FIRE REHABILITATION - WENATCHEE NATIONAL FOREST

The Regional fire rehabilitation team at the request of the Wenatchee Forest Supervisor, provided assistance in rehabilitation of two fires which occured on the Wenatchee and Okanogan National Forests in early August 1968. The team spent the week of August 12 through 17 on the fires assessing damage and making land treatment recommendations for revegetation and reforestation. Team members were Loren Herman, Soil Scientist, Division of Watershed Management; Harold Dahl, Silviculturalist, Division of Timber Management; Chuck Waldron, Revegetation Specialist, Division of Range and Wildlife and Rod Canutt, Wildlife Biologist, Division of Range and Wildlife.

The fires occured on lands of mixed ownership. This necessitated working closely with other Federal and State agencies and private landowners to coordinate rehabilitation measures on all lands as well as Forest Service lands. Under section 216 of the Flood Control Act of 1950 emergency funds may be available from the Secretary of Agriculture for "emergency measures for runoff retardation and soil erosion prevention as may be needed to safeguard lives and property from floods and the products of erosion on any watershed whenever fire or any other natural element of force has caused a sudden impairment of that watershed." With this in mind a meeting was held on Monday morning August 12, with representatives of all Federal and States agencies present, to discuss the possibility and need for requesting such funds. It was agreed by Forest Service and Soil Conservation Service representatives to submit a request to the Secretary for these funds as soon as possible. Other representatives of ownerships not qualified for Department of Agriculture funds agreed to cooperate, as possible, to make the necessary land treatment needed to restore the burned area to productive use.

This report by the rehabilitation team was prepared primarily for the Wenatchee and Okanogan National Forest. It also will be used to provide necessary information for the joint report to the Secretary of Agriculture for emergency funds prepared by the Forest Service and Soil Conservation Service. Jim Crates, Watershed Specialist on the Wenatchee National Forest has been designated as coordinator of the joint report.

The two fires are the Fourth of July Burn and Ardenvoir Burn. The Fourth of July fire was much the larger, covering the following ownership and acreage:

Wenatchee National Forest (Chelan Ranger District)	6,134 ac.
Okanogan National Forest (Twisp Ranger District)	1,861 ac.
Bureau of Land Management	2,315 ac.

State	595 ac.
Private Indian Allotment	630 ac.
Private	15,255 ac.
Long Creek Reclamation District	330 ac.
TOTAL	27,120 ac.

The Ardenvoir Burn ownership and acreage is:

Wenatchee National Forest (Entiat R.D.)	328 ac.
Bureau of Land Management	164 ac.
Chelan County	18 ac.
Private	700 ac.
TOTAL	1,210 ac.

FOURTH OF JULY BURN

SOILS OF THE FOURTH OF JULY BURN

The soils on the Forest Service land of this burn are derived from volcanic ash and pumice. Generally they have surface soils of sandy loam textures with very weak granular structure overlying sandy loam textured material that is massive in structure but very porous and loose. Most of the soil has many roots in the surface. The soils have high rates of infiltration and percolation, are well drained, have low organic matter content, low fertility and are easily dispersed by raindrop impact.

Erosion potential ranges from moderate to high depending upon slope, intensity of burning and the remaining vegetative protection to the soil surface. The non-wettability phenomenon was observed on areas of hot burn where vegetation and litter has been almost totally destroyed. Because of these conditions revegetative seeding is recommended to reduce erosion, help prevent rapid surface runoff of high intensity rainfall and to hold the soil in place from the high winds which occur in this area. Perhaps the most serious potential for surface runoff and erosion is from the "Chinooks" which occur quite often in this area. The "Chinooks" are very warm winds and rains which occur in the spring causing very rapid snow melt. This often results in very high water runoff from the uplands and could cause

severe erosion and major damage downstream.

Management of the burn in the future must be done with caution to avoid erosion. The most important consideration is this: do not allow water to concentrate and start overland flow in a confined area such as a skid trail or cat trail. Once water is allowed to concentrate and move over the soil, severe cutting and erosion will take place. Care must be taken in salvage logging and site preparation to avoid this situation. This is particularly important on steep slopes and at head walls of drainages where surface soils may be disturbed during logging.

It is most important to have adequate waterbars on all firelines and cat trails. Much of this work has already been done and is adequate. The remaining areas should be waterbared before fall rains.

Several soil units have been recognized which are important to treatment measures of revegetation and reforestation. These are based on depth of soil, slope, aspect, vegetation, and amount of rock outcrops. These are shown on the soil map and in the "Table of Soil Unit Characteristics and Interpretations."

REVEGETATION AND SOIL PROTECTION OF FOURTH OF JULY BURN

I. Firelines. Firelines need immediate protection from erosional processes. Waterbar construction, already in process, should be completed while equipment is available.

1. Waterbars should provide for adequate outflow. (See attached diagram)

   FF funds

2. Seed grass mixture as soon as possible and before fall rains promote the crusting of the ash at the rate of 10 lbs. per acre, either manually or aerially with:

Hard Fescue	2 lbs.
Perennial Ryegrass	3 lbs.
Alta Fescue	2 lbs.
Sweet Clover	1 lb.
Crested Wheatgrass	2 lbs.
	10 lbs./acre

FF funds

3. Fertilizer application of 200 lbs. per acre of 16-20-0 to be applied, either manually or aerially at the time of seeding. FF funds

II. General Burned Areas. The combination of ashy surface and pumice subsoil throughout the burn presents difficult revegetation opportunities. The soils are droughty and have low fertility. Grass species and fertilizer recommendations have been selected that exhibit characteristics best suited to these conditions. Variable burn intensities, percent of slope and vegetative types have created variable erosion potentials. As an example, in the portions of the fire where the fire did not crown there are sufficient live grasses, shrubs or forbs remaining that are expected to regrow with sufficient density that erosion seeding is not recommended. Also on slopes of less than 30 percent where erosion potential is less than on the steeper slopes, smaller quantities of grass seed are recommended. Revegetation and fertilizer recommendations are:

Revegetation Area A (See attached map)
This area lies generally in the Washington and Antoine Creek drainages. The fire intensity was considered to be light to moderate in that relatively small areas of reproduction or mature timber was killed. The ground fire was not of sufficient intensity to burn into the crowns of the bunch grasses or to affect the rhizomes of pine grass. Sufficient recovery of ground vegetation is expected so that adequate soil protection will be provided by existing native species.

No seeding is recommended except for firelines described above.

Included in this area are three clear burned areas up to 100 acres in size. These areas contain merchantable salvage as well as a dense (up to 10,000 stems per acre) understory of fire killed reproduction. Salvage of this area is planned as soon as possible. The root mass of this dense stand should provide adequate stability to the soil until salvage logging is completed. When logging is completed erosion seeding should be done using coop. funds.

Revegetation Area B

The soils in area B are moderately deep with very few rock outcrops. Slopes are less than 30 percent and erosion hazard is considered to be moderate. This area is described as being heavily burned with all ground cover and tree foliage burned. An evaluation of the understory vegetation shows little if any of the bunch grasses surviving the fire. Some rhizomes of pine grass may have survived but the density of such surviving plants are considered to be less than is needed to provide satisfactory stabilization to the soil. Seeding recommendations are:

Hard Fescue	1½ lbs.
Alta Fescue	1½ lbs.
Perennial Ryegrass	2 lbs.
	5 lbs./acre

Watershed funds

Near the forest boundary in Purtteman Gulch are two or three hard burned north facing slopes that were heavily stocked with up to 10,000 stems per acre. If further examination shows these north slopes to contain surviving pine grass rhizomes (normally found at a depth of 3-4 inches) at an average spacing of one plant per four square feet, grass seeding is not recommended. If not, the 5 lb. seeding recommendation should be followed.
Watershed funds

Fertilizer Recommendations. If grass seeding is accomplished in sufficient time for germination in the fall 67 lbs. of 45% Urea per acre aerially applied in the fall is recommended. If germination in the fall is not likely then fertilizer recommendations are for spring aerial application of 200 lbs. 16-20-0 per acre at the time of spring snow melt. Fertilizer must be applied when soil is moist to obtain response.
Watershed funds

Revegetion Area C

The soils in vegetation area C are relatively shallow (2'-4') with variable rock outcropping and are generally south facing. Slopes range from 30% to an excess of 60%. The area was generally hard burned with tree foliage and most ground cover consumed by the fire. Grass species present were bunch grasses (wheatgrass) and pine grass, with the bunch grasses the dominate species. Surviving grass or other herbaceous ground cover is expected to be less than needed to stabilize the soil.

Aerial seed as soon as possible and before fall rains promote crusting of the ash. Seeding recommendations are:

Hard Fescue	1½ lbs.
Alta Fescue	1½ lbs.

Perennial Ryegrass	2 lbs.
Sweet Clover	1 lb.
Standard Crested Wheatgrass	2 lbs.
	8 lbs./acre

Watershed funds

Fertilizer Recommendations. Same as for Area B.

Revegetation Area D

The remaining areas evaluated for possible revegetation seeding on National Forest lands are the sparsely or nontimbered southerly slopes with varying steepness. The soils are essentially the same as found over the general area which consist of an ash overburden with a pumice subsoil. These soils are shallow and contain surface rocks to a varying degree. An evaluation of this area shows that the fire burned so rapidly and with relatively low intensity that a high percentage of the perennial grasses survived the fire. Mapping of these units was not fully attempted as they are scattered for the most part throughout soil area number 2 on ridgetops or lower elevations near the forest boundary. Soil area number 7, the only nontimbered grassland type mapped on this study, is included in Area D. Grass seeding is not recommended on these types.

WILDLIFE CONSIDERATIONS OF FOURTH OF JULY BURN

The fire burned through an important winter deer range. Bitterbrush, the key game forage species, was heavily affected. Other than on open timbered and grass-browse south slopes at lower elevations, winter range is largely confined to BLM, Washington Department of Natural Resources, and privately-owned lands. It is estimated that eighty percent of the stand was killed. The principal significance of this loss is that the deer herd will now concentrate feeding on the remaining plants. This additional use will very probably reduce plant vigor and seed production and thereby restrict regeneration of the species. A further impact may be expected on orchards and farmlands as the deer herd seek a replacement supply of food.

Immediate regeneration of bitterbrush on National Forest land should be done in that restoration of this game forage species would reduce excessive browsing on adjacent unburned winter and spring-fall game range (National Forest and private), and reduce anticipated depredation of orchards and farmland.

Planting of bitterbrush should be completed, within limits of available funds and seed, in the fall of 1968. Endrin-treated seed should

be planted using either the Hanson Browse Seeder or a hand planting implement such as a corn planter. A little, if any, success can be expected from broadcast seeding of bitterbrush. Wildlife funds should be used for this purpose.

SILVICULTURAL PRACTICES OF FOURTH OF JULY BURN

I. Salvage of Timber

A. Washington Creek Sale. Okanogan National Forest, Twisp Ranger District. About 1000 acres of the total of 2000 acres within the sale boundary are within the burn. Over ½ of the 15.1 MM was damaged in the fire. The burn intensity varies greatly from scattered ground fire to complete crowned-out condition.

The sale was sold in 1966 to C. A. Harris & Sons. About 2½ miles of the main road has been roughed out. Other than right-of-way timber, no volume has been cut. The status of the sale will not be known for several weeks.

The cleanup after the fire will be dirty, rough, expensive and complicated. Crowned-out areas eventually will be clear-cut. Clearcuts will vary from small patches up to 100 acres or more. In the partially destroyed stands, obviously healthy trees should be reserved as a seed source and to protect the site quality.

B. Cooper-Purrteman Sale. Wenatchee, Chelan Ranger District. This sale, including 2500 acres and 8.5 MM board feet has been recently cut out. Most of the K-V funds of about $40,000 have been spent on thinning. A balance of about $6,000 of work remained to be done prior to the fire. All of the thinning was destroyed. There is no salvage on the sale since all of the overstory was harvested.

C. Deer Fence Sale. Wenatchee National Forest, Chelan Ranger District. This uncut sale of about 200 acres totaled about 300 M board feet. The timber crowned-out. There is serious question about whether it is salvageable. This determination will be made soon. It is located on East Fork of Joe Creek. The understory is destroyed.

D. Older Cutover Lands. Practically all of the overstory on the remaining area outside of the timber sales, approximately 2400 acres, was harvested before the fire. At the most, about ½ million board feet remain. This volume is in widely scattered patches of poor quality, small trees. A substantial part is on steep to very steep slopes.

E. Antione Creek. Salvage logging in the Antione drainage should be restricted to the benches on ridges above the creek. Cable logging is preferable. If available some yarding of salvage below benches is appropriate. A maximum of healthy survivors of the fire should be left on the steep slopes into the creek.

F. Recommendations.

1. Washington Creek Sale.

a. Clearcut crowned-out areas. Provide for erosion control immediately after logging is completed in parts of units.

b. In stands partially killed by the fire:

(1) Remove fire killed merchantable trees.

(2) Reserve as many trees as possible that will survive up to the "leave" volume left on areas before the fire.

(3) Prescribe cable logging on clearcut units and preferably in partial cut stands also.

2. Cooper-Purrteman Sale. No salvage chance. Revise the K-V Plan and appraisal to include fill-in planting, seeding, animal damage control, site preparation for rework areas later on, and surveys. This plan should include approximately the cost of the remaining work that was to be done before the fire.

3. Deer Fence Sale. If present sale is cancelled by mutual agreement, salvage timber only on slopes less than 30%. In addition cable skidding is preferred. If present sale is not cancelled but reappraised, appropriate logging methods should be considered in appraising timber values and contract terms. Consideration should also involve eliminating slopes and soils where erosion may be triggered.

4. Antione Creek. If the fire killed timber can be reached on and from benches above the steep ridges into the creek, some timber may be salvaged. Cable yarding in the salvage area is recommended.

II. Timber Stand Improvement. Over 1400 acres of recently thinned areas were destroyed. In addition the few remaining stands programmed for thinning on the Chelan Ranger District were destroyed. Several stands included in the Washington Creek Sale K-V Plan, Twisp Ranger District, were also killed. The total acres are unknown now.

III. Reforestation. Except for parts of the 1000 acres burned in the Washington Creek Sale, planting or seeding will be needed to reforest timber producing lands. The fire essentially destroyed all existing and potential seed sources.

The total reforestation job includes 6,330 gross acres. This acreage excludes 1,000 acres in the Washington Creek Sale and 761 acres of range lands on the Twisp Ranger District north of Antione Creek.

A total of 6,130 acres is on the Chelan Ranger District and about 100 acres on the bluffs south of Antione Creek and 100 acres on the south side of Washington Creek on the Twisp Ranger District. The total estimated reforestation cost, based on current average costs, is $500,000.

A. Chelan Ranger District.

1. Tree Seeding. Of the total 6,130 acres, about 1,000 acres are suited for aerial seeding. These are roughly sketched in an aerial picture GS-VBTU 1-64, 7/15/67.

   Other scattered patches in Cooper Gulch are suited to seeding, but sufficient seed for these is not available and aerial seeding success is more doubtful than the areas shown on the aerial picture. These areas, located on north, northwest, and northeast slopes in Cooper Gulch and formerly consisting of a mixed stand of Douglas-fir and ponderosa pine, may be successfully spot seeded. Sufficient seed is on hand to sow several of these areas. A few scattered, small patches in similar sites are located in other drainages also. As much as 300 acres may be spot seeded. The possible total acreage of aerial and spot seeding is 1,300 acres. The estimated cost of the aerial seeding is $45,000 and spot seeding $9,000.

2. Planting. The remaining total of 4,830 acres (6,130 gross total minus 1,300 acres seeding = 4,830 acres) includes a total net plantable area of about 3,000 acres (65% estimated plantable). The remaining 1,830 acres are open range, scablands, and bluffs.

   a. Site Quality. The plantable areas, although generally in suitable soils, lay mostly on south, east, and west slopes. Soils are droughty; annual rainfall ranges from 9" at about the 2500' elevation to 16" at the higher elevations.

      Native vegetation and aerially sown grasses in some areas are expected to establish a grass and sedge cover within 2 years. Hand or machine site prepa-

ration to reduce vegetative competition will be needed after the spring of 1969.

This area is a mosaic of site condition changes. Skilled professional direction is essential to the development of a realistic and applicable project plan. The plantable areas vary in quality from Site V, V+, IV- to IV. The project plan should include delineations between nonplantable and, at least, Site IV and V. These delineations will help to define priorities of work areas. When identified on the ground, they will become the project areas.

b. Reforestation Methods. Part of the plantable area is adapted to contracting. Other areas may be so patchy that force account work will be the efficient way of doing the job. Spring planting offers the best prospects for success.

Gopher populations exist on all areas. There is a distinct possibility of damage to plantations. If it occurs it may persist for 5 to 10 years. Refer to animal damage recommendations for details.

c. Tree Supply. Very few trees are available for planting in F.Y. 1969 or 1970. The expected needs are 1,000,000 trees within the next 5 years. Once the project plan schedule of work is reasonable firm, nursery sowing schedules should reflect annual tree needs beginning in the spring of 1971. Meanwhile, the Regional Forester will find out if Colville National Forest, Republic Ranger District, or nearby Forests, have some suitable trees for planting in the spring of 1969 and 1970. The Forest will be advised by 10/15/68.

d. Site Preparation. On steep areas, generally over 55%, hand site preparation in advance of planting after the spring of 1969 is essential. This work should consist of constructing hand terraces during the spring, summer, and fall. Building these while planting will delay planting work unduly. The terraces, if areas are contract planted, will control the location of trees to be planted. Hand terrace construction may also be contracted. A sample contract is not available. Regional Forester will assist Forests to prepare one if requested by the Forest. Below slopes of 55% machine scalping is possible and the most efficient.

e. Rework. Undoubtedly rework will be required in both planting and seeding areas. The need for rework should be recognized and completed promptly. The rework will consist of site preparation and planting.

f. Surveys. Stocking surveys and tree survival checks should be scheduled at times to identify reasons for success or failure.

(1) Seeding. Critical periods are during the 2-4 week germination period in the spring and survival of germinated seedlings in the fall. The spring checks will identify fate of seed and germinates. The fall survey should identify rework areas for planting the following spring. Staked germinates may help to identify causes of loss.

(2) Planting. Critical periods are 2-3 months after spring planting and late in the fall. The reasons for losses in early summer can be accurately identified. Surveys in the fall after spring planting will identify rework areas for the following spring.

Subsequest surveys on at least an annual basis should be made for the 2 through 4 growing seasons. Intensity of surveys may vary depending on on-the-ground observations.

B. Twisp Ranger District. The area to be reforested includes about 200 acres of tree seeding including two areas - one in Washington Creek and the other in Antione Creek. Both areas are on the steep north slopes and should be aerially seeded. The estimated cost is $9,000. See photo GS-VBTU, 1-63, 7/15/67. Refer to Seeding and Surveys on the Chelan Ranger District for details.

C. Recommendations.

1. A project plan for the entire 6,330 acres be prepared as soon as feasible. This plan should contain the total reforestation program including schedule, location, and financing of work for both Ranger Districts.

2. The F.Y. 1969 program should include as a minimum the completion of the 1,500 acre aerial tree seeding project. The proposed seed application should include 2 lbs. of ponderosa pine and 1 lb. of Douglas-fir per acre. A list of seed lots has been prepared and is available at the Chelan Ranger District office. Refer to animal damage controls for recommended census traplines, rodent baits seed treatments, etc.

3. The F.Y. 1969 work program should include as much spot seeding contiguous to aerial seeding areas and tree planting in other areas as funds, tree seed, trees, and personnel will allow. Refer to FSH 2472.1, Chapters

40, 50, and 60 for guidelines.

4. Spot seeding, including a mixture of Douglas-fir and ponderosa pine, should be completed this fall. Use endrin-treated seed. Average seed spot spacing should be about 10 feet. Spot seeding sample contract is available in contract libraries at ranger district and Forest offices. Contract technical specifications also may be used for force account work.

5. Program the planting as early in the spring as possible. Snow plowing may be required. Fall planting, although not completely out, should be kept to a minimum. The possibilities of loss from winter desication and frost heaving are enhanced by the generally southerly exposure of the planting areas and light snow blanket.

6. Planting scheduled for the next two springs should be located on slopes less than 20% and in reasonably rock-free soils. Suggested areas are shown on aerial picture GS-VBTU, 1-64, 7/15/67. Ground cover is not a problem. The reason for locating these plantations as described is so possible gopher infested areas can be treated with the Forest Land Burrow Builder. For details refer to animal damage control. An average of about 350 trees per acre should be planted - more trees on poorer sites, less on good sites.

7. Locate and plant four ½-acre patches, one on each of east, west, north, and south aspects this fall if possible. The purpose is to quickly determine if gophers or other animals will hamper successful survival. No animal protection treatment should be programmed on these plots.

8. Planting after the spring of 1969 should be preceeded by site preparation. Use hand terraces on slopes over 55%. Construct machine scalps, 40-50 per acre on slopes less than 55% - about 40 on better sites, 50 on poorer sites. Refer to FSH 2472.1, Chapter 40 for details. Plant 4-6 trees per machine scalp.

9. Inspect reforested areas by methods described in FSH 2472.1, Chapter 10, Stocking Surveys. Inspect seeded areas, aerial and spot, in the early spring shortly after germination and again before snow covers the ground. The methods and intensity of application may by varied according to obvious needs. Leave little to doubt - get the facts.

Examine planted areas during the first growing season

in early summer and before snowfall. Determine survey needs and intensity as described above.

10. Identify and program rework promptly.

ANIMAL DAMAGE CONTROL OF FOURTH OF JULY FIRE

I. Tree Seeding.

A. Small Mammal Census. On August 13, 1968, three transects of 25 traps each, were placed in the burn. Results of one nights exposure are as follows:

Transect No. 1	1 deer mouse	
Transect No. 2	1 deer mouse	
Transect No. 3	4 deer mice	4 chipmunks
	6 deer mice	4 chipmunks

The average catch was 13% which is ample justification for control. However, since two transects had only 4% catches, it would be desirable to conduct additional census for baiting justification.

1. Set out 4 trapline transects in areas to be aerially seeded. (Refer to attached chapter 32.12 of Animal Damage Control Handbook for details)

2. Recensus 4 areas within the seeded area 5 to 10 days following tree seed sowing. This will give information on the combined effects of 1080 and endrin in controlling seed eating rodents.

3. Make a final census of the seeding area in the spring of 1969. Four transects should run within one week following snow disappearance to determine if a second baiting is needed.

B. Baiting Procedures.

1. Bait area 5 to 10 days before seeding. This should be between October 5 and 10, as the seeding is scheduled for October 15.

2. Use 1080 wheat treated at the rate of 10 ounces of 1080 per 100 pounds of wheat. (See FSM 6316.3 for ordering details)

3. Apply bait aerially at the rate of ½ pound per acre, over all areas to be seeded. Tree seeding will consist of a number of various sized units. It is therefore

recommended that all units be included in one block, all of which will be baited. This block should provide a minimum baiting buffer strip of 5 chains. (See appended parts of Animal Damage Control Handbook Ch. 60 for additional details)

C. Seed Treatment. The nurseryman supplying tree seed should be instructed to have the seed endrin treated as prescribed in the seed treatment contract administered by the Gifford Pinchot National Forest. This is a 0.5% active endrin treatment.

D. Safety. (Refer to Ch. 8.3, Health and Safety Code). Place aerial baiting signs R6-26-1 at all points where roads or trails enter areas to be baited and at suitable points within the baited area. Signs should be put up two weeks ahead of bait distribution and removed immediately following germination of endrin treated seed in the spring.

E. Coordination and Cooperation.

1. To secure an adequate buffer strip it will be necessary to place bait on private lands. A suggested form for securing written approval of private landowners was sent to the Forest on August 15, 1968. Bait should not be placed on any private property unless the agreement is in writing.

2. Private landowners wishing to bait for protection of tree seed should be invited to participate in a unified baiting program. However, any program involving the use of 1080 for baiting private lands will require clearance through the State Supervisor of the Bureau of Sport Fisheries and Wildlife.

F. Determining Hazard to Non-target Wildlife.

1. Establish five ¼ by 20 chain transects by marking the center line with ribbon.

2. Transects should be within the tree seeding areas.

3. Check transects to determine if non-target birds or mammals have been killed.

4. Transects should be read three days following seeding and at two week intervals until snow covers the ground.

5. Any specimens found should be frozen immediately and the Regional Office should be contacted for information on disposition of carcasses.

6. Results of surveys should be reported to the Regional Office, Division of Range and Wildlife Management.

II. Tree Planting.

A. Pocket Gophers. Pocket Gophers are numerous throughout proposed tree planting sites and potentially dangerous to plantation success. Initial plantings should be made on slopes of 20% or less and on sites reasonably free of surface and subsurface obstructions. These criteria will permit machine gopher baiting if needed.

The Regional Office will supply a Forest Land Burrow Builder and technical assistance on the project if the Forest finds there is a need and wishes help.

Limited planting for the first two years might be advisable. This will provide an opportunity to determine whether gophers pose a serious threat to seeding survival before a large amount of money is spent on the planting program.

B. Deer. The Forest Wildlife Biologists reports that very few deer winter in Forest Service lands within the burn. It is therefore unlikely that they will present any problems to the reforestation program.

ARDENVOIR BURN

SOILS OF THE ARDENVOIR BURN

Soils of the Ardenvoir Burn have been mapped and described in the Entiat Soil Survey Report. The soil series occuring in the burned area are Morical, Tyee and Dinkleman. A majority of the area is occupied by Morical. This soil has a surface layer of sandy loam texture with strong structure overlying a subsoil of sandy clay loam texture. Slopes range from 30 to 60 percent. The Tyee and Dinkleman soils have sandy loam textures and very weak structure, and occur on very steep slopes. Erosion potential is moderate for Morical soil and high for Tyee and Dinkleman.

The burn was very spotty and varied greatly in intensity. Some nonwettability of the soil was observed in heavy burned areas. Revegetative seeding is needed only in the areas of heavy burn. The area of light burning has many live grass and brush plants remaining.

The most important consideration of this fire is waterbaring of all firelines and cat trails. Much of this has already been accomplished and appears adequate. The remaining lines should be waterbared before fall rains. Spacing recommendations:

Morical soil, slopes 30-45% - 150'
Morical soil, slopes 45-60% - 100'
Tyee and Dinkleman, slopes 60% - 50-75'

A soil map is not included in this report because of the detailed soil survey report available. Field observation found the soil map already prepared by the District from the soil survey to be very adequate for this fire rehabilitation.

REVEGETATION RECOMMENDATIONS OF THE ARDENVOIR BURN

Due to the relatively light and spotted nature of the burn on National Forest lands, limited reseeding for soil stabilization is needed. Examination showed where the fire did not crown out in the timber overstory or where it burned through the non-timbered openings sufficient live grass or browse was present so that regrowth will provide adequate soil stability to the burned area.

Within the burn, there are several small timbered areas that burned with sufficient intensity to destroy all ground cover. These areas which in total cover an estimated 25-35 acres should be hand seeded as soon as possible and prior to the fall rains with the following seed mixture:

Hard Fescue	1½ lbs.
Alta Fescue	1½ lbs.

Perennial Ryegrass	2 lbs.
Standard Crested Wheatgrass	2 lbs.
Sweet Clover	1 lb.
	8 lbs./acre

Funding - Watershed Rehabilitation Funds

FERTILIZER RECOMMENDATIONS OF THE ARDENVOIR BURN

If grass seeding is accomplished in sufficient time for germination in the fall, 67 lbs. of 45% Urea per acre aerially applied in the fall is recommended. If germination in the fall is not likely, then fertilizer recommendations are for spring aerial application of 200 lbs., 16-20-0 per acre at the time of spring snow melt. Fertilizer must be applied when soil is moist to obtain response.

FIRELINE STABILIZATION OF THE ARDENVOIR BURN

Seeding and fertilizer recommendations are the same as for the hard-burned areas of this fire.

SILVICULTURAL PRACTICES OF THE ARDENVOIR BURN

Reforestation. Protection of natural seedfall of seed is essential. Refer to animal damage control for recommended practices and methods.

ANIMAL DAMAGE CONTROL OF THE ARDENVOIR BURN

I. Small Mammal Census

A. Conduct census immediately to obtain justification for baiting to protect natural seed fall. A catch of 5% or greater averaged over all traplines in the burn will constitute adequate justification.

B. Place 2 trapline transects within fire perimeter and one immediately outside of fireline. (See appended Ch. 32.12 of Animal Damage Handbook for details).

C. Recensus 2 areas within the burn, three weeks following baiting, to determine if additional control is needed. If a second baiting is required it should be scheduled to coincide with baiting on the Fourth of July fire.

D. Make a final census of the area in the spring of 1969. Two transects should be run within one week following snow disappearance to determine if additional control is needed.

II. Baiting Procedures. (assuming baiting is justified)

A. Bait area between September 1-15.

B. Use 1080 wheat treated at the rate of 10 ounces of 1080 per 100 pounds of wheat. (See FSM 6316.3 for ordering details)

C. Apply bait aerially at a rate of ½ pound per acre over all areas in which natural seed fall is to be protected. Also apply bait in a 5 chain buffer strip around all areas to be protected to limit the amount of reinvasion by seed eating rodents. (See appended parts of Animal Damage Control Handbook Ch. 60 for additional details)

III. Safety. (Refer to Chapter 8.3 Health and Safety Code)

A. Place aerial baiting signs R6-26-1 at all points where roads or trails enter areas to be baited. Signs should be put up two weeks ahead of bait distribution and removed 60 days following baiting.

B. Two small isolated sections of Forest Service lands in sections 26 and 32 are fairly close to human habitation. These areas should be surveyed to determine if baiting poses a threat to humans or domestic animals. If there is a reasonable chance of problems developing, the areas should not be baited.

IV. Coordination and Cooperation.

A. To secure an adequate buffer strip it will be necessary to place bait on private lands. A suggested form for securing written approval of private landowners was sent to the Forest on August 15, 1968. Bait should not be placed on any private property unless the agreement is in writing.

B. Private landowners wishing to protect natural seed fall on their own lands should be invited to participate in a unified baiting program. However, any program involving the use of 1080 for baiting private lands will require first clearance through the State Supervisor of the Bureau of Sport Fisheries and Wildlife.

V. Determining Hazard to Non-Target Wildlife.

A. Three to five days following baiting, two one-half acre transects should be run to determine if non-target birds or mammals have been killed.

B. Transects should be ¼ chain by 20 chains.

C. Any specimens found should be frozen immediately and the

Regional Office should be contacted for information on disposition of carcasses.

D. Results of the survey should be reported to the Regional Office, Division of Range and Wildlife Management.

OTHER RECOMMENDATIONS

1. The Wenatchee National Forest - explore the need for a well qualified project leader to develop a work program, execute project plans, follow-up on performance, and train personnel involved in the total project. This recommendation considers the several resources involved, the large cost, and the several years that will elapse before the project work is complete.

2. The Forest - consider the need for fire protection within and adjacent to the burn on National Forest lands. The large total investment cost would seem to justify careful thought on the risk of future fires for many decades.

3. The Wenatchee National Forest - locate picture points within the burn for the purpose of maintaining a pictoral record of changes in the condition of the burn. Specifically locate at least five points in different representative areas of the burn including one in the distinct range type. Pictures should be taken in the spring and fall. One closeup and one view, preferably in color and stereo, are suggested at each picture point.

TABLE OF SOIL UNIT CHARACTERISTICS AND INTERPRETATIONS

Fourth of July Burn

SOIL UNIT	SOIL DEPTH	SLOPE RANGE	ASPECT	DOMINANT VEGETATION	ROCK OUTCROP	EROSION POTENTIAL	NON-WETTABILITY	WATER-BAR SPACING	GENERAL BURN INTENSITY	POSSIBILITY OF NATIVE GRASS SURVIVAL
1	2-6 ft.	less than 30%	generally northeast	ponderosa pine, grass, brush	less than 5%	moderate water, high wind	moderate	150 ft.	hot	low
2	2-4 ft.	30-60%	southerly	ponderosa pine, grass, brush	10-15%	high water and wind	high	100 ft.	hot	low
3	2-4 ft.	20-40%	southerly	ponderosa pine, grass, brush	20%	slight water & wind	slight	150 ft.	light, some hot spots	high
4	15-40 in.	40-70%	southerly	ponderosa pine, grass, brush	25-35%	high water, mod. wind	moderate	50-75 ft. some hand installation	hot	low
5	over 6ft.	5-15%	-	mixed timber	none	slight	slight-mod.	150 ft.	light	high
6	2-5 ft.	30-60%	northerly	Douglas-fir, grass	10%	high water	slight-mod.	100 ft.	hot and light	moderate
7	15-20 in.	20-50%	southerly	grass, brush	10-15%	high water and wind	slight	100 ft.	light	high
8	1-2 ft.	60-70%+	northerly	ponderosa pine	30-40%	high water	slight	50 ft. some hand installation	light	high
9	Rock Outcrop									

Waterbar Construction