MESSAGE SCAN

To RWS:R01A

From: Valdon Hancock:R01F15A
Postmark: Dec 03,90 2:51 PM Delivered: Dec 03,90 2:50 PM
Status: Certified Previously read Urgent
Subject: FORM 2500-8, TURKEY FIRE, BURNED AREA REPORT & REQUEST FOR FUNDING

Comments:
Judy, attached is the form as signed by Dick Smith. The FSH 2509.13 Chp. 41 indicates that the Regional Forester should send requests to the Chief via telecommunication; I believe it is suppose to go in today. A narrative will follow. Please let me know the outcome.
Thanks. --Valdon

----------X----------

Best
I got signature
OK to transmit
to WO Yes Am?
Judy
Yep! BK

R01W
WSA: WDF

mailed elec 12/4/90
0951 JH

USDA-FOREST SERVICE Date of Report: Dec. 3, 1990

BURNED AREA REPORT
(Reference FSH 2509.13, Report FS-2500-8)

PART I - TYPE OF REQUEST

1. Type of Report

[X] A. Funding (Request for estimated NFFF-FW22 funds)
[ ] B. Accomplishment Report

2. Type of Action

[X] A. Initial (estimated funding is first requested)
[ ] B. Interim

a. [ ] Updating the initial funding request.
b. [ ] Supplying information for accomplishments to date on emergency work underway.

[ ] C. Final

a. [ ] Best estimate for funds needed to complete eligible rehabilitation measure.
b. [ ] Following completion of funded work.

PART II - FIRE LOCATION

a. Fire Name (from Form FS-5100-29): TURKEY
b. Forest Supervisor's Fire No. (from Form FS-5100-29): MT LCF 013
c. State: MONTANA
d. County: JUDITH BASIN
e. Region: 01
f. Forest: 15 LEWIS & CLARK
g. Ranger District: 04 JUDITH
h. Date Fire Started: 11/24/90
i. Date Fire Controlled: 11/30/90
j. Estimated Suppression Costs: $500,000
k. Fire Suppression Damages Repaired with FFF 102 Funds: (In Progress)

X 1. _____12 miles (firelines waterbarred)
2. _____20 acres (firelines seeded)
3. _____ Other (identify)

l. Fire Intensity: 5 % (low) 18 % (medium) 77 % (high)

PART III - NATIONAL FOREST SYSTEM PROBLEM INVENTORY

a. Watershed No.: 1004010317 (Judith River, Sage Creek subdrainage)
b. NFS Acres Burned: 3500 ac.; Total Acres Burned: 32,035 ac.
Ownership type and acres:
1,500 Ac. State; 400 Ac. BLM; 25,600 Ac. PVT; None other
c. Water Repellant Soil: 77 % of NFS acres burned (from dryness, duff gone)

d. Vegetation Types: Douglas fir, lodgepole pine, limber pine, ponderosa pine
e. Geologic Types: Limestone with igneous intrusions
f. Soil Erosion Hazard Rating:

85 % (low) 15 % (medium) None % (high)

g. Erosion Potential: 20,650 cu. yds/sq. mile
h. Miles of Stream Channels by Regional Order or Classes: Order I, 10 miles; Order II, 3 miles; Order III, 2 miles; Order IV, 1 mile.
i. Miles of Forest Service Trails: 0.5 mile
j. Miles of Forest Service Roads by Maintenance Levels:

0 miles (Level I); 1.0 mile (Level II); 4.4 miles (Levels III, IV, V)

PART IV - CALCULATED RISK AND CLIMATIC EVALUATION

a. Estimated Vegetative Recovery Period: 5 years.
b. Chance of Success Desired by Management: 80 percent.
c. Equivalent Design Recurrence Period: 10 years.
d. Related Design Storm Duration: 6 hours.
e. Related Design Storm Magnitude: 1.7 inches.
f. Related Design Flow: 12 cfsm.
g. Estimated Reduction in Infiltration: 80 % (where treatment recommended)
h. Adjusted Related Design Flow: 22 cfsm.

PART V - SUMMARY OF SURVEY AND ANALYSIS

a. Skills Represented on Burned Area Survey Team ("x" appropriate boxes):

[X] Hydrology	[X] Soils	[X] Geology	[X] Range
[ ] Timber	[X] Wildlife	[ ] Fire Mgmt.	[ ] Engineering
[ ] Contracting	[ ] Local Mgmt.	[ ] Research	[X] Plant Ecology

b. Describe Emergency: High intensity fire burned out much of the Sage Creek watershed, exposing soils to severe erosion with potentially severe effects on the road in the canyon, downstream county roads and property.

c. Emergency Rehabilitation Objective: Stabilize soils in order to maintain site productivity and reduce damage from sediment to downstream roads and other property, primarily hay meadows.

d. Probability to Complete Treatment Before 1st Major Damage-Producing Storm:

Land 80 %, Channel (N/A), Roads (N/A)

e. Net Environmental Quality Benefit Index:

[X] Significant [ ] Not Significant

f. Net Social Well Being Benefit Index:

[ ] Significant [X] Not Significant

g. Benefit/Cost Ratio: 0.91
h. Net Benefits: $ 24,520
i. Cost Effectiveness Index: [ ] I. [ ] II. [X] III. [ ] IV.

PART VI - ELIGIBLE EMERGENCY REHABILITATION MEASURES OR TREATMENTS AND SOURCE OF FUNDS

NOTE: Emergency rehabilitation is work done promptly following a wildfire and is not to solve watershed problems that existed prior to the wildfire.

			NFS Lands			Other Lands			All Lands
Line Items	Units	Unit Cost	No. of Units	NFFF-FW22 $	Other $ ident.	No. of Units	Federal$ ident.	Non-Fed. $ ident.	Total $
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
A. 1) Land									
a. Seeding	Acres	$25	1075	$26,900		100		$2,500	$29,400
b.									
c.									
d.									
e.									
A. 2) Channels									
a. Opening water courses	Miles								
b. Stabilizing streambanks	Miles								
c.									
d.									
e.									
B. ROADS AND TRAILS									
a.									
b.									
c.									
C. MAJOR STRUCTURES									
a. Preplanned - from Forest Plans									
D. TOTAL				$26,900	$		$	$2,500	$29.400

PART VII - APPROVALS

1. /S/ Richard H. Smith — December 3, 1990
   Forest Supervisor (Signature) — Date

2. /S/ Robert B. Hall for — 12/3/90
   Regional Forester (Signature) — Date

FS-2500-8

TURKEY FIRE
Burned Area Analysis Report

December 3, 1990

The Turkey fire was detected the evening of November 23, 1990 in the Sage Creek area of the Little Belt Mountains approximately 14 miles southwest of Stanford, Montana. Under extremely windy conditions, the fire burned rapidly through the heavily timbered Sage Creek and Woodhurst Mountain areas of the Forest and then out onto the plains to the east. Fanned by winds in excess of 70 miles per hour, the fire quickly spread from the Forest to adjacent Bureau of Land Management, State, and private lands igniting timber, sagebrush, and eventually range and agricultural lands. Approximately 31,000 acres of land are in the burned area within a perimeter of about 57 miles. Consummed in its path were ranch dwellings and buildings, fences, haystacks, cattle, sheep, wildlife, machinery, and winter pasture lands. Fortunately, no one was injured.

Rehabilitation of fire suppression damages was coordinated with mop-up. Where needed, catlines were treated to reduce erosion by installing waterbars and seeding. Firelines are being seeded with a mix of perennial grasses, spring wheat and clover at a rate of 15 pounds per acre. Steep sections of hand-built fireline were also waterbarred where needed.

A burned area emergency rehabilitation team of Forest personnel evaluated the need to implement immediate measures to protect resource values that were or might be affected as a result of the fire. Skills represented on the team include hydrology, geology, soils, wildlife, range, and plant ecology. District personnel supplied additional information on timber, noxious weeds, and archaeological resources. Soil Conservation Service personnel participated with the team in evaluating watershed rehabilitation needs and provided recommendations for watershed rehabilitation on burned private land, coordinated with the planning for the burned National Forest System land. An initial suppression rehabilitation plan was prepared and delivered to the Overhead Team on November 26, 1990. The plan was updated daily to reflect additional line constructed between November 25 and 28.

Affected Area

Burned areas on National Forest System land were primarily mixed Douglas-fir forest with small areas of grassland and rocky scree. The Forest Plan has allocated the area to Management Area B, emphasizing timber production and providing a moderate level of livestock forage. The area was also known to provide important seasonal habitat for elk and other wildlife. Slopes of the Sage Creek drainage, including the majority of Woodhurst Mountain, are permeable limestone with inclusions of hard igneous rock and dense limestone. Moisture percolates through the fractured limestone and surfaces as springs or moist areas when the impermeable formations are encountered. Soils on the upper elevations and the south exposures are shallow and rocky, supporting low volumes of timber. Lower slopes and moister aspects support somewhat better growing sites. Annual precipitation in the area averages 20 to 25 inches.

Sage Creek, the main drainage in the fire area, is mostly a dry gulch within the Little Belt Mountains (within the Forest boundary) and downstream a mile or two on the prairie on private land. This gulch does not have a well-defined channel within most of the National Forest and does not even carry water in

response to major precipitation or snowmelt events, though extreme events of the distant past have clearly shaped the bottom of the gulch, now obscured by trees and soil development. A small fishery of brook trout begins about two and a half miles downstream from the Forest boundary. The Sage Creek road is a main system road providing public access to the upper drainage.

Willow Creek is a major tributary of Sage Creek that rises on the north side of Woodhurst Mountain (the north side of the burned area) then flows northeast. Flows are greatly reduced in the highly permeable limestone within the National Forest. Willow Creek also supports a fishery of small brook trout about a mile or two outside (downstream from) the Forest boundary.

High intensity fire consumed tree canopies on approximately 75 percent of the area within the National Forest. The fire was patchy and underburned in about 20 percent of the area, but due to very dry conditions, mortality of trees and understory plants may be substantial in these areas as well. There were a few unburned areas within the fire perimeter. The grasslands, mostly located outside the Forest boundary will have minimal and short-term impacts from the fire. Due to high winds, the fire burned very quickly over grassland and other open areas, in most cases only charring the surface of organic duff layers protecting the soil. However, in some areas, all organic material was consumed.

Emergency Rehabilitation Purpose and Need

The objectives of emergency rehabilitation are to minimize (1) loss of soil and onsite productivity, (2) loss of water control and deterioration of water quality, and (3) threats to life and property onsite and offsite. Using these objectives, the rehabilitation team surveyed the burned area and made the following findings:

1. In the Sage Creek watershed, there is little risk of impacts to fisheries or water quality from sediment originating on National Forest land, due to the long distance and low channel gradients from the portion of the burned area (steep, severly burned timber) that is susceptible to erosion to any live streams. Water yield is expected to increase for many years, and peak flows will be higher, but total precipitation is low and the bedrock is highly permeable at lower elevations within the Sage Creek watershed. Both drought and fire have caused hydrophobic soils in about 75 percent of the burned area. Winter snows are expected to reduce the area of water repellant soils, but runoff and sediment yield will be much greater than prefire rates. The sediment will probably be deposited in alluvial fans and along the valley bottom, covering many acres of hay and range meadow along the drainage downstream from the Forest boundary.

2. Willow Creek has some risk of impacts to fisheries and water quality because there is a perennial streamflow adjacent to the burned area with a fishery only a short distance downstream. The first three miles of the main Willow Creek watershed were essentially not impacted by fire. Increases in water and sediment yield are expected to be negligible on the main channel to the west and north of Woodhurst Mountain. Tributary channels on the east slopes of Woodhurst Mountain were severely impacted by fire. Sediment and water yields are expected to greatly increase. Most sediment will be deposited along valley bottoms on private lands. During periods of heavy rainfall events and spring snowmelt, some sediment can be expected to reach the main Willow Creek channel and have a negative impact on fisheries.

3. The major threat to life and property after a fire is flooding. Sage Creek road is vulnerable to flood damage because it crosses the channel many times, and culverts are likely to become blocked by debris. County roads and property downstream from the Forest boundary along Sage Creek and Willow Creek are also more susceptible to damage from flooding and sediment deposition as result of the fire.

   The rehabilitation team considered several alternatives to protect the Sage Creek road. Felling of additional large woody debris into the channel could help reduce stream energy and trap sediment but could also contribute to additional channel scouring and damage to the road and downstream hay meadows. Existing large woody debris, particularly standing trees, can be left in place to provide a natural level of channel obstruction. Placement of straw bales in the channel bottom would trap finer sediments during low flows but would not be expected to remain effective if there is any flooding. Placement of logs in the valley bottom to act as water spreaders could dissipate stream energy and trap some sediment, but the team dismissed this option because of expense and lack of effectiveness in high flows. Slope treatments to reduce sediment delivery to the main channel could include such measures as log erosion barriers (LEBS), mulching, and seeding. The team concluded that LEBS or mulching would be far too costly to be justifiable, considering the resource values at stake. Seeding would not appreciably contribute to reduction in flood damage but would be useful in protecting soil productivity and in reducing impacts of sediment deposition by controlling erosion.

   Due to the very limited impacts of the fire on the main channel of Willow Creek west of Woodhurst Mountain, the rehabilitation team does not recommend any watershed treatments. Tributary channels on the east side of Woodhurst Mountain contain woody debris that will help to reduce the volume of sediment deposited on adjacent private lands. In-channel treatments to reduce flood damage are not justified. Seeding will help protect soil productivity by controlling erosion.

4. Large contiguous areas of high intensity fire on the slopes of Woodhurst Mountain and in upper Sage Creek will be susceptible to surface erosion, especially where soils are fine textured. Site productivity is poor in much of the general region, so maintenance of productivity on those sites that can grow timber is relatively important. The team discussed the option of aerial seeding grass to gain early control of soil erosion. Seeding would maintain site productivity for future timber growth and provide initial forage for wildlife. Only parts of the burn area are amenable to this treatment. South facing slopes have very harsh growing conditions, and in these areas grass would not be expected to establish unless the first growing season is extremely favorable. On very steep slopes, frost heaving and early spring surface erosion will tend to wash the seed off-site. A map was prepared showing those areas where grass seeding would be expected to establish and where current soil productivity appears to be high. The cost effectiveness index developed for this option shows that seeding is a marginally economical method of protecting site productivity only because of the lengthy period of time (about 130 years per timber rotation) necessary to recover the costs.

Other Considerations

Effects on unique resources

A known archaeological site adjacent to Sage Creek was unaffected by suppression efforts. During initial suppression a skidder and bulldozer were driven through the site but did no damage other than leave wheel and track impressions. An archaeological survey indicates that artifacts are covered by 15 centimenters of soil.

A small population of a rare plant, short-styled columbine (Aquilegia brevistyla) has been located on toeslopes and forest-meadow ecotones in the the Sage Creek drainage and tributaries. Portions of known habitat and many unsurveyed areas of potential habitat were burned over. This plant is currently on the Northern Region Watch list, and is ranked as Sensitive by the Montana Natural Heritage program. This plant may be adversely affected by competition from introduced plants; therefore known and potential habitat areas are excluded from any seeding proposals.

Noxious weeds

Spotted knapweed is known to exist in the burned area. Weed invasion will be controlled according to Forest noxious weed policy. Certified noxious weed-free seed will be used for reseeding.

Conflicts with timber salvage operations.

The team discussed potential conflicts between aerial seeding and the likelihood of timber salvage operations. If there were adequate conditions for seedling establishment before heavy snows, winter salvage would have little effect on the success of seeding. Given the late date of the fire, such conditions are not expected. Protection from soil erosion on salvage harvest units would be more efficient after harvest is completed, and such measures are needed mitigation for these sales.

Effects on Sage Creek allotment

Several structural range improvements on the Sage Creek Allotment were damaged or destroyed by the Turkey Fire. These improvements include about 1.5 miles of allotment boundary and pasture fences, two water developments and .2 mile of pipeline. The improvements effected will have to be repaired or replaced before permitted livestock grazing can be resumed. Use of the Sage Creek Allotment during the 1991 grazing season will have to be scheduled to provide for the protection of areas burned until regrowth is adequately established and important forage species have set seed.

Consistency with Forest Plan

Actions recommended by the rehabilitation team are guided by the Forest Plan. The burned area is allocated to Management Area B which emphizes timber management and provides a moderate level of livestock forage production and minimizes impacts to other resources. Within this management area, the primary watershed objective is to maintain soil productivity. Loss in productivity can be greatly reduced through erosion control, reseeding with certified weed-free seed, and control of noxious weeds. Maintaining soil productivity will help to meet timber, range, and wildlife managment objectives for the management area.

Impacts on Wildlife, Scenic, and Recreation values

Scenic and recreational values within the Sage Creek burned area will be reduced for many years. Reestablishment of grasses and shrubs in the first few years following the fire will reduce the visual impacts of the charred area. One of the primary recreational uses of the area is big game hunting. The loss of timber which provides hiding cover for elk and mule deer will result in a reduction in hunting opportunity in portions of the burned area due to a shift of animals to more secure habitat. However, the reestablishment of grass and forb vegetation either naturally or due to seeding in areas adjacent to undisturbed timber stands will provide important foraging areas for big game animals for a number of years in the future.

Health and safety

Sage Creek Road (No. 265) will require additional maintenance to protect public safety. Because of the potential for flooding, culverts will need to be checked and cleared of debris to prevent plugging. In the event of a major rainfall event or rapid snowmelt, there is a high probability that the lower portion of the Sage Creek road will be washed-out or severely eroded: road reconstruction or major maintenance will likely be required to keep the road open. Removal of the soil vegetation cover adjacent to the road will result in rockfall and sediment deposition on the road surface that will have to be removed to maintain a safe running surface width. Standing dead timber adjacent to the roadway has the potential to fall across the roadway blocking access or falling on vehicles. Periodic patrol of the road to remove downed trees will be required. Road closure to protect the public may be necessary unless dead trees that could fall on the road are removed.

Recommendations

1. Seed 1075 acres by helicopter with the following mixture:

Winter Wheat (Norstar or Winalta)	5.0 lbs./Ac.
Annual Ryegrass	1.0 lbs./Ac.
Orchardgrass (Piaute or Potomac)	1.5 lbs./Ac.
Slender Wheatgrass (Pryor or Revenue)	4.0 lbs./Ac.
White Dutch Clover	0.5 lbs./Ac.
Total	12.0 lbs./Ac.

Seeding is best done now before snow depths are too great, to allow germination and seedling establishment at the first opportunity in the spring. Seeding can be done in the spring before all snow is gone if weather prevents seeding before then. Seedling establishment would be helpful for late spring storms and would be effective for protection from summer thunderstorms. Seedling establishment would not occur before potentially damage-producing storms in May or early June.

2. Cooperate with the Soil Conservation Service and the adjacent landowner to achieve similar seeding on approximately 100 acres of adjacent similar severely-burned forested private land on the northeast side of Woodhurst Mountain. Seed mixture may differ somewhat depending on the desires of the landowner.

3. Monitor the effects of burned-area erosion and flows on the Sage Creek road to provide for public safety. Retain standing trees, dead and live, in the bottom of the gulch to help stabilize the channel when flow occurs.

4. Repair range improvements in the Sage Creek Allotment before livestock are turned in. Adjust grazing schedule as necessary to allow for the natural reestablishment of vegetation and the protection of important forage species.