

FIRE REHABILITATION REPORT

FILE

CRUM CANYON FIRE Entiat District Wenatchee National Forest

The Crum Canyon Fire began at 14:45 on July 24, 1976, at the bottom of Crum Canyon adjacent to the BPA powerline and the Entiat Highway. The fire was contained on July 28 at 0100 and was declared controlled on July 29 at 0900.

From the point of origin the fire extended over an area of approximately 9000 acres, reaching the Columbia River breaks above Highway 97. Major drainages affected by the fire were Crum Canyon, Byers Canyon, McKinstry Canyon, and Byrd Canyon.

Total damages caused by the fire are estimated at \$18,225,000 with an estimated 9 million board feet of timber lost valued at \$225,000 and the remaining losses attributed to watershed, grazing, and wildlife values.

The purpose of the Regional Fire Rehabilitation team is to conduct the investigations and analysis needed to prepare a burned area survey report, make recommendation on emergency measures for rehabilitation of wildfires and request the funds needed for emergency rehabilitation.

The following people were on the team for the Crum Creek Fire:

Loren Herman - Soil Scientist
Philip McColley - Soil Scientist
Louis Spink - Plant Materials Specialist
Alan Fox - Economist
Richard Denker - Contracting
Keith Guenther - Wildlife Biologist
Max Copenhagen - Hydrologist
Bruce Brown - Entiat District Liaison

Situation

It is estimated that 6,230 acres of National Forest System lands were burned over and 2,770 acres in the ownerships including private, Bureau of Land Management, Washington Department of Game, and the City of Seattle.

Damages on National Forest System lands occurred primarily on non-forested range lands with significant amounts of damage to forested lands in the heads of the canyons. The area burned is part of the Potato Creek Cattle and Horse allotment and is covered by a cooperative agreement between private owners, BLM, the Washington State Department

of Game, Washington State Department of Natural Resources, City of Seattle, and the Forest Service. In addition to the damage to the forage and wildlife habitat resource, some range management facilities, primarily fences but possibly some water sources occurred. Some grain crops have been produced in the area in the past, both for market and for wildlife use, but none has been identified as having been lost at this time. Some deer fences along the Columbia River breaks also may have been lost. Damage has been reported to have occurred to some orchards on the periphery of the fire but no estimate of the extent has yet been made.

Burned Area Treatment

Erosion control seeding needs to be accomplished as quickly as possible to take advantage of the fresh seedbed. The fertilization can be accomplished in September and October. Spring fertilization is not recommended because fall growth is needed for ground cover. Protection fencing this fall or next spring will protect the erosion seedings from livestock next summer.

Treatment

A - First priority is on 35 acres of hot and moderate burned draw bottoms to establish quick cover and feed. Orchard grass is for perennial cover, until native vegetation and P & M planted shrubs and giant wildrye clones get established or recover from the burn. The seed mix should be flown lengthwise in the draws. The sweet clover needs inoculation. Effective moisture should be good enough in the draws for 50# N w/sulfur.

Treatment

B - Second priority, 1100 acres of hot burned scattered conifer with bunchgrass and shrub understory. The grass mix should be well adapted and assist in stabilizing these extreme burned sites. 50# N with sulfur/acre will help establishment of grass seedlings. It is not expected that these sites will be replanted with conifers as they are typed non-commercial.

Treatment

CT - Third priority, 65 acres of key big game thermal cover that appeared to have been eliminated by the fire. These five areas are mostly non-commercial and probably wouldn't be reforested for timber production alone. The cover patches are isolated and serve important feed areas on key winter range. The grass mix was adjusted to establish quick cover and food with low competition to planted trees the second, third and fourth years.

Treatment

C - Fourth priority is 280 acres of conifer that probably can be reforested successfully. The erosion control mix is designed to stabilize the severely burned soils, while providing a minimum amount of competition to newly planted conifers.

Treatment

D - Fifth priority is 120 acres of extremely hot burned grassland. The crested wheatgrass-hard fescue mix should be able to become established on this site. The shallow soils have a low moisture holding capacity that could not use more than 25# of nitrogen with sulfur per acre.

Treatment

E - Sixth priority is 320 acres of light and moderate burned acres where adequate residual vegetation remains that will respond to 50# N with sulfur fertilization per acre. Areas treated are all on good soil sites within Byrd and Crum Canyon watershed.

Treatment

F - Seventh priority is 350 acres of moderate and light burned areas in the Crum Canyon watershed. These areas have some residual vegetation on fair soils that are shallow and should not have more than 25# N with sulfur per acre.

Firelines and roads were treated with FF 102 funds, including waterbars, seeding and fertilization (see attached report). This job was begun immediately after control and is expected to be completed before the fire is out. Any activity that subsequently disturbs these structures or seedings will be expected to repair the waterbars and reestablish the disturbed seedings.

Comments and Observations by Functions

Soils Considerations

The highest risk for sheet erosion is a high intensity storm this season. The risk of debris avalanche is very high for next spring and will be even greater the following year. This hazard will continue to be high for the next 2-5 years. Byrd and McKinstry are particularly high risk drainage for debris avalanches. (Risk factor before burn 1:100). (Risk factor after burn 10:100). The area north of Crum Canyon shows evidence of heavy runoff in the recent past and the upper part of this area was not burned.

Vegetative gully stabilization is important in the watershed areas. Channel cutting on private land is inevitable. There will be increased runoff both in rate and amount. Knapweed invasion in the lower areas and on private land will afford little protection and make establishment and recovery of perennial cover difficult.

Critical soils stabilization on fire line trails and roads, helispots, etc., was accomplished immediately after the fire. Disposal of slash created in construction of these facilities, and other erosion control or resource activities that disturb the FF 102 stabilization practices, like waterbars and seeding, will need to figure on putting them back into shape.

A soil condition and ground cover sample was taken to determine erosion hazard and recovery potential on four areas on the fire. A copy of the Moderate Burn Transect and Hot Burned Area sample information is attached as an exhibit to this report.

The revegetation efforts must be protected from livestock damage because of the granitic and ashy soil conditions that will contribute to pull-up of young and immature plants. (See livestock considerations below).

Wildlife Considerations

The entire fire area is important mule deer winter range. Some important thermal cover areas were burned hot during the fire. The areas that were identified as needing to be replanted to provide thermal cover in the more open low elevation winter range areas need to be verified on the ground. A wildlife biologist and silviculturist should inspect the identified areas to verify the sites needing replanting for winter range thermal cover.

The bottoms of most draws were burned very hot. The draws need to be inspected on the ground to see if the original vegetation will resprout. If the original brush and giant wildrye appears dead, consideration should be given to planting shrubby cover in these important wildlife areas.

Livestock Grazing Consideration

Approximately 4 miles of erosion control seeding protection fence is needed along the ridge and trail, north and west of the fire. Livestock will enter the burn area from the west through this area that was mostly natural barrier in the past. Some additional P & M fence reconstruction is needed east and north of Crum Canyon.

The burn area seedings need complete rest, followed by deferment to plant maturity the second year, to get established. Even a few cows on the new seedings will cause a lot of damage the first two growing

seasons because of the ashy and gravelly soils. Planning for complete non-use and protection should begin now. The Potato Creek allotment has six pastures and currently has provision for some rest and deferment.

Hydrological Considerations

No debris collection structures are planned. Some debris removal work and clean-up will be needed on the lower end of Byrd and McKinstry Canyons. A large part of these areas are on private land.

Grass seeding for quick cover this fall and next spring, plus perennial cover through reforestation of timber sites and shrub planting in the draws will help the watershed to recover. Moderate fertilization on the good soils in lightly burned areas for fast ground cover will help prevent channel and downstream siltation in the drainages that are highly susceptible to accelerated run-off and erosion damage.

TABLE 1

RECOMMENDATION

Burn Intensity	Veg. Type	Land Type	Ground Veg. and Grass Seeding	Fertilizer	Planting or (TBA)	Treatment
Hot			Cereal Rye 35# Sweet Clover 2# Orchard grass 6#	50# N/acre	Shrub and giant wild-rye	A
Hot			Orchard grass 4# Hard fescue 4# Intermed. Wheat #6	50# N/acre		B
Hot			Hard Fescue 4# Cereal Rye 35# Ceanothus 2#	50# N/acre	Ponderosa Pine	C
Hot	(See table 2)	(See overlay)	Hard fescue 4# Cereal Rye 35# Bitterbrush 2#	50# N/acre	Ponderosa Pine	CT
Hot			Crested Wheat 10# Hard fescue 2#	25# N/acre Max.		D
Mod. & Light			None	50# N/acre		E
Mod. & Light			None	25# N/acre		F

TABLE 2

PRIORITIES

Burn Intensity	Vegetation Type	Land Type	Acres	FF 102 Firelines	Structure & Location	Priority No.	Treatment
Hot	SD89		35	-		1	A draws
Hot	CP S2 16 CD S6 14 CP S9 CP S2 22		1100	-	2 mile protec- tion fence	2	1 B conifer, no plant
Hot	CP S2 22 CD S6 14		280	-	2 mile protec- tion fence	4	C conifer, plant
Hot	DP S2 22 CD G3 CP S9 CD S6 14		65	-		3	CT conifer, plant thermal cover
Hot	SD 31 22 GB 49 13 GB S9		120	-		5	D grassland seed + fertilizer
Mod & light	GB 49 13 CP S2 16 CP S2 22 CP S9 CD S6 14		320	-		6	E Fertilize only 50#N
Mod & light	SD 31 22 CP S2 16		350	-		7	F Fertilize only 25#N

(See overlay)

7/29/76

Approx center Sec. 19
T.26N., R. 21E.

TRANSECT #1 (Direction due south)

<u>Tree stump</u>	<u>Distance</u> 0+00	<u>Ground Condition</u>
		3 unburned grass
Begin transect	20 paces	3 unburned-grass litter
	22 "	2 burned-grass litter
	24 "	2 burned-grass litter
	26 "	1 burned-grass litter ½ bare soil
	28 "	3 unburned
	30 "	0 bare soil
	32 "	1 ½ bare soil
	34 "	0 bare soil
	36 "	2 burned-grass litter
	38 "	3 unburned
	40 "	3 unburned 100%
	42 "	2 ½ bare soil - ½ burned litter
	44 "	2 burned - no root crowns
	46 "	2 ½ bare soil - ½ burned litter
	48 "	0 bare soil
	50 "	0 bare soil
	52 "	2 burned litter
	54 "	0 bare soil
	56 "	0 bare soil
	58 "	2 burned litter
	60 "	2 burned litter
	62 "	1 ½ bare soil ½ burned litter

No hydrophobic effect on light burn

Bluebunch wheatgrass has ½" of unburned straw above root crowns.

#2

NE¼ SE¼ Sec. 13 T.26N. R.20E. - very hot burn approx. area of jeep trail - surface soil has a non-wettable factor pine grass (crowns & all) has been totally consumed.

#3

NW¼ SW¼ Sec. 19 T.26N. R.21E. Medium to hot burn (disturbed area) non-wetability not a problem.

NOTE: Volcanic ash is present in sufficient quantities to affect the soils in sections 12, 13, & 24 T26N R20E and those in sections 7, 8, 17, 18, 19, & 20 lying on N an NW aspects, on slopes less than 20 percent, or in concave drainage basins. This ash increases the incidence of non-wetability and also creates a much more erosive surface condition.

#4

SW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 18 T.26N., R.21E.

Upper basin - south side of Byrd Canyon

4-10" dbh Douglas-fir

(angular) gravelly sandy loam surface

ash is creeping down slope (slope is 70%)

wind causes ash to blow

hydrophobic condition exists about $\frac{1}{2}$ to 1" below the surface

Intensity of burn is very high

Non-wetable layer* approx $\frac{3}{8}$ " thick lies about one inch below the surface. Surface 1" has about $\frac{1}{4}$ " of fire ash overlying $\frac{1}{2}$ " of cooked soil. Most of roots & twigs have been destroyed by the fire. Below the non-wetable layer the infiltration rate and permeability are excellent.

*Non-wetable - as determined in field test where applied water stood on the surface for a period in excess of 10 seconds. Some tested spots retained surface water beads for 25 seconds.

NOTE: Concave slope basins in this area are very fluffy (ash) and appear to be very erosive, the non-wetability aggravates the problem.

PHASE I FF102 PLANNED
REHABILITATION FOR SUPPRESSION ACTION
DRUM CANYON FIRE

I. General:

All damage to resources and improvements from the suppression action can be rehabilitated from FFF Funds. These include: repairing damage to roads, waterbarring, seeding, and fertilizing fire trails, etc. Damage caused to the resources will be handled by the Forest Rehab Team.

II. Work To Be Done:

A. Roads: All roads which were used will need to be re-shaped and drain-dips re-constructed. This includes:

- 1) Steliko Road - water and re-shape; install drain-dips, considerable watering will be needed prior to blading.
- 2) Crum Creek Road (above Russell Place) - same as Steliko; this is a county road to the Shipley Place.
- 3) Byers Canyon Road - Re-shape and outslope.
- 4) Morical Canyon Road - Re-shape and install drain-dips.
- 5) Roads under BPA Powerlines - Re-shape, pull berm, install drain-dips.
- 6) Crum Canyon Entiat Side - Re-shape.
- 7) Byrd Canyon - Water, Re-shape.
- 8) Oklahoma Gulch - Water, Re-shape.
- 9) South Fork Mud and Mud Creek - Check with Ranger for work to be done.
- 10) Wilkinson Canyon System - Check with Ranger for work to be done.

B. Fire Camp:

- 1) Check fences.
- 2) Check with Manager Russ Ferg for any additional work that needs to be done.

C. Fire Lines:

1. Tractor Firelines:

- a. Water Bar: On slopes under 30% about 100' apart; on slopes over 30% about 50' apart.
- b. Rangeland Drill seed all lines with slopes less than 35%. Broadcast seed slopes over 35%.
- c. Fertilize as specified below (ANS).
- d. Construct massive blockades next roads to ORV cannot enter.

2. Handlines:

- a. Construct water bars - on slopes under 30% about 100' apart; on slopes over 30% about 50' apart.
- b. Use a substantial reinforcement such as a large crib, small log and pin as necessary. Construct in a "Herring-bone" pattern.

3. Special:

Save 300' of line (tractor) in an undisturbed condition for PNW research project. (to be designated by Max Copenhagen & Art Tiedemann)

D. Seed Mix:

Treatment A		(Timbered areas)		
1 lb. of seed		Percent of mix	Percent of purity	Percent of germination
338	Greenar Intermediate Wheatgrass	50	90	85
168	Durar hard fescue	25	95	85
177	Latar Orchardgrass	25	90	80
<u>675</u>		<u>100%</u>		

Treatment B		(Grassland Areas)		
1 lb. of seed		Percent of <u>mix</u>	Percent of <u>purity</u>	Percent of <u>germination</u>
300	Nordan crested wheatgrass	35	95	85
400	Pubescent wheatgrass	47	90	85
100	Poa canbyi	9	95	75
100	Yellow sweetclover	9		
900	(Inoculate)	100%		

Fertilization with pelleted fertilizar (31-0-0-5) at 75 pounds of actual N per acre. Fertilizer was ordered at these rates. Cut grassland rate (area B) by one-third and add extra to timbered (area A). Shallow soils, rocky ridge tops exposure, and effective moisture are the rational.

F. Slash Piling:

- a. Pile all slash (for later burning) created in construction of Helispots.
- b. Pile all slash (for later burning) created in construction of fire lines.

Shrub Establishment

Willow Planting

Seedlings - staminate and pistillate flowers are produced in catkins on separate trees, usually appearing before or with the leaves. Willow seed must be collected as soon as the fruits ripen-when the catkins turn from green to a yellowish color June or July. A few species are known to ripen in May or as late as August. Frequent observations are necessary to determine time of maturity. It is unnecessary to separate the seed from the opened capsules after collecting. Because seed is viable for only a few days, commercial seed is not available. The maximum period of storage is from 4 to 6 weeks, but germination drops rapidly after 10 days when stored at room temperature. Seed should be sown immediately, by broadcast seeding on fresh soil.

Cuttings

The cuttings should be planted early in the spring, as soon as the frost has left the ground. Fortunately, this is about the proper time to make cuttings. Make the cuttings with 5 or 6 buds on the new growth. Try to get material about 1/3 to 1/2 inches in diameter, with at least 5 buds and a minimum of 10-12 inches long.

The bottom of the cuttings are dipped in indolebutric acid (0.3% or 0.8%) in a talc carrier solution. They are planted with 1 or 2 buds above the ground. Pushing the cuttings into the ground may peel the bark and ruin them. Use a straight rod to make a hole and tamp or pick the soil around the cutting to eliminate air pockets. It is important for the new plants to be deep enough for some of their roots to be in wet soil during the summer.

Storage is a point you may need to consider for your materials. It can be done, but is complicated and risky. Cut plants to be stored only during dormancy.

They will continue to grow in storage if growth has started before cutting. Refrigerate in 34°F in moist packing to prevent bacteria, mold and dehydration. A moisture proof container is needed.

If you plan to store your material let me know and I will dig up some more information for you. Other wise, I will definitely recommend fresh cuttings.

Rose - the hips can be hand picked soon after the dark green color fades into a reddish color or at any time afterwards. Fruits collected shortly after ripening will germinate more readily than those allowed to dry in the hip. Seeds can be extracted by mashing the hips in water and allowing the pulp to float away. Planting depth recommended is 1/4 and 3/4 inches or about 3 times the diameter of the seed. Use of stored seed is not recommended without more information. Scarification of the seed is not necessary.

Sumac (Rhus) - Seed should be collected in the fall or early winter and can be stored without special treatment. Visible seed will sink in cool water. Seed treatment is not needed for fall or winter planting. Seed treatment is needed for spring sowing. Soaking in water 180° - 200°F for 24 hours, followed by refrigeration at 34-40°F for (60 days) will break dormancy. A 1 to 2 minute dip in boiling water (212°F) will speed up the water process, but may result in loss of some seed. Planting depth should be about 1/2 inches.

Ceanothus - The common method of seed collection is to the cloth bags over clusters of green seed. As the capsules split, the seed is ejected with considerable force. Cutting the seed capsules will ruin the seed. Germination can be induced by immersion in boiling water for 5 minutes followed by refrigeration for 90 days. In lieu of the 90 day cold stratification a chemical treatment with gibberellin or thiourea has been used. Survival is closely related to seeding depth. About 3/4 inches is recommended. Deep fire ash is excellent for broadcast.

Other species - We have additional information on several other species if you find some that are important in the area. Locally produced material often works out much better than seeds or plants from other areas, but don't overlook the possibility of an early contact with Coeur d'Alene to find out what they have, cost, and etc.