

Environmental evaluation of Colville National Forest



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ENVIRONMENTAL EVALUATION OF
COLVILLE NATIONAL FOREST RESOURCE MANAGEMENT PROGRAMS

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INTRODUCTION

This report summarizes observations made during a field evaluation of the environmental aspects of the Colville National Forest programs. The purpose of the study was to examine the Forest Service environmental control programs and to assess the program effectiveness in terms of conditions in the field.

The primary objectives of the evaluation were (a) to gain a better understanding of environmental problems, overall operations, and problems faced by the Forest Service at the field level, (b) to identify areas where Environmental Protection Agency (EPA) and Forest Service (FS) can work together to deal with resource management related environmental problems, (c) to establish EPA-FS contacts at the field level, and (d) to increase environmental awareness on the part of the land management agency (FS) field personnel.

The evaluation covered Forest operations involving air quality, water quality, water supplies, solid waste management, pesticides, oil and hazardous materials handling and storage, and noise. Five weeks were spent on the Forest (July - 1 week, August - 3 weeks and September - 1 week). It was not possible nor was it intended to do a comprehensive study of each Forest activity within this time frame. The field objective was to identify typical problems or potential problems and to attempt to determine an implication of their impacts. Discussions and field reviews of some activities were conducted with

Forest Supervisor's Staff and District Ranger's Staff. Some field observations were also made alone.

The Forest is located in the northeast corner of Washington (Figure 1) in parts of a three-county area (Stevens, Ferry and Pend Oreille). It is approximately 114 kilometers (71 miles) north of the Spokane metropolitan area. The Forest boundary at the time of field evaluation included 382,199 hectares (943,700 acres) of National Forest land plus 30,780 hectares (76,000 acres) of private and State lands within the National Forest boundary. The four Ranger Districts on the Colville are located at Republic, Kettle Falls, Colville and Sullivan Lake.* The Forest administers the Curlew Civilian Conservation Center located in northwestern Ferry County under agreement with the U.S. Department of Labor.

The Forest sustains a significant allowable cut of timber. There are thousands of hectares in Ferry and Stevens Counties where forage and cattle production are key values. A recreation resource is available. Water from the Forest is important for municipal, industrial, irrigation, downstream power production and navigation purposes.

The Forest Managers' responsibilities are to ensure that the basic resources, soil, water and air are managed in a manner compatible with and complementary to people's needs and desires. The productivity of the land, the several resources derived from the land, and human demands

*Forest boundary was revised in 1973. Forest now includes 445,211 hectares (1,100,100 acres) of National Forest land and 70,175 hectares (173,400 acres) of private and State land within the boundary. The Newport Ranger District was added to the Forest.

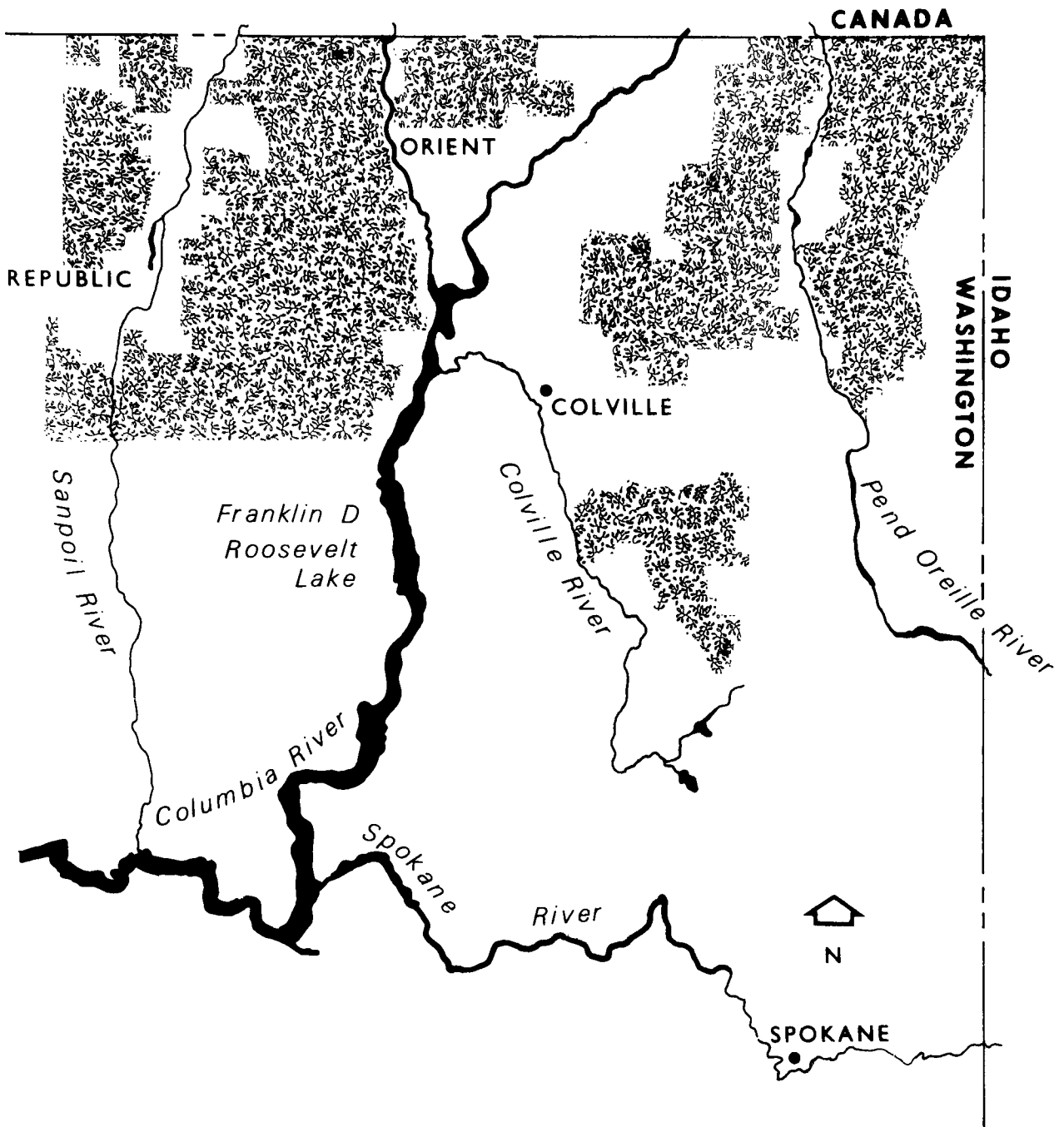


FIGURE 1

COLVILLE NATIONAL FOREST



FOREST SERVICE LAND

must be balanced to protect the environment, as well as to ensure sustained productivity for the future.

Major environmental problems in the Forest are associated with water supplies at campgrounds, solid waste, mining and oil and hazardous materials handling. Primary problems associated with these activities are as follows:

1. Inadequate surveillance of water supplies, including field surveys of facilities and monitoring.
2. Indiscriminate dumping and disposal of waste generated in the Forest.
3. Mining-related problems such as road construction off claims, large excavations without restoration, exploration without filing a claim and abandoned mines.
4. A contingency plan for handling accidental pollution or spills is not available.

Forest Service personnel are aware of the major problem areas, but are constrained in solutions by legal, budgetary and manpower limitations. Legislative revisions are necessary to adequately resolve mining problems.

The Forest environmental control programs are being strengthened through the following actions:

1. The planning unit process is being used to develop long range management plans for defined units of land. Maintenance and improvement of environmental quality are primary considerations in plan development.

2. Resource management decisions such as timber sales, road construction and other changes in land use are preceded by a Forest interdisciplinary team review, to evaluate alternatives and assess impacts of the proposed action.

3. The Forest is using mechanical procedures for volume reduction in slash generated from silvicultural thinning. The procedures reduce the amount of materials burned for volume reduction.

Summary of the major recommendations are presented below. These and other recommendations are at the conclusion of the various sections.

It is recommended that:

1. One individual be designated to coordinate the water supply operation, maintenance, sampling, inspection and reporting programs for campgrounds and the Curlew Center.

2. The Forest Service do everything possible to assist local government in expediting the development and implementation of their solid waste management plans.

3. Mining operations which are violating established water quality standards be identified, and the standards used to regulate discharges.

4. A contingency plan for handling accidental pollution or spills of oil, pesticides and other hazardous materials be developed.

RECREATION

Water Supply

Description of Field Observations

Water supplies are available at 23 of the 25 developed campgrounds (Appendix C). Users supply their own water at the minimum developed sites along Sullivan Creek. These sites are one family or occupant units. A list of recreation sites with developed water supplies is in the appendix.

A reconnaissance level evaluation of water supplies was made at the campgrounds. The review was focused on the adequacy of Forest Service policy and operating criteria, and compliance of field operations with such established criteria. The Millipore Portable Water Test Kit was used for bacteriological analyses for total coliforms at nine campgrounds randomly sampled.

Field Descriptions

The Forest has a recent agreement with Stevens County Health Department to do bacteriological analyses. The agreement was initiated in 1972. Prior to the recent agreement, water samples were sent to various laboratories for analyses, primarily State Health Department laboratories. Consequently, a structured or defined bacteriological sampling program is relatively new on the Forest.

The results of the random bacteriological samples are given in Table 1. Two of the nine sites analyzed had positive tests.

TABLE 1

CAMPGROUND WATER SUPPLIES SAMPLED FOR TOTAL COLIFORMS -
8/28 TO 9/5/72 - COLVILLE NATIONAL FOREST

<u>Campground</u>	<u>Results (total coliform) 100 ml sample</u>
Lake Ellen	<u>Positive (11 colonies)</u>
Sherman Pass Rec. Site	Negative
Trout Lake	<u>Positive (47 colonies)</u>
Mill Pond	Negative
Swan Lake (tap adjacent to shed)	Negative
Noisy Creek	Negative
Ten Mile	Negative
Deer Creek	Negative
Lake Leo	Negative

The hand pump at Lake Ellen Campground has a loose base seal and lacks base drainage. The pump is an older model and needs resealing around the base or possible replacement. The pump is shown in Figure 2. The most serious bacteriological problem of the sites analyzed occurred at Trout Lake Campground. A site description of the campground is in Appendix A. The water supply is a developed spring with a gravity distribution system with one hydrant.

Lake Ellen and Trout Lake Campgrounds water supplies were not sampled for bacteriological analyses during the 1972 season of use by the Forest. A list of campground water supplies analyzed by Stevens County Health Department for the Forest is given in Table 2. Of the 23 campgrounds with developed ground and spring water supplies, 17 were sampled one or more times prior to or during season of use.

Bacteriological data for all sites sampled on the Forest during 1972 (May - September) were reviewed in the Stevens County Health Department Office and spot-checked on two Ranger Districts (Colville and Kettle). The data reviewed indicated:

1. Samples were not taken periodically for all water supplies; samples for bacteriological test were not taken before some seasonally operated sites were opened.

2. Four positive tests for coliforms were reported to districts between March and September 1972; there were no formal follow-up procedures for positive test. Follow-up sampling or review of problem sites was left to districts.

TABLE 2

SAMPLES ANALYZED FOR TOTAL COLIFORMS, MARCH - SEPTEMBER
1972, BY STEVENS COUNTY HEALTH DEPARTMENT FOR COLVILLE
NATIONAL FOREST

<u>Site</u>	<u>Number of Samples</u>
Crescent Lake	4
Colville Camp	1
Deer Creek	1
Elbow Lake	2
Ferry Lake	5
Harvey Creek	2
Ione Camp	5
Little Pend Oreille Lakes	3
Lake Gillette	10
Lake Thomas	8
Mill Pond Camp	2
Noisy Creek	2
*Pierre Lake	12
Sullivan Lake Camp	3
Sullivan Lake Camp East	1
Sullivan Lake Camp West	1
*Summit Lake	2
*Swan Lake	25
Long Lake	5
Lake Ellen	None
Trout Lake	None
Davis Lake	None
Canyon Creek	None
Lake Leo	None

*Positive bacteriological test reported during season of
use.

3. There were no records of samples taken at five campgrounds.

4. Some samples were rejected by the County Health Department for analyses, because they were over 48 hours old when received for analysis. Samples were also rejected that were taken in unsterilized bottles for turbidity samples. Samples were retaken for analysis.

Available chemical data for the supplies were fragmented. Chemical analyses data collected during initial development of water supplies were not readily available in the Supervisor's Office. Some chemical analyses data were available for the Curlew Center. Analyses were not made for the important parameters as arsenic, barium, cadmium, lead, silver, etc. These substances in excess of PHS Drinking Water Standards are grounds for the rejection of the supply from a health standpoint. Therefore, the chemical analyses being done are not complete. The partial analyses indicate that parameters measured were below PHS recommended limits. Samples for the Center are analyzed by the State Health Department.

There is no established schedule of sampling for chemical analyses for the Center. Data reviewed for the Center indicate that the two most consecutive analyses were done April 20, 1967 and August 7, 1972, or a five year period between analyses.

Most of the pump supplies are shallow wells and are adjacent to shallow lakes. The water supply at Deer Creek Summit is used by both livestock and campground users. The supply is a spring with a pipe a few centimeters above the livestock watering trough. The

spring area is not fenced or protected. There is a potential for contamination of the water supply.

Forest Service Manual Requirements

Forest Service Manual 5652.03 requires that water furnished at developments on National Forest lands meet at least the minimum requirements established in the 1962 U.S. Public Health Service's (PHS) Drinking Water Standards. The standards include physical features as well as bacteriological quality, chemical and physical characteristics and radioactivity.

The Manual (2331.32a) requires water sampling for bacteriological tests at all public use sites which have developed water supplies. Samples are to be taken before seasonally operated sites are opened, and periodically from all systems when in use. The Forest Service recommended frequency for periodic sampling varies from once per season to twice monthly depending on size of the site and the history of previous test results.

The Forest Service Manual does not have guidelines for chemical sampling of water supplies. Chemical analyses are not done periodically on campground supplies. The Forest Service Water Development and Sanitation Handbook is the guide for water supply developments. The handbook states that one chemical analysis of a new source of supply is ordinarily sufficient, and that additional samples for chemical analyses of existing sources should be taken when there is a reason to believe there has been a change in the chemical characteristics

of the water. The PHS Drinking Water Standards states that, under normal circumstances, chemical analyses need be made only semiannually; the frequency should be increased or decreased when warranted by conditions affecting the water supply and the system.

The Manual (5652.42) requires at least annual documented condition surveys of all water supplies and sanitation systems. These surveys are to be done by a technically qualified inspector. The PHS Drinking Water Standards require frequent sanitary inspections to identify health hazards. No periodic documented sanitary inspections are done on water supplies. Some of the observations made during the reconnaissance survey such as broken base seals on pumps and positive coliform tests, suggest a need for routine surveys of water supplies.

Municipal Watersheds

There are six recognized municipal or industrial watersheds on the Forest. The land ownership and approximate number of people served are given in Table 3. There are no formal agreements on watershed management with the communities served by the watersheds. Watershed management plans have not been developed for most of the areas. This Forest along with other forests in the region began to develop management plans for all recognized watersheds. The program was de-emphasized after one plan was developed. A cattle grazing problem occurred in the Ione watershed (high coliforms) some time ago. The Forest required that cattle, which were allowed

TABLE 3

MUNICIPAL SUPPLY WATERSHEDS, COLVILLE NATIONAL FOREST

<u>Drainage</u>	<u>Municipality or Industry</u>	<u>Land Ownership</u>		<u>People Served</u>
		<u>Hectares</u>	<u>Other</u>	
		<u>FS (acres)</u>		
East Deer Creek	Orient	4,694 (11,590)	223 (550)	125
Cedar Creek	Ione	3,110 (7,680)	940 (2,320)	500-600
N. Fork Sulliyen Creek	Metalline Falls	3,175 (7,840)	None	450-500
Addy Creek	Addy	648 (1,600)	146 (360)	61
<u>Industrial</u>				
Flume Creek	Pend Oreille Mine and Mill	*	*	Used for drinking, mining and sanitation
Sullivan-Harvey Creek	Lehigh Portland Cement Company	*	*	75

*Not computed by Forest Service.

to graze in the watershed be removed. The community has obtained a chlorinating facility for drinking water, and cattle grazing is now allowed in the watershed. One of the proposed timber sales in the current Three Year Management Plan is in the Ione Watershed as discussed in the Timber Management section.

Recommendations

Water supply sampling, inspection and reporting programs for campgrounds and Curlew Job Corps Center should be strengthened.

Actions suggested to implement this include:

1. Transfer control for Forest water supplies from Districts to a water supply specialist in the Supervisor's office. The specialist's duties could include:
 - a. Coordinating with State and County Health Departments.
 - b. Making sure water samples are taken in accordance with the Forest Service Manual.
 - c. Follow-up action on unsatisfactory samples.
 - d. Initiating a routine chemical analysis program for parameters included in the PHS Drinking Water Standards on all campgrounds and the Curlew Camp water supplies. Since there is no data base for chemical analyses of water supplies, supplies should be analyzed once per year for one or two years to establish a data base. A complete analysis every three years (unless specific problems develop) afterwards would be adequate for Forest supplies.

e. Conducting and documenting annual and follow-up sanitary surveys on all drinking water systems including those found unsatisfactory during season of use.

2. Conducting periodic training sessions for employees involved with water supplies.

3. A better or alternative water supply should be developed for Deer Creek Summit Campground. The spring should be fenced as a minimum health protection measure. The campground could be designated as dry by removing the signs that encourage use of the spring.

4. Identify municipal water supply areas, uses to be accommodated and restrictions that will apply.

Sanitary Waste

The primary methods of sanitary waste disposal on the Forest are pit and vault toilets. Septic tanks are used at administrative sites and at Sullivan Lake Campground. Pit privy sites were reviewed and inventoried by Forest Service personnel in 1971 to assess their water pollution potential. The analyses were conducted as part of the Forest Service's Water Pollution Abatement Program (WPA). The program was implemented partially in response to Executive Order 11507. Therefore, most of the privies contributing to water pollution are documented. However, the WPA program was discontinued in January, 1972. With the elimination of the program, corrective actions are being delayed.

Most campground toilets were observed during the evaluation. In addition to water pollution potential, the facilities were checked for general structural conditions, odor problems and evidence of rodent activities. A summary of observations at campgrounds having potential problems is in Appendix A. Shallow depth of seasonally high ground water, and proximity to lakes, streams and springs, are the major limitations of privies with a potential for pollution.

Some of the minimum developed sites (sites with only a privy or two, and a picnic table in some instances) have severe limitations for pit toilets. Lower O'Brien, Sullivan Lake Camp #3 and the old privy in the boat launch area at Sullivan Lake are located on alluvial terraces or streambeds. The depth to seasonally high ground water

from the surface to a few meters below the surface results in some water pollution. The value of these installations should be carefully determined in terms of cost of needed corrective actions, and eliminated if the corrections cannot be justified economically.

Disposal of Vault Toilet and Septic Tank Pumpings

A study concerning the disposal of vault toilet and septic tank pumpings along with a proposed procedure for disposal was prepared by the Forest Engineer in March 1972. The proposed plan has been approved by the Forest Service Regional Office, and the Forest is proceeding with trench disposal. There are several vault toilets and septic tanks on the Forest. The vaults may be pumped every three or four years. Cities in the area have been reluctant to accept pumpings, because they use lagoons, and the sewage from recreation sites would upset and overload the lagoons. Republic accepts pumpings from Forest Service for \$2.00 per load.

No formal guidelines for site selection were used in selecting the initial disposal site. The site was evaluated by the Forest Soil Scientist; however, there is a need for a formal evaluation procedure for disposal sites for vault pumpings. The quantity and frequency of pumpings will increase, with the recent past conversions to vaults in many areas on the Forest. The sewage disposal vault recently installed at Lake Gillette Campground will increase the volume for disposal. The installation is shown in Figure 3.

Land disposal of vault toilet and septic tank pumpings should be done on an interim basis only. Long term solutions should be developed, including possible construction of or use of mechanical sludge digestors.

Recommendations

Sewage disposal inspections and monitoring programs for camp-grounds should be improved. Specific actions could include:

1. A priority listing or accomplishment schedule for conversions or relocations of privies polluting or having a potential for pollution of water.
2. Land disposal for vault and septic tank pumpings should be conducted on an interim basis. Long term solutions including possible sludge digester construction should be developed.

Solid Waste

There is one authorized open dump on the Colville National Forest, under special use permit to the Spruce Canyon Youth Camp (State facility). The dump is shown in Figure 4. The dump is on Forest Service land at Hosmer Creek in the Little Pend Oreille Lakes Area. Dumping is done over the bank with infrequent covering and periodic burning at the site. An evaluation of the site and some of the other sites used by the Forest for solid waste disposal are in Appendix B.

Those using the Little Pend Oreille dump include Forest Service, Spruce Canyon and local property and resort owners. Forest Service use is from the Little Pend Oreille Lakes Campgrounds. Approximately one hundred cans are dumped per day by users during the recreation season (May - October). Solid waste disposal from campgrounds in the Little Pend Oreille Lakes area requires a full-time summer solid waste collector.

The Colville National Forest disposes of approximately 177,000 kilograms (391,000 pounds) of refuse annually. Estimated volumes of waste generated per month on a district basis are given in Table 4. In addition to the Little Pend Oreille Lakes dump, the Forest uses Ferry County dump, and dumps at Curlew, Republic*, Orient, Ione and Metaline Falls.

The Colville National Forest is under a mandate to have all solid wastes disposed of in sanitary landfills by Fiscal Year 1974.

*Dump at Republic closed at Forest Service request because of fire danger. County dump now used.

TABLE 4

Vol. 2,300 C.Y.

The mandate includes USDA Secretary's Regulation 42 C.F.R. 476.8 (19) and the Resource Recovery Act of 1970. In November 1972, the Forest developed plans to specify how they will meet Fiscal Year 1974 deadline; this schedule is required by the Secretary's Regulation.

An amount of \$8,000.00 has been requested to complete studies on solid waste management on the Forest with \$40,000.00 requested for implementation of closing dumps (includes purchasing equipment to operate transfer stations with landfill). The requested appropriations and all the current planning is based on the assumption that at least one sanitary landfill will be operating in the tri-county area (Stevens, Ferry and Pend Oreille) by 1974, by a local unit of government.

The solid waste management plan^{1/} prepared for the area in February, 1972 was rejected by the local units of government. The plan included development of sanitary landfills in the area with transfer stations. The plan was rejected for presumed failure to deal realistically with implementation cost. Forest Service land and solid waste disposal were considered in the TRICO Plan.

The county and city dumps in the area that are used by the Forest Service are all poor, with none approximating a sanitary landfill. The Pend Oreille County Sanitarian indicated that some of the dumps formerly used by the Forest Service (now closed) were better from an environmental standpoint than the county dumps that replaced them. The dump at Metaline Falls was cited as an example. The

^{1/} TRICO 1972. A Comprehensive Solid Waste Management Plan for Ferry, Pend Oreille and Stevens Counties, Washington. Economic Development District, Colville, Washington.

Metaline Falls dump receives approximately 19 metric tons of waste generated on the Forest, Appendix B. Unauthorized or trespass dumping on Forest Service land is a perennial problem on some districts. Two unauthorized dumps were observed on the Forest. One site had evidence of recent dumping and is located on a county road above the Pend Oreille River (Appendix B). This site was the worst of the sites observed. The Ranger is currently pursuing trespass legal action against an individual whose refuse was found on Forest Service land.

Recommendations

The recommendations and comments are based on a review of the Solid Waste Implementation and Operating Plan prepared by the Forest in October, 1972. Specific recommendations are:

1. The Forest Service do everything possible to assist local government in expediting the development and implementation of their solid waste plans. It appears that an additional effort toward a regional solid waste management program should be actively pursued with local government. The influence of the Forest Service, through a combination of their resources, land ownership and cooperative attitude could be the deciding factor in acceptance and implementation of a regional solid waste plan.

2. In closing indiscriminate dumps, where a water pollution potential exists, as in the dumps along the Pend Oreille River, refuse should be removed to a sanitary landfill rather than buried in place.*

*Dump is no longer being used near Pend Oreille River.

3. To avoid an indiscriminate dumping problem in closing trespass dumps, a public information program should be instituted informing local individuals of closing dates and recommended alternative disposal sites.

Noise

Noise levels were measured on the Forest from August 29 to September 4, 1972, at randomly selected points, primarily at campgrounds. The General Radio Sound Level Meter model 1565-B was used to measure sound levels. The meter will measure levels from 40 to 140 decibels. Several campgrounds which were observed where there was little or no vehicular activity had levels too low to record on the measuring instrument. This was the dominant situation in areas where measurements were attempted. Motor bikes were the major source of noise in campgrounds where measurements were recorded. The highest levels measured on the Forest were at Le Clerc Creek Campground. A motorcycle club was using the campground during the time measurements were taken (Figure 5). Levels were recorded between 5:30 and 6:00 pm, September 3, 1972, at Le Clerc Creek Campground. Twenty-five to thirty bikes were operated continuously during the time measurements were recorded.

Sound levels recorded above 60 dBA's are given in Table 5. Several campers at Le Clerc Creek complained about noise levels and hazards with the continuous use of the campground and vicinity by the bike riders. En route to the campground, a family camping group was encountered that had been driven away from the area by the continuous high noise levels and dust from the motor bikes. The campers were unable to persuade the bike riders to decrease the noise. The campers indicated the bike riders began before 8:00 am

TABLE 5
SOUND LEVEL MEASUREMENTS WITH A GENERAL RADIO SOUND LEVEL METER
MODEL 1565-B - COLVILLE NATIONAL FOREST

Area	Highest dBA Range ¹	Date-Time	Source	Distance from Source Being Measured(meters)
Swan Lake Campground	65-75	9/2/72 - 9-9:30 am	motor bikes	1 to 2
Sherman Pass Rec. Area (Picnic Area closest to highway)	60-65	9/2/72 - 2-2:30 pm	cars, trucks ²	5
Le Clerc Creek Camp- ground	95-105 (3 readings) 85-95 continuous	9/3/72 - 5:30-6:30 pm	motor bikes	1 to 2
Noisy Creek Campground	70-95	9/4/72 - 1:30-2:30 pm	motor bikes	1 to 2

¹There were intermittent periods of low or no readings during period of measurement, with the exception of Le Clerc Creek, where high level readings were continuous.

²Traffic levels were low during period of measurement; eight vehicles were counted during the period.

and were riding nearly continuously until the time measurements were recorded.

High sound levels were also recorded at Noisy Creek Campground (Table 5). The most continuous high level recorded was in the 80's; highest readings (90-95 dBA's) were recorded when cycles were accelerated within a few meters of the measuring instrument. There were three or four motorcycles operating in the campground during the time measurements were recorded.

Motor bikes have been recognized as a major source of high noise levels on the Forest. A recent report by Washington State University,^{2/} which includes interviews with several campers and Forest users, indicates that high noise levels from motor bikes was the number one complaint of most of the people interviewed. Forest Service regulations related to activities in developed recreation sites (Title 36, Code of Federal Regulations) were posted in all the campgrounds where measurements were made. The regulations relative to noise levels are 251.95 (k) "Failing to maintain quiet in campgrounds between the hours of 10:00 pm and 6:00 am is prohibited" - and 251.96 (f) - "Operating a motor vehicle in such a manner as to create excessive or unusual noise or annoying smoke, or using a muffler cutoff, bypass, or similar device is prohibited."

The problem with controlling high noise levels appears to be one of enforcement or monitoring motorcycle traffic in camping areas. The regulation that no motor bikes are to be operated except during

^{2/} R.L. Shew, 1971. Recreation Use Report. Sullivan Lake Area, Colville National Forest. Division of Forestry and Range Sciences, Washington State University.

ingress and egress in the campground was frequently violated at all the campgrounds where motorcycles were observed and sound level measurements recorded.

Most of the sound level measurements were made during early September. The impact of heavy recreation use because of the Labor Day weekend was probably at a maximum. The sound level measurements, therefore, may more closely approximate maximum impact levels rather than average levels during the season of use. Since annoyance is directly related to peak levels, these maximum levels are critical and warrant attention.

There appears to be a need to limit or restrict motorcycle activities, especially by groups in campgrounds. The use of campgrounds as riding arenas by individuals or groups makes the camping experience unpleasant for other campers.

Recommendations

High noise levels recorded in campgrounds were related to peak periods of use. Actions which may be used to reduce noise annoyances in campgrounds are:

1. Vigorously enforce regulations related to noise levels, particularly in developed recreation areas.
2. Monitoring of noise levels should be conducted as part of routine campground monitoring for vandalism and other violations.
3. The noise level and speed of cycles in campgrounds should be specified.

4. The long term solution to the motorcycle noise and resulting soil resource damage problems will require restricting the use of cycles in camping areas and vicinities.

NATURAL RESOURCES

Timber Management

The 1965 timber inventory indicated Douglas fir and larch species occupied about 61 percent of the commercial forest land; ponderosa pine and lodgepole pine species each covered 13 percent. The remaining important species on the Forest are spruce, cedar, white pine, hemlock and subalpine fir. The Timber Management Plan approved in 1965 established an annual allowable cut for the Forest of 92.5 million board feet. Since 1965 the annual cut has averaged about 82 million board feet.

Several timber sales in progress and past timber sales were reviewed on the Forest. One of the problems observed was poor utilization of some of the timber cut. In some instances, merchantable material was left in the Forest for disposal. A logging operation resulting from blowdown was reviewed on the Sullivan Lake District. The area is shown in Figure 6. Some environmental degradation was evident such as excess debris accumulation in streams and logging through some streams. Most of the affected streams were intermittent mountain streams. The blowdown logging operation represented maximum impact from logging operations on the Forest that was observed. The environmental impact of logging on other forest resources was less with other sales observed.

The timber sale contracts for the most part have adequate stipulations to ensure environmental protection; the major exception is related to timber sale road construction, as discussed in the section on roads. Timber sale contract administration is the area where environmental considerations can be assured during a logging operation. One administrator was responsible for 14 active sales on the Sullivan Lake District during the assessment. In this case, commitment to environmental protection and contract compliance was evident with the administrator.

There was an obvious need for additional manpower in the Sullivan Lake District to adequately enforce and monitor the active timber sales. One administrator was ill during most of the operating season.

Dozer piling and burning is the most widely used method of slash disposal on the Forest. The acreage of slash disposal by various burning methods is given in Table 6. The Washington State Department of Natural Resources (DNR) has been designated by the Department of Ecology as the air quality control unit for smoke management from Forest operations in the Colville area. The Forest coordinate with the DNR and report their burning activities and smoke dispersal.

The average annual amount of slash generated in the Forest during Fiscal Years 1968 to 1972 was approximately 600,000 metric tons. An estimated 100,000 metric tons of the slash generated were burned annually during Fiscal Years 1968 to 1972. The largest percentage of the slash resulted from silvicultural thinning, and remained in the Forest for natural decomposition.

TABLE 6

HECTARES (ACRES) BURNED BY VARIOUS METHODS -
COLVILLE NATIONAL FOREST - FY 1968-72

Burning Method	1968	1969	1970	1971	1972
Dozer piles	843 (2,082)	577 (1,424)	577 (1,424)	771 (1,903)	697 (1,720)
Hand piles	---	---	---	218 (538)	190 (468)
Broadcast	204 (503)	521 (1,287)	59 (146)	471 (1,163)	260 (642)
Jackpot	---	---	---	---	667 (1,647)

Burning woody materials affects air quality through the emission of hydrocarbons, particulate matter, and carbon monoxide. Because of the broad variety of fuel constituents and burning methods involved, accurate emission inventories for sources of air pollution are difficult to obtain. Consequently, the lack of an adequate emission inventory or other suitable data makes it difficult to assess the impacts of slash burning on the atmospheric environment.

The most obvious concern about Forest residue burning is the reduction in visibility due to smoke generation, and the potential for regional transfer of the smoke into an area encountering air pollution episodes.

One of the major timber management problems is the large acreage and dense stands of trees in the 20 to 40 year age class, a result of fires. The stands require thinning for commercial timber management. The Forest has used several thinning methods in the timber management program. Thinning methods used and acreage on the Forest are shown in Table 7.

One thinning method, the tomahawk, has been used on the Forest on an experimental basis to assess its potential for use to reduce fire hazards in logging, right of way and chain saw thinning slash. The implement crushes, chips, and compacts the slash. The mechanical method reduces the amount of slash to be burned. Several areas where the method was used were reviewed. The implement appears effective for treating slopes up to 45 percent in light to medium slash. The

TABLE 7
THINNING METHODS AND HECTARES (ACRES)
COLVILLE NATIONAL FOREST, 1965-71

Method	Hectares	(Acres)
Saw (Colville District)	810	(2,000)
Dozer (Colville District)	4,860	(12,000)
Chemical	2,633	(6,500)
Other Districts (Saw and Dozer)	6,885	(17,000)
Forest Total	15,188	(37,500)

limitations of the implement are: (1) use on steep slopes may result in soil damage, (2) it is less effective for materials over 10 centimeters (4 inches) in diameter, and (3) its effectiveness is limited on green dozer-thinned slash.

Dozer thinning involves removing intermittent strips of timber in a stand by moving through the stand with a dozer. A dozer-thinned area is shown in Figure 7. The method has been used extensively on the Forest as shown in Table 7. The primary limitations of the method are: (1) initial site appearance after treatment is devastating, and (2) the impacts of run-off from treated areas are unknown.

An assessment is in progress on the Sullivan Lake Ranger District to determine the effects of past timber harvesting on the streams in the Sullivan Creek Watershed. Impacts have been significant; excessive debris accumulations and jams are common. Turbidity levels above 25 Jackson Turbidity Units (JTU's) are common in parts of the watershed. The highest turbidity levels measured on the Forest during spring runoff occurred there. A high reading of 500 JTU's was recorded in May, 1972, as a result of mass gravity soil slides. The slides were accelerated as a result of prior logging operations and road construction. Soils in the watershed are highly susceptible to erosion.

The Forest has imposed a moratorium on clear cutting in three drainages (John, Pass and Stony Creeks) of the Sullivan Creek Watershed to limit or reduce the impacts of additional runoff. Reclamation operations, including debris removal from some of the streams is

anticipated as a result of the watershed assessment. The moratorium on cutting is a needed environmental protection measure. A study is in progress in the McGahee Watershed (Kettle District) to obtain basic information related to watershed management. Information related to stream flow, bank stability and effects of vegetation manipulation on the watershed are being studied.

The environmental impact of commercial timber sales on the Forest are difficult to determine at the reconnaissance level. Several timber harvesting methods are used. Methods and hectares are given in Table 8. Eighty-five percent of harvesting is currently done by tractor logging, with fifteen percent jammer or high lead logging. The proposed timber sale program for the Forest during the period July 1, 1972 through June 30, 1975 (3 Year Plan) was reviewed. Information in the plan on road construction and cutting methods are too general for determination of impacts.

Some of the proposed sales in the Forest Three Year Timber Management Plan are in municipal watersheds, and three are in essentially roadless areas identified in the Forest Service inventory. Roadless areas were inventoried in the Forest in 1970-71 as part of the Forest Service requirement. A summary of the roadless inventory data is in Appendix D. The Three Year Timber Plan suggests that skyline logging may be required for some sales, primarily in steep areas with highly erosive soils. The method would minimize the resource damage, and should be mandatory if some of the proposed sales are carried out.

TABLE 8

HECTARES (ACRES) CUT BY SILVICULTURAL PRACTICES
COLVILLE NATIONAL FOREST - FY 1968-72

Method	1968	1969	1970	1971
Clearcut	1,234 (3,048)	865 (2,136)	698 (1,724)	1,537 (3,794)
Shelterwood	521 (1,287)	327 (808)	218 (538)	397 (979)
Overstory Removal	864 (2,132)	1,311 (3,237)	2,012 (4,968)	1,610 (3,975)
Selection	10 (25)	38 (94)	52 (128)	100 (248)
Salvage	106 (261)	102 (252)	216 (532)	535 (1,322)
Intermediate	0	0	0	333 (821)
Wildlife	199 (490)	0	0	357 (882)

Recommendations

Many of the following recommendations are found in the U.S. Forest Service publication National Forest in a Quality Environment Action Plan. Actions which may be used in reducing degradation from timber management activities are:

1. Follow the provisions of an environmental impact statement on the timber sales planned for a three year period, including areas to be cut, methods of cutting, placement of roads, slash disposal, and general soil characteristics necessary to evaluate the impacts of timber harvesting. Include in this statement the Forest Service environmental analysis report for those sales which may cause potential problems. Develop procedures for predicting in the planning phase, effects from individual timber sales including whether these activities will comply with water and air quality standards. If deviations are expected, list them and duration of such deviations.
2. Develop a program to monitor water and air quality affected by logging for compliance with Federal, State and local air and water pollution laws and regulations.
3. Determine level of regular field inspection of logging and road building necessary to ensure compliance with environmental standards. Logging and road construction should proceed to the extent adequate administration can be provided.
4. Strengthen contract language to allow an effective means of penalizing timber sale contract violators.

5. The moratorium on logging in the Sullivan Creek drainage is a needed environmental protection measure and should be implemented until studies indicate otherwise.

Road Construction

The Colville National Forest has approximately 97 kilometers (60 miles) of system roads constructed per year. There are currently about 564 kilometers (350 miles) of system roads under contract. Construction will be completed in approximately three years. The Forest Service locates, designs and inspects all system roads.

Temporary roads have no specific building specifications other than measures such as outsloping, drainage dips and water spreading ditches for erosion control, which are required in Division B--Timber Sale Contract. Locations of spur roads must be approved by the Forest Service. Forest personnel are currently preparing a "c" clause addition for timber sale contracts issued in relation to temporary roads. The "c" clause will have additional provisions for constructing and closing off temporary roads for the timber purchaser. This type clause, if properly implemented, could reduce resource damage that is occurring with present provisions.

Several kilometers of roads were reviewed during the assessment. The most consistently observed problem appeared to be mass road failures or stability problems. A dominant soil characteristic is contrasting textures such as ashy over loamy or ashy over fine silt. The results in much of the Forest are contrasting soil permeabilities that produce areas of soil-moisture build-up, resulting in mass-gravity movements when combined with steep slopes and high precipitation.

Roads observed in detail were a recent (1971) road constructed in the Johns Creek Area of Sullivan Lake Ranger District and the South Fork of Sherman Creek Road on the Kettle Falls District. Several sections of the Johns Creek Road washed out during spring runoff; several culverts were destroyed with several metric tons of soil eroded. Repairs and reconstruction were in progress during field observations. Some of the culverts were being placed in the same location as the ones washed-out with only minimal modifications. Recently deposited sediment was used as the major fill material for one culvert. Areas of the fill remained nearly saturated after filling, again resulting in poor road bed conditions. Several areas were observed where road-side drainage ditches were constructed to transport water several meters before diversion away from the road; gullies were beginning to develop in some of these areas.

Approximately 23 meters (75 feet) was washed out on Johns Creek Road approximately one mile from the lower damaged area. This was a mass road failure, with several hundred cubic meters of fill washed out. The mass failure resulted from water being channeled to the fill from a large area with a relatively steep gradient. The soil above the fill was ashy over loamy (light silty clay loam), therefore water moved laterally above the somewhat restrictive silty clay loam horizon and accumulated above the fill. With a build-up of water, the fill became supersaturated resulting in a mass gravity movement. The road was being relocated further into the slope, with the intention

of diverting water above the cut slope to prevent concentration in the road fill area.

The South Fork of Sherman Creek Road was observed from its junction with Highway 30 to above the intersection with the Snowshoe Creek Road. The road is a Land Access Road (LAR), which is designed and constructed as a high quality single lane road. Road stability was the major problem observed. Erosion was severe in the road bed, cut banks and fill areas on most of the road. The road was under construction at the time of field observations.

The surface soil horizons are high in silt and volcanic ash, making them highly susceptible to erosion when disturbed. Water running down gradients for several meters (25 to 31 meters) without outward drainage resulted in soil movement. Banks and fills were largely unprotected during spring run-off resulting in excessive erosion. Some culverts were plugged with large quantities of sediment. Some of the road banks and fills were seeded before run-off to attempt to minimize erosion. Stand establishment was unsuccessful before run-off occurred.

The Forest is currently involved in a field study with the Coeur d'Alene National Forest Nursery to assess the potential of using native browse species (snowberry, ninebark, cenothetus, etc.) as plantings for road bank stability, along with various mulching and seeding experiments. The South Sherman Road is one of the areas being studied in detail to attempt to reduce the erosion problems associated with the road and other similar situations on the Forest.

A road construction project was observed in conjunction with the Cottonwood Creek Timber Sale in the southeastern part of the Kettle Falls District (sec. 28, 29 - T. 35 N., R. 36 E.). The portion of the road constructed did not adequately serve the timber purchaser's needs or the land management needs of the Forest (Supervisors 1440 Inspection - 11/21/72). The construction also differed from the plan proposed in the multiple use impact statement. Nearly twice as much system road of a lesser width would have been optimum for management purposes. The timber sale purchaser would have preferred to have had a system road into the main sale area. The timber sale appraisal, however, did not make sufficient allowances for the substituted spur road.

Construction of the road in the Cottonwood Creek area involved a number of cuts and fills with a large amount of soil movement. As in other areas of the Forest, soil erosion susceptibility increases with surface disturbance. The land characteristics along the construction route varied from shallow to moderately deep soils with rockland and rock outcrops. Construction cost and environmental impact were increased because of the land characteristics.

Several other roads were observed on the Forest, many having a limited adverse environmental impact. The problems observed were generally similar to those described for South Sherman and Johns Creek Roads. Road stability and erosion problems are the major environmental problems.

Recommendations

Construction and healing of road banks and fills before resource damage occurs is a major problem. Actions which may be used to reduce degradation from road construction are:

1. Development and implementation of the proposed "c" clause related to temporary and permanent roads constructed as part of timber sales.

2. Development and implementation of specifications relative to the desired character of roadfill material appears to be needed. In deep fills of more than 2 to 4 meters, coarse fragments larger than 2 mm would improve drainage, particularly in soils that are dominantly medium and fine textured.

3. Road design modifications related to length of drainage ditches or the distance runoff water is allowed to travel before diversion, appears necessary to reduce erosion and sedimentation.

4. In areas where road locations are questionable from an environmental impact standpoint, use logging methods not requiring new roads or modify methods to eliminate impacts.

Mining

Although there are no active mines on the Colville National Forest where minerals are being extracted for commercial processing, there are several claims where extensive exploratory prospecting work is in progress. A recent review of active unpatented claims on the Forest inventoried 1,434 claims, where claimants have kept assessment work up to date. Two hundred eighteen of the claims are new or were filed during the past year.

A distribution of assessments and new claims by Ranger Districts is shown in Table 9. In addition to known claims, there are hundreds of old claims of unknown validity or status scattered throughout the Forest. The Forest retains surface rights on all unpatented mining claims with the exception of eleven claims totaling approximately 74 hectares (180 acres). Several mineral material permits for ornamental building stones are also active.

Extensive geological surveys have revealed large areas of lead and zinc ore in the northeast corner of the Forest from Metaline Falls to the Canadian border. Other significant mineralized areas that have been extensively explored are in the Leadpoint - Deep Lake vicinity and the Eagle Mountain - Quartzite Mountain area east of Chewelah. Principal commercial minerals on the Forest are lead, zinc, silver, copper, molybdenum and associated minerals.

The problems associated with mining activities are unauthorized or trespass activities such as road construction off claims by

TABLE 9

RECORDINGS OF NEW CLAIMS AND ASSESSMENT WORK - COLVILLE NATIONAL FOREST - FEBRUARY 8, 1972

	<u>Ferry County</u>		<u>Stevens County</u>		<u>Pend Oreille County</u>		<u>TOTAL</u>	
	<u>Assess- ment</u>	<u>New New</u>	<u>Assess- ment</u>	<u>New</u>	<u>Assess- ment</u>	<u>New</u>	<u>Assess- ment</u>	<u>New</u>
Republic R.D.	78	29					78	29
Kettle Falls R.D.	38	16	105	71			143	87
Colville R.D.			345	24	8	1	353	25
Sullivan Lake R.D.					860	77	860	77
TOTAL	116	45	450	95	868	78	1434	218

prospectors without obtaining a special use permit, exploration without filing a claim, and abandoned mines.

An excavation was done in the Sullivan Lake District by an individual without filing a claim or consulting the Forest Service. The hole, approximately 31 meters (100 feet) wide and 5 meters (16 feet) deep was excavated because the individual found what appeared to be high grade galena ore on the surface near the road and began digging to locate the source. The area is shown in Figure 8. The Ranger surmised, "The source of galena could have been many miles removed from the found piece." The piece was probably dropped during hauling or transported from its original location in any number of ways. The individual has been advised by the Forest to rehabilitate the area (cover the hole and revegetate) or trespass legal actions will be initiated against him. The Forest assesses the resource damage to be in excess of \$800.00.

The Forest has initiated some legal actions against claimants or prospectors that continually violate mining laws, primarily in the area of road construction off claims, without obtaining a special use permit prior to construction.

The Noisy Creek mining activities were reviewed as a representative example of mining in the Forest. The operation is located at the south end of Sullivan Lake adjacent to Noisy Creek, which drains into Sullivan Lake at Noisy Creek Campground. The individual has 48 placer claims in the area. Equipment buildings and sheds have been constructed on the site. Mobile living quarters are also on site.

The claimant's activities have consisted of road construction and exploratory excavations into the mountains. Several hundred cubic yards of earth and rock materials have been moved during various phases of the operation.

Because of the proximity of the operation to Noisy Creek and Sullivan Lake, it has received close scrutiny from the Ranger District. The prospector is also sensitive to potential public reaction against his operations. He has therefore been cooperative with the Forest Service, and attempted to minimize the obvious adverse impacts of his operation. Because of the adjacent location of some of the excavations and road construction to Noisy Creek, some sediment problems developed. There is a profound visual or aesthetic impact associated with the large excavations into the mountains, in an otherwise heavily vegetated area.

The major means available to the Forest for regulating potential impacts of mining activities is the special use permit requirements for activities off the claims, as necessary road construction for ingress and egress. There has been a reluctance to initiate trespass legal actions related to mining activities, because of the large amount of time and coordination with legal personnel required. Therefore, unless resource damage was major or the violation was flagrant, trespassers were left alone.

Recommendations

Unauthorized or trespass activities such as road construction off claims by prospectors; exploration without filing a claim and

abandoned mines are problems. Actions which may be used in reducing impacts from mining activities are:

1. Use special use permits whenever possible to cover or assess mining related activities.
2. An environmental impact statement should be required in connection with Forest Service permits associated with significant mining operations.
3. Include the cost of environmental protection as a mining cost in evaluating the validity of a mineral discovery.
4. Use Departmental level (Department of Agriculture through Department of Interior) mineral withdrawal authority to protect public lands whenever possible, particularly in areas where there is a major conflict with other resource uses.

Grazing

Cattle and sheep are permitted to graze on the Forest through permits issued to 93 ranchers. There are approximately 6,000 cattle on the Forest, with 3,000 on the Republic District. One band (1,200 head) of sheep graze in the Sherman Creek area of the Kettle Falls District. The remainder of the cattle are distributed on the other three districts.

The Republic District is located in the western part of the Forest, where timber stands are open, and grassy slopes and ridges are abundant. Most of the forage is found in timbered bottoms and lower slopes close to water.

There are 58 grazing allotments, which vary in size and grazing capacities. Permittees are assessed .81¢ to .85¢ per Animal Unit Month (AUM) for grazing privileges. Permitted grazing occurs from June through October. Grazing varies on individual allotments according to forage availability, weather and management requirements. Rotation grazing systems are being used on some allotments (approximately 10) to provide soil and vegetation protection. Unsatisfactory or over-grazed conditions exist on the Forest, primarily along streams or near water developments where cattle congregate. Localized over-grazed areas were observed adjacent to the South Fork of Mill Creek and in the vicinity of Deer and Ninemile Creek.

Recommendations

To minimize pollution potential from grazing the following actions are suggested:

1. Develop base-line water quality data from various intensities of grazing as a guide to identification of problem areas.
2. Assess problems related to grazing, and identify springs, water bodies, etc., that should be fenced or otherwise protected.

OTHER ACTIVITIES

Pesticides

The primary uses of pesticides by the Forest are for range improvement (broad leaf control) and silvicultural chemical thinning. Pesticides are used for right-of-way maintenance by Bonneville Power Administration (BPA), Railroads and State and County Highway Departments, as special use permittees.

Forest Service Uses of Pesticides

Range Management. Herbicide and fertilization programs used in range management have been limited on the Forest. Spraying and fertilization have been done in two meadows, that were cleared for former homesteads. A meadow of approximately 62 hectares (150 acres) in the Mill Creek area of the Colville District was sprayed in 1971 with 2, 4-D (1 kg. active ingredient per acre) and fertilized with 14 to 23 kgs. of nitrogen per hectare for range improvement. The Tiger Meadow area (116 hectares (284 acres)) on the Sullivan Lake District was sprayed in the past (late 1960's) for broadleaf control, with 1/4 to 1 kg. per acre of 2, 4-D. Both projects were one-application, with no follow-up applications scheduled.

The range pesticide applications were made by the special use permittees with Forest Service supervision and monitoring. Monitoring was visual, primarily for drift. The Forest Service employee is a state licensed pesticide operator. There is not an annual spray program operated by the Forest.

Chemical Thinning. The major use of pesticides by the Colville National Forest is in the chemical thinning program. Organic arsenicals are used in the program. Monosodium Acid Methanearsonate (MSMA) is the silvicide used. Two factors have led to increased use of organic arsenicals on the Forest: (1) increased management for timber along with other forest uses has resulted in increased thinning, and (2) the development of organic arsenicals for tree injection as an economical and effective substitute for cutting has resulted in adoption of chemical thinning as a timber management tool.

Silivisar 510 (MSMA) was applied to excess trees in several forest stands between June 1969 and March 1971. Forest Service crewmen using an axe and squirt-can applied the commercial formulation (Table 10). One milliliter of chemical per 5 centimeters of DBH (diameter breast height) was applied in spaced hacks on the stem of the trees to be killed. The crewmen were issued guidelines for chemical thinning by the Forest Service Ranger District. The guidelines contained methods of handling and safety precautions to be used in applying the chemical.

The Forest Service has initiated a study titled "The Behavior of Organic Arsenical Herbicides in the Forest Environment in 1970." The study was precipitated by eight cattle deaths on the Okanogan National Forest (adjacent to Colville National Forest) in an area on the Forest that had been chemically thinned. The study includes, monitoring urine arsenic levels and analysis of soil, browse, litter, and water

TABLE 10
CONTENTS OF MSMA

Active Ingredients:	
Monosodium Acid Methanearsonate	48.0%
Inert Ingredients	52.0%
Total Arsenic (as elemental) in water soluble form	22.2%
Product contains 3 Kgs. MSMA per gallon	

for arsenic levels. The study is currently in progress. An interim report has been prepared by the research team. The research is a cooperative study headed by the Forest Service, Pacific Northwest Range and Forest Experiment Station, Corvallis, Oregon. Two universities, several state agencies and a local veterinarian are involved in the study. The Colville was selected as a pilot study forest because of the potential for use of the method on the Forest.

Summary of the findings of interim report on chemical thinning are as follows:

1. Workers applying the organic arsenicals in the study had a higher level of arsenic in urine than did a control group. Recent crews (May 1971 to January 1972) applying the chemicals on the Colville National Forest urine arsenic levels remained below 2 ppm objective, with weekly analysis.

2. No arsenic residues have been found in streams from or through treated areas.

3. Snowshoe hares are very sensitive to low arsenic levels. Hare mortality near Colville resulted from arsenic poisoning during early part of study. No hares were found for a one-year period prior to interim study report. The possibility of adding a rabbit repellent to the chemical was investigated; because of cost benefit potential it was not done.

4. Data indicate appreciable quantities of arsenic will enter the Forest floor when dead needles fall. Arsenic levels of 116 ppm

have been found in dead pine needles from the upper limbs of treated pine trees. The environmental impacts and mobility of arsenic from the needles are unknown.

5. MSMA can be leached through short columns of soil and forest floor material from the Colville area. The depth of leaching, with respect to the amount of water applied, remains to be determined.

6. Evidence now available indicates the key to safe use of organic arsenical silvicides is carefully controlled handling and application to minimize exposure of man and animals.

Approximately 2,633 hectares have been chemically thinned in Fiscal Year 1972. The program has been gradually expanded since initiation. Approximately 1,760 liters (465 gallons) per year of the chemical were used in FY 1971 and 1972. Four hundred forty-one liters is the maximum amount of the chemical ordered. The maximum amount of the chemical stored during any period on the Forest is 454 liters (120 gallons). The chemical is stored on the Colville District only. The District is in the process of obtaining a special building for storage of the chemical.

Waste pesticide containers are buried in road fills on the Forest. This is apparently a temporary alternative until a suitable disposal site is developed. The Forest is working with Stevens County to select an acceptable site. There is no contingency plan for handling accidental spills of pesticides on the Forest. Only enough chemical for one day's use is taken to the field. Spilled chemicals are covered with soil to minimize impacts on non-target organisms.

Special Use Permittees' Uses of Pesticides

Forest Service and BPA cooperation on pesticide applications for control of vegetation in transmission line corridors has been limited. BPA sprayed a corridor in 1972 without any coordination with the Forest Service. Tordon 101 was the herbicide used.

The Tordon spray incident has been reviewed by both agencies, in an attempt to prevent future misuse of pesticides. Several BPA and Forest Service meetings and correspondences have also taken place. The Forest Service and BPA have a memorandum of understanding for coordination of pesticide uses; however, according to Forest Service personnel, it has not been followed at the field level.

Special use permittees applications are not monitored by the Forest Service. Annual pesticide use reviews are required of perennial special use permittees by the Forest Service.

Recommendations

The inspection, monitoring, reporting and enforcement program for storage, application and disposal of pesticides used by the Forest Service and special use permittees should be strengthened. Specific recommendations are:

1. Develop and implement a more satisfactory agreement between Bonneville Power Administration (BPA) and the Forest Service on BPA's pesticide programs.
2. Prepare impact statements on individual pesticide projects, particularly chemical thinning program, rights-of-way spraying, and

range improvement, which may have a significant impact on the environment.

3. Require special use permittees to identify methods and locations for disposing of pesticide residues and containers. The Forest disposal of pesticide residues and containers should also be improved to comply with State and proposed Federal guidelines for disposal and storage of pesticides and other hazardous wastes.

4. Crew Chiefs used in the chemical thinning program should be (if program continued) certified State Pesticide Public Operators.

5. The hazardous material section of the recommended contingency plan should specify procedures for handling and reporting pesticide spills.

Oil and Hazardous Materials

The largest use of oil on the Forest is in the road oiling or dust coating program. The Forest has been involved for three years (since 1970) in a program to reduce dust emissions from Forest roads. The dry consistency of the soils is generally soft and very friable, making them extremely dusty under heavy traffic use conditions. A typical dust coated road is shown in Figure 9.

Two hundred and nine kilometers were dust coated in 1972. One hundred sixty one kilometers were dust coated in 1971. Approximately 105 to 113 kilometers of road were oiled the first year the program was initiated in 1970. The dust coating program has expanded each year since its initiation.

Arcadia Dust Oil (medium grade) is the material used. The application rate for dust coating is .04 to .09 liters per .84 square meters, depending on soil and road bed conditions. Approximately 946,350 liters (260,000 gallons) of oil was used in the program during 1972. The Forest Service rents the distributor and uses Forest Service personnel to apply the oil. Ninety to ninety-five percent of the applications are done in this manner. Timber purchasers may oil five to ten percent of roads as a condition of the timber sale contract. The oil for dust coating is delivered the day of application with little stored on the Forest.

The monitoring program in connection with the dust coating program consists primarily of checking weather conditions and reports

prior to application. Temperature and the possibility of precipitation are checked by the Maintenance Foreman the morning before oiling begins. Temperature drops reduce penetration, and precipitation may cause runoff problems.

The Forest Engineer requested from the Forest Service Regional Office a study on the possible effects of dust coating on other Forest resources such as water, roadside vegetation, etc. The request was not approved. Many of the roads that are dust coated are adjacent to streams such as Sherman Creek, Sullivan Creek and many others. The Forest is continually expanding the oiling program. The potential for oil entering water is great.

There has been one accidental oil spill during the three years the oiling program has been operational. A full tanker and trailer (approximately 18,927 liters) turned over on a county road in the Harvey Creek area. The Forest Service reported the spill to the Washington State Fish and Game Department and the State Department of Ecology. The Forest Service worked with the two state agencies in cleaning up the spill. The spill could have been more efficiently handled. There was a period of indecision on agency notification procedure; and field personnel were not knowledgeable on procedures to minimize the effects of the spill.

There is not a contingency plan for handling accidental spills of oil and other hazardous material available on the Forest. Section 4(a) 4, Executive Order 11507, February, 1970, requires development

by all Federal agencies of emergency plans and procedures for dealing with accidental pollution. Plans developed pursuant to the authority shall be in accordance with appropriate regional oil and hazardous substances pollution contingency plans.

The major area where oil and other hazardous material are stored on the Forest is associated with the heavy equipment program of the Curlew Job Corps. Oil quantity varies seasonally from a few liters to 1,892 liters. Diesel quantities vary from a few liters to over 3,407 liters during peak operation of heavy equipment. The average quantity of gasoline stored on the Forest is 7,571 liters, with the largest storage at the Job Corps Center. An inventory is maintained at the Center of oil and hazardous material stored.

Safety precautions in effect at the Curlew Center appeared adequate to minimize damage from an accidental spill.

Recommendations

With the large quantities (over 946,000 liters) of oil handled directly on the Forest, it is recommended that:

1. A contingency plan for handling accidental pollution or spills as required by Executive Order 11507 be developed for the Forest. An employee training or information program should be conducted to be sure all Forest personnel are aware of the plan, and knowledgeable regarding its contents.
2. A study be conducted to assess the impacts of the dust coating program on other Forest resources.

3. Water quality monitoring be conducted in connection with the dust coating program.

Surveillance and Monitoring

General

Recent Forest Service regulation 2504.3 requires Forest Supervisors to develop and implement water quality plans to establish baseline water quality and provide surveillance of resource use, management and development. To begin implementing the regulation, the Forest has started collecting water quality data from some of the streams and lakes within the Forest boundary in 1972.

Site selection for monitoring stations was done by field personnel on the districts, in areas felt to reflect representative water quality in a watershed area. The major parameters measured are temperature, pH, dissolved oxygen, alkalinity and turbidity. Bacteriological determinations are done in approved swimming areas, during the season of use.

Turbidities and bacteriological determinations are done by Stevens County Health Department Laboratory. Turbidity measurements are done primarily during the spring and summer. The frequency of sampling varies with districts. Participation in the baseline data collection also varies with districts. Some districts are collecting only drinking water samples at recreation sites for bacteriological analyses. Site selection procedures to assess various resource management effects also vary with districts.

Parameters other than bacteria and turbidity are measured in the field with the small Hach Kit. The principal advantages of using the small Hach Kits are that: (1) they produce data that

offers a frame of reference or ball park type estimate of water quality parameters, and (2) they are relatively easy to use and are adaptable to field conditions. The principal disadvantages are: (1) sample analyses are not done using standard methods (APHA, AWWA and WPCF, Standard Methods for the Examination of Water and Wastewater, 13th Edition, 1971) and they may be difficult to duplicate, (2) the margin and potential for error in analysis is large and (3) no analysis quality control is used with the Kits. Consequently, use of water quality data based on Hach Kit analysis should be done with a consideration of its limitations.

Data reviewed of current station locations and parameters being measured indicate that effects of some activities are not being measured. Some of these measurements could be made with a minimum additional effort. As an example, a turbidity station and analysis for heavy metals above and below the current large scale surface mining exploration operation in the Noisy Creek area could provide useful information. Some districts have selected sites to measure or monitor turbidities associated with road construction and past logging activities. There are also specific surveillance and monitoring studies on the McGahee Watershed and water monitoring related to the organic arsenical studies on the Forest.

Several Federal and State agencies are involved in collecting water quality data in the vicinity of the Forest. The U.S. Geological Survey, EPA and the State Department of Ecology either have or are presently collecting data within or adjacent to the Forest boundary.

A latitudinal and longitudinal block retrieval of water quality data was made from the STORET System to evaluate the potential usefulness of available data to the Forest program.

Fourteen stations from the STORET data are either within or adjacent to the Forest boundary. Several other stations in the block retrieval are within the vicinity of the Forest. The data include measurements of a number of parameters. The stations vary in length of time of collection from 1960-72, as well as recently established stations.

Forest wide storage of water quality data in a system which allows their rapid retrieval in a variety of formats depending on data requirements would be a useful tool in water quality management. The STORET systems of the EPA is an operational program for this purpose. Forest Service water quality data based on standard methods such as the turbidity and bacteria data could be added to STORET data bank. The system would allow retrieval of Forest Service and any other data stored in the system.

Radioactivity

Uranium prospects and mines were examined and water samples collected on June 19, 20, 1973 for radioactivity analysis. Fifteen samples were collected within or near the Forest boundary, and sent to the National Environmental Research Center, Las Vegas, Nevada for analysis. The sampling stations are described in Table 11.

TABLE 11. WATER SAMPLES OF MINE DRAINAGE, SPRINGS AND STREAMS
ASSOCIATED WITH URANIUM PROSPECTING,
MINING, AND PROCESSING IN NORTHEASTERN WASHINGTON

June 19 - 20, 1973

<u>Sample No.</u>	<u>Description</u>
1	Spring in prospect trench of Atomic Silver Monarch Claim located 2300 feet east and 1000 feet north from the southwest corner of Section 12, Township 36 North, Range 42 East W.M. (Ione Quadrangle). Spring has flow of about 1 gpm and disappears into the soil immediately below the cut.
2	Tributary to Lost Creek at trail crossing located 1500 feet east and 1500 feet north from the southwest corner of Section 12, Township 36 North, Range 42 East W.M. (Ione Quadrangle). Flow is 1 to 2 cfs.
3	Mine drainage from lower adit of the Triple H & J Mine located 2200 feet west and 2600 feet south from the northeast corner of Section 30, Township 36 North, Range 43 East W.M. (Timber Mtn. Quadrangle). Drainage has flow of 5+ gpm and disappears into the soil a short distance below the mine.
4	Mine drainage from adit of High Noon Mine located on section line 2000 feet west from the southeast corner of Section 19, Township 36 North, Range 43 East W.M. (Timber Mtn. Quadrangle). Flow of about 5 gpm that disappears into soil immediately below mine.
5	South Fork of Lost Creek below the High Noon and Triple H & J Mines at road bridge located 1500 feet south and 900 feet west from the northeast corner of Section 30, Township 36 North, Range 43 East W.M. (Timber Mountain Quadrangle). Flow is about 4 cfs.
6	North Fork of Ruby Creek at road culvert located on section line 2600 feet west from the southeast corner of Section 5, Township 35 North, Range 43 East W.M. (Timber Mountain Quadrangle).

<u>Sample No.</u>	<u>Description</u>
7	Ruby Creek at road crossing located 1400 feet south and 2400 feet west from the northeast corner of Section 12, Township 35 North, Range 42 East W.M. (Timber Mountain Quadrangle).
8	Menear Spring located along Tacoma Creek Road approximately 500 feet east and 1100 feet north from the southwest corner of Section 31, Township 35 North, Range 43 East W.M. (Tacoma Peak Quadrangle).
9	Tacoma Creek at road crossing near Sportsn Pond, located 300 feet east and 2000 feet north from the southwest corner of Section 22, Township 34 North, Range 43 East W.M. (Jared Quadrangle).
10	Cusick Creek at Highway Bridge located 1400 feet north and 1300 feet east from the southwest corner of Section 13, Township 34 North, Range 43 East W.M. (Jared Quadrangle).
11	Ruby Creek near mouth at Blueslide Station located 1000 feet south and 500 feet east from the northwest corner of Section 11, Township 35 North, Range 44 East W.M. (Ruby Quadrangle).
12	South Fork Lost Creek at Highway Bridge 1200 feet south and 1400 feet east from the northwest corner of Section 22, Township 36 North, Range 44 East W.M. (Ruby Quadrangle).
13	Lost Creek at Highway Bridge 700 feet south and 1200 feet east from the northwest corner of Section 22, Township 36 North, Range 44 East W.M. (Ruby Quadrangle).
14	Chamokane Creek above Ford Plant at Highway Bridge at Ford. Section 19, Township 28 North, Range 40 East W.M. (Wellpinit, Wash.)
15	Chamokane Creek below Ford Plant at bridge on Marth Boardman Road. Section 11, Township 27 North, Range 39 East W.M.

The levels of radioactivity in terms of pCi/liter of gamma, beta, alpha, dissolved Ra-226 and suspended Ra-226 are in Table 12. The data indicates that the radioactivity levels in the water are approximately equivalent to the RA-226 drinking water standards of 1962 or 3 pCi/liter. At some stations the radioactivity was slightly higher, but since the water sampled should not be considered under the strict drinking water standard, the water itself is not a hazard, especially in terms of occasional drinking and for irrigation purposes.

Recommendations

The monitoring program should be strengthened by better coordination and definition of objectives. Specific recommendations are:

1. Baseline air and water quality data should be collected in coordination with other agencies as the Departments of Natural Resources and Ecology.
2. Determination of effects of Forest activities on air and water quality be a separate surveillance and monitoring activity.
3. Specific timber sales and related construction should be monitored for turbidity, temperature and other appropriate parameters measured before, during and after sales.
4. The Forest monitoring program should be coordinated with the Federal and State regional surveillance program, with the Environmental Protection Agency, Geological Survey and State Department of Ecology, the current participants.

TABLE 12. ENVIRONMENTAL PROTECTION AGENCY

NATIONAL ENVIRONMENTAL RESEARCH CENTER

LAS VEGAS, NEVADA

09/13/73

WASHINGTON WATER RESULTS

NOTE--RESULTS ARE GIVEN IN EXPONENTIAL NOTATION--THE NUMBER FOLLOWING AN -E- IS THE EXPONENT OF TEN BY WHICH THE PRECEDING NUMBER SHOULD BE MULTIPLIED. -LT- INDICATES LESS THAN, -NA- INDICATES NO ANALYSIS, AND -ND- INDICATES NOT DETECTED. TWO-SIGMA VALUES ARE GIVEN IN PARENTHESES WHEN AVAILABLE.

WASHINGTON WATER RESULTS

WASHINGTON

REPORTED 09/13/73

-----ANALYSIS---RESULT---2SIGMA-

SEATTLE WASH NO 1

03 0650 033 46 0 20 06 25 1115

124939 001 DATE- 06 19 73

SIZE- 3.50 L

GAMMA-SPECTRUM-NEGLIGIBLE

BETA LT3.3E00

ALPHA LT1.3E00

226RA-DISS 2.2E-01 8.0E-02

226RA-SUSP 4.3E-01 1.1E-01

SEATTLE WASH NO 2

03 0650 033 46 0 20 06 25 1115

124940 002 DATE- 06 19 73

SIZE- 3.50 L

GAMMA-SPECTRUM-NEGLIGIBLE

BETA LT3.3E00

ALPHA 1.3E00 1.2E00

226RA-DISS 1.0E-01 5.0E-02

226RA-SUSP 1.5E-01 6.0E-02

SEATTLE WASH NO 3

03 0650 033 46 0 20 06 25 1200

124941 003 DATE- 06 19 73

SIZE- 3.50 L

GAMMA-SPECTRUM-NEGLIGIBLE

BETA 7.7E01 6.5E00

ALPHA 1.1E02 1.0E01

226RA-DISS 2.1E00 2.2E-01

226RA-SUSP 2.8E01 7.9E-01

SEATTLE WASH NO 4

03 0650 033 46 0 20 06 25 1200

124942 004 DATE- 06 19 73

SIZE- 3.50 L

GAMMA-SPECTRUM-NEGLIGIBLE

BETA 2.7E01 4.6E00

ALPHA 4.6E01 6.9E00

226RA-DISS 5.6E00 3.5E-01

226RA-SUSP 1.4E00 1.8E-01

SEATTLE WASH NO 5

03 0650 033 46 0 20 06 25 1130

124943 005 DATE- 06 19 73

SIZE- 3.50 L

GAMMA-SPECTRUM-NEGLIGIBLE

BETA LT3.3E00

ALPHA 3.0E00 1.8E00

226RA-DISS 7.5E-01 1.3E-01

226RA-SUSP 2.5E-01 7.0E-02

SEATTLE WASH NO 6

03 0650 033 46 0 20 06 25 1130

124944 006 DATE- 06 19 73

SIZE- 3.50 L

GAMMA-SPECTRUM-NEGLIGIBLE

BETA LT3.3E00

ALPHA 1.6E00 1.4E00

226RA-DISS 2.7E-01 8.0E-02

226RA-SUSP 1.5E-01 6.0E-02

SEATTLE WASH NO 7

03 0650 033 46 0 20 06 25 1240

124945 007 DATE- 06 19 73

SIZE- 3.50 L

GAMMA-SPECTRUM-NEGLIGIBLE

BETA LT3.3E00

ALPHA 3.0E00 1.8E00

226RA-DISS 2.7E-01 8.0E-02

226RA-SUSP 2.9E-01 8.0E-02

SEATTLE WASH NO 8

03 0650 033 46 0 20 06 25 1240

124946 008 DATE- 06 19 73

SIZE- 3.50 L

GAMMA-SPECTRUM-NEGLIGIBLE

BETA LT3.3E00

ALPHA LT1.3E00

226RA-DISS 1.1E-01 5.0E-02

226RA-SUSP 1.3E-01 6.0E-02

WASHINGTON WATER RESULTS

WASHINGTON

REPORTED 09/13/73

-----ANALYSIS---RESULT---2SIGMA-

SEATTLE WASH NO 9

03 0650 033 46 0 20 06 26 0915

124947 009 DATE- 06 19 73

SIZE- 3.50 L

GAMMA-SPECTRUM-NEGLIGIBLE

BETA LT3.4E00

ALPHA LT1.1E00

226RA-DISS 1.4E-01 5.0E-02

226RA-SUSP 1.4E-01 6.0E-02

SEATTLE WASH NO 10

03 0650 033 46 0 20 06 26 0915

124948 010 DATE- 06 19 73

SIZE- 3.50 L

GAMMA-SPECTRUM-NEGLIGIBLE

BETA LT3.5E00

ALPHA LT1.5E00

226RA-DISS 4.8E-01 1.1E-01

226RA-SUSP 1.5E-01 6.0E-02

SEATTLE WASH NO 11

03 0650 033 46 0 20 06 26 1005

124949 011 DATE- 06 19 73

SIZE- 3.50 L

GAMMA-SPECTRUM-NEGLIGIBLE

BETA LT3.4E00

ALPHA LT1.2E00

226RA-DISS 3.1E-01 8.0E-02

226RA-SUSP 1.0E-01 5.0E-02

SEATTLE WASH NO 12

03 0650 033 46 0 20 06 25 1255

124950 012 DATE- 06 19 73

SIZE- 3.50 L

GAMMA-SPECTRUM-NEGLIGIBLE

BETA LT3.3E00

ALPHA 1.6E00 1.4E00

226RA-DISS 1.0E-01 6.0E-02

226RA-SUSP 1.0E-01 5.0E-02

SEATTLE WASH NO 13

03 0650 033 46 0 20 06 25 1255

124951 013 DATE- 06 19 73

SIZE- 3.50 L

GAMMA-SPECTRUM-NEGLIGIBLE

BETA LT3.3E00

ALPHA LT1.3E00

226RA-DISS 2.5E-01 8.0E-02

226RA-SUSP 1.5E-01 6.0E-02

SEATTLE WASH NO 14

03 0650 033 46 0 20 06 26 0830

124952 014 DATE- 06 19 73

SIZE- 3.50 L

GAMMA-SPECTRUM-NEGLIGIBLE

BETA LT3.5E00

ALPHA LT1.1E00

226RA-DISS 2.1E-01 8.0E-02

226RA-SUSP 1.1E-01 6.0E-02

SEATTLE WASH NO 15

03 0650 033 46 0 20 06 26 0830

124953 015 DATE- 06 19 73

SIZE- 3.50 L

GAMMA-SPECTRUM-NEGLIGIBLE

BETA LT3.5E00

ALPHA LT2.1E00

226RA-DISS 1.9E-01 8.0E-02

226RA-SUSP 1.7E-01 8.0E-02

PCI/L

PCI/L

1/L

1/L

1/L

PCI/L

PCI/L

PCI/L

PCI/L

PCI/L

PCI/L

PCI/L

PCI/L

5. Forest Service water quality data based on standard method analyses should be added to STORET. The data along with other data could be retrieved for use in water quality management decisions on the Forest.

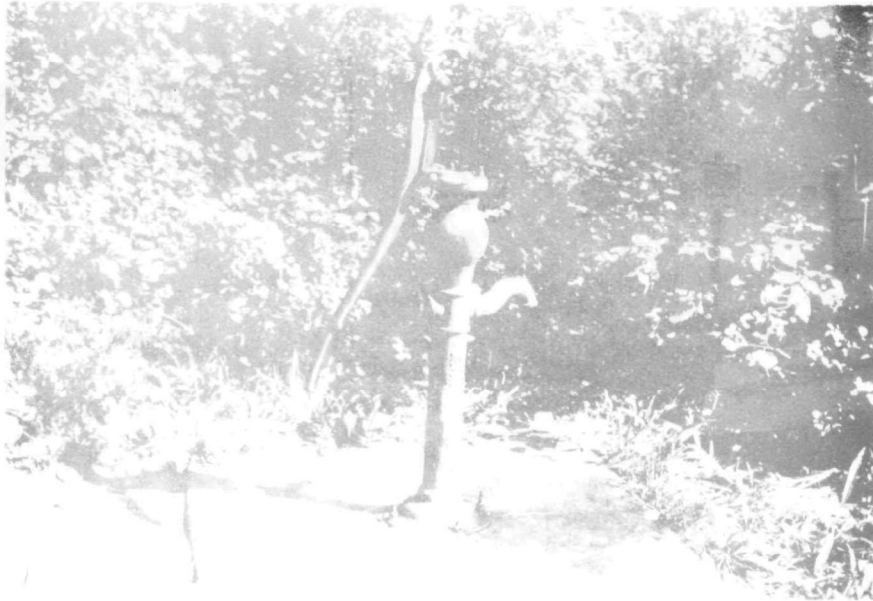


FIGURE 2 Hand pump at Lake Ellen Campground. The pump has a loose base seal. Bacteriological tests for total coliforms were positive.



FIGURE 3 Trailer sewage disposal installation at Lake Gillette Campground. The facility will increase the volume of pumpings to be disposed.



FIGURE 4 Special use permit dump on Forest Service land at Hosmer Creek.



FIGURE 5 Motor bikes at Clerc Creek Campground, Sullivan Lake District.



FIGURE 6 Salvage timber sale area - Sullivan Lake Ranger District.



FIGURE 7 Dozer thinned area - Colville District.

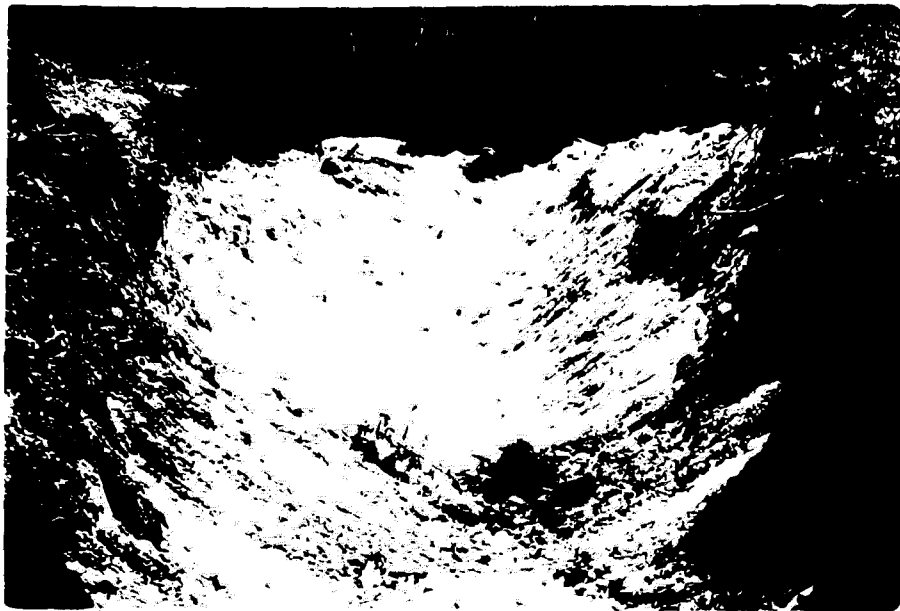


FIGURE 8 Mining excavation done without filing claim or consulting Forest, Sullivan Lake District.



FIGURE 9 Dust coated road in Colville District. Arcadia dust oil was used.

APPENDICES

APPENDIX A-1

SUMMARY OF OBSERVATIONS OF RECREATION SITES WITH WATER SUPPLY AND SANITARY WASTE DISPOSAL PROBLEMS - COLVILLE NATIONAL FOREST

*Trout Lake Campground

The campground consists of 5 camping units and a boat launching ramp. The site is adjacent to the Southwest shore of Trout Lake about five kilometers (three miles) north of State Highway 30 in Ferry County, Washington. A small stream flows through the northwest corner of the site and enters the lake approximately 31 meters (100 feet) northwest of the boat launch. Trout Lake is classified as Class AA lake according to Water Quality Standards for Intrastate Waters of the State of Washington.

Water supply and sanitation facilities include a developed spring for drinking water approximately 16 meters (50 feet) from the site perimeter with a gravity distribution system with one drinking hydrant. The spring is approximately 8 meters (25 feet) higher in elevation than the elevation of the campground. Two pit toilets located about 25 meters from the small stream flowing from the developed spring through the site serve the campground.

Pollution Problem - The two pit privies, approximately three meters deep are polluting ground water. Passage of polluted ground water into the adjacent small stream is possible. A fluctuating water table could cause further contamination in the spring. Drainage from the pits is toward the stream.

APPENDIX A-2

*Lake Gillette Campground

The picnic area is located on the southeast shore of Lake Gillette. Sanitation facilities include four open-bottom vault toilets (over 62 meters from lake). The boat launch is served by two open-bottom vault toilets located approximately 25 meters from the lake shore. Two shallow wells with hand pumps serve the area. The picnic area and boat launch area are served by four water hydrants with a storage tank and gravity distribution system.

Pollution Problem - The two open vault installations serving the boat launch are polluting ground water near lake shore. Drainage from toilets is toward the lake, increasing the potential for polluted ground water entering the lake.

*Lower O'Brien Camp

This is a minimum developed site consisting of two camping units adjacent to the east side of O'Brien Creek. A pit privy is located approximately 16 meters from O'Brien Creek at each unit.

Pollution Problem - The privies on the bank of O'Brien Creek are polluting ground water. Polluted ground water may also be entering the creek.

*Pierre Lake Campground

The site is on a narrow stretch of land (6 hectares or 15 acres) between the west shore of Pierre Lake and the county road. Sanitation facilities include 6 pit toilets and 2 sealed vault toilets. Water

APPENDIX A-3

supply facilities include 3 wells with hand pumps located at each end and in the center of the site.

Pollution Problem - The 2 pit toilets located approximately 8 meters (25 feet) from the lake on the north side of the picnic area are setting in the ground water table. Drainage from the pits is toward the lake.

*Long Lake Campground

This is a minimum developed site adjacent to the north end of Fish Lake. A privy approximately 3 meters (8 feet) deep is located approximately 16 meters (50 feet) from Fish Lake on a slope steeper than 10 percent.

Pollution Problem - The privy is polluting ground water. Seasonally high water may cause extended pollution of ground water with drainage toward the lake.

*Ten Mile Campground

The site is adjacent to the west bank of the San Poil River south of Republic. Ten Mile Creek flows through the center of the site and into the San Poil River. Water supply facilities include a cased well 11 meters (34 feet) deep located approximately 16 meters (50 feet) from the river. A 159 liter (42 gallon) water supply storage tank distributes water to six drinking water hydrants serving the site. Two open-bottom vaults are located near the center of the site serving the picnic area and two camping units. They are

APPENDIX A-4

approximately 31 meters (100 feet) from Ten Mile Creek and 47 meters (150 feet) from the San Poil River. One vault toilet is located near the southeast edge of the site approximately 28 meters (90 feet) from the San Poil River.

*Swan Lake Campground

The site includes 11 hectares (26 acres) adjacent to the east shore of Swan Lake. Water and sanitation facilities include a shallow (3 meters or 8 feet deep) well, 9 meters (30 feet) from the lake. A gas pump and a 3,785 liter (1000 gallon) covered storage tank with a gravity distribution system with 9 water hydrants serve the site. Eight open-bottom concrete vault toilets serve the site. Two toilets are located near the swimming beach approximately 39 meters (125 feet) from the lake.

Pollution Problem - The two open-bottom concrete vaults near the swimming area are polluting ground water. A higher ground water table in the spring will increase the contamination impact. Drainage from the toilets is towards the lake.

*Crescent Lake Campground

The site is adjacent to the south shore of Crescent Lake. Water facilities include one hand pump at north end of site. A pump on the south end was closed because of mechanical problems. Four open-bottom vault toilets serve the campground. Two toilets are located (north end) less than 31 meters (100 feet) from the well.

APPENDIX A-5

Pollution Problem - The two open-bottom vaults at the north end of the site are polluting ground water. The site is located in alluvial lacustrine soil material with a seasonally high water table.

*Sullivan Road Campsite #3

This site is classified as a minimum development. The site consists of two camping or picnic units located adjacent to the north bank of Sullivan Creek. Sanitation facilities include one pit toilet approximately 16 meters (50 feet) from Sullivan Creek. No drinking facilities are provided.

Pollution Problem - The pit privy located at this site is extending into the ground water table and polluting ground water. Seasonally high water from Sullivan Creek may create additional pollution problems.

Sullivan Lake Campground #2

The privy in the boat launch area is an older structure. The back side of the structure is caving in. The structure is over 47 meters (150 feet) from the lake shore during low water; high water levels would be closer. The structure appears to have limited use and could be eliminated without creating visitor use problems.

Twin Lakes Area

The lower end campground (peninsula) has two toilets. One is an old structure privy. A recently constructed vault toilet also serves the site. The older structure is approximately 47 meters

APPENDIX A-6

(150 feet) from the lake. The new structure was apparently intended as a replacement; therefore, the privy should be removed.

Davis Lake Campground

This is a small campground adjacent to Davis Lake. Water and sanitation facilities consist of two vault toilets and one hand pump. The pump is an older model, with no base drainage. Water from the pump was rusty colored, and had been for some time, according to campground users. A chemical analysis of the supply should be done.

Lake Leo Campground

The old structure privy (minimum construction, from old standards) located in the depression at the road turn-around could be eliminated. The newer structures were apparently intended as replacements. The privy also has a major odor problem.

Deer Creek Summit Campground

This is a small campground at the summit, consisting of two toilets and two or three camping units. The water supply is a spring development that was apparently constructed for cattle watering; therefore, both cattle and campground users use the same water supply. The spring has a pipe to the watering trough. Neither the spring or pipe is fenced or protected.

*Some information from Forest Service files on the Water Pollution Abatement Program; other information recorded from field observations during evaluation.

APPENDIX B-1
FEDERAL FACILITIES INVENTORY

Solid Waste Disposal Sites Used or Regulated by a Federal Agency

State Washington County Stevens Date 8/3/72

Name of Site Little Pend Oreille Lakes Site Location Sec. 19, T. 36 N., R. 42 E

Name of Person Completing Form ^{Dump}Elbert Moore Organization Federal

Activities Coordination Section, EPA

Federal Agency Associated with Site U.S. Forest Service

Site Operated by State of Washington - Special Permit, Spruce Canyon Camp

Does Federal Agency:	Yes	No	Name and Address of Owner if Other than the Federal Agency
----------------------	-----	----	---

Own Site?	<u>XX</u>	<u> </u>	<u> </u>
-----------	-----------	-------------	---

Use Site?	<u>XX</u>	<u> </u>	<u> </u>
-----------	-----------	-------------	---

Issue Permit/Lease for Use of Site? yes

Names of All Users of Site (Communities, Federal Agencies, etc.) The site is
used by permittee, Forest Service and residents in the area

Estimated Annual Quantities ^{Metric} Tons 31 (FS contribution) Yd³

Check Types of Waste Deposited Municipal XXX Industrial XXX

Agricultural XXX Demolition Toxic Other (Specify)

Forest Service contribution is from Little Pend Oreille Lakes Campgrounds
(municipal)

Site Characteristics

Does Burning Take Place? <u>yes</u>	Is Blowing Waste a Problem? <u>yes</u>
-------------------------------------	--

Frequency of Cover <u>None</u>	Does Waste Contact Groundwater? <u> </u>
--------------------------------	---

Obvious Leachate Problem? <u>not obvious</u>	<u>not obvious</u>
--	--------------------

Adjacent to Waterway <u>yes</u>	Name of Waterway <u>Hosmer Creek</u>
---------------------------------	--------------------------------------

Does Waste Enter Water? <u>not obvious</u>	<u> </u>
--	---

Are There Plans for Closing or Improving the Site? The dump is currently
being planned for closing by FY 1974. The dump is a blight on the landscape.

APPENDIX B-2
FEDERAL FACILITIES INVENTORY

Solid Waste Disposal Sites Used or Regulated by a Federal Agency

State Washington County Pend Oreille Date 9/2/72
Name of Site S.L. Trespass Dump #1 Site Location SF 1/4 Sec. 15, T.36N, R.43E.
Name of Person Completing Form Elbert Moore Organization Federal
Activities Coordination Section, EPA
Federal Agency Associated with Site U.S. Forest Service
Site Operated by Trespass dump - Colville National Forest
Does Federal Agency: Yes No Name and Address of Owner if
Own Site? XX Other than the Federal Agency
Use Site? XX
Issue Permit/Lease for Use of Site? No
Names of All Users of Site (Communities, Federal Agencies, etc.) Assumed to
be residents of the area by District Ranger
Estimated Annual Quantities Tons Yd³
Check Types of Waste Deposited Municipal XXX Industrial
Agricultural XXX Demolition Toxic Other (Specify)

Site Characteristics

Does Burning Take Place? No Is Blowing Waste a Problem? Yes
Frequency of Cover None Does Waste Contact Groundwater?
Obvious Leachate Problem? Yes Possible
Adjacent to Waterway Yes Name of Waterway Pend Oreille River
Does Waste Enter Water? Yes
Are There Plans for Closing or Improving the Site? The recent (Nov. 1972)
Solid Waste Management Plan for the Forest specify plans for closing the site.
The site is a polluter and a blight on the landscape. It is adjacent to a
county road.

APPENDIX B-3
FEDERAL FACILITIES INVENTORY

Solid Waste Disposal Sites Used or Regulated by a Federal Agency

State Washington County Pend Oreille Date 9/2/72

Name of Site Le Clerc Creek Trespass Site Location Le Clerc Creek

Name of Person Completing Form #2 Elbert Moore Organization Federal

Activities Coordination Section, EPA

Federal Agency Associated with Site U.S. Forest Service - Colville N.F.

Site Operated by Unauthorized or trespass dump

Does Federal Agency: Yes No Name and Address of Owner if
Other than the Federal Agency

Own Site? XX

Use Site? XX

Issue Permit/Lease for Use of Site? No

Names of All Users of Site (Communities, Federal Agencies, etc.) Assumed to
be residents of the area

Estimated Annual Quantities Tons Yd³

Check Types of Waste Deposited Municipal XXX Industrial XXX

Agricultural XXX Demolition Toxic Other (Specify)

Site Characteristics

Does Burning Take Place? No Is Blowing Waste a Problem? No

Frequency of Cover None Does Waste Contact Groundwater?

Obvious Leachate Problem? No not obvious

Adjacent to Waterway Yes Name of Waterway

Does Waste Enter Water? Potential Le Clerc Creek

Are There Plans for Closing or Improving the Site? The recent (Nov. 1972)

Solid Waste Management Plan for the Forest specify plans for closing the site.

There is no evidence of recent dumping; however, previously dumped material
is above Le Clerc Creek on a slope approximately 35 percent.

APPENDIX B-4
FEDERAL FACILITIES INVENTORY

Solid Waste Disposal Sites Used or Regulated by a Federal Agency

State Washington County Pend Oreille Date 9/3/72
Name of Site Meteline Falls Site Location Meteline Falls
Name of Person Completing Form Elbert Moore Organization Federal
Activities Coordination Section, EPA
Federal Agency Associated with Site U.S. Forest Service - Colville N.F.
Site Operated by Meteline Falls
Does Federal Agency: Yes No Name and Address of Owner if
Own Site? XX Other than the Federal Agency
Use Site? XX City of Meteline Falls
Meteline Falls, Washington
Issue Permit/Lease for Use of Site? no
Names of All Users of Site (Communities, Federal Agencies, etc.) Meteline
Falls residents and U.S.F.S. - Colville N.F. - Sullivan Lake District
Estimated Annual Quantities ^{Metric} Tons 17(FS contribution) Yd³
Check Types of Waste Deposited Municipal xxx Industrial xxx
Agricultural xxx Demolition xxx Toxic Other (Specify)
F.S. contribution is from campgrounds (municipal only)
Site Characteristics
Does Burning Take Place? yes Is Blowing Waste a Problem? yes
Frequency of Cover infrequent Does Waste Contact Groundwater?
Obvious Leachate Problem? Potential Potential
Adjacent to Waterway Yes Name of Waterway Meteline Falls
Does Waste Enter Water? Potential Sewage lagoon closest
Are There Plans for Closing or Improving the Site? Plans were proposed for
closing the dump in the Comprehensive S.W. Mgt. Plan prepared by TRICO, since
the plan was rejected, there are no immediate plans to close the dump.

APPENDIX B-5
FEDERAL FACILITIES INVENTORY

Solid Waste Disposal Sites Used or Regulated by a Federal Agency

State Washington County Ferry Date 9/1/72
Name of Site Ferry Co. Dump Site Location 3 mi. NE of Republic
Name of Person Completing Form Elbert Moore Organization Federal
Activities Coordination Section, EPA
Federal Agency Associated with Site U.S. Forest Service - Colville N.F.
Site Operated by Ferry County
Does Federal Agency: Yes No Name and Address of Owner if
Own Site? XX Ferry County
Use Site? XX Republic, Washington
Issue Permit/Lease for Use of Site? XX
Names of All Users of Site (Communities, Federal Agencies, etc.) Residents
of Curlew Lake area, surrounding farms, Curlew Job Corps Center
Estimated Annual Quantities ^{Metric} Tons 4.5 (FS contribution) Yd³
Check Types of Waste Deposited Municipal XXX Industrial XXX
Agricultural XXX Demolition XX Toxic XX Other (Specify) XX

Site Characteristics

Does Burning Take Place? yes Is Blowing Waste a Problem? yes
Frequency of Cover periodic Does Waste Contact Groundwater? XX
Obvious Leachate Problem? possible Possible
Adjacent to Waterway no Name of Waterway Curlew Creek
Does Waste Enter Water? Not obvious
Are There Plans for Closing or Improving the Site? TRICO Solid Waste Mgmt.
Plan recommended conversion of site to a sanitary landfill. No definite
schedule for conversion or closing site is developed.

APPENDIX C
RECREATION SITES - COLVILLE NATIONAL FOREST

Name	C	P	H	F	SW	B	No. of Tables	Water Supply
1. Swan Lake	X	X	X	X	X	X	33	Dug well
2. Ferry Lake	X	X	X	X	-	-	5	Drilled well
3. Long Lake	X	X	X	X	-	-	5	Drilled well
4. 10-Mile Camp	X	X	X	X	-	-	13	Drilled well
5. Sherman Pass	X	X	X	-	-	-	16	Spring pipeline
6. Deer Creek	X	X	X	-	-	-	4	Spring
7. Davis Lake	X	X	X	X	-	-	4	Dug well
8. Trout Lake	X	X	X	X	-	-	5	Spring
9. Canyon Creek	X	X	X	X	-	-	19	Drilled well
10. Lake Ellen	X	X	X	X	-	-	11	Dug well
11. Summit Lake	X	X	X	X	-	-	5	Drilled well
12. Pierre Lake	X	X	X	X	X	X	26	Dug wells
13. Elbow Lake	X	X	X	X	-	-	4	Dug wells
14. Dominion Mtn.	X	X	X	-	-	-	5	None
15. Little Twin Lakes	X	X	X	X	-	-	8	Drilled well
16. East Gillette	X	X	X	X	X	X	50	Drilled well
17. Lake Thomas	X	X	X	X	X	-	14	Spring pipeline
18. Lake Leo Camp	X	X	X	X	X	-	8	Drilled well
19. Crescent Lake	X	X	X	X	-	-	23	Drilled well
20. Sullivan Lake Picnic Area	X	X	X	X	X	X	17	Drilled well
21. Sullivan Lake Camp	X	X	X	X	X	X	18	Drilled well
22. Mill Pond Camp	X	X	X	X	-	-	10	Drilled well
23. Sullivan Creek Camp 1 & 2	X	X	X	X	-	-	4	None
24. Noisy Creek Camp	X	X	X	X	X	X	19	Drilled well
25. Ione Camp	X	X	X	X	X	X	29	Drilled well
26. Curlew Job Corps	Water storage tank, distribution system							Drilled well

Key to Abbreviations

C - Camping
P - Picnicking

H - Hunting in Season
F - Fishing

SW - Swimming
B - Boating

APPENDIX D

SUMMARY OF ROADLESS AREAS - COLVILLE NATIONAL FOREST

	<u>Hectares</u>	<u>(Acres)</u>	<u>Percent</u>
*Total Colville National Forest	382,199	943,700	100
17 Roadless, essentially roadless areas	80,352	198,400	21
7 Roadless areas with back-country potential	20,453	50,500	
Roadless Area - tentative candidate study area (Colville portion: Salmo- Priest Area)	9,720	24,000	7.9

*Before addition of Newport Ranger District