatively small percentage (3.6%) of this larger basin and is limited to three small west-flowing streams (Thomason, Sherwood & Cottonwood) that drain into the Colville River. Thirty six miles downstream from the analysis area, the Colville River empties into the Franklin D. Roosevelt Reservoir, the pool formed by the Columbia River Grand Coulee Dam.

The analysis area is 36.4 square miles (23,311 acres) in size, 55% of which is private or other ownership (12,723 acres). Elevations range from the 5,700 foot Chewelah Mountain, to the Colville River, which is 1,640 feet above sea level. Vegetation in the watershed is dominated by coniferous forest, however occasional pastures and fields are found at the lower elevations. Fire suppression has occurred for the past 80 years. The Flowery Trail Road passes through the Thomason Creek Drainage, in the northern third of the analysis area. It provides access to the adjacent downhill ski area (49° North), for an estimated 50,000 visitors per year.

The legal description for the project planning area is: Township 33 North, Range 41 East, Sections 31-34; Township 32 North, Range 41 East, Sections 3, 9-14, 17, 22-

24, 26, 27, 34 & 36; and Township 32 North Range 42 East, Sections 18-20 & 29-32; Willamette Meridian, on the Three Rivers Ranger District, of the Colville National Forest in Stevens County, Washington.



Management Direction

The Forest Plan provides management direction in terms of Standards and Guidelines. Standards and Guidelines may be Forest-wide or directed to a specific Management Area where more detailed direction is provided.

The Forest Plan established thirteen unique management areas across the Forest. Management Areas are defined by the Forest Plan as units of land to which a prescription or set of prescriptions is applied in order to achieve a particular management objective.

The Forest Plan identifies six different management areas within the Quartzite Watershed Management Project planning area.

MA-1: Old Growth - Dependent Species Habitat: Provide essential habitat for wildlife species that require old growth forest components, and contribute to the maintenance of diversity of wildlife habitats and plant communities. MA-1 = 2% of the NFS Lands within the analysis area.

MA-3A: Recreation - Provide roaded and unroaded recreation opportunities in a natural appearing setting. MA-3A = 3% of the NFS Lands within the analysis area.

MA-5: Scenic/Timber - Provide a natural appearing foreground, middle, and background along major scenic

travel routes while providing wood products. MA-5 = 37% of the NFS Lands within the analysis area.

MA-6: Scenic/Winter Range - Provide a natural appearing foreground, middle and background along major scenic travel routes while providing for winter range management. MA-6 = 20% of the NFS Lands within the analysis area.

MA-7: Wood/Forage - Manage to achieve optimum production of timber products while protecting basic resources. MA-7 = 20% of the NFS Lands within the analysis area.

MA-8: Winter Range - Meet the habitat needs of deer and elk to sustain carrying capacity at 120% of the 1980 level, while managing timber and other resources consistent with fish and wildlife management objectives. MA-8 = 18% of the NFS Lands within the analysis area.

The Forest Plan includes two amendments that also influence the management direction for this project. The Regional Forester's Forest Plans Amendment #2 and the INFISH Direction are collectively referred to as "Screening Direction." The screening direction was implemented to preserve future planning options concerning wildlife habitat associated with Late and Old structural stages, fish habitat, and old forest abundance.

Purpose and Need for the Proposed Action

In the winter of 1998/99, the Colville National Forest completed a detailed ecosystem analysis for the Quartzite Watershed. The analysis looked at the differences between present conditions and past conditions for a variety of ecosystem components (erosion processes, hydrology, vegetation, stream channels, water quality, species and habitats, and human uses). Significant changes from past conditions were identified, and their causes and effects on ecosystem processes were determined.

As a result of the Quartzite Ecosystem Analysis, the Colville National Forest is proposing watershed management activities in the Quartzite Watershed. The Quartzite Ecosystem Analysis considered all lands within the Thomason, Sherwood, and Upper Cottonwood creek drainages. One of the key findings of the analysis is that fire exclusion has changed forest vegetation. These changes in upland forest density, understory composition, and tree species have increased forest susceptibility to insects, disease, drought and atypical fire. The objective of vegetation management proposals is to improve ecosystem integrity by moving the vegetation toward the natural range of

variation; by developing forest matrix, patches and corridors that are consistent with fire landscapes; and by improving the landscape patterns of habitats for native and desired non-native species.

A second ecosystem analysis finding revealed that vegetation diversity and in-stream fish habitat in low elevation riparian areas has deteriorated. The objective of riparian and wetland management is to improve ecosystem integrity by increasing the diversity of vegetation, and by improving in-stream fish habitat in low elevation riparian areas.

A third ecosystem analysis finding concerns roads. Forest roads provide access to conduct needed management. The benefits of forest roads are many. However, the ecosystem analysis notes that road corridors create habitat for noxious weeds that displace native plants. They also have introduced change to a variety of wildlife habitats. The connectivity of wildlife travel corridors has been disrupted in many places where roads cross riparian areas. In addition, road access has fragmented seclusion habitat for large home range vertebrates. Objectives for road management proposals are to upgrade, maintain and develop those roads, which are necessary for long-term land management and important to public access, and to eliminate unneeded roads.

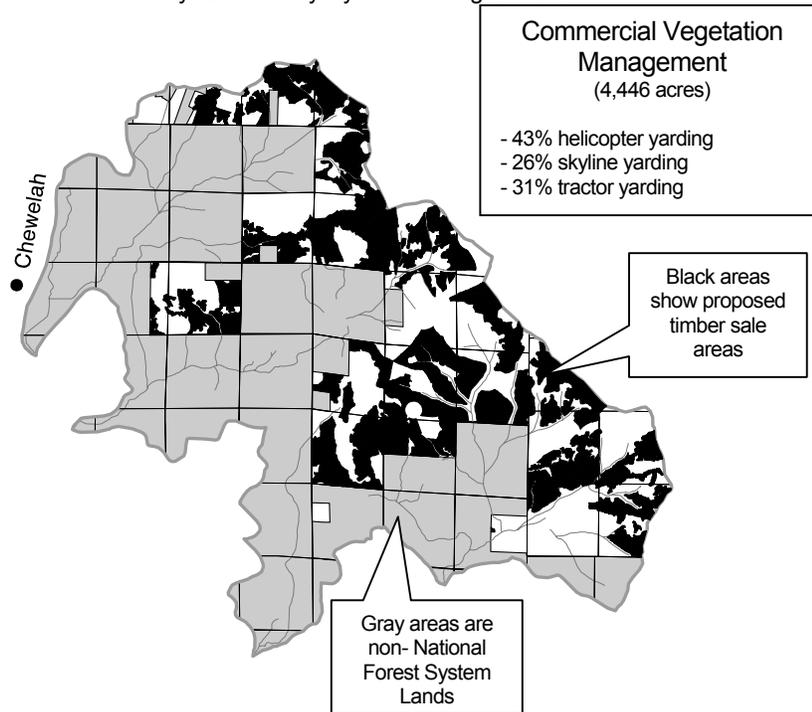
The Proposed Action

The objectives of the Quartzite Ecosystem Analysis were to identify significant departures from past ecosystem conditions, and to make recommendations that improve ecosystem integrity. This watershed management proposal is the result of these recommendations. It includes **vegetation management, riparian/wetland management and road management** activities. These proposals are intended to reduce the disparity between past and present ecosystem conditions.

Vegetation Management

Upland forest vegetation dominates the watershed and consequently provides the majority of wildlife habitat. A particular concern is the increase in upland forest uniformity and density, and the decrease in patchiness in the watershed, all of which have shifted landscape habitat patterns and reduced native species diversity. Vegetation management activities are grouped into two categories: Timber Sale activities; and Prescribed Fire and Non-Commercial Thinning activities.

Timber Sale: The proposed action includes 4,446 acres of timber sale activities. Eighty years of fire suppression has increased uniformity and density by establishing a class of



younger trees across the Quartzite Watershed. Many of these 70-80 year old trees are now merchantable and are included in the timber sale proposal. This *commercial* vegetation management proposal is designed to restore or maintain vegetation conditions consistent with fire ecology. Consequently, silvicultural prescriptions vary across the area. Most would thin trees to reduce stocking, and some small areas (up to 5 acres) would leave only a few trees, to increase patchiness and mimic intense fires.

Prescribed Fire and Non-Commercial Thinning: The proposed action includes 6,342 acres of non-commercial thinning and prescribed fire activities. Like the commercial proposals, these activities are designed to restore or maintain vegetation conditions consistent with fire ecology.

Riparian/wetland management

Riparian/wetland management proposals are located on National Forest System Lands, in the Woodward Meadows riparian area. They are designed to improve riparian vegetation diversity and wetland habitat in this lower elevation wetland that was previously modified for livestock grazing. Management activities include improving the stream channel, and planting native riparian plant species.

Road management

Objectives for road management proposals are to upgrade, maintain and develop those roads, which are necessary for long-term land management and important to public access, and to close or eliminate unneeded roads.

The Quartzite Watershed Management Project's Interdisciplinary Team used the road management recommendations found in the Quartzite Roads Analysis to develop a road system that is safe and responsive to public needs and desires. It is designed to be affordable and efficiently managed. It is also designed to have minimal negative ecological effects on the land. And it is designed to be in balance with available funding for the proposed management actions.

Road management proposals include road development, road/stream crossing improvement, and road closures.

Road Development: Road re-construction and new road construction are proposed in conjunction with timber sale activities. This includes 10.83 miles of new road and 35.52 miles of re-construction of existing roads. These roads are designed to improve the feasibility of vegetation management proposals while minimizing effects on wildlife, hydrology and native plants. Following the timber sale, all new roads would be closed, as would all presently closed existing roads.

Road/stream crossing improvement: Six locations are proposed for improvement, where roads cross streams. Proposals are designed to reduce the amount of road-generated sediment that reaches streams, by modifying road and ditch drainage structures such that water is directed away from streams. Applications of crushed rock to the road surface in these areas would also reduce the amount of sediment that moves off roads during storms and spring runoff. While these six locations are all outside National Forest System road maintenance jurisdiction¹, legislation passed by Congress² allows the Forest Service to enter into and contribute financial resources toward cooperative watershed enhancement agreements on private or public land that benefits resources on National Forest System lands. The county may also elect to use funds from *The Secure*

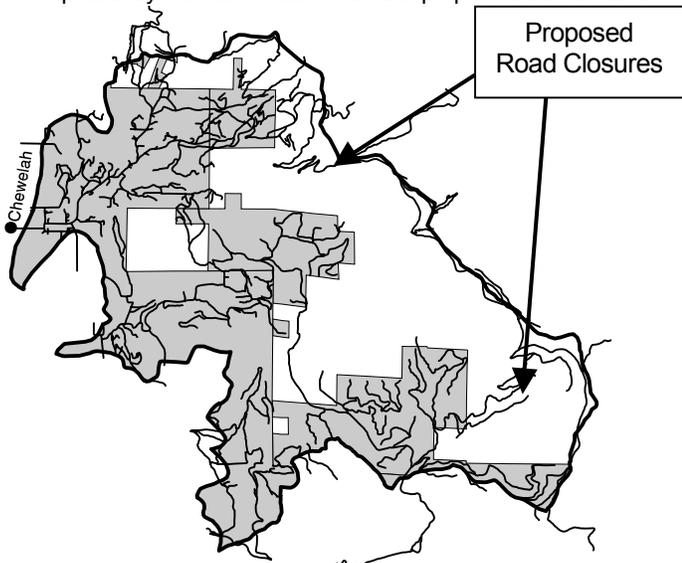
¹ Roads C2888 and C2857 are maintained by Stevens County.

² This legislation is most commonly referred to as The Wyden Amendment.

Rural Schools and Community Self-determination Act of 1999 (Public Law 106-393)³.

Road closures: the Forest Service road management strategy identified three primary actions to help find an appropriate balance between the safe and efficient access for all forest road users, and the protection of healthy ecosystems. The second of these three actions allows for the decommissioning of non-beneficial or unauthorized roads that are determined to be damaging to the environment or to be no longer necessary for achieving resource management objectives.

Using this strategy, the Quartzite Watershed Management Project Interdisciplinary Team used the road management recommendations found in the Quartzite Roads Analysis to help identify the two roads that are proposed for closure.



One is located in the Jay Gould Ridge Area, and the other is adjacent to Woodward Meadows.

Responsible Agency and the Decision to be Made

The Colville National Forest Supervisor is the deciding official for this environmental impact statement. The decision options are:

- Whether or not to implement vegetation management activities, and if so, identify the site-specific location of

appropriate timber sale, prescribed fire, and non-commercial thinning practices.

- Whether or not to implement riparian/wetland management activities in the Woodward Meadows area.
- Whether or not to implement road management activities, and if so: identify the appropriate level of road development necessary to accomplish activities.
- Whether or not to implement road/stream-crossing improvements.
- Whether or not to implement road closures.

Chapter 2: Alternatives Including the Proposed Action

The National Environmental Policy Act of 1969, (NEPA) directs all agencies of the Federal Government to study, develop, and describe appropriate alternatives to those proposed actions involving unresolved conflict. Public comment on the proposed action defines unresolved conflict.

Public Involvement

The public was first asked to comment on the proposed action on May 27, 1999, when the Three Rivers District Ranger initiated scoping with a letter and newspaper notices. Also, in an effort to fully disclose what was being proposed, two public meetings were held in the summer of 1999. Both took place in Chewelah, Washington, the first occurred on June 3rd and the second on July 27th.

A notice of intent to prepare an environmental impact statement for the project was published in volume 64, number 150 of the Federal Register, on Thursday, August 5, 1999.

Comments were received from over 120 individuals, agencies, businesses and organizations before this Draft EIS was published. Public comments were received in the form of letters, electronic mail messages, phone calls, and personal visits.

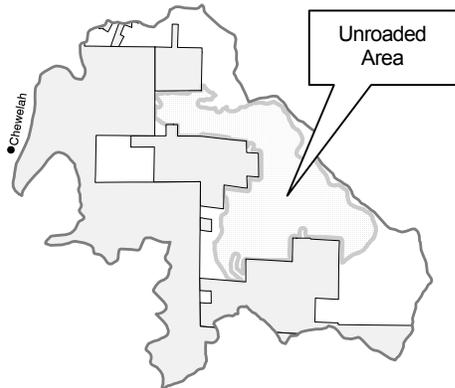
Issues

The interdisciplinary team used the comments received during scoping, to identify conflicts and to develop issues. Three Key Issues were used to develop alternatives to the proposed action

³ Public Law 106-393 is designed to restore stability and predictability to the annual payments made to States and counties containing National Forest System lands and public domain lands managed by the Bureau of Land Management for use by the counties for the benefit of public schools, roads, and other purposes.

Key Issue -- Road Management: Forest roads are an essential part of the transportation system in this part of Stevens County. They help to meet recreation demands and they provide economic opportunities. The proposal to build new roads and close existing roads caused concern for some. New road construction is viewed by some of the public to be inconsistent with ecosystem management. Would new roads reduce the quality of wildlife habitat? Would they reduce water quality? Also, two roads currently open would be closed by the proposed action. One is steep and unsafe for most vehicles and would be closed to protect unknowing travelers. The other would be closed to improve wildlife habitat and wetland conditions in the Woodward Meadows area. Some people would prefer these be left open for recreation, firewood gathering and wildfire access.

In addition, an unroaded area 4,801 acre in size is located on national forest system lands between the Upper Cottonwood Road, and the Cottonwood Divide Road. To improve



disturbance ecology, the proposed action builds roads and cuts trees in this area. There is concern that these activities would reduce natural integrity, reduce the opportunity for solitude, and reduce primitive recreation opportunities. Some consider unroaded areas essential for both humans and wildlife. Should the improvements to disturbance ecology be forfeited to preserve this unroaded area? If so, are the risks of catastrophic fire acceptable? Can disturbance ecology be improved without building roads and cutting trees?

Key Issue -- Betts Basin: The Betts Meadows Wetland Preserve is a 140-acre family trust, located on the 3,420 acre Upper Cottonwood Creek drainage. The purpose of the trust is to maintain the property as a wildlife refuge and native fishery. Many are concerned that building roads and cutting trees above this area would reduce water quality and degrade fish habitat in the preserve. Should the area above the Betts Meadows Wetland Preserve be exempted from treatment to establish baseline water quality information? Or conversely, would the proposed treatments reduce the

possibility of an atypical fire event and its associated sedimentation?

Key Issue -- Forest Health: There are areas where storm damaged trees; trees infested by Douglas-fir beetle; trees dying from root rot; and overstocked trees are not proposed for treatment. There are concerns that if left un-treated, forest health and productivity will decline. Should all areas with forest health problems be treated? Are certain amounts of these areas typical for the ecosystem? What role do they play in ecosystem functions and processes? If left un-treated, will these areas cause significant losses? If the trees are going to die anyway why shouldn't they be salvaged for human use? What is the difference between ecosystem health and forest health? Should tree vigor and forest health be given priority over ecosystem health?

Alternative Description

The National Environmental Policy Act gives the interdisciplinary team the responsibility of providing the decision maker with alternatives to the proposed action, when unresolved conflict exists.

To provide a reasonable range of effects in the context of these three issues, the team considered the features of the proposed action that sparked public comment. These include the timber harvest and road construction proposed in Betts Basin; road closures; unattended insect and disease problems; and timber harvest and road construction proposed in an unroaded area. Varying these activities between alternatives extends the range of effects the alternatives have on the issues. As you consider the six action-alternatives, you will notice that some severely limit these activities, some impose moderate limitations and others do not limit them at all.

No Action (A): Alternative A is the No Action alternative. This alternative is required by law and serves both as a viable alternative in itself as well as a baseline for comparison of the effects of all the alternatives. No Action means that the proposed vegetation management riparian/wetland management and road management activities described in the Proposed Action would not be initiated at this time. Under No Action there would be no change in current management direction or change from the level of ongoing management intensity within the project area. While this alternative doesn't propose any new management activities, changes in vegetation would still result where insects and disease are active, or where fire occurs. In this case, No Action would still result in visible and measurable changes caused by these events. Work previously planned within the project area would still occur under this No Action Alternative.

Proposed Action (B): The Proposed Action was designed to improve ecosystem integrity. It is the result of recommendations found in the Quartzite Watershed Scale Ecosystem Analysis Report. Vegetation management proposals are designed to restore or maintain vegetation conditions consistent with fire ecology. Consequently, prescriptions vary across the area. Most commercial activities (4,446 acres) would thin trees to reduce stocking and some small areas (up to 5 acres) would leave only a few trees to increase patchiness and mimic intense fires. Most non-commercial thinning and prescribed fire vegetation management proposals (6,342 acres) would come after commercial activities. Like the commercial proposals, these activities are designed to restore or maintain vegetation conditions consistent with fire ecology. Road management proposals include the construction of 10.83 miles of new road. These roads are designed to improve the feasibility of vegetation management proposals while minimizing effects on wildlife, hydrology and native plants. Two segments of existing open road would be closed (1.8 miles total). 35.52 miles of existing road would be re-constructed. Riparian/wetland management proposals in the Woodward Meadows riparian area include stream channel improvements, and planting native riparian plant species (roughly 100 acres). Other activities improve road drainage at six stream crossings (some outside NFS lands). The Proposed Action alternative is consistent with the Forest Plan.

Upper Cottonwood (C): The Upper Cottonwood alternative was designed to limit the effects associated with timber harvest and road construction proposed in Betts Basin. This alternative would implement the Proposed Action Alternative in all areas except the Betts Basin (as defined by ownership and hydrologic divisions). It would implement 3,044 acres of commercial harvest, and 4,784 acres of non-commercial thinning and fire. It would build 6.89 miles of new road, and re-construct 32.68 miles of existing road. The Upper Cottonwood alternative is consistent with the Forest Plan.

Wildland (E): Alternative E broadens the range of effects the alternatives have on the unroaded area by excluding all proposed activities located within the unroaded area (as defined by the Quartzite Watershed Scale Ecosystem Analysis). It would implement all other activities associated with the Proposed Action Alternative, including 1,860 acres of commercial harvest, and 3,020 acres of non-commercial thinning and fire. It would build 2.33 miles of new road, and re-construct 35.05 miles of existing road. The Wildland alternative is consistent with the Forest Plan.

Vegetation (F): This alternative is designed to address forest health concerns. It would implement the Proposed Action Alternative plus additional commercial harvest areas

where insects, disease, storm damage and overstocking occur. Unlike the Proposed Action, it would not close the two segments of existing open road. It would implement 5,476 acres of commercial harvest, and 7,034 acres of non-commercial thinning and fire. It would build 18.37 miles of new road, and re-construct 35.54 miles of existing road. The Vegetation alternative is not consistent with Forest Plan water quality and visual resource management standards and guidelines. Because the alternative increases the chance of channel-forming flows resulting from timber harvest and road construction in four sub-watersheds, it would not meet Forest Plan water quality standards. Road construction would not meet Forest Plan partial retention visual standards in two areas. A Forest Plan amendment would be required to implement this alternative.

Wildland Fire (J): This alternative uses fire to maintain desired vegetation conditions in the unroaded area. It would implement the Wildland alternative plus any maintenance fire areas within the unroaded area. It would implement 1,860 acres of commercial harvest, and 3,479 acres of non-commercial thinning and fire. It would build 2.33 miles of new road, and re-construct 35.05 miles of existing road. The Wildland Fire alternative is consistent with the Forest Plan.

Existing Roads (K): This alternative is designed to reduce the effects of road construction. It would implement the Proposed Action Alternative except for any commercial harvest areas (and associated restoration fire areas) not feasible from existing roads. It would implement 3,944 acres of commercial harvest, and 5,635 acres of non-commercial thinning and fire. It would not build any new roads. It would reconstruct 35.52 miles of existing road. The Existing Roads alternative is consistent with the Forest Plan.

Features Common to All Action Alternatives

Silvicultural Prescriptions: All action-alternatives propose silvicultural prescriptions. However, they differ by how much area is affected. While the area varies between alternatives, silvicultural prescription definitions are consistent for all alternatives. These range from classic silvicultural textbook definitions, to project specific definitions.

- **Commercial Free-thinning:** The removal of trees in even-aged or uneven-aged stands to control stand spacing and favor desired trees, using a combination of thinning criteria without regard to crown position. This prescription combines elements of crown and low thinning to achieve the desired results. The objectives are: to remove trees that exhibit poor form, vigor, or pose a significant risk of insect and disease mortality; reduce competition; and to

increase growing space for the development of large trees. Up to 50 percent of existing trees would be harvested.

- **Uneven Age Management:** The application of a combination of actions needed to simultaneously maintain continuous high-forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter classes to provide a sustained yield of forest products. Cutting is usually regulated by specifying the number or proportion of trees of particular sizes to retain in each area. Cutting methods that develop and maintain uneven-aged stands are *Single Tree Selection Cutting* - The removal of selected trees from specified size and age classes over the entire stand in order to meet a predetermined goal of size or age distribution and species composition in the remaining stand; *Group Selection Cutting* - The removal of small groups of trees to meet a predetermined goal of size distribution and species in the remaining stand. Up to 50 percent of the existing trees would be harvested in each unit, with up to 25 percent emphasizing regeneration objectives using group openings.
- **Irregular Shelterwood:** A variant of the Shelterwood Method in which some or all of the shelter trees are retained, well beyond the normal period of retention, to attain goals other than regeneration. The resulting stand may be two-aged or trend towards an uneven-aged condition as a consequence of both an extended period of regeneration establishment and the retention of reserve trees that may represent one or more age classes
- **Salvage:** These areas include forest stands in which the Douglas-fir beetle has led or contributed to high mortality in the stand. In addition to beetle, other disturbance agents, which have attributed to high mortality in the forest stands, may include wind, snow, ice, root pathogens or mistletoe. Two types of harvest would occur. A regeneration harvest where greater than 50% of the stand of trees is dead and a selective harvest where less than 50% of the stand is dead or dying or is expected to die from beetles and other disturbance agents. Some dead tree greater than 21.0 inches diameter breast height may be harvested after other resource considerations are made.
- **Seed Tree:** An even-aged regeneration method in which a new age class develops from seedlings that germinate in a fully-exposed micro-environment after removal of all the previous stand, except for a small number of trees left to provide seed.
- **Non-commercial Thinning:** Removing some of the trees in a stand (those that are too small to make a merchantable product) to allow the remaining trees to grow

faster due to reduced competition for nutrients, water, and sunlight.

Post Harvest Activities: Post harvest activities would occur with all action-alternatives. They include fuel management, seedling site preparation, reforestation and cleaning.

Road Development: New road construction or reconstruction of existing roadbeds is proposed by all but one⁴ action-alternative. New construction falls into two categories: classified or temporary. Classified construction is controlled by contract specifications. Specified roads are classified roads⁵, and are intended to serve multiple use needs as long-term facilities however, specified roads proposed with this project would include an intermittent service life, and would be closed one year after completion of the sale.

For this project, road reconstruction falls into two classes: *Light Reconstruction* would involve occasional construction of drainage features, with associated light blading and brushing on roads used for log haul. *Medium Reconstruction* would involve light reconstruction plus occasional cut bank and roadbed excavation to increase width (for safety). Reconstruction work would occur on most of the road length proposed for medium reconstruction.

Road/Stream Crossing Improvement: The action alternatives would make improvements to existing roads at six locations where roads cross streams. Road graders, excavators, dump trucks, and bulldozers would be used to modify road and ditch structures such that water is directed away from streams. Applications of crushed rock to the road surface in these areas would also reduce the amount of sediment that moves off roads during storms and spring runoff.

Road/ Closure: The proposed action identified two roads for closure. This proposal is carried through all action alternatives, except for the Vegetation Alternative (Alternative F). The Jay Gould Ridge road closure uses boulders to block access. The second closure, located adjacent to Woodward meadows, would erect roughly 200 feet of wooden fence above, across and below the road. Behind this fence, an excavator would be used to pull the existing road fill back up into place to re-establish the native slope contour. This would occur on a 500-foot section of road located immediately behind the fence.

⁴ Alternative K: Existing Roads, avoids new road construction.

⁵ A classified road is constructed or maintained for long-term highway vehicle use.

Rock Pit Sites: Two new sites located on National Forest System Lands could be developed to accommodate these needs. One of these aggregate sources is adjacent to existing Stevens County Road #2888 (Mud Lake Road) in Township 32 North, Range 41 East, in the southwest 1/4 of the northeast 1/4 of Section 22. The other is adjacent to a proposed new road⁶ located in Township 32 North, Range 40 East, in the southeast 1/4 of the northeast 1/4 of Section 9.

Non-Commercial/Restoration Thinning: Thinning is proposed where the trees are too small to provide a commercial product. In the majority of the areas proposed for thinning, chainsaws would be used to reduce the number of trees down to 250 to 450 trees per acre. In other areas, where tree stocking is excessive, mechanical thinning would be employed with the use of a rotating cutting head attached to a boom, which in turn is mounted on a track or rubber tired vehicle.

Maintenance Fire: Prescribed fire that is designed to maintain current desired conditions would occur outside commercial vegetation management areas.

Riparian/Wetland Management: All action alternatives propose improvements to Woodward Meadows. These improvements include the installation of small earthen dams and the planting of riparian species. A track-mounted excavator would use on-site materials to construct up to ten small structures, placed across existing human-made channels in Woodward Meadows. Red-osier dogwood, black cottonwood, and other native (locally collected) riparian species would be planted where appropriate.

Wildlife Habitat Area Adjustments: Included with all action-alternatives is a proposal to adjust the boundaries of three pine marten habitat units and one pileated woodpecker habitat unit. These minor adjustments in unit boundaries are proposed in areas where better habitat exists outside current unit locations. The proposed adjustments would include these areas, and exclude inferior habitat currently located within marten habitat units. Also, all action alternatives stipulate that 260 acres contiguous to the MA-1 would be managed as barred owl habitat, on an interim basis, until the Forest Plan revision⁷ considers Forest-wide barred owl habitat strategies.

Timber Sale Area Improvements: Other activities proposed to guide the character of the management areas toward their respective desired conditions would be financed by timber sale generated funding, if available. The

interdisciplinary team lists these eligible activities by priority. The amount of available funding is dependent on the sale bids and timber market values. Beginning with the highest priority, projects are funded to the extent that KV funds are available. The activities are listed below by priority.

- 1) One hundred fifty acres of the non-commercial thinning would occur on 150 acres, to reduce inter-tree competition for water, nutrients and sunlight.
- 2) Prescribed fire for big-game winter range improvement would occur on 150 acres.
- 3) Two road closures would occur. They are Forest Roads 4300.300 and 4342.250.⁸

Mitigation Measures

These measures are used to reduce negative effects on area resources. They are considered part of the alternatives and will be incorporated as such. All mitigation measures listed (some of which are the standard management practices included in both timber sale contracts and road construction contracts) are common to all the action-alternatives, unless otherwise noted. They would be required if one of the action-alternatives is implemented. In general, all action-alternatives incorporate the mitigation associated with Forest Plan standards and guidelines, as amended. Over 95 mitigation measures are included in this project. They apply to:

- Water Quality
- Soil
- Air Quality
- Noxious Weeds and Competing Vegetation
- Heritage Sites
- Scenery
- Fish and Wildlife
- Minerals

Monitoring

Monitoring is designed to verify that the projects are implemented as designed, and are effective and efficient in meeting project and Forest Plan objectives.

The Colville National Forest has developed a plan to monitor Forest Plan Implementation, monitor the effectiveness of management practices implemented under the Forest Plan, and validate the assumptions and models used in planning. The Colville National Forest prepares a Forest Plan

⁶ This pit and associated road construction are only proposed with Alternatives B, C & F.

⁷ The Forest Plan revision is scheduled to start in 2003.

⁸ In the event that KV funding is insufficient, other funding would be used.

Monitoring and Evaluation Report to document the results of this monitoring. The Forest Plan identified monitoring needs in Chapter 5, and the Colville National Forest Monitoring Guide describes this monitoring in more detail. This monitoring includes NEPA compliance, Best Management Practices, Water Quality, Heritage Resources, Threatened, Endangered and Sensitive Animals and Plants to name a few. The following monitoring items are part of the monitoring needs identified in the Colville National Forest Monitoring Guide. These items are particularly pertinent to this project, and will be monitored.

The following monitoring items are part of the monitoring needs identified in the Colville National Forest Monitoring Guide. These items are particularly pertinent to this project, and will be monitored.

- Snag retention
- Visual quality objectives
- Soils
- Insect and Disease
- Water Quality

In addition to these Forest monitoring items, the District Ranger will ensure the following project specific items will be monitored.

- Mitigation
- Timber management
- RHCA protection
- Noxious weeds
- Vegetation condition
- Air quality
- Down woody material
- Water quality

Alternative Comparison and Synopsis of Environmental Consequences

This section provides a cursory comparison of the alternatives, and a synopsis of issue related environmental consequences. The intent is to highlight the differences between the alternatives and between the effects the alternatives have on the issues. The following tables present the values of the measurements of change, by alternative.

Key Features							
Activity	Alternatives						
	A	B	C	E	F	J	K
Timber Sale Area (acres)	0	4,446	3,044	1,860	5,476	1,860	3,944
Prescribed fire and Non-commercial thinning (acres)	0	6,342	4,784	3,020	7,034	3,479	5,635
Woodward Meadows Riparian/Wetland Improvement (acres)	0	20	20	20	20	20	20
New road construction (miles)	0	10.83	6.89	2.33	18.37	2.33	0
Road/Stream Crossing Improvement (number of crossings)	0	6	6	6	6	6	6
Road Closures (miles)	0	2	2	2	0	2	2

Road Management Issue								
Concern	Measurement of Change	Alternatives						
		A	B	C	E	F	J	K
Wildlife habitat & Water quality	Miles of road constructed.	0	10.83	6.89	2.33	18.37	2.33	0
Road access	Miles of existing open road closed by the alternatives.	0	2	2	2	0	2	2
Unroaded area preservation	Acres meeting unroaded criteria.	4801	0	2701	4801	0	4801 ⁹	1466

⁹ Without affecting unroaded criteria (any contiguous area greater than 1000 acres in size and greater than 100 meters from any existing road or harvest activity), the Wildland Fire alternative *does* implement 459 acres of prescribed fire in the Unroaded area.

Betts Basin Issue								
Concern	Measurement of Change	Alternatives						
		A	B	C	E	F	J	K
Water quality & Fish Habitat	Percent increase in unforested open areas.	0% ¹⁰	18%	0%	1%	27%	1%	12%

Forest Health Issue								
Concern	Measurement of Change	Alternatives						
		A	B	C	E	F	J	K
Forest health	Acres of Douglas-fir beetle infestation included in timber sale units.	0	433	193	127	589	127	392

The Forest Service Preferred Alternative

The *Existing Roads Alternative* (K) was the Forest Service preferred alternative during review of the Draft EIS.

Chapter 3: Affected Environment and Environmental Consequences

The DEIS contains an analysis of the effects of the proposal and its alternatives on many aspects of the physical, biological and human environment. This summary focuses on environmental consequences the alternatives would have on resources associated with the three key issues.

Key Issue: Road Management

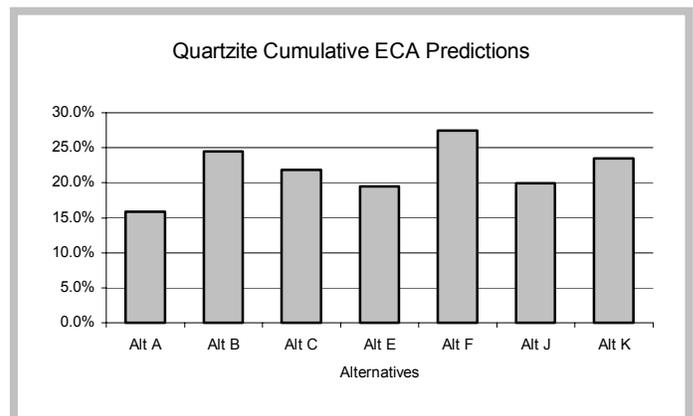
Forest roads are an essential part of the transportation system in this part of Stevens County. They help to meet recreation demands and they provide economic opportunities. The proposal to build new roads and close existing roads caused concern for some. New road construction is viewed by some of the public to be inconsistent with ecosystem management. Would new roads reduce the quality of wildlife habitat? Would they reduce water quality? Also, two roads currently open would be closed by the proposed action. One is steep and unsafe for most vehicles and would be closed to protect unknowing travelers. The other would be closed to improve wildlife habitat and wetland conditions in the Woodward Meadows

area. Some people would prefer these be left open for recreation, firewood gathering and wildfire access.

In addition, an unroaded area 4,801 acre in size is located on national forest system lands between the Upper Cottonwood Road, and the Cottonwood Divide Road. To improve disturbance ecology, the proposed action builds roads and cuts trees in this area. There is concern that these activities would reduce natural integrity, reduce the opportunity for solitude, and reduce primitive recreation opportunities. Some consider unroaded areas essential for both humans and wildlife. Should the improvements to disturbance ecology be forfeited to preserve this unroaded area? If so, are the risks of catastrophic fire acceptable? Can disturbance ecology be improved without building roads and cutting trees?

Water quality & Wildlife habitat

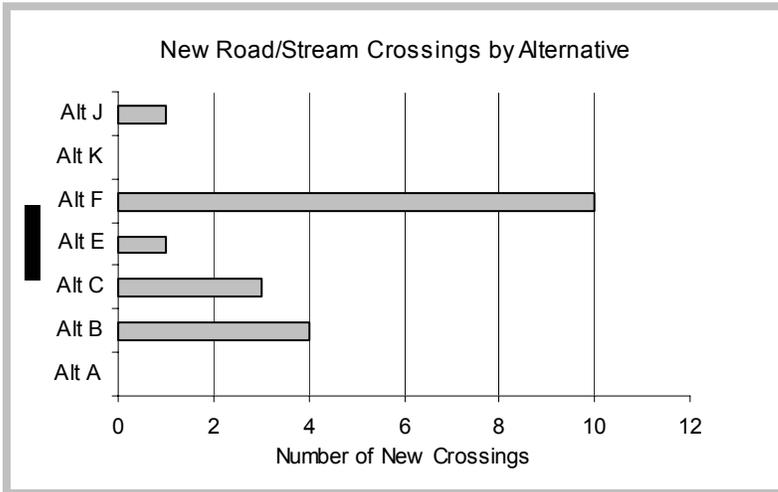
Water Quality: The Equivalent Clearcut Acre (ECA) model provides a snapshot in time of the amount of area in a watershed that exists in a *clearcut-condition*. ECA evaluates



¹⁰ This measurement for the No Action alternative does not consider the effects of a fire event.

the likelihood of any increase in the average duration of near bankfull (channel-forming) flows, and the potential for increases in high magnitude peak flows due to rapid snowmelt. Past treatments such as timber harvest and road construction, when expressed as a percentage of the total watershed, provide a baseline against which proposed management activities can be compared. For purposes of this analysis, if ECA values exceed 25%, more intensive field investigations and evaluations may be required.

basin has experienced the most activity with about 3500 acres harvested, primarily outside the Forest Boundary. Almost 50% of the harvest activity in the Thomason basin within this time period occurred on Forest Service land (755 acres). Only Alternative F exceeds the Colville National Forest's ECA threshold of concern, and does not comply with Forest Plan standards.

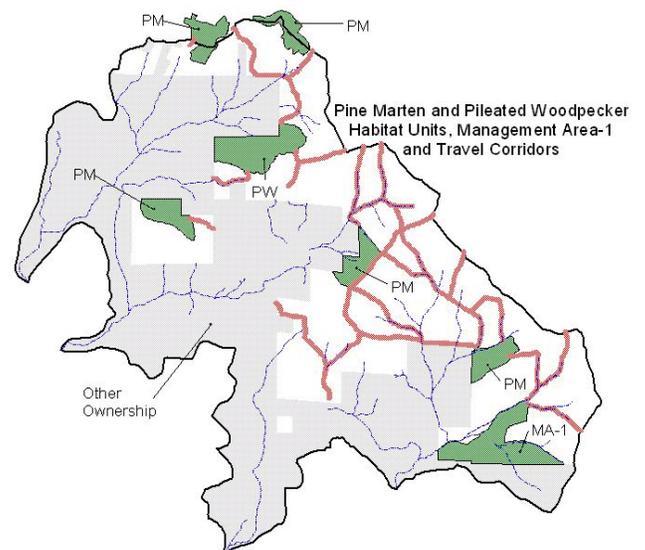


Wildlife Habitat: The Quartzite Analysis Area has a variety of wildlife habitat types, ranging from high ridges to dense forests to cleared agricultural lands. The ridges and riparian vegetation serve as travel corridors for many species. The Colville River valley connects the area with the Columbia River valley, and provides access to the area for many birds and other species. Fields and logging areas create patches in the background forest matrix and roads interrupt many riparian corridors. Road density across the Quartzite Analysis Area averages 3.84 miles per square mile. The road density on National Forest System Lands is 2.01 m/m². An isolated block of unroaded upland forest habitat, 4,801 acres in size is located on National Forest System Lands on the east side of the area.

The number of stream crossings is directly related to the expected increase in sediment and its corresponding relationship to channel morphology. Sediment increases would also occur as a result of timber haul over existing roads. Such increases would be expected to fall within the natural range of variation of sediment production within these watersheds, and would therefore be undetectable.

Wildlife corridors link late structure stands, marten and pileated woodpecker habitat units and the MA-1. This connectivity serves a variety of indicator species associated with eastside old forest habitats including northern goshawk, pine marten, pileated woodpeckers and three-toed woodpeckers. Other ownership, Flowery Trail Highway and other roads in the analysis area disrupt continuity in a few places.

The cumulative effects of past and proposed activities on flow regimes were estimated using the Forest's Equivalent Clearcut Acre (ECA) Model. This model calculates the amount of area in a watershed that exists in a "clearcut condition," regardless of ownership. This procedure evaluates the likelihood of any increase in the average duration of near bankfull (channel-forming) flows, and the potential for increases in high magnitude peak flows due to rapid snowmelt caused by snowpack exposure to rain or warm winds. Past treatments such as timber harvest and road construction provide a baseline against which proposed management activities can be compared. If ECA values exceed 25%, more intensive field investigations and evaluations may be required.

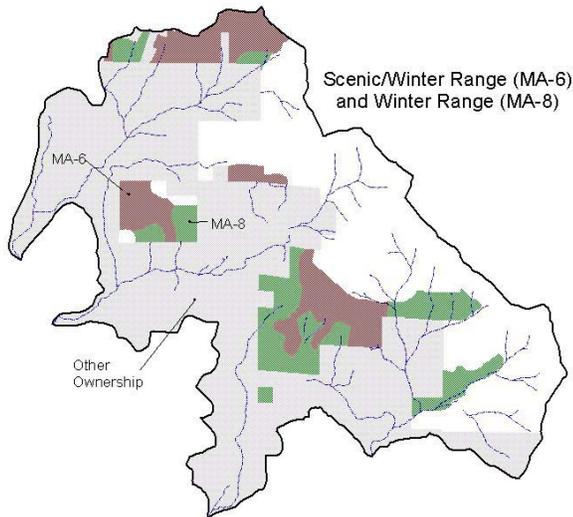


Over 5,000 acres of timber harvest activity has occurred within the analysis area during the last 30 years. About 92% of that has been on state and private land. Some areas have been entered more than once during this time period. The Sherwood

The travel corridor network crosses existing roads in 20 places. A very small portion of corridor is affected by each crossing (0.3 acres). While road crossings do not preclude use, they do reduce the effectiveness of this habitat. The more crossings an alternative has, the more negative effects it imposes on the travel corridor network.

Because new road construction is not included with either alternative, the No Action Alternative (A) and the Existing Roads Alternative (K) add no new crossings. All other action alternatives propose new road crossings.

The Forest Plan allocated 37% of the analysis area (3,954 acres) for big game winter range (MA6 and MA8). Small pockets of winter range habitat are also scattered throughout the planning area, especially on more open south and west aspects. Most of these small pockets are located in higher elevations, on the ridges between sub-watersheds. These



areas provide winter range for mule deer rather than white-tailed deer, which tend to winter at lower elevations. A small herd of mule deer uses the Eagle Mountain area. Other mule deer winter range habitat occurs on the south side of Quartzite Mountain and in steeper areas between Horseshoe Lake and Roundtop Mountain, above Wessendorf Canyon.

Roads cause negative direct and indirect effects to big game and big game habitat. Direct effects are the loss of habitat converted to roadway. The greatest indirect effects are the potential for noxious weeds to encroach, and for vehicle traffic to increase (noxious weed vector, poaching potential, and disturbance).

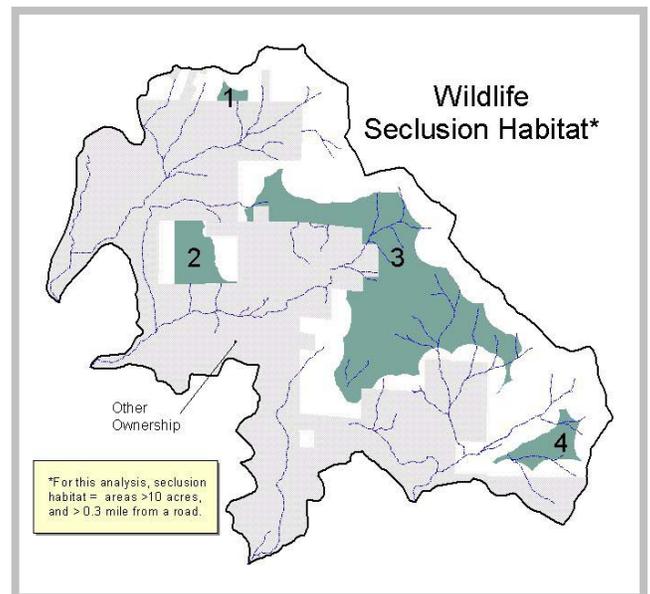
Direct effects from roads to *winter range* in all action alternatives range from minimal to moderate. The No Action Alternative (A) and the Existing Roads Alternative (K)

construct no new roads. The other alternatives convert the varying amounts of acres from habitat to non-habitat. The Vegetation Alternative has the greatest short-term negative effects.

Harvest units or roads can affect seclusion habitat for several species. The effects of units relate to the duration of activities and to harvest intensity. Roads affect seclusion habitat both directly and indirectly. Direct effects of roads relate to length of time the road remains open, the level of traffic on the road, and habitat loss to the road prism. Indirect effects relate to the potential loss of prey habitat due to noxious weed encroachment and future disturbance by humans.

Because mitigation closes new roads, most negative effects would be short term and limited to the time the roads remain open. Although closed roads restrict some vehicles, they still allow access by humans riding ATVs, so nearly all closed roads have some effect to seclusion habitat until the road becomes too grown-over to pass.

For this analysis, seclusion habitat is any area on NFS land, more than ten acres in size, and more than 0.3 of a mile from a road. Currently four blocks of land meet this criterion. The No Action Alternative (A) and the Existing Roads Alternative (K) would have the least direct and indirect effect to this habitat.



The Colville National Forest contains habitat for five threatened, one endangered and nine sensitive animal species and 54 sensitive plant species. The Quartzite Project Planning Area was examined for likely habitat for those species. The Prefield Review determined that suitable habitat for woodland caribou, American white pelican, and California bighorn sheep does **not** exist within or adjacent to

the analysis area. Habitat for the remaining species is included within the analysis area. The likelihood of adverse effects for these remaining species is low for the Wildland Fire Alternative (J), which is not likely to result in a trend toward Federal listing or loss of viability.

Road access

The existing Forest Service managed roads do not represent the main access routes used by the public in the Planning Area. Forest Service roads within the area are not maintained for passenger cars, and many are managed to close naturally over time depending on use. Some get seasonal dispersed use by high clearance vehicles, but the primary roads offering public access to the area are county roads, typically single lane with turnouts and minimal surfacing.

Firewood gathering and four-wheel driving would be limited by those alternatives that propose to close two roads (Alternatives B, C, E, J & K). The Jay Gould road closure, while limiting four-wheel drive opportunities, also increases user safety. Existing dispersed campsites located within 500 feet of the beginning of this road would remain accessible. The Woodward Meadows road closure would not create a significant loss of quality dispersed recreation sites. Access to the area will not be denied; however, the location of some dispersed campsites would be changed.

Unroaded area preservation

Current Forest Service policy imposes significant restriction on road construction or reconstruction in inventoried roadless areas. No inventoried roadless areas occur within or adjacent to the Quartzite analysis area. No road construction restrictions apply to the area.

While the agency does not define the term "unroaded", the Quartzite Interdisciplinary team chose to use it in response to public concern for proposed road construction. **For this analysis** the team defines an unroaded area as any area greater than 1,000 acres in size and greater than 100 meters from any existing road or past harvest activity. The team uses this definition to help the public understand the effects associated with road construction.

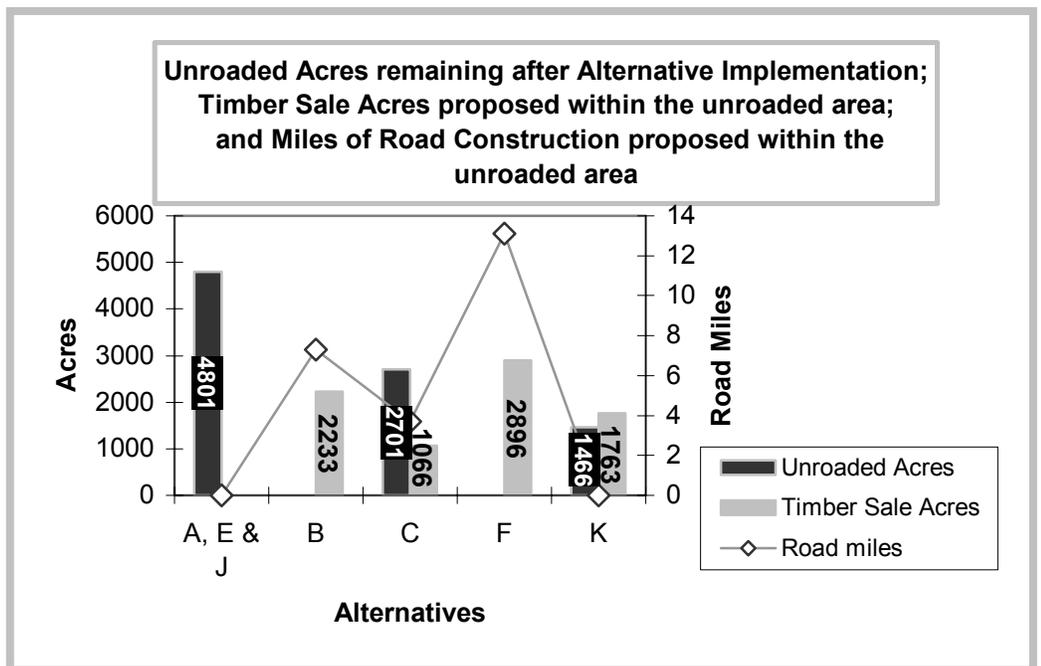
The definition is specific to this project. No road construction or reconstruction restrictions apply to areas that meet this definition.

For the Quartzite Project, recreation and wilderness attributes were used to depict the existing character of the unroaded area. Five descriptors were used to determine the Recreational-Opportunity-Spectrum rating: *access, remoteness, social encounters, visitor management and on site development*. Four criteria were used to describe wilderness attributes: *natural integrity, apparent naturalness, opportunity for solitude and primitive recreation opportunities and unique features*.

Natural integrity, apparent naturalness, opportunity for solitude, and primitive recreation opportunities and unique features all have the potential to be affected by any of the seven alternatives.

Even the three alternatives that propose no timber sale or road construction within the unroaded area (A, E, & J) could reduce the opportunity for solitude. The incumbent risk of large, intense wildfire that is associated with these alternatives includes the risk that views and sounds from outside the area would increase after such a fire.

Those alternatives that propose a timber sale and road construction however, would more effectively reduce the opportunity for unroaded recreation.



Key Issue: Betts Basin

The Betts Meadows Wetland Preserve is a 140-acre family trust, located on the 3,420 acre Upper Cottonwood Creek drainage. The purpose of the trust is to maintain the property as a wildlife refuge and native fishery. Many are concerned that building roads and cutting trees above this area would reduce water quality and degrade fish habitat in the preserve. Should the area above the Betts Meadows Wetland Preserve be exempted from treatment to establish baseline water quality information? Or conversely, would the proposed treatments reduce the possibility of an atypical fire event and its associated sedimentation?

Water quality & Fish Habitat

Water Quality: See the preceding Key Issue discussion for the environmental consequences the alternatives would have on Betts Basin water quality.

Fish Habitat: The fish bearing streams in the analysis area are Cottonwood Creek, Thomason Creek, and possibly the lower end of Sherwood Creek. However only Cottonwood Creek is a known fishery on National Forest System lands. In 1992, the Forest Service surveyed Cottonwood Creek at the Forest Boundary and above the beaver pond at Woodward Meadows. Fifty-one brook trout and 2 Rainbow trout were found below Woodward Meadows on reaches 1 and 2. The largest fish, a brook trout, was 9 inches, but most fish averaged 4 to 6 inches. Young of the year brook trout were common. The rainbow trout measured 3.75 and 4.75 inches long. The habitat is supporting brook trout better than rainbow trout.

An upper fork of Cottonwood Creek runs through Betts Meadow. Betts Meadow is not on Forest Service land, but activities in the watershed influence the fisheries of the Meadow. Brook and cutthroat trout reside in the meadow. An intensive effort is under way to eradicate the brook trout. The landowner intends to restore the meadow to a native cutthroat trout fishery.

In the tributaries to Cottonwood Creek above Woodward and Betts Meadows, the channels are similar to the upper portions of Sherwood Creek. Bar formations behind debris jams create multiple channels. The riparian vegetation consists of cedars and forbs. Very little management has occurred in these areas causing the somewhat reference condition of these streams. These streams carry high amounts of gravels. This causes the water to go under ground. Fish only occupy the channels up to the first few subterranean flow barriers. They provide excellent seasonal

spawning habitat. These channels move high amounts of bedload.

Harvest units are located outside of riparian areas. There would be no effect to trout or INFISH RMOs from harvest activities within individual unit boundaries, except that the risk of catastrophic fire is reduced.

Prescribed burns would not be ignited in riparian areas. The vegetation would remain intact. The filtration capacity of the riparian forest floor would not decrease. For these reasons, it is unlikely that noticeable increases in sediment influxes to streams would be caused by the fuel treatments. However, the potential for prescribed fire to bare more soil than desired and to cause some increase in sediment production is recognized. With regard to water quality, the burning of slash and burning to restore open ponderosa pine-Douglas-fir forest stands would result in nutrient flushes into streams. This would support rather than damage the fishery, but in any event would probably be too minor to be a significant influence.

From an aquatics perspective alternatives B and K are preferable because they reduce catastrophic fire impacts and do not have stream crossings that would negatively affect fisheries. Alternatives C, E and the majority of J do not have harvest units within the Betts Basin so this leaves that area prone to catastrophic fire and the associated aquatic impacts. Alternative F has harvest units in Betts Basin however the road system and associated road crossings would negatively impact fisheries.

Key Issue: Forest Health

There are areas where storm damaged trees; trees infested by Douglas-fir beetle; trees dying from root rot; and overstocked trees are not proposed for treatment. There are concerns that if left un-treated, forest health and productivity will decline. Should all areas with forest health problems be treated? Are certain amounts of these areas typical for the ecosystem? What role do they play in ecosystem functions and processes? If left un-treated, will these areas cause significant losses? If the trees are going to die anyway why shouldn't they be salvaged for human use? What is the difference between ecosystem health and forest health? Should tree vigor and forest health be given priority over ecosystem health?

Forest health

Upland forests can roughly be divided into two environments: south-facing slopes and north-facing slopes. South-facing slopes contain mixed conifers characteristic of the drier

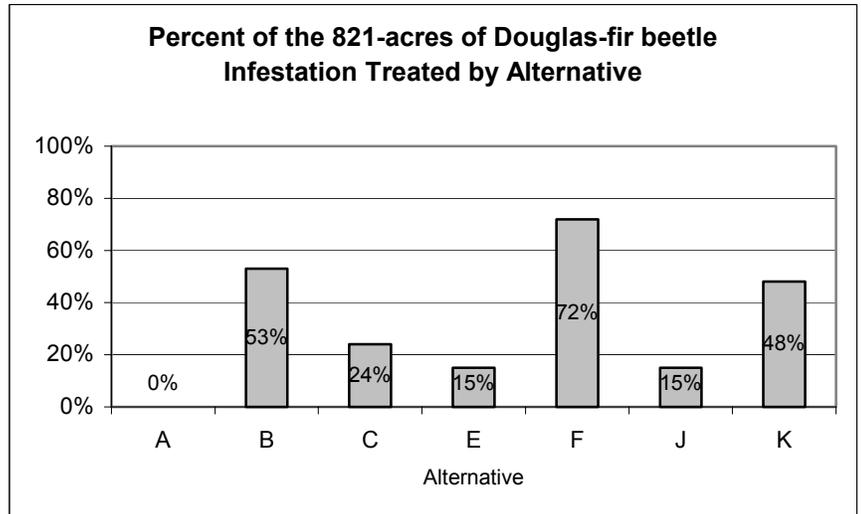
Douglas-fir plant associations, with ponderosa pine serving as the dominant seral species. On many of these south-facing sites, thickets of Douglas-fir grow beneath large diameter ponderosa pine, Douglas-fir and western larch. The remnants of trees damaged by storms, insects and disease contribute to the 10-25 tons per acre of fire-fuels found in most stands. Cool, moist Douglas-fir plant associations dominate north-facing slopes, with grand fir and western redcedar plant associations common in moist and protected areas. Fire-fuels trend toward larger diameter (> 3") pieces and range from 15-35 tons per acre.

Forest Health is a measurement of the condition of stands or landscapes of trees. Generally, it is defined as a measure of the robustness of forests in terms of their biological diversity, soil, air, and water productivity, disturbance ecology, and capacity to supply a sustainable flow of goods and services for humans.

The majority of stands in the dry Douglas-fir or grand fir habitat types within the analysis area have moderate to high susceptibility to Douglas-fir beetle. Stand susceptibility is highest on Forest Service lands in the Betts, Woodward, Sherwood, and Thomason subwatersheds. The current outbreak of Douglas-fir beetle in the analysis area is significant and predicted to create additional tree mortality over the next several years until the suitability of food source (Douglas-fir trees available as brood trees) diminishes or weather/disturbance event alters beetle population dynamics. Generally, this would occur when trees less than 9.0 inches in diameter are the only available food source, or when climate or weather influence beetle populations. Resistance of live trees is the most important natural factor controlling Douglas-fir beetle populations.

Within the Quartzite Analysis area Douglas-fir and grand fir has been replacing western larch, ponderosa pine, and western white pine. Many of the stands in Quartzite are infected with *Armillaria* root disease, caused by *Armillaria ostoyae*. Douglas-fir trees infected with *Armillaria* root disease are predisposed to attack by Douglas-fir beetles. Stand hazard and risk to Douglas-fir beetle remains high. The species composition of Douglas-fir in many stands exceeds 50% with stand basal areas greater than 150 square feet per acre. Although Douglas-fir beetles are native to eastern Washington, the current outbreak cannot be construed as entirely natural, due to the significant changes in stand structure, composition, and hazard that have occurred as a result of human actions. Severe overstocking and a shift in tree species composition have created large homogeneous areas within the analysis area predisposing stands to risks of insects and disease.

Mapping of Douglas-fir beetle activity on National Forest System Land shows 55 polygons totaling 821 acres within the Quartzite analysis area.



A sustainable landscape is not a static entity but one that changes within particular ranges of disturbance frequency, intensity, and extent. Alternative proposals are analyzed against the objectives of maintaining and improving the distribution and representation of structural stages within the Historic Range of Variability as appropriate to each Biophysical Environment and/or acres that show indications of high risk of insect and disease epidemics as well as the extent in which prescribed fire is used to reduce fuel levels.

Harvesting and prescribed fire treatments in the dry site structural stage 6 stands are designed to move stand toward late structural stage 7 characteristics. Treatments would remove much of the ingrowth of Douglas-fir and understory trees that are creating a fuel ladder. This will create open stands of ponderosa pine and Douglas-fir similar to historic conditions. Late structural stage 6 would be within historic conditions within BPE 2 and 4.

Chapter 4: List of Preparers

Chapter 5: List of Agencies, Organizations, and Persons to Whom Copies of the Statement are Sent

For Additional Information about this project contact:

Sherri Schwenke, District Ranger, 255 West 11th,
Kettle Falls, WA 99141. Telephone (509) 738-7700,
FAX (509) 738-7701, E-mail sschwenke@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, and 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 US's TARGET Center at 202-720-2600 (voice and TDD). To file a complaint of discrimination, write USDA's 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 or TDD). USDA is an equal opportunity provider and employer.