

United States  
Department of  
Agriculture

Forest  
Service

Rocky  
Mountain  
Region

11177 W. 8th Avenue  
Box 25127  
Lakewood, CO 80225-0127

Black Hills  
Horse Creek  
1991

Reply to: 2520

Date: April 16, 1990

Subject: Horse Creek Emergency Burn Rehabilitation Request

To: Forest Supervisor, Black Hills National Forest

I have reviewed your request for Emergency Burn Rehabilitation funds for the Horse Creek incident. Your request is approved in the amount of \$18,750 for seeding, additional road maintenance needs, and ID Team cost.

Emergency Burn Funds have strict requirements as defined in FSH 2509.13. Please use code FFFS-FW22 when expending these funds. A final accomplishment report is required on Form FS-2500-8 thirty (30) days after completing rehabilitation measures.

GARY E. CARGILL  
Regional Forester

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MSA  
O&F Van Seyoc  
S.Libby:R02F03A

JF:mp



United States  
Department of  
Agriculture

Forest  
Service

Black Hills  
National  
Forest

Highway 385 North  
RR 2, Box 200  
Custer, SD 57730

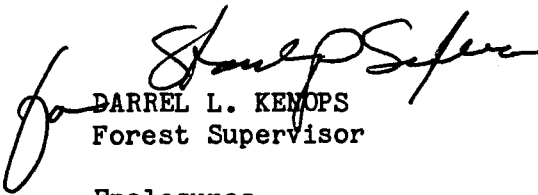
Reply to: 2520

Date: April, 11, 1991

Subject: Horse Creek Fire Burned Area Survey Report

To: Regional Forester, R-2

Attached is the Burned Area Survey Report and request for emergency  
rehabilitation funds for the Horse Creek Fire.

  
DARREL L. KENOPS  
Forest Supervisor

Enclosures

cc: J. Freeouf, R.O.- WSMAM

JM: jm



Caring for the Land and Serving People

HORSE CREEK FIRE  
BLACK HILLS NATIONAL FOREST

I. LOCATION OF FIRE (see attached map)

The fire was located in:

T1N, R5E: Sections 20, 21, 22, 23, 26, 27, 28, 34 & 35

II. CAUSE OF FIRE

The fire started on Friday April 5, 1991 when unexpected strong winds rekindled the Horse Creek prescribed burn. The prescribed burn had been safely completed the day before with crews spending the night on the fire.

III. DESCRIPTION OF AREA

The area is characterized by moderately sloping to very steep timbered sideslopes, interspersed with grassy meadows, small aspen stands, and rock outcrops. Dissection is strong. Precambrian slate and schist are the dominant geologic features. Dominant soils are Virkula and Pactola. Ponderosa pine is the dominant timber type. Typical understory species include big and little bluestem, pin cherry, chokecherry, and kinnikinnick.

The fire area is designated as Management Areas 2B, 5B and 6B in the Black Hills Forest Plan. 2B management emphasis is on roaded-natural recreation opportunities; 5B management emphasis is on wildlife winter range in forested areas; and 6B management emphasis is on livestock grazing on mountain and prairie grasslands.

IV. SIZE OF BURNED AREA

The fire burned a total of 1355 acres, approximately 1155 acres of National Forest System lands and 200 acres of private lands.

V. EXTENT OF RESOURCE DAMAGE

High intensity burns (area completely blackened, with all foliage removed from the trees) occurred on approximately 570 acres of National Forest System lands. Most of the high intensity burns occurred near the drainage heads including the hilltops and connecting ridgelines. On the remaining National Forest System lands, 140 acres received moderate intensity burns (understory burned, and some discoloration and loss of overstory foliage), and approximately 445 acres received low intensity burns (only understory vegetation burned). The private land received low intensity burns.

No structures were lost in the fire. Structural engines and "back burning" were used to protect homes and buildings in the area. There were about 140 private homes in the vicinity of the fire. The fire burned past 7 structures but all of them were saved.

Several miles of highway R-O-W fence, private land fence, and range allotment pasture fences were burned or damaged and will require repair or replacement.

## VI. AFFECTED RESOURCES

The area has undergone changes affecting many other resources. Visual quality and esthetics are a major concern, especially along heavily travelled US Highway 385. Over 1.2 million people travel US 385 on an annual basis. Scenic quality and tourism may be impacted for several years to come.

The burned area is visible from two major recreation complexes, Pactola Reservoir located two miles to the north and Sheridan Lake located 3 miles to the south. Developments at these areas include campgrounds, picnic areas, boat launches, marinas and swimming beaches. About 50,000 people visit the Pactola Visitor Center at Pactola Reservoir during the summer months.

The area supports a small band of elk, several hundred head of deer and wild turkey. There will be few, if any, adverse effects on these species in the short-term. Due to the time of the year when the fire occurred, green-up is expected to be rapid and result in improved forage conditions within meadows and grassland areas. Long-term management of this area will have to address the availability and distribution of cover to insure that this improved forage base can be used effectively by elk and deer.

The short term loss of ground cover will reduce nesting habitat availability for wild turkey, sharp-tailed grouse and other early season ground nesting birds during the current year. Natural regeneration and rehabilitation efforts will offset this loss within a few growing seasons. The loss of ground cover also makes this area vulnerable to infestation by noxious weeds, especially Canada Thistle. Within the Black Hills, Canada Thistle is an aggressive invader that readily colonizes areas of bare or exposed soil. Control measures taken after Canada Thistle becomes established are expensive and show little effect beyond controlling the rate of spread. Eradication on a particular site is seldom achieved. Aggressive management to restore desirable vegetation on disturbed sites is showing promise at reducing the number of new Canada Thistle infestations.

Potential soil loss from erosion will affect the area's ability to regenerate and eventually produce timber again. The area is characterized by relatively thin soils, making any soil loss a potentially severe problem. Runoff from the southern half of the fire area contributes flow to Horse Creek, a tributary to Sheridan Lake which is a high value fishing lake. The South Dakota Department of Water and Natural Resources has expressed interest in dredging Sheridan Lake to improve boating opportunities and lengthen the life of the lake. Increased sedimentation via Horse Creek will have a negative impact on Sheridan Lake.

## VII. REHABILITATION STRATEGY

The proposed rehabilitation strategy includes seeding 570 acres of National Forest System lands that received high intensity burns. The steep to very steep sideslopes have little or no effective ground cover remaining to reduce or prevent soil erosion. The high intensity burned areas have no needles left on the blackened pines, consequently there will be no needle cast to provide ground cover.

The proposed rehabilitation seeding mixture is presented below.

Annual Ryegrass	5 pounds/acre (PLS)
Slender Wheatgrass	5 pounds/acre (PLS)
Timothy	3 pounds/acre (PLS)
Alsike Clover	<u>3 pounds/acre</u> (PLS)
Total	16 pounds/acre (PLS)

Aerial seeding with a helicopter is planned and included in the seeding costs presented in the report.

In addition to the soil, water and fishery protection efforts described above, the Rehabilitation Plan includes funding for additional road maintenance on 5.7 miles of system roads. It is expected that sediment from burned areas will increase road maintenance needs and frequencies, and that some culverts will need to be replaced.

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

## PART I - TYPE OF REQUEST

1. Type of Report  
A. ☒ Funding (Request for estimated FFF funds) B. ☐ Accomplishment Report
2. Type of Action  
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

1. Fire Name (From Form FS-5100-29) | 2. Forest Supervisor's Fire No. | 3. State | 4. County  
    | (From FS-5100-29) | | |  
Horse Creek | SD-BKF-006 | S.D. | Pennington
5. Region | 6. Forest | 7. Ranger District | 8. Date Fire | 9. Date Fire | 10. Estimated Suppression  
    | | | Started | Controlled | |  
02 | Black Hills | Pactola | 4/5/91 | 4/8/91 | \$ 800,000+
11. Fire Suppression Damages Repaired with FFF 102 Funds  
    a. 8 miles (firelines waterbarred) b. 15 acres (firelines seeded) c. Other (identify)  
    10 acre fire camp  
    Handline on Private land
12. Fire Intensity  
    a. 50 % (low) b. 10 % (medium) c. 40 % (high)

## PART III - NATIONAL FOREST SYSTEM PROBLEM INVENTORY

1. Watershed No. | 2. NFS Acres Burned | 3. Water Repellant Soil  
10120109 | 1155 | 40 % of NFS acres burned
4. Vegetation Types | 5. Geologic Types  
Ponderosa Pine/Bluestem/Chokecherry | Precambrian Slate and Schist  
Aspen, & Bluegrass Meadows
6. Soil Erosion Hazard Rating # | 7. Erosion Potential #  
a. 20 % (low) b. 40 % (medium) c. 40 % (high) | 22,703 cu.yds/sq.miles
8. Miles of Forest Stream Channels By Regional Order or Classes | 9. Miles of Forest Service  
1st Order - 3.3 miles | Trails  
0
10. Miles of Forest Service Roads By Maintenance Levels #  
a. 0 miles (Level I) b. 5.7 miles (Level II) c. 0 miles (Level III, IV, V)

## PART IV - CALCULATED RISK AND CLIMATIC EVALUATION

1. Estimated Design Recurrence Period (Years) | 2. Chance to Success Desired By Management (Percent)  
5 years | 85%
3. Equivalent Design Recurrence Period (Years) | 4. Related Design Storm Duration (Hours)  
33 years | 30 minutes
5. Related Design Storm Magnitude (Inches) | 6. Related Design Flow (cfs)  
1.75 inches | 150 cfs
7. Estimated Reduction In Infiltration (Percent) | 8. Adjusted Related Design Flow (cfs)  
15% | 175 cfs

**PART V - SUMMARY OF SURVEY AND ANALYSIS**

1. 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. ☐ Eng.    i. ☐ Contr.    j. ☒ Local Mgmt.    k. ☐ Research    l. ☐ Other  
m. ☒ Recreation

(identify)

2. Describe Emergency: High erosion potential on 570 acres of NFS lands.

3. Emergency Rehabilitation Object: Maintain soil productivity by meeting soil loss tolerance limits of Forest Plan. Reduce sedimentation potential into Sheridan Lake.

4. Probability of Completing Treatment Prior to First Major Damage Producing Storm

a. 60 % (land)    b. 60 % (channel)    c. 60 % (roads)    d. \_\_\_\_\_ % (other)

(identify)

5. Net Environmental Quality Benefit Index

6. Net Social Well Being Benefit Index

a. ☒ Significant    b. ☐ Not Significant

a. ☐ Significant    b. ☒ Not Significant

7. Benefit/Cost Ratio

8. Net Benefits

9. Cost Effectiveness Index

2.5:1

\$ 28,811

a. ☐ I    b. ☒ II    c. ☐ III    d. ☐ IV

**PART VI - ELIGIBLE EMERGENCY REHABILITATION MEASURES OR TREATMENTS & 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.

Line Items	NFS LANDS					OTHER LANDS			ALL LANDS
	Units	Unit	No. of	FFF 092	Other \$	No. of	Federal \$	Non-Federal	Total
		Cost	Units			Units		State & Pvt	\$
					Identify		Identify	Identify	
(1) A. LAND	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
a. Seeding	Acres	\$25	570	\$14,250					\$14,250
b. Seeding pvt land	Acres								
c.									
d.									
e.									
(1) B. CHANNELS									
a. Opening water courses	Miles								
b. Stabilizing Streambanks	Miles								
c. Sediment fence	Struct								
d. Sediment barrier	Struct								
e. Tree Felling	Acres								
(1) C ROADS & TRAILS									
a. Maintain drainage				\$ 2,300					\$ 2,300
b.									
c.									
d.									
e. ID Team costs				\$ 2,200					\$ 2,200
D. MAJOR STRUCTURES									
a. Preplanned - from Forest Plans									
E. TOTAL				\$ 18,750					\$ 18,750

**PART VII - APPROVALS**

1. FOREST SUPERVISOR (Signature)

2. DATE

3. REGIONAL FORESTER (Signature)

KS/ Darrel L. Kenops

4/11/91

Stan Sylva (for)

**EXAMINING IMPACTS OF MANAGEMENT ALTERNATIVES FOR AN  
EMERGENCY PROGRAM**

(Reference FSH 2509.13)

Fire Name	Date of Report
Horse Creek	April 11, 1991

**A. ENVIRONMENTAL QUALITY BENEFIT INDEX**

Environmental Factor (a)	Weight	Without Treatment		With Treatment		Difference	
	Factor (b)	Actual (c)	Weighted (d)	Actual (e)	Weighted (f)	Actual (g)	Weighted (h)
1. Erosion and sediment *	10	2	20	0	0	2	20
2. Aesthetic land quality *	8	1	8	1	8	0	0
3. Water quality *	4	1	4	1	4	0	0
4. Site productivity *	5	1	5	0	0	1	5
5. Wildlife habitat *	9	2	18	0	0	2	18
6. Fish habitat *	3	0	0	0	0	0	0
7. Other *							
8. TOTAL *	39	////////	55	////////	12	////////	43
9. Average weighted index *	////////	////////	1.4	////////	0.3	////////	1.1
10. Net environmental quality benefit index*	////////	////////	////////	////////	////////	////////	1.1

**B. SOCIAL WELL-BEING BENEFIT INDEX**

Social Criteria (a)	Weight	Without Treatment		With Treatment		Difference	
	Factor (b)	Actual (c)	Weighted (d)	Actual (e)	Weighted (f)	Actual (g)	Weighted (h)
1. Life, health, safety *	1	0	0	0	0	0	0
2. Employment *	1	0	0	0	0	0	0
3. Recreational opportunity *	4	1	4	0	0	1	4
4. Economic stability *	1	0	0	0	0	0	0
5. Income distribution *	1	0	0	0	0	0	0
6. Preserve special sites *	1	0	0	0	0	0	0
7. Other *							
8. TOTAL *	9	////////	4	////////	0	////////	4
9. Average weighted index *	////////	////////	.44	////////	0	////////	.44
10. Net social well-being benefit index *	////////	////////	////////	////////	////////	////////	.44

**C. REMARKS**



## D. EXPECTED DAMAGE REDUCTION BENEFIT SUMMARY

Note: At current Water Resources Council interest rate 8.875 percent

Economic Benefit Indices	Units of Measure	Damage Expected				Expected \$ Damage Reduction
		Without Treatment		With Treatment		
		No. of Units	Present Value(\$)	No. of Units	Present Value(\$)	
(a)	(b)	(c)	(d)	(e)	(f)	(g)
I. Watershed Impacts Sediments	////////	////////	////////	////////	////////	////////
1. Downstream water storage *						
2. Sediment removal *						
3. Fish habitat *						
4. Water quality *						
II. Flood Water	////////	////////	////////	////////	////////	////////
1. Land *						
2. Water Improvements *						
3. Subtotal, Watershed *	////////	////////		////////		
III. Resource Related Impacts	////////	////////	////////	////////	////////	////////
1. Range *						
2. Wildlife and recreation *						
3. Timber *						
4. Subtotal, Resource Related *	////////	////////		////////		
IV. Other Impacts	////////	////////	////////	////////	////////	////////
1. SOIL FERTILITY	TONS	15,875	\$ 73,044	5,141	\$25,483	\$ 47,561
2. Subtotal, Other *	////////	////////	\$ 73,044	////////	\$25,483	\$ 47,561
V. TOTAL DOLLARS *	////////	////////	\$ 73,044	////////	\$25,483	\$ 47,561

## E. REMARKS

No significant increase in flooding potential is expected. Lost soil fertility was estimated at \$6.00/ton of soil lost.

ON-SITE AND OFF-SITE DEVELOPMENTS SUBJECT TO HAZARDS<sup>1</sup>

(Reference FSH 2509.13)

Fire Name			Date of Report
Horse Creek			4/11/91
Line Items	Type of Units	Number of Units	Estimated Value \$
(a)	(b)	(c)	(d)
1. Community and urban development	People	0	0
2. Municipal and domestic water supply	People Served	0	0
3. Transportation systems	Miles	0	0
4. Water distribution system (irrigation)	Miles	0	0
5. Agricultural development (crops, facilities)	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)			
2	XXXXXXXXXX	XXXXXXXXXX	
11. Total Hazard Potential	XXXXXXXXXX	XXXXXXXXXX	0

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

No developments on or off site subject to flooding or other damage as a result of the fire.

<sup>1</sup> Hazards from floods, floating 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.)

<sup>2</sup> Indicates values threatened by design storm. Does not enter into the B/C.

**SUMMARY OF EMERGENCY REHABILITATION NEEDS BY LANDOWNERSHIP**  
(Reference FSH 2509.13)

Fire Name

Horse Creek

Date of Report

April 11, 1991

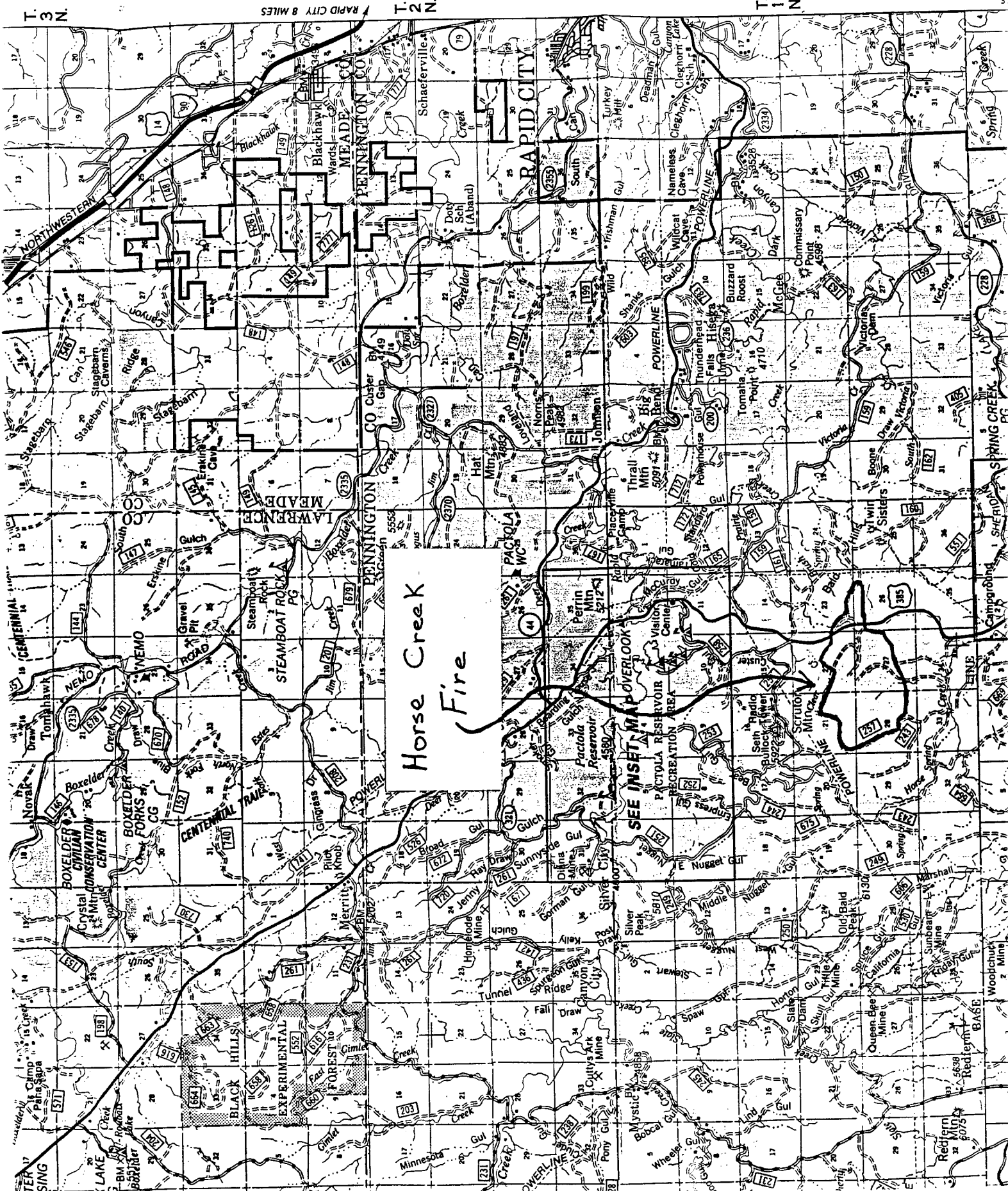
Landownership	A. Acres Burned	B. Emergency Rehabilitation Needs			
		(1) Land (acres)	(2) Channel (miles) structures	(3) Road & Trail (miles)	(4) Other
Federal (NFS) *	1155	570			
Other (specify) *					
Subtotal (NFS) *	1155	570			
Non-Federal (State & County) *					
Indian reservation *					
Private *	200	0			
Subtotal (Non-Federal) *	200	0			
<b>TOTAL *</b>	<b>1355</b>	<b>570</b>			

**C. Source of Emergency Rehabilitation Funds for Needed Work (\$)**

Landownership	1. FFF		2. Emergency Flood Prevention	3. FR & T	4. Other Federal (Enter fund)	5. Non- Federal (Enter fund) State & Pvt	6. Total
	(a) 092	(b) 102					
Federal (NFS) *	\$ 18,750						\$ 18,750
Other (specify) *							
Subtotal (NFS) *	\$ 18,750						\$ 18,750
Non-Federal (State & County) *							
Indian reservation *							
Private *							
Subtotal (Non-Federal) *							
<b>TOTAL *</b>	<b>\$ 18,750</b>						<b>\$ 18,750</b>

D. Remarks

\*



Horse Creek  
Fire

SEE INSET MAP OVERLOOK