Black Hills
Flint Hill
1985

United States Department of Agriculture | Forest Service | Rocky Mountain Region | 11177 W. 8th Avenue Box 25127 Lakewood, CO 80225

Date: July 25, 1985

Reply to: 2520 Watershed Protection and Management

Subject: Burned Area Report, Flint Hill Fire

To: Chief

A copy of the Burned Area Report for the Flint Hill Fire is enclosed.

THOMAS E. ELSON

for CHARLES J. HENDRICKS
Director, Watershed, Soils, and
Mineral Area Management

Enclosure

GJN:ls

BN 7/98) Note: Range/WL reply to this proposal said "seed mix of 19# too much. Charge to 10# + 12#/acre"
R? Winterstein

USDA–Forest Service

BURNED AREA REPORT

(Reference FSH 2509.13, Report FS-2500-A)

Date of Report: July 22, 1985

PART I – TYPE OF REQUEST

1. Type of Report

A. [X] Funding (Request for estimated FFF funds) B. [ ] Accomplishment Report

2. Type of Action

A. [X] 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

1. Fire Name (From Form FS-5100-29)	2. Forest Supervisor's Fire No. (From FS-5100-29)	3. State	4. County
Flint Hill	138	SD	Fall River

5. Region	6. Forest	7. Ranger District	8. Date Fire Started	9. Date Fire Controlled	10. Estimated Suppression $
02	Black Hills	Custer	7/11/85	7/19/85	$1,500,000

11. Fire Suppression Damage Repaired with FFF 10% Funds

a. 40 miles (fireline waterbarred) b. 150 acres (firelines seeded) c. Other (Identify) _____

12. Fire Intensity

a. 15 % (low) b. 25 % (medium) c. 20 % (high)

PART III – NATIONAL FOREST SYSTEM PROBLEM INVENTORY

1. Watershed No.	2. NFS Acres Burned	3. Water Repellent Soil
10170106O3	9720	15 % of NFS acres burned

4. Vegetation Types	5. Geologic Types
Ponderosa Pine/Rocky Mtn. Juniper – Little Bluestem and Little Bluestem/Western Wheatgrass	Interbedded sandstone, shale and limestone

6. Soil Erosion Hazard Rating

a. 30 % (low) b. 10 % (medium) c. 60 % (high)

7. Erosion Potential: 21,995 cu. yds/sq. miles

8. Miles of Stream Channel by Regional Order or Class: 1st order = 44.5mi, 2nd order = 15.5mi, 3rd order = 12.0mi, 4th order = 7.2mi. All channels within the burn area are intermittent. All drain into the Cheyenne River which is a value class III fisheries.

9. Miles of Forest Service Trails: 0

10. Miles of Forest Service Roads by Maintenance Level

a. – miles (Level I) b. 22 miles (Level II) c. – miles (Levels III, IV, V)

PART IV – CALCULATED RISK AND CLIMATIC EVALUATION

1. Estimated Vegetative Recovery Period (Years)	2. Chance of Success Desired by Management (Percent)
5	50
3. Equivalent Design Recurrence Period (Years)	**4. Related Design Storm Duration (Hours)**
10	30 minute
5. Related Design Storm Magnitude (Inches)	**6. Related Design Flow (cfsm)**
1.4	140
7. Estimated Reduction in Infiltration (Percent)	**8. Adjusted Related Design Flow (cfsm)**
10%	155

Previous edition of this form is obsolete. FS-2500-9 (11/82)

(OVER)

USDA- Forest Service

EXAMINING IMPACTS OF MANAGEMENT ALTERNATIVES FOR AN EMERGENCY PROGRAM

(Reference FSH 2509.13)

Name: FLINT HILL FIRE

Date of Report: 22 July 85

A. ENVIRONMENTAL QUALITY BENEFIT INDEX

Environmental Factor (a)	Weight Factor (b)	Without Treatment		With Treatment		Difference	
		Actual (c)	Weighted (d)	Actual (e)	Weighted (f)	Actual (g)	Weighted (h)
. Erosion and sediment	9	2	18	1	9	1	9
. Aesthetic land quality	3	1	3	1	3	0	0
. Water quality	3	2	6	1	3	1	3
. Site productivity	7	2	14	0	0	2	14
. Wildlife habitat	6	1	6	0	0	1	6
. Fish habitat	1	0	0	0	0	0	0
. Other Range	7	0	0	0	0	0	0
. TOTAL	36		47		15		32
. Average weighted index			1.31		.42		.89
. Net environmental quality benefit index							.89

B. SOCIAL WELL-BEING BENEFIT INDEX

Social Criteria (a)	Weight Factor (b)	Without Treatment		With Treatment		Difference	
		Actual (c)	Weighted (d)	Actual (e)	Weighted (f)	Actual (g)	Weighted (h)
. Life, health, safety	3	1	3	0	0	1	3
. Employment	1	0	0	0	0	0	0
. Recreational opportunity	1	1	1	0	0	1	1
. Economic stability	1	0	0	0	0	0	0
. Income distribution	1	0	0	0	0	0	0
. Preserve special sites	5	0	0	0	0	0	0
. Other							
. TOTAL	12		4		0		4
. Average weighted index			.33		0		.33
. Net social well-being benefit index							.33

C. REMARKS

PART V – SUMMARY OF SURVEY AND ANALYSIS

Skills Represented on Burned Area Survey Team (X appropriate boxes)

a. ☒ Hydrology b. ☒ Soils c. ☐ Geology d. ☒ Range e. ☐ Timber f. ☒ Wildlife
g. ☐ Fire Mgmt. h. ☒ Engineering i. ☐ Contracting j. ☒ Local Mgmt. k. ☐ Research l. ☒ Other (Culture) (Identify)

Describe Emergency Severe erosion potential on 1300 acres of very steep slopes. Protection of channels draining into Cheyenne River and Angostora Reservoir. Protection of livestock watering reservoirs.

Emergency Rehabilitation Objectives
Maintain soil productivity by meeting soil loss tolerance limits within 4 yrs. Maintain vegetative productivity on all slope classes. Maintain water quality to state water quality standards.

Probability of Completing Treatment Prior to First Major Damage Producing Storm

a. 20 % (land) b. 20 % (channel) c. 20 % (roads) d. ____ % (other) ____ (Identify)

5. Net Environmental Quality Benefit Index
a. ☒ Significant b. ☐ Not Significant

6. Net Social Well Being Benefit Index
a. ☐ Significant b. ☒ Not Significant

7. Benefit/Cost Ratio	8. Net Benefits	9. Cost Effectiveness Index
2.68:1	$323,855 NFS Lands only	a. ☐ I b. ☒ II c. ☐ III d. ☐ IV

PART VI – ELIGIBLE EMERGENCY REHABILITATION MEASURES OR TREATMENTS & SOURCE OF FUNDS

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

Line Items	Units	Unit Cost	NFS Lands: No. of Units	NFS Lands: FFF 092 $	NFS Lands: Other $ (Identify)	Other Lands: No. of Units	Other Lands: Federal $ (Identify)	Other Lands: Non-Federal $ (Identify)	All Lands: Total $
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
a. Seeding	Acres	~~5~~ 90	1340	~~62,600~~ $121,000					~~62,600~~ $121,000
b. Seeding		90				900		81,000	81,000
c.									
d.									
e.									
a. Opening water courses	Miles								
b. Stabilizing Streambanks	Miles								
c.									
d.									
e.									
f.									
g.									
h.									
i.									
j.									
MAJOR STRUCTURES									
a. Preplanned – from Forest Plans				62,680					150,680
TOTAL			1340	~~121,000~~		900		81,000	~~202,000~~

PART VII – APPROVALS

1. Forest Supervisor (Signature)	2. Date	3. Regional Forester (Signature)	4. Date
T. L. O. Eaton	7/23/85	S. H. Hanks	1/25/85

GPO 893-836

USDA Forest Service

ON-SITE AND OFF-SITE DEVELOPMENTS SUBJECT TO HAZARDS[1]

(Reference FSH 2509.13)

Fire Name: Flint Hill

Date of Report: July 22, 1985

Line Items (a)	Type of Units (b)	Number of Units (c)	Estimated Value $ (d)
1. Community and urban development	People	0	0
2. Municipal and domestic water supply	People Served	0	0
3. Transportation systems	Miles	1	$10,000
4. Water distribution systems (irrigation)	Miles	1	5,000
5. Agricultural development (crops, livestock)	Acres	0	0
6. Industrial development (dams, power, manufacturing)	Number	0	0
7. Power and communication lines	Miles	0	0
8. Recreation development	PAOT	0	0
9. Fish habitat	Miles	0	0
10. Other (specify)			
11. Total Hazard Potential[2]			15,000

12. Narrative (Optional - If additional space is needed, attach another sheet.)

Sediments that could enter the Cheyenne River should have an insignificant effect on either the sediment carrying capacity of the river or the fisheries within the river. Irrigation withdrawls that are located above the area of the fire reduces flows within the river to near zero in most years.

[1] Hazards from floods, flooding debris, erosion, or sediment because a watershed is impaired by wildfire. (Do not include value of resources damaged or destroyed by the fire reported on FS-5100-29.)

[2] Indicates value threatened by design item. Does not enter into the B/C.

FS-7500-9b(11/82)

D. EXPECTED DAMAGE REDUCTION BENEFIT SUMMARY

At current Water Resources Council interest rate 6.125 percent

Economic Benefit Indices (a)	Units of Measure (b)	Damage Expected				Expected $ Damage Reduction (g)
		Without Treatment		With Treatment		
		No. of Units (c)	Present Value ($) (d)	No. of Units (e)	Present Value ($) (f)	
Isolated Impacts Sediments						
Downstream water storage						
Sediment removal	Cubic Yds	10,500	105,000	5,150	51,500	53,500
Fish habitat						
Water quality						
Flood Water						
Land						
Water improvements						
Subtotal, Watershed						
Resource Related Impacts						
Range	AUM [1.]	315	4500	210	2441	2041
Wildlife and recreation	RVD [2.]	625	17431	375	8820	7555
Timber						
Subtotal, Resource Related						
Other Impacts						
Soil Fertility	TONS	126,000	756,000	61,800	370800	385,200
Subtotal, Other						
TOTAL DOLLARS			882,931		433,561	448,296

E. REMARKS

No change in Timber expected with or without treatment

1. RPA value per aum used, damages calculated as a 5 year basis, range recovers at a rate of 20 percent per year.
2. RPA Value for RVD's used, damage calculated over a 5 year basis.

FLINT HILL FIRE
Black Hills National Forest

The Flint Hill Fire is located in Sections 28, 29, 30, 31, 32, 33 and 34, T7S, R4E; Sections 3, 4, 5, 6, 7, 8, 9, 10, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36 T6S, R4E; Sections 1, 12, 13, 24, 25 and 26, T6S, R3E and Sections 3, 4, 5 and 6 T7S, R4E. See attached map which shows exterior boundaries of the fire. The southern perimeter is the Cheyenne River. The fire was lightning caused.

The area is characterized by flat open ridgetops which drop abruptly into very steep canyons. The canyon sideslopes range from 35-80% slopes. The northern and eastern aspects have relatively thick stands of ponderosa pine. The southern and western aspects have very sparse stands of ponderosa pine with an understory of little bluestem, sideoats grama, blue grama, prairie junegrass, sedges, western wheatgrass, Rocky Mountain juniper and some shrubs. The flat ridges are rangeland with scattered ponderosa pine. Rangeland species include little bluestem, sideoats and blue grama, junegrass, sedges and western wheatgrass.

Nine cultural sites are within the boundaries of the fire. Six of the sites are on private land; three are on NFS Lands. The sites are on the open ridges. The fire intensity on the ridges was low and damage was negligible.

The acreage breakdown by ownership is 9720 acres of NFS lands, 12,280 acres of private land and 160 acres of South Dakota state lands.

The fire burned severely on the very steep northern and eastern timbered slopes. Approximately 1300 acres of NFS lands on these slopes were severely burned with few or no needles left on the burned trees. The litter, duff and understory vegetation was burned leaving bare soil and charred litter which turns to ash when compacted. This ashy material will soon be washed or blown away resulting in virtually no ground cover. The very steep slopes will have a severe erosion potential with no or very little ground cover. About 40 acres of bottomland in Wildcat Canyon burned severely.

The proposed rehabilitation plan includes seeding 1300 acres of NFS land on very steep north and east aspects and 40 acres of bottomland. The very steep slopes have little or no effective ground cover to reduce soil erosion. The 40 acres of bottomland should be seeded to reduce channel scouring and sedimentation.

The recommended seeding mixture for the very steep slopes follows:

little bluestem	6 lbs/acre	3#/Ac
sideoats grama	3 lbs/acre	2#/Ac
western wheatgrass	4 lbs/acre	3#/Ac

USDA - Forest Service

SUMMARY OF EMERGENCY REHABILITATION NEEDS BY LANDOWNERSHIP

(Reference FSH 2509.13)

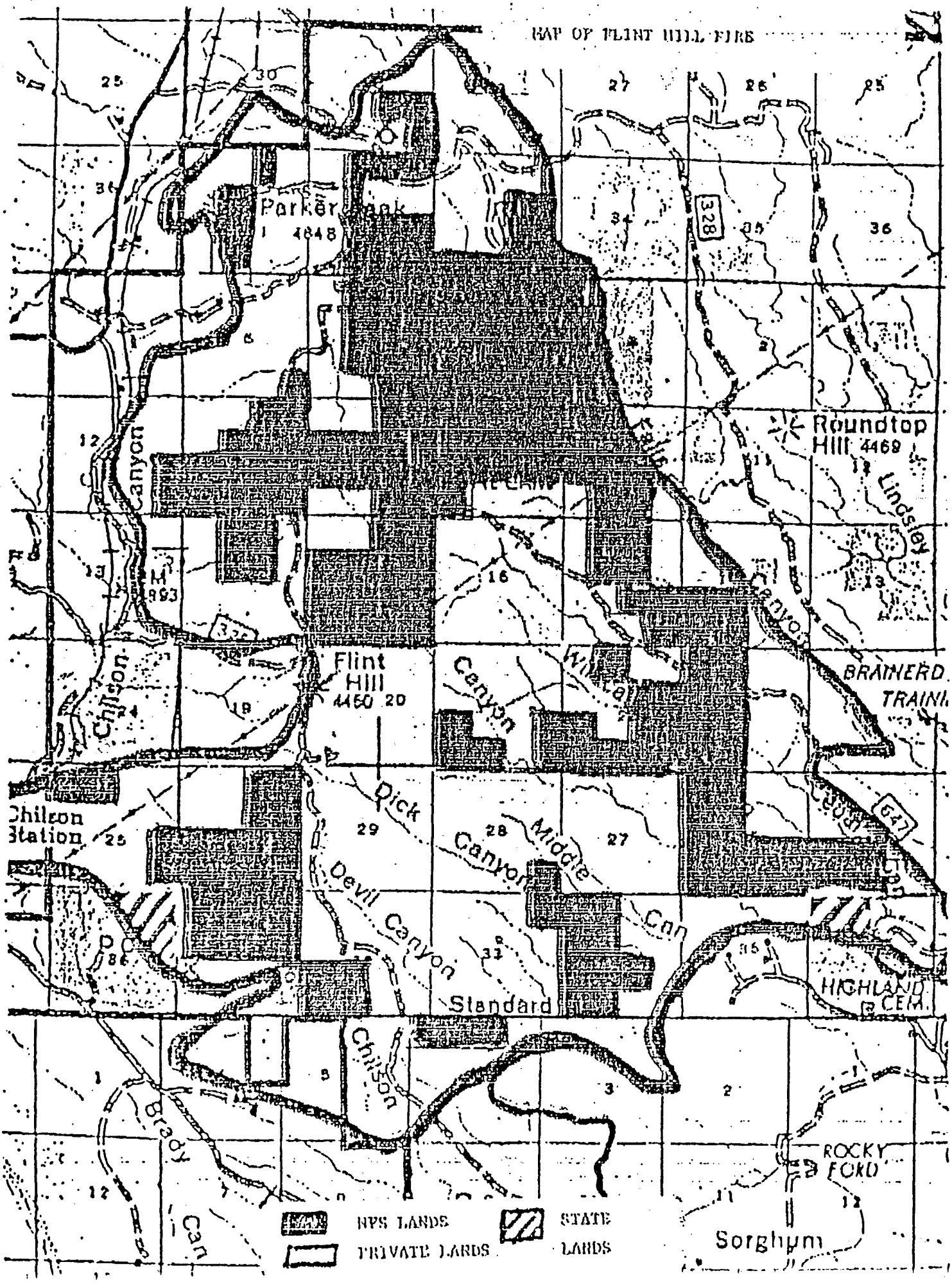
Fire Name: Flint Hill

Date of Report: July 22, 1985

Landownership	A. Acres Burned	B. Emergency Rehabilitation Needs (1) Land (acres)	(2) Channel (miles)	(3) Road & Trail (miles)	(4) Other	C. Source of Emergency Rehabilitation Funds for Needed Work ($) 1. FFF (a) 092	(b) 102	2. Emergency Flood Prevention	3. FR & T	4. Other Federal (Enter Total)	5. Non-Federal (Enter Total)	6. Total
Federal (NFS)	9720	1340				69,680 ~~121,000~~						69,680 ~~121,000~~
Other (specify												
Subtotal (NFS)												
Non-Federal (State & County)	160	-0-										
Indian reservation												
Private	12,280	900				-					81,000	81,000
Subtotal (Non-Federal)												
TOTAL	22,160	2240				69,680 ~~121,000~~	-				81,000	150,680 ~~202,000~~

D. Remarks:

FFF 092 funds requested are for seeding 1300 acres of steep slopes and 40 acres of bottomlands where fire destroyed the timber canopy and vegetative ground cover. Costs are for reseeding the burned areas from the air with native grass species.


MAP OF FLINT HILL FIRE
Parker Bank
4848
Roundtop
Hill 4469
Lindsley
Canyon
Flint
Hill
4450
Chilson
Canyon
Dick
Devil Canyon
Middle
Canyon
Standard
Chilson
Station
BRAINERD
TRAINI
HIGHLAND
CEM.
ROCKY
FORD
Sorghum
Brady
Can
328
647
NPS LANDS
PRIVATE LANDS
STATE
LANDS

blue grama	2 lbs/acre	1 #/Ac
yellow sweetclover	2 lbs/acre	2 #/Ac
		Total 11 #/Ac

The recommended seeding mixture for the bottomland is:

big bluestem	3 lbs/acre	2# Ac
western wheatgrass	8 lbs/acre	5# Ac
green needlegrass	3 lbs/acre	2# Ac
sideoats grama	2 lbs/acre	1# Ac
yellow sweet clover	2 lbs/acre	2 #/Ac
		12#Ac

There is about 900 acres of severely burned private land within the fire boundary. This severely burned land is mainly on northern and eastern aspects.

MESSAGE SCAN

TO P.LEGER:W01B CC G.NAGY

From: WS&MAM
Postmark: Jul 24,85 4:12 PM
Status: Certified Previously read
Subject: FLINT HILL BURNED AREA REPORT

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

USDA-FOREST SERVICE

Date of Report: July 22, 1985

BURNED AREA REPORT
(REFERENCE FSH 2509.13, REPORT FS-2500-A)

PART I - TYPE OF REQUEST

1. Type of Report

[X] A. Funding (Request for estimated FFF funds)
[ ] B. Accomplishment Report

2. Type of Action

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

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

[ ] C. Final

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

PART II - FIRE LOCATION

1. Fire Name (from Form FS-5100-29): Flint Hill
2. Forest Supervisor's Fire No. (from Form FS-5100-29): 138
3. State: SD
4. County: Fall River
5. Region: 02
6. Forest: Black Hills
7. Ranger District: Custer
8. Date Fire Started: 7/11/85
9. Date Fire Controlled: 7/19/85
10. Estimated Suppression Costs: $1,500,000
11. Fire Suppression Damages Repaired with FFF 102 Funds:

40 miles (firelines waterbarred)
150 acres (firelines seeded)
- Other (identify)

12. Fire Intensity: 55 % (low) 25 % (medium) 20 % (high)

PART III - NATIONAL FOREST SYSTEM PROBLEM INVENTORY

1. Watershed No.: 1012010603
2. NFS Acres Burned: 9720
3. Water Repellant Soil: 15 % of NFS acres burned

4. Vegetation Types: Ponderosa Pine/Rocky Mtn. Juniper-Little Bluestem and Little Bluestem/Western Wheatgrass
5. Geologic Types: Interbedded sandstone, shale and limestone.
6. Soil Erosion Hazard Rating:

   30 % (low) 10 % (medium) 60 % (high)

7. Erosion Potential: 21,995 cu. yds/sq. miles
8. Miles of Stream Channels by regional Order or Classes: All channels within the burn area are intermittent. All drain into the Cheyenne River which is a value class III fisheries.
   1st order = 44.5 mi.
   2nd order = 15.5 mi.
   3rd order = 12.0 mi.
   4th order = 2.2 mi.
9. Miles of Forest Service Trails: 0
10. Miles of Forest Service roads by Maintenance Levels:

    - miles (Level I) 22 miles (Level II)
    - miles (Level III, IV, V)

PART IV - CALCULATED RISK AND CLIMATIC EVALUATION

1. Estimated Vegetative Recovery Period: 5 years.
2. Chance of Success Desired by Management: 50 percent.
3. Equivalent Design Recurrence Period: 10 years.
4. Related Design Storm Duration: 30 minutes.
5. Related Design Storm Magnitude: 1.4 inches.
6. Related Design Flow 140 cfsm.
7. Estimated Reduction in Infiltration: 10 percent.
8. Adjusted Related Design Flow: 155 cfsm.

PART V - SUMMARY OF SURVEY AND ANALYSIS

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

[X] Hydrology	[X] Soils	[ ] Geology	[X] Range
[ ] Timber	[X] Wildlife	[X] Fire Mgmt.	[X] Engineering
[ ] Contracting	[X] Local Mgmt.	[ ] Research	[X] Other (identify)cultural

2. Describe Emergency: Severe erosion potential on 1300 acres of very steep slopes. Protection of channels draining into Cheyenne River and Angostura Reservoir. Protection of livestock watering reservoirs.
3. Emergency Rehabilitation Objective: Maintain soil productivity by meeting soil loss tolerance limits within 4 yrs. Maintain vegetative productivity on all slope classes. Maintain water quality to state water quality standards.
4. Probability of Completing Treatment Prior to First Major Damage Producing Storm:

   Land 20 % Channel 20 % Roads 20 % Other - %

5. Net Environmental Quality Benefit Index:

   [X] Significant [ ] Not Significant

6. Net Social Well Being Benefit Index:

   [ ] Significant [X] Not Significant

7. Benefit/Cost Ratio: 2.68:1
8. Net Benefits: $323,855 (NFS Land only)
9. Cost Effectiveness Index: [ ] I. [X] II. [ ] 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	FFF 092 $	Other $ Ident	No. of Units	Federal $ Ident.	Non-Federal $ identify	Total $
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
A. LAND									
a. Seeding	Acres	52	1340	69,680					69,680
b. Seeding		90				900		81,000	81,000
c.									
d.									
e.									
B. CHANNELS									
a. Opening water courses	Miles								
b. Stabilizing streambanks	Miles								
c.									
d.									
e.									
C. ROADS AND TRAILS									
a.									
b.									
c.									
D. MAJOR STRUCTURES									
a. Preplanned-from Forest Plans									
E. TOTAL			1340	$69,680	$	900	$	$81,000	$150,680

PART VII - APPROVALS

/S/ Richard D. Estes
Forest Supervisor (Signature)

7/22/85
Date

/S/

Regional Forester (Signature)

Date