

United States
Department of
Agriculture

**Monitoring and
Evaluation Report:
2001 through 2002**

Forest Service

Pacific
Northwest
Region

**Colville National Forest
Land and Resource
Management Plan**

2003



TABLE OF CONTENTS

Chapter

	<u>Page</u>
I. Introduction	2
II. Budget and Work/Outputs	2
III. Monitoring Results and Evaluation	4
IV. Amendments to the Forest Plan	7
V. Appendix A: Monitoring Item Descriptions	8

I. Introduction

The following monitoring report covers fiscal years 2001 through 2002. Forest budget and outputs are discussed in Section II. A sample of projects from around the Forest were selected for monitoring. They are summarized in Section III.

II. Budget and Work/Outputs

The following table displays Forest budget and work accomplishments for fiscal years 2000 through 2001. Some of the items being reported, such as Watershed Analyses and Grazing Allotment NEPA decisions, had no Forest Plan Target.

Table 1. Budget and work accomplishments on the Colville National Forest during Fiscal Years 2001 and 2002.

	Forest Plan Annual Average	Fiscal Year 2001	Fiscal Year 2002
Forest Budget (\$1,000's)	\$28,300	\$16.133	\$15,264
Grazing Allotments NEPA Decisions		1	0
Watershed Analysis		1	0
Level II Aquatic Inventory (Miles)		15	20
Stream Enhancement (Miles)		2	4
Soil/Water Improvements (Acres)		50	110
Roads Decommissioned (Miles)		7.3	0.0
Wildlife Habitat Enhanced (Acres)		1832	1875
Noxious Weeds Treated (Acres)		4310	1031
Reforestation (Acres)	7,000	906	789
Precommercial Thinning (Acres)	2,700	1646	662
Fuel Treatments (Acres)		3849	4471
Timber Sold Volume (MMBF)	123.4	27.1	32.5
Livestock Grazing (AUM)	35,000	32,516	28,591
Roads Constructed (Miles)		4.6	6.5
Roads Reconstructed	10	52.3	11.9
Trails Maintained (Miles)		237	392
Recreation Visits* (RVD's)		NR	NR

Output Codes: AUM – Animal unit months, MMBF – million board feet, RVD – Recreation Visitor Days

NR – Not Reported in the fiscal year.

* - Reporting of Recreation Visits has been inconsistent over the years. A study of RVD reporting has been initiated on the Forest to develop consistent criteria for reporting this item. The Colville National Forest is participating in this study, and will use the reporting methods recommended.

III. Monitoring Results and Evaluation

The following are synthesized from the items monitored during 2001 through 2002. Complete descriptions of each monitoring item are contained in the Appendices referenced by the same letter designator as in this section.

A. Flowery Trail Federal Highway Reconstruction Monitoring. Initial revegetation treatments were applied hydraulically several times on finished slopes starting in mid-September 1999. Topsoil conserved from selected areas within the construction limits was spread on slopes 50% and less and compacted with a small dozer. In addition, several plantings with willow and red-osier dogwood cuttings, and conifer seedlings has occurred. Livestock was also fenced from the revegetation area in 2001.

Monitoring shows that slopes where topsoil was replaced, has a greater diversity of plant species and a higher percent of cover than slopes without topsoil. Cover is measured as total plant cover. Average cover on slopes where topsoil was replaced ranged from 20 to 30 percent in the first growing season of 2000, and from 60 to 80 percent in the second growing season of 2001. Average cover on slopes without topsoil ranged from 15 to 40 percent in the first growing season, and from 40 to 60 percent in the second growing season.

Plant diversity was also greater on the slopes with replaced topsoil than for the slopes without topsoil. On slopes with topsoil, there were 50 different species of plants recorded in the first growing season compared with 12 different species on slopes without topsoil. However, the number of plants per site is in a downward trend from the first to the second growing season on both the topsoil and non-topsoil sites. The number of plants per square foot decreased from an average of 4 per square foot in topsoil sites, and 1 per square foot for sites without topsoil. This may indicate some loss in diversity as more aggressive species take over from less aggressive species.

All slopes, except for those with natural or placed rock armor are generally vegetated. On individual slopes, there are bare areas and highly vegetated areas, probably corresponding to the locations where subsurface water outlets the slope. The project area appears to be successfully revegetated with a variety of plants, mostly composed of grass and forb species. Subsequent monitoring will need to determine if planting and seeding with these pioneer species will reduce the time to reach the goal of establishing deeper rooted vegetation on these slopes.

B. Revegetation Monitoring. Revegetation field monitoring occurred on May 31, 2001 with the objectives of observing revegetation needs in five areas. Stops 1

and 2 looked at Memorial Day off-highway vehicle (OHV) damage and trail revegetation problems. Site visits were made to Batey-Bould and Delaney Meadows. At Delaney, resource damage to lands that are not part of the system trails, surrounding uplands and riparian areas, and improvements were apparent. The revegetation team acknowledged that this situation was more than a revegetation issue. The situation was elevated to the Forest Leadership Team. The Forest Leadership Team discussed this issue at several meetings after these monitoring results were made known. In July of 2002, they agreed to produce an OHV Strategy for the central part of the Colville National Forest, which includes these areas. The Resource RDMA, Debbie Wilkins from Newport and Sullivan Lake RD's, was given this task. She has developed a draft OHV Strategy and has mobilized public and user groups to comment and refine the draft. Debbie will be presenting the policy for decision in the spring of 2003.

The third stop was in the South Fork of Skookum Creek where an arched bridge was installed to replace a wooden bridge. The site was seeded with sheep fescue and mountain brome (30 lbs/ac) and mulched with hay (4000 lbs/ac) within two weeks of project completion. Efforts were made during the project to minimize disturbance around the site. Monitoring showed that grasses are coming up and the site is revegetating well. No stream siltation was evident. The revegetation on this site looks very good, and the monitoring team suggested that these techniques should be used in future projects.

The fourth stop monitored reseeding of burn piles. One slash pile was burned 3-4 years ago and seeded about 3 years ago. Sheep fescue covers at least 50% of the pile. An adjacent pile burned about the same time was not seeded. This pile was covered with mullein, Canada thistle and knapweed. Seeding appears to substantially reduce colonization by noxious weeds. Seeding of burn piles is not a common practice. The monitoring team suggested that seeding should be standard practice on machine burn piles.

C. Timber Sale Monitoring Two timber sales were monitored in 2001, Sheep, a sale that was recently sold and not harvested, and Old Berry, a sale in which the logging had been substantially completed. The sales were monitored for compliance with the Eastside Screening direction (Regional Forester's Forest Plan Amendment #2).

The harvest objective in all units was to provide for late/old structural stage development. The prescribed treatments resulted in stands that would develop into this condition more rapidly, and result in a better representation of this structural stage, than adjacent uncut stands. The completed treatments indicate a very thoughtful design and excellent implementation. Post harvest stands contained better representation of hardwoods and western white pine.

Logging was carefully implemented. Very few damaged residual trees were noted, even in stands with advanced regeneration. Logging slash was often bucked up and placed in skid trails to protect soils.

D. Key West Mine Monitoring. Monitoring of reclamation at this small open pit mine site continues. Except for some minor work done in 2001, physical reclamation at this mine was completed in 1997. Supplementary monitoring work carried out during the last two years examined Key West pit lake limnology and water quality.

Forest Service water samples and analyses are consistent with data reported by Echo Bay Minerals. Waters in the Key West pit are slightly alkaline (7-8.5), calcium-sulfate type. TDS concentration average 628 mg/l and sulfate about 336 mg/l. Metal concentrations are low. Sulfate concentrations in the lake have decreased over time. Despite thermal stratification during the summer, water chemistry did not change substantially with depth. Some trace constituents did vary notably with depth during stratification, but those differences are not expected to affect lake water quality.

The results of that study indicate that the lake behaves like many natural lakes in the region. That is, the water stratifies during the summer due to density differences from solar heating. The water column “turns over” in the fall and spring, fully mixing the lake waters. This is characteristic of oligotrophic and dimictic water bodies.

E. Noxious Weed Treatment Monitoring. Rd. 7005 550. Roadsides, approximately 8 ft. from road edge were treated with Tordon herbicide on 7/10/01. Target species for noxious weed treatment were Hawkweed and Scotchbroom. Species noted on the site were hawkweed, Oxeye Daisy, spotted knapweed, and St. Johnswort. Scotchbroom was successfully eradicated by a combination of pulling and spraying. Hawkweed looked as though treatment was successful. Plants were deformed and showed no evidence of seed head development. In addition to the target species, Oxeye Daisy and knapweed were in very poor condition due to spray effects. Non-target species Kinnickinick showed no evidence of herbicide burning. Conifer species along treated area showed signs of burning. Mortality was not evident in conifer species.

F. Post Prescribed Burn Monitoring for Noxious Weed Encroachment. The Cooks Mountain prescribed burn was conducted in the spring of 1997. The burn was monitored in the fall of 2001 to see if noxious weeds were encroaching. Several dry grass dominated areas were monitored. St. Johnswort was encroaching in these areas, though competition from native species, especially pinegrass, appeared high. Toadflax was also encroaching. It had moved 1 to 2 chains into the burn on dry ravelly sites. Neither species appeared to be encroaching into the forest canopy.

Some evidence of hawkweed was noted at one site. Again competition from native species and overstory shading appeared to keep hawkweed from successfully moving very far into the stand.

G. Water Quality, Including Cumulative Effects. There were 16 water bodies on the Colville National Forest that were listed as impaired for either fecal coliform, temperature, pH or dissolved oxygen on the 1998 303(d) report by Washington State Department of Ecology (DOE) to the US EPA. This list has been "set aside" by DOE. A 2000 list was never prepared and a 2002 list is being formulated at this time with new criteria found in WQ Policy 1-11 dated September 2002. DOE is currently proposing that 12 water bodies be listed as impaired for fecal coliform. It is thought that the other 1998 listed parameters reflect natural conditions. The current proposed listed water bodies drain watersheds that contain permitted livestock grazing. While livestock may not be the total source of elevated bacteria levels, they are a permitted activity and their location in relation to water bodies is controllable. Adaptive management (fencing) has occurred in problem allotments in 2001 and 2002 and additional monitoring and fencing will continue in 2003.

IV. Amendments To The Forest Plan

There were no amendments to the Forest Plan during fiscal year's 2001 and 2002.

APPENDIX A. MONITORING DOCUMENTATION

A. Flowery Trail Revegetation Monitoring

Executive Summary

Constructed slopes on the Flowery Trail Road, Segment 1, are generally revegetating at a satisfactory rate. The entire monitoring report is filed at P:\FSFiles\Office\Col\Projects\01_flowery_trail_monitoring.

The percent cover monitored in the 2001 (second) growing year averages 64% on slopes with topsoil, and 46% on slopes without topsoil, with the percent cover increasing from the year 2000 growing year. The vegetative cover goal is 80% for slopes with topsoil, and 60% for slopes without topsoil, as monitored in the third growing year.

Stockpiling and replacing topsoil on slopes is a key factor in maintaining a diversity of plant species on constructed slopes, and generally increases the rate at which slopes are covered with vegetation.

Initial and subsequent vegetative applications

Initial revegetation treatments were applied hydraulically several times on finished slopes starting in mid-September 1999. The applications were made on slopes moistened after a rain or by watering with the hydromulcher to assure that the seeding application penetrated the face of the slope. Applications generally had two days without rain, to cure out. Two different revegetation treatments were prescribed, depending on whether an individual slope was lesser or greater than 33% (in the applications below, a slurry unit equals 1,000 sq. m. or 10,758 sq. ft).

Topsoil conserved from selected areas within the construction limits was spread on slopes 50% and less and compacted with a small dozer. The dozer created a bond between the underlying slope and the topsoil, and left grouser marks in the surface to allowed places for runoff to slow and infiltrate into the soil. Topsoil was generally stripped from flatter areas in swales, which ultimately ended up being covered with compacted fill material. Topsoil was stripped up to a depth of 12 inches where deep soils were present, and was spread to a depth of approximately 3 inches.

In addition, the wetland area at the white pine plantation (station 25+500 to 25+600) was planted with Ponderosa pine, white pine and lodgepole pine in the spring of 2000. In the spring of 2001, Ponderosa pine in 5 gallon containers were planted in this location.

The old Winchester Creek crossing was initially hydraulically seeded with the less than 33% roadside mix in the summer of 2000, as the road construction contract was finishing up.

Small wetland sites 1 through 4 were constructed in road obliteration sections where there was a natural source of moisture from which to propagate wetland plant species. Centerline wetland was constructed adjacent to the main Flowery Trail Road. The Woodward Meadows wetland site was constructed adjacent to Forest Road 4342 on the Three Rivers Ranger District. Centerline wetland relies on a high groundwater table to provide moisture for wetland plants. The Woodward Meadows wetland site relies on surface water impoundments to provide moisture for wetland plants.

Winchester Creek Floodplain

Willow live stakes were planted upstream and downstream from the new Winchester Creek crossing on the floodplain west of the creek in the fall of 1999. In the fall of 2000, Newport District personnel planted willow (*Salix bebbiana*) and red osier dogwood (*Cornus sericea*) cuttings in the Winchester Creek floodplain. In the spring of 2000, Newport District personnel planted black cottonwood (*Populus trichocarpa*) in this same area.

Winchester Cut, 30+100 to 30+500

In the fall of 1999, rice logs were installed at locations on this cut slope and willow live stakes were installed behind some of the mid-slope rice logs. In the spring of 2000, black cottonwood plantings were made across the top portion of the slope, behind the uppermost rice log.

Road Obliteration Treatments

Road obliteration areas were seeded utilizing the **hydraulic mix** for slopes 33% and less in the fall of 1999. In the spring of 2000, Ponderosa pine, lodgepole pine and white pine seedlings were planted. In the spring of 2001, Ponderosa pine in 5 gallon containers were planted at the junctions of these old road segments and the new Flowery Trail Road cut or fill slopes.

Spirea Seeding

In the fall of 1999, spirea seed collected from wetland sites was spread over the wet cut and fill slopes west of the Winchester Creek crossing, the wet cut slope and ditch east of the Gletty Creek crossing, on the slumping cut slope at Station 24+900, and on wetland sites 1 and 2. In the 2000 construction season, the fill slope west of the Winchester Creek crossing, and the cut slope east of Gletty Creek were covered with rock slope protection. Visual monitoring of the slump area at station 24+900 has shown no sprouting of spirea plants in the last 2 growing seasons. This slope will be reconstructed under the Segment 2 project in 2002.

Snowberry, Oregon Grape and Penstemon Planting

In the spring of 2000, Snowberry, Oregon Grape and Penstemon were planted above the road between stations 27+000 and 27+100. Approximately 50 plants of each species were planted. In the Spring of 2000, District personnel planted Oregon grape root cuttings and cottonwood plugs at station 25+525.

Ninebark, Ocean spray and Shineyleaf Ceonothus Planting

In the spring of 2001, ninebark, oceanspray and shineyleaf ceanothus were planted on the cut slopes from station 26+100 to 27+100.

Fencing Livestock Out of the Project Area

In the first growing season, cattle were herded out of the project area and generally kept to the south of the Flowery Trail Road, in the Middle Fork Calispell Creek Drainage. During this time there was medium cattle use of the constructed slopes, especially in the wetter areas throughout the summer. In the spring of 2001, Newport District personnel constructed an exclusion fence, which tied from the vicinity of the cattle guard on the east to the North Fork Calispell Creek, in Section 11, T32N, R42E. Grazing impacts to the slopes during the summer of 2001 were slight due to this fence.

2000 and 2001 Monitoring

Initial monitoring of slope stability was done through the winter of 1999 to 2000. Topsoil generally held in place on fill slopes, even ones that were steeper than 50%, such as the slopes around Dorchester Creek (Station 28+300). Grouser marks in this slope allowed water infiltration, even to the extent that some topsoil did start to creep down slope, especially where overland flow off of the roadbed spread onto the fill. Topsoil spread on smoother cut slopes, such as in the through cut around Station 25+400 tended to slip down slope, into the ditch after the first winter. These slopes were finished smooth using an excavator bucket scooping down slope.

Initial monitoring of vegetation on Segment 1 of the Flowery Trail Road was conducted on September 7th, 13th and 14th of 2000, at the end of the first full growing season. The second growing season monitoring trip occurred on August 22, 2001. Transect points were selected on representative slopes throughout the project in 2000. All points were on National Forest System Land, except for points 19 and 20, which were on Stimson Lumber Company Land. Points were set and marked with a survey stake in 2000 and remarked permanently with 3/8" diameter rebar in 2001. A 13" diameter ring (delineating an area of 0.92 sq. ft.) delineated sampling sites. The ring was centered over the monitoring point location then thrown randomly in the cardinal points of the compass, 5 to 15' from the monitoring point location. At each of the 5 points, percent of cover was estimated, as the amount of plant cover suspended over the hoop or rooted in the hoop (including dead plants and moss). Number and species of live plants were also recorded.

Monitoring Point Locations

Twenty-six monitoring points were located on the first segment of the Flowery Trail Road, to sample cut and fill slopes, with and without topsoil, wetland sites, and road obliteration sites.

Weather Conditions

The average yearly precipitation for the area, taken at the Chewelah Peak rain gauge is approximately 39 inches. The 2000 growing year was somewhat wetter than normal, with a total precipitation of 41.3 inches. The 2001 growing year was one of the driest years on record, with a total precipitation of 22.8 inches.

Noxious Weeds

In the 2000 monitoring, significant infestations of noxious weeds were only noted in the area of Winchester Creek around the junction with the Winchester Creek Road and up around the White Pine Plantation at approximately station 25+600. In these two areas mullein was established on cut and fill slopes. In the Centerline Wetlands, Canada thistle, bull thistle and mullein were established. The seed heads on the Canada thistle were cut and disposed of in the fall of 2000 to prevent additional spread of this plant until it can be sprayed in 2001.

In 2001 minor infestations of dock were noted in the road obliteration wetland sites 1 through 3, with wetland 4 at the old Winchester Creek crossing having a significant infestation (this site also has a significant infestation of bull thistle). Spotted knapweed is beginning to populate cut slopes on the Flowery Trail Road, coming from plants on the surrounding land, and outside of the construction limits. The most significant knapweed infestations are below Forest Road 4300471 and between stations 28+300 and 29+300. In August of 2001, Newport District personnel selectively sprayed weeds along the route and in the Centerline Wetlands. In general, infestations of mullein and bull thistle were not sprayed since populations of these species appear to get smaller over time, as they are shaded out.

Monitoring Results

Monitoring results are separated into three categories: average percent cover, total number of plants per site and average number of plants per square foot. The diversity of plant species was recorded on individual site monitoring forms.

Generally, monitoring shows that on slopes where topsoil was placed, a greater diversity of plant species and a higher percent of cover was seen, than for slopes without topsoil. Average cover on slopes with topsoil ranged from 20 to 30 percent in the first growing season of 2000, and from 60 to 80 percent in the second growing season of 2001. Average cover on slopes without topsoil ranged from 15 to 40 percent in the first growing season of 2000, and from 40 to 60 percent in the second growing season of 2001.

Plant diversity was greater on the slopes with topsoil than for the slopes without topsoil. On slopes with topsoil, there were 50 different species of plants recorded in the first growing season compared with 12 different species on slopes without topsoil. The number of plants per site is in a downward trend from the first to the second growing season on both the topsoil and non-topsoil sites, with the number of plants per square foot decreasing an average of 4 per square foot in topsoiled sites, and 1 for sites without

topsoil. This may indicate some loss in diversity as more aggressive species take over from less aggressive species.

There was an average of 15 plants per square foot of slope in the second growing season on slopes with topsoil. On slopes without topsoil, the average was nine plants per square foot. The number of plants per square foot and per site declined from the first to the second year, more so on the slopes with topsoil, than without, however, the percent of cover is generally increasing. Cover increased an average of 37 percent to 64 percent coverage on slopes with topsoil. For slopes without topsoil, cover increased an average of 18 percent to 46 percent coverage.

All slopes, except for those with natural or placed rock armor are generally vegetated. On individual slopes, there are bare areas and highly vegetated areas, probably corresponding to the locations where subsurface water outlets the slope. Generally, the project appears to be revegetating with a variety of plants, mostly composed of grass and forb species. Subsequent monitoring will need to determine if starting off with these early serial stage species moves these slopes constructed into "C" horizon soils will shorten the timeline in reaching the goal of getting deeper rooted vegetation established on these slopes.

Plants that appear to be good colonizers from the seed mix are the slender wheat grass, mountain brome, Idaho fescue and yarrow. These species showed up in 18 to 22 of the monitoring sites, showing their tolerance for a wide range of growing conditions. Both the seeded yarrow and seeded grasses established well on the harsh sandy soil at monitoring points 17, 18, 25 and 26. Both the grasses and yarrow formed seeds in the first and second growing seasons. Grass seed was collecting on the harsher slopes such as at monitoring points 11 and 12, where cows had worked the slope and provided footprints for the seed to collect. Pearly everlasting was the fourth best colonizer of the seeded species, showing up in 9 of the monitoring sites. The shrub species seeded on the project were not successful in establishing themselves.

Plants, which appeared to colonize well from the topsoil seedbank were the plantains, the yellow and white clover, goatweed, and bull thistle. These species were present in 8 to 12 of the monitoring sites.

The vetches (American and hairy) started off with a distinct presence on slopes with and without topsoil. By the second growing year the hairy vetch had mostly disappeared, even though plants produced a seed crop the first growing season. Monitoring forms in the 2000 growing season noted that a lot of vetch was eaten by cows grazing the slopes.

Pearly everlasting and fireweed (supplied by a commercial source in the roadside seed mix) were planted in the fall of 1999. Locally collected seed of these two species was hydroseeded the following year onto deficient slopes and at the old Winchester road obliteration site. While the monitoring shows that plant numbers for pearly everlasting are generally declining, there is a good stand of pearly everlasting developing in 2001 on the Winchester obliteration, possibly due to the viability of the locally collected seed.

This is similar for fireweed, mainly in the large cut area west of the new Winchester Creek crossing.

Live staking which was done in the floodplain at the new Winchester Creek crossing has at least a 75% success rate, with most of the dead stakes having been planted in the duff under the cedar overstory downstream and to the west side of the creek from the crossing. Live stakes installed intermittently with the rice logs on the large cut slope west of the new Winchester Creek crossing were generally unsuccessful. At least some of these stakes were noted as being planted upside down on monitoring forms in the 2000 growing season. The few living stakes were associated with some perennial wet areas on the face of the slope. It appeared that most of the stakes were frost heaved out of the slope face in the last two winters, since most of them were laying on the ground.

The soil binder used on the first segment was still evident on slopes, which hadn't been trampled by cows or wildlife. A photo near monitoring point 21 shows the crust of soil still present.

Alder plants seeded in the winter of 1999 over the snow on some of the road obliteration sites have sprouted. A photo taken near monitoring point 5 shows 4 to 12 inch tall plants in the road obliteration.

Yellow clover and white Dutch clover colonized sites with topsoil and sufficient moisture. These clovers provided a major portion of the cover on many of the slopes with topsoil on them and at road obliteration wetland sites 3 and 4. A reduction in the diversity of species on slopes with these clovers may have been caused by competition of these clovers.

Slopes were generally seeded at a rate sufficient to spread 70 to 80 seeds per square foot. In the first growing season, the average number of plants per square foot at the monitoring sites ranged from a low of 5 to a high of 30, and averaged 19, for monitoring sites with topsoil. For monitoring sites without topsoil, the low was 3 plants/sq.ft., the high was 15 plants/sq.ft., and the average was 10 plants/sq.ft. Accounting for seed viability losses for hydroseeding, a 50 percent increase is usually allowed for seed damage. In this case, starting at the 70 to 80 seeds per square foot applied, we could expect that half those seeds would be damaged in the application process, so actual expectations for plant concentrations on the slope should range between 35 and 40 plants per square foot. Monitoring results show that on the average, there are 50 percent of this number of plants sprouting the first growing season for those sites with topsoil, and 40 percent of this number sprouting in the first growing season for those sites without topsoil.

B. Revegetation Monitoring in 2001

Revegetation field monitoring occurred on May 31, 2001 with the objectives of observing Memorial Day off-highway vehicle (OHV) damage and to look at trail portions for revegetation problems. These Individuals participated at one or more of the five sites: Dan Lynn, Julie Richardson, Jay Berube, Nan Berger, Ginger Gilmore and Kathy Ahlenslager.

The first of the five sites visited was Batey-Bould All-terrain Vehicle (ATV) Trail, 50 miles of challenging trail for motorcycles (not 4-wheelers). It goes out 21 miles to Washington State Department of Natural Resources land and on to the Little Pend Oreille National Wildlife Refuge. So far, Nan hasn't had much assistance from motorcycle groups in maintaining the trail. They are too busy. Although there's currently no funding for dispersed sites, we can't ignore the damage to these areas or to the problems identified during the visit.

Problems:

- Riders go around downed trees creating new trails.
- Trail goes through a wetland.
- There are numerous access points. Areas less than a mile from roads have resource impacts.
- The trail has the most structures of any trail on the Forest. Many of the bridges and punctions need replacement. CIP money will cover 15 miles of maintenance this year and another 15 next year. The trail is expensive to maintain, because of high use.
- People have created loops to drive in the parking lot. These were created in 1-2 weekends. At the trailhead the public has stayed off the meadow, which is delineated by a low parking barrier. Funding is needed for barrier rock and fencing.

Questions:

- Is there a need to include revegetation efforts in the yearly maintenance? Nan has hand-seeded grasses. Perhaps seed or plant low-growing deterrent vegetation such as snowberry or rose.
- Do we need to mow the meadow at the parking lot? The unmowed vegetation could help deter riding in the meadow. The meadow is mowed because of fire danger. But how well does green grass carry fire?

The next stop was Middle-Fork Calispell Meadows, also called Delaney Meadows. It is three miles long with 25 dispersed sites. There are more people at the dispersed sites, than the developed ones. Over Memorial Day weekend this year, there were 300 vehicles and 200 ORVs in the meadows. On the same weekend last year there were 250 vehicles and 180 ORVs. Since Memorial Day weekend was dry this year, there wasn't as much resource damage as other years.

The poorly designed 12-mile long ORV trail uses old logging roads with a layout shaped like a chicken's foot. It was built to take the pressure off the meadows. It is too short, as well as too steep and too dry (and no mud play areas). A system of 30-40 miles is what a daily OHV rider uses. The District put in connector segments, but the turns are too sharp and one portion dead-ends. ORV users are off-trail at any hint of an obstacle and cut new trails. OHV's appear to tear cause more resource damage than motorcycles.

This area isn't regularly visited by recreation personnel. There is less damage when the FS has a presence in the drainage. (What about more law enforcement funding?) Memorial Day weekend damage usually results in a slurry of mud flowing into the creek. Eighteen signs about resource damage were installed in obvious places of resource damage. Nan suggests creating a sacrifice area and developing it the way the OhV users want. Numerous site problems were identified.

This area is in a grazing allotment. The permittee is conscientious and moves his cattle. He is upset because he respects the rules, but the public goes where they want. Recently cows were herded into the cattle guard by users resulting in 2 of them getting stuck.

Problems:

- Single lane dirt roads are widening to two.
- Typically, people camp, leave trash, and drive all over the meadows. The District may limit the number of people camping here by putting in culvert campfire rings to designate campsites.
- People are cutting new trails. The trail on north side of road at the 2-mile marker was put in 2 weeks ago.
- People drive right to the edge of the river to camp and have started driving through the creek and tearing out shrubs.
- Run-off draining through mud gullies is running into the creek. Last year Teresa Catlin organized a group to install worm fencing along a segment of the creek, but ran out of money. Could WIN funding be used? Bert Wasson, Karen Honeycutt and Jan Bodie need to be involved.
- Sensitive plant surveys have never been conducted here, yet there is on-going habitat degradation.

A second site visit was made to Delanie Meadows on July 13, 2001 by Dan Dallas, Carl Wright, Karen Honeycutt, Kathy Ahlenslager, Joe Coates, Jan Bodie and Don Gonzalez to further discuss issues identified during the first visit.

Results

The revegetation team acknowledged that this situation was more than a reveg problem. The situation was elevated to the Forest Leadership Team. The Forest Leadership Team discussed this issue at several meetings after these monitoring results were made known. They agreed to produce an OHV Policy for these areas. The Resource RDMA, Debbie Wilkins from Newport RD, was given this task. She will be presenting the policy for

decision in the spring of 2003. A summary of the policy will be presented in the 2003 Monitoring Plan.

The third stop was South Skookum Arch (5000999) (Bearfoot Timber Sale, New Moon EA) where an arched bridge was installed to replace a wooden bridge. The site was seeded (sheep fescue and mountain brome @ 30lbs/ac) and mulched with hay (4000 lbs/ac) within two weeks of completion. Disturbance around the site was kept to a minimum. The grasses are coming up. The site looks good.

Costs per acre that Ginger compared:

Dry seeding without mulch	\$337
Dry seeding with straw mulch	\$750
Dry seeding with wood fiber mulch	\$900
Hydroseeding, no mulch	\$605
Hydroseeding with straw mulch	\$1086
Hydroseeding with wood fiber mulch	\$1300

Bridge cost comparisons:

Arch bridge lasts 50 years	\$25,000-30,000
Concrete bridge	\$80,000-100,000
Pole bridge lasts 10 years	\$

The fourth stop was at a couple of burn piles (921 Salvage, New Moon EA). One slash pile was burned 3-4 years ago and seeded about 3 years ago. Sheep fescue covers at least 50% of the pile. About 30 feet away is a burn pile on State land. It is covered with mullein, Canada thistle and knapweed.

Question:

- How do we get the word out to seed burn piles? (ID team leaders put it in the EAs.) Is this an appropriate collection under BD? Talk with the FMOs.

The last site visited was along the 016 Road, which was a major haul route for the Bearfoot Timber Sale. The damp roadbed was raised a foot and ditches were put in on either side. It was completed (cleared, rocked, seeded) in October 2000. Since the width of road was kept to a minimum, so was disturbance. A brush cutter was used to clear a path for the larger equipment. A backhoe would have been more destructive. We didn't see any grass coming up.

Summary of the day:

- These revisits are good feedback for the people who worked on the projects.
- The revisits are good for keeping up the momentum for our Forest reveg efforts and for the reveg group.
- The Seeding Guide has helped.

C. Ecosystem Screen Monitoring

Two timber sales were monitored in 2001, Sheep, a sale that was recently sold and not harvested, and Old Berry, a sale in which the logging had been substantially completed. The sales were monitored for compliance with the Eastside Screening direction (Regional Forester's Forest Plan Amendment #2).

Biophysical Environments and Historic Ranges of Variability (HRV)

The Sheep Analysis area contains three biophysical environments: Douglas-fir shrub, Cool mesic western redcedar/western hemlock, and very moist western redcedar/western hemlock bottoms. The analysis of structural stages shows that 18% of the analysis area is in the early stage, 75% in middle, and 7% in late/old stages. All biophysical environments are below HRV in late/old structures. The Regional Forester's Amendment #2 directs that when late/old structures are below HRV, harvest in late/old stands is prohibited, and management activities must be designed to restore late/old structures onto the landscape. The silvicultural report identifies that management activity for this sale will be focused on restoring late/old structures onto the landscape. Sale mapping indicates that several late/old structural areas may be encroached upon with the sale. Monitoring will be focused on evaluating these areas on the ground to ensure that late/old structures will not be entered, and that recreating late/old structures is the focus of management.

The silvicultural prescriptions indicate that these areas have a few large trees, => 21 inches, but not enough to qualify as late/old structure. Where these large trees are encountered, they are to be retained. The objective is to create open late/old structures, structural stage 7.

B. Unit Monitoring

Four units were monitored in the Sheep T.S.;

Unit #1: was a structural stage 5, multi-storied stand without large trees. The objective of the prescription was to develop the stand into late-old structure. The prescription called for thinning the understory and smaller diameter trees, and leaving the larger diameter trees and overstory remnants, about 2 per acre are present in the stand. There will be no site preparation after treatment. The prescription should allow existing under and mid story trees to develop, while thinning the larger diameter trees so they can grow faster than they would without treatment. The prescription should allow the stand to move into a structural stage 6 more quickly than no treatment. There is a nice hardwood, primarily paper birch, component in the stand. These trees are programmed to be left for species diversity. The prescription also provided for variable spacing, which will enhance the spatial diversity within the stand after harvest.

Unit #2 is a pole to small sawlog size stand classified as structural stage 3. The prescription is to commercially thin the stand and allow the remaining trees to accelerate

diameter growth, while developing an understory to provide structural diversity. The leave trees contain shallow rooted species, lodgepole pine and englemann spruce. These trees may be susceptible to blowdown since the unit is located along a broad flat ridge. Slash treatment calls for grapple piling and burning. This should provide scarification and allow for natural regeneration. The prescription should provide for faster development of late/old structure if blowdown of leave trees is minimal.

Unit #21 is a structural stage 4/5. It contains larger trees than unit #2 and a hardwood component. The prescription is similar, to thin out understory and smaller diameter trees and allow for development of structural stage 6 more rapidly than no treatment. The proportion of trees removed is much higher than in stand #1. About 2/3 of the standing basal area will be removed. Slash treatment is only being done along the main rd. #15. Post harvest monitoring would be warranted in this unit to see if the treatment meets the objective.

Old Berry Timber Sale

A. Biophysical Environments and Historic Ranges of Variability (HRV)

The Old Berry Analysis area was analyzed within the Lost Ruby Watershed Analysis (EAWS). The watershed contains five biophysical environments: Douglas-fir shrub, Cool mesic western redcedar/western hemlock, very moist western redcedar/western hemlock bottoms, Cold Dry ABLA2 shrub, and Cold Mesic ABLA2 shrub. The analysis of structural stages shows that 10% of the analysis area is in the early stage, 89% in middle, and 1% in late/old stages. All biophysical environments are below HRV in late/old structures. The Regional Forester's Amendment #2 directs that when late/old structures are below HRV, harvest in late/old stands is prohibited, and management activities must be designed to restore late/old structures onto the landscape. The silvicultural report identifies that management activity for this sale will be focused on restoring late/old structures onto the landscape. Sale mapping indicates that several late/old structural areas may be encroached upon with the sale. Monitoring will be focused on evaluating these areas on the ground to ensure that late/old structures will not be entered, and that recreating late/old structures is the focus of management.

B. Old Growth

Only one stand meets the North Idaho zone definition of old growth in the sale area. This 96 acre stand has been deferred from treatment. If, during layout, any other stands are discovered that meet the old growth definition, and will be identified and deferred from treatment (Old Berry EA, Date?).

C. Unit Monitoring

Units 2 and 3 were sold as a separate sale, Buckshot, along with unit #1.

Unit #2 – This unit was prescribed as a shelterwood harvest. Trees left were primarily western larch and Douglas-fir, a ponderosa pine was also noted in the unit. Leave trees averaged about 14” dbh and had good crowns and crown ratios. The unit was originally to be burned and planted after harvest, but burning did not take place. The unit was interplanted with western white pine and western larch. Douglas-fir and lodgepole pine is also seeding in (though probably not to the extent it would have if the unit had been burned). Hardwood species were also present in the unit prior to harvest, and were retained.

Adjacent uncut stands were also reviewed. The size and stand density of these areas indicates that the harvest objective of reaching a large tree classification faster in the harvested units than the non-harvested would be met with this treatment.

Unit #3 – had the same prescription as unit 2 but looked much different after harvest. More trees were retained, along with uncut islands. This unit looked almost like a commercial thin than a shelterwood harvest. Slash treatment and underplanting were the same as unit 2. There was more of a grass component in this unit.

The unit also would meet the objective of creating large trees faster than adjacent uncut stands. In addition, the 3 units, 1, 2, and 3, lie along the same road and together along with uncut areas comprise a landscape. The treatment will result in a more diverse landscape than would occur prior to harvest. In the future, there will be clumps of large trees with developing understories, and uncut self-thinning areas with naturally developing understory.

Units 8 (shelterwood harvest), 11 (shelterwood harvest), and 30 (commercial thin) - had very similar post harvest stand conditions. Mid-story intermediate trees were removed and some thinning occurred. Overstories were opened to allow a post harvest growth response. Mid and understory trees that were left were undamaged; about 1 tree in 10 showed any cambial damage. These trees should develop due to decreased competition. The stands should develop into structural stage 6, multi-canopy with large trees, as a result of this prescription. A few large remnant trees remain in the stands. They were also undamaged during harvest. A good mix of species was retained in the overstory. Western white pine is especially evident in the canopy, along with western larch, Douglas-fir, Western redcedar, Englemann spruce, and an occasional ponderosa pine. Understory species also contain more diversity than expected, again with a good component of western white pine. This species in particular, should be more conspicuous in the units after harvest. (Note: I was very impressed with these prescriptions. Due to the varied structure, these are delicate stand conditions to prescribe treatments in. The completed treatments indicate a very thoughtful design and excellent implementation.)

General note for all units reviewed: Logging was very professional. Very few damaged residual trees were noted, even in regeneration. Logging slash was often bucked up and placed in skid trails to protect soils.

D. Key West Mine Monitoring

Monitoring of reclamation at this small open pit mine site continues. Except for some minor work done in 2001 physical reclamation at this mine was completed in 1997. Supplementary monitoring work carried out during the last two years examined Key West pit lake limnology and water quality. The results of that study indicate that the lake behaves like many natural lakes in the region. That is, the water stratifies during the summer due to density differences from solar heating. The water column “turns over” in the fall and spring, fully mixing the lake waters. This is characteristic of oligotrophic and dimictic water bodies.

Forest Service water samples and analyses are consistent with data reported by Echo Bay Minerals. Waters in the Key West pit are slightly alkaline (7-8.5), calcium-sulfate type. TDS concentration average 628 mg/l and sulfate about 336 mg/l. Metal concentrations are low. Sulfate concentrations in the lake have decreased over time. Despite thermal stratification during the summer, water chemistry did not change substantially with depth. Some trace constituents did vary notably with depth during stratification, but those differences are not expected to affect lake water quality.

Recommended Action: Results Acceptable/Continue to Monitor

E. Noxious Weed Treatment Monitoring

August 2, 2001

Rd. 7005 550. Roadsides, approximately 8 ft. from road edge were treated with Tordon herbicide on 7/10/01. Target species: Hawkweed and Scotchbroom. Species noted on the site were hawkweed, Oxeye Daisy, spotted knapweed, and St. Johnswort. Daisy and knapweed showing effect of spray. Hawkweed looked as though treatment was successful. Plants were deformed and showed no evidence of seed head development. Non-target species Kinnickinick showed no evidence of burning. Conifer species along treated area showed signs of burning. Mortality was not evident in conifer species.

Tordon was the herbicide used. Objectives of the spray were to 1) kill existing target species, and 2) to stop germination of seeds for following season.

Some rain was received after treatment. The adjacent stream was sampled after rain to test for evidence of herbicide contamination. No evidence of spray was found in water samples.

The goal of treatment on this site was to reduce the spread of plumeless thistle, hawkweeds, and small populations of A and B designate weeds, such as scotchbroom.

Road 5015, Cook's Mountain. Sprayed July 2000 and again on 7/25/01. Noxious weed species present include common tansy, hawkweeds, St. Johnswort, knapweed.

Target Species:

Hawkweed and tansy show evidence of spray. Hawkweed has set seed, but viability is questionable. Residual spray should hold down germination. Associated species, kinnickinick doesn't show effects of spray.

Herbicide Used: Tordon 22K

F. Post Prescribed Burn Monitoring for Noxious Weed Encroachment

Cook's Mountain Prescribed Burn

The Cooks Mountain prescribed burn was conducted in the spring of 1997. The burn was monitored in the fall of 2001 to see if noxious weeds were encroaching. Several dry grass dominated areas were monitored. St. Johnswort was encroaching in these areas, though competition from native species, especially pinegrass, appeared high. Toadflax was also encroaching. It had moved 1 to 2 chains into the burn on dry ravelly sites. Neither species appeared to be encroaching into the forest canopy.

Some evidence of hawkweed was noted at one site. Again competition from native species appeared to keep hawkweed from successfully moving very far into the stand.

One dry southerly facing open hillside on the far southerly side of the burn showed evidence of St. Johnswort moving far up the hill. This encroachment did not appear to be a result of the burn. The encroachment appeared to have been progressing for a number of years. Again, the encroachment appeared to be successful only in the grassy opening, and did not extend under the forested canopy.

G. Hydrology Monitoring

Item 25A Water Quality, Including Cumulative Effects Evaluation

There were 16 water bodies on the Colville National Forest that were listed as impaired for either fecal coliform, temperature, pH or dissolved oxygen on the 1998 303(d) report by Washington State Department of Ecology (DOE) to the US EPA. This list has been “set aside” by DOE. A 2000 list was never prepared and a 2002 list is being formulated at this time with new criteria found in WQ Policy 1-11 dated September 2002. DOE is currently proposing that 12 water bodies be listed as impaired for fecal coliform. It is thought that the other 1998 listed parameters reflect natural conditions. The current proposed listed water bodies drain watersheds that contain permitted livestock grazing. While livestock may not be the total source of elevated bacteria levels, they are a permitted activity and their location in relation to water bodies is controllable. Adaptive management (fencing) has occurred in problem allotments in 2001 and 2002 and additional monitoring and fencing will continue in 2003. It is hypothesized that the cumulative effects of grazing on National Forest land and private land is causing downstream water quality to exceed state water quality standards.

Water quality monitored at Bead Lake in 2001 and 2002 to determine changes in the Trophic State Index of the lake associated with the construction and use of the boat launch. No change has been detected since the Forest Service boat launch was constructed.

Water quality is also being monitored to determine if roadside herbicide applications are impacting streams. No contamination was detected in 2001 or 2002.

Item 25B Watershed Best Management Practices

Evaluation

Best Management Practices (BMPs) to protect water quality are specified as mitigation in environmental assessment documents for projects on the forest. There is a 1998 ‘Blue Book’ listing generic BMPs. From this list the forest has adapted a list of ‘Project Specific’ BMPs that rate ‘ability to implement’ and ‘effectiveness’ and which apply on the Colville National Forest. Individual projects adapt BMPs to the needs of the project and include them in environmental assessments. Soil, water and fish specialists monitor projects for implementation and effectiveness and create monitoring reports.

Watershed monitoring in 2001 and 2002 have determined that BMPs are being implemented as specified and are highly effective at protecting water quality.

Item 26 Riparian Areas

Evaluation

Riparian area conditions are monitored both on a project and watershed survey basis. There are several forms that are used to document results. The Inland Native Fish Strategy (INFISH) is used to determine the extent of and management of riparian areas. INFISH Riparian Management Objectives (RMO’s) are specified in environmental

documents and are in addition to BMP's. Project monitoring in 2001 and 2002 indicated that timber harvest and roading activities meet the RMO's, but livestock grazing generally does not. Additional work is needed to protect bank stability and riparian vegetation from any negative effects of grazing.