

United States  
Department of  
Agriculture

Forest  
Service

Rocky  
Mountain  
Region

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

Black Hills  
Seven Sisters  
1985

Date: July 23, 1985

Reply to: 2520 Watershed Protection and Management

Subject: Burned Area Report, Seven Sisters Fire

To: Forest Supervisor, Black Hills National Forest

This is in reply to your July 17, 1985, request for emergency burn rehabilitation funds for the Seven Sisters Fire.

Your request is approved in the amount of \$15,600 for rehabilitation of fire caused watershed damage.

*Robert J. Mulvaney*

CHARLES J. HENDRICKS  
Director, Watershed, Soils,  
and Minerals Area Management

cc: Fiscal  
WO, W&AM

GJN:hs

*RW*

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Date: July 23, 1985

Reply to: 2520 Watershed Protection and Management

Subject: Burned Area Report, Seven Sisters Fire

To: Chief

A copy of the Burned Area Report for the Seven Sisters Fire is  
enclosed.

  
CHARLES J. HENDRICKS  
Director, Watershed, Soils,  
and Minerals Area Management

Enclosure

GJN:hs

USDA-Forest Service

# BURNED AREA REPORT (Reference FSH 2500.13, Report FS-2500-A)

Date of Report

July 17, 1985

## 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. ☐ Interima. ☐ Updating the initial funding requestb. ☐ Supplying information for accomplishments to date on emergency work underwayC. ☐ Finala. ☐ Best estimate for funds needed to complete eligible rehabilitation measureb. ☐ Following completion of funded work

## PART II - FIRE LOCATION

|  |                          |  |                                     |  |   |
|--|--------------------------|--|-------------------------------------|--|---|
| 1. Fire Name (From Form FS-3100-20)<br>Seven Sisters     |                          | 2. Forest Supervisor's Fire No. (From FS-3100-22)<br>139 |                                     | 3. State<br>SD                           | 4. County<br>Fall River                 |
| 5. Region<br>02  | 6. Forest<br>Black Hills | 7. Ranger District<br>Custer                             | 8. Date Fire Started<br>July 12, 85 | 9. Date Fire Controlled<br>July 16, 1985 | 10. Estimated Suppression<br>\$ 600,000 |
| 11. Fire Suppression Damages Incurred with FFF 102 Funds |                          |  |                                     |  |   |
| a. 30 miles (fireline waterbarred)                       |                          | b. 100 acres (fireline seeded)                           |                                     | c. Other (identify)                      |   |

## 12. Fire Intensity

a. 60 % (low)

b. 25 % (medium)

c. 15 % (high)

## PART III - NATIONAL FOREST SYSTEM PROBLEM INVENTORY

|   |                             |   |
|---|-----------------------------|---|
| 1. Watershed No.<br>1012010603  | 2. NFS Acres Burned<br>1700 | 3. Water Repellent Soil<br>10 % of NFS acres burned   |
| 4. Vegetation Types<br>Ponderosa Pine/Rocky Mt. Juniper-Little Bluestem, Little Bluestem-Western Wheat  |                             | 5. Geologic Types<br>Interbedded Sandstone, Shale & Limestone   |
| 6. Soil Erosion Hazard Rating<br>a. 25 % (low) b. 10 % (medium) c. 65 % (high)  |                             | 7. Erosion Potential<br>21,200 cu. yds./sq. miles   |
| 8. Miles of Stream Channels By Regional Order of Channel<br>1st Order Channels - 27 mi.<br>2nd Order Channels - 8.4 mi.                           |                             | 9. Miles of Forest Service Trails<br>3rd Order Channels - 2.1 mi.<br>0 Miles of live stream waters w/in fire perimeter. |
| 10. Miles of Forest Service Roads By Maintenance Level<br>a. _____ miles (Level I) b. _____ miles (Level II) c. (III) 3 miles (Levels III, IV, V) |                             |   |

## PART IV - CALCULATED RISK AND CLIMATIC EVALUATION

|   |  |
|---|--|
| 1. Estimated Apparentive Recovery Period (Years)<br>5   | 2. Chance of Success Desired by Management (Percent)<br>50 |
| 3. Equivalent Design Recurrence Period (Years)<br>10    | 4. Related Design Storm Duration (Hours)<br>30 Minutes     |
| 5. Related Design Storm Magnitude (inches)<br>1.4       | 6. Related Design Flow (cfs)<br>145                        |
| 7. Estimated Reduction in Infiltration (Percent)<br>10% | 8. Adjusted Related Design Flow (cfs)<br>160               |

Previous edition of this form is obsolete.

FS-2500-3 (11/82)

(OVER)

# PART V - SUMMARY OF SURVEY AND ANALYSIS

Skills Represented on Burned Area Survey Team (if appropriate, add):

1. ☐ Hydrology 2. ☒ Soils 3. ☐ Geology 4. ☐ Range 5. ☐ Timber 6. ☒ Wildlife  
7. ☐ Fire Mgmt. 8. ☒ Engineering 9. ☐ Contracting 10. ☒ Local Mgmt. 11. ☐ Research 12. ☒ Other Economics (Identify)

## Describe Emergency

Loss of timber & forage producing soils. Severe erosion potential on 1100 acres of steep slopes. Protection of Channels draining into the Cheyenne River & Angustora Reservoir.

## Emergency Rehabilitation Objective

Maintain soil productivity by meeting soil loss tolerance levels w/in 4 years  
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. 20 % (other) (Identify)

## Net Environmental Quality Benefit Index

a. ☒ Significant b. ☐ Not Significant

## Net Social Well Being Benefit Index

a. ☐ Significant b. ☒ Not Significant

Benefit/Cost Ratio  
2.9:1

8. Net Benefits  
116,900

## 9. Cost Effectiveness Index

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<br>(1)                 | Units<br>(2) | Unit<br>Cost<br>(3) | NFS Lands              |                      |                               | Other Lands            |                              |   | All Lands            |
|-----------------------------------|--------------|---------------------|------------------------|----------------------|-------------------------------|------------------------|------------------------------|---|----------------------|
|                                   |              |                     | No. of<br>Units<br>(4) | FFF 082<br>\$<br>(5) | Other \$<br>(Identify)<br>(6) | No. of<br>Units<br>(7) | Private<br>(Identify)<br>(8) | Non-Federal<br>State<br>(Identify)<br>(9) | Total:<br>\$<br>(10) |
|                                   |              |                     |                        |                      |                               |                        |                              |   |                      |
| a. Seeding                        | Acres        | <del>90</del>       | 300                    | 27,000               |                               |                        |                              |   | <del>27,000</del> 15 |
| b. Seeding                        |              |                     |                        | 15,600               |                               | 160                    |                              | 14,400                                    | 14,400               |
| c. Seeding                        |              |                     |                        |                      |                               | 635                    | 57,150                       |   | 57,150               |
| d.                                |              |                     |                        |                      |                               |                        |                              |   |                      |
| e.                                |              |                     |                        |                      |                               |                        |                              |   |                      |
| a. Opening water courses          | Miles        |                     |                        |                      |                               |                        |                              |   |                      |
| b. Stabilizing Streambanks        | Miles        |                     |                        |                      |                               |                        |                              |   |                      |
| c.                                |              |                     |                        |                      |                               |                        |                              |   |                      |
| d.                                |              |                     |                        |                      |                               |                        |                              |   |                      |
| e.                                |              |                     |                        |                      |                               |                        |                              |   |                      |
| f.                                |              |                     |                        |                      |                               |                        |                              |   |                      |
| MAJOR STRUCTURES                  |              |                     |                        |                      |                               |                        |                              |   |                      |
| a. Preplanned - from Forest Plans |              |                     |                        | 15,600               |                               |                        |                              |   | 87,150               |
| TOTAL                             |              |                     |                        | 27,000               |                               |                        |                              |   | 98,550               |

## PART VII - APPROVALS

Forest Supervisor (Signature)

*Richard D. Estes*

2. Date

7-18/85

3. Regional Forester (Signature)

*SHanks*

2. Date

7/22/85

# EXAMINING IMPACTS OF MANAGEMENT ALTERNATIVES FOR AN EMERGENCY PROGRAM

(Reference FSH 2509.13)

Name

Seven Sisters

Date of Report  
July 17, 1985

## A. ENVIRONMENTAL QUALITY BENEFIT INDEX

| Environmental Factor<br>(a)             | Weight<br>Factor<br>(b) | Without Treatment |                 | With Treatment |                 | Difference    |                 |
|---|-------------------------|-------------------|-----------------|----------------|-----------------|---------------|-----------------|
|   |                         | Actual<br>(c)     | Weighted<br>(d) | Actual<br>(e)  | Weighted<br>(f) | Actual<br>(g) | Weighted<br>(h) |
| Erosion and sediment                    | 9                       | 2                 | 18              | 1              | 9               | 1             | 9               |
| Aesthetic land quality                  | 3                       | 1                 | 3               | 1              | 3               | 0             | 0               |
| Water quality                           | 2                       | 2                 | 4               | 1              | 2               | 1             | 2               |
| Site productivity                       | 7                       | 2                 | 14              | 0              | 0               | 2             | 14              |
| Wildlife habitat                        | 6                       | 0                 | 0               | 0              | 0               | 0             | 0               |
| Fish habitat                            | 1                       | 0                 | 0               | 0              | 0               | 0             | 0               |
| Other Range                             | 5                       | 0                 | 0               | 0              | 0               | 0             | 0               |
| <b>TOTAL</b>                            | <b>34</b>               |                   | <b>38</b>       |                | <b>14</b>       |               | <b>25</b>       |
| Average weighted index                  |                         |                   | <b>1.1</b>      |                | <b>.41</b>      |               | <b>.74</b>      |
| Net environmental quality benefit index |                         |                   |                 |                |                 |               | <b>.74</b>      |

## B. SOCIAL WELL-BEING BENEFIT INDEX

| Social Criteria<br>(a)              | Weight<br>Factor<br>(b) | Without Treatment |                 | With Treatment |                 | Difference    |                 |
|-------------------------------------|-------------------------|-------------------|-----------------|----------------|-----------------|---------------|-----------------|
|                                     |                         | Actual<br>(c)     | Weighted<br>(d) | Actual<br>(e)  | Weighted<br>(f) | Actual<br>(g) | Weighted<br>(h) |
| Life, health, safety                | 1                       | 1                 | 1               | 0              | 0               | 1             | 1               |
| Employment                          | 1                       | 0                 | 0               | 0              | 0               | 0             | 0               |
| Recreational opportunity            | 2                       | 1                 | 1               | 0              | 0               | 1             | 1               |
| Economic stability                  | N/A                     | -                 | -               | -              | -               | -             | 0               |
| Income distribution                 | N/A                     | -                 | -               | -              | -               | -             | 0               |
| Preserve special sites              | N/A                     | -                 | -               | -              | -               | -             | 0               |
| Other                               |                         |                   |                 |                |                 |               |                 |
| <b>TOTAL</b>                        | <b>4</b>                |                   | <b>2</b>        |                | <b>0</b>        |               | <b>2</b>        |
| Average weighted index              |                         |                   | <b>.5</b>       |                | <b>0</b>        |               | <b>.5</b>       |
| Net social well-being benefit index |                         |                   |                 |                |                 |               |                 |

## C. REMARKS

# D. EXPECTED DAMAGE REDUCTION BENEFIT SUMMARY

At current Water Resources Council interest rate 8.125 percent

| Economic Benefit Indices      | Units of Measure | Damage Expected   |                        |                  |                        | Expected \$ Damage Reduction |
|-------------------------------|------------------|-------------------|------------------------|------------------|------------------------|------------------------------|
|                               |                  | Without Treatment |                        | With Treatment   |                        |                              |
|                               |                  | No. of Units (c)  | Present Value (\$) (d) | No. of Units (e) | Present Value (\$) (f) |                              |
| USFS Land Only (a)            | (b)              | (c)               | (d)                    | (e)              | (f)                    | (g)                          |
| Watershed Impacts Sediments   |                  |                   |                        |                  |                        |                              |
| 1. Downstream water storage   |                  |                   |                        |                  |                        |                              |
| 2. Sediment removal           | Cubic Yds.       | 5,100             | 51,000                 | 2,200            | 22,000                 | 29,000                       |
| 3. Fish habitat               |                  |                   |                        |                  |                        |                              |
| 4. Water quality              |                  |                   |                        |                  |                        |                              |
| Flood Water                   |                  |                   |                        |                  |                        |                              |
| 1. Land                       |                  |                   |                        |                  |                        |                              |
| 2. Water Improvements         |                  |                   |                        |                  |                        |                              |
| 3. Subtotal, Watershed        |                  |                   |                        |                  |                        |                              |
| Resource Related Impacts      |                  |                   |                        |                  |                        |                              |
| 1. Range                      |                  |                   |                        |                  |                        |                              |
| 2. Wildlife and recreation    | RVD              | 62                | 1700                   | 75               | 2000                   | 300                          |
| 3. Timber                     |                  |                   |                        |                  |                        |                              |
| 4. Subtotal, Resource Related |                  |                   |                        |                  |                        |                              |
| Other Impacts                 |                  |                   |                        |                  |                        |                              |
| 1. Soil Fertility             | Tons             | 25,500            | 153,300                | 10,950           | 65,700                 | 87,600                       |
| 2. Subtotal, Other            |                  |                   |                        |                  |                        |                              |
| TOTAL DOLLARS                 |                  |                   |                        |                  |                        | 116,900                      |

## E. REMARKS

No change in timber expected with or without treatment  
Sediment removal equals 20% of soil fertility

USDA Form 1-750

**ON-SITE AND OFF-SITE DEVELOPMENTS SUBJECT TO HAZARDS<sup>1</sup>**  
(Reference FSH 2509.12)

Fire Name

Seven Sisters

Date of Report  
7-17-85

| Line Item<br>(a)                                       | Type of<br>Units<br>(b) | Number of<br>Units<br>(c) | Estimated<br>Value \$<br>(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 systems (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                              | PMGT                    | 0                         | 0                            |
| 9. Fish habitat  | Miles                   | 0                         | 0                            |
| 10. Other (specify)                                    |                         |                           |                              |
| 11. Total Hazard Potential <sup>2</sup>                |                         |                           |                              |

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

There is an insignificant reproduction of warm water fish species on the western shoreline of Angostura Reservoir according to a SD Game, Fish and Parks fisheries biologist. There is an adequate buffer zone between the fire and Angostura Reservoir to filter sediment. Major drainages have sufficient vegetative cover on the bottoms to adequately reduce sediment.

<sup>1</sup> Harms 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 5100.28.)

<sup>2</sup> Indicate value threatened by design storm. Does not enter into the S/C.

## SUMMARY OF EMERGENCY REHABILITATION NEEDS BY LANDOWNERSHIP

Date of Report

July 17, 1985

(Reference FSH 2509.15)

## C. Source of Emergency Rehabilitation Funds for Ceded Work (\$)

## E. Emergency Rehabilitation Needs

## A. Acres Burned

## Landownership

|                                    | (1) Land (acres) | (2) Chemical (inches) | (3) Road & Trail (inches) | (4) Other | 1. FFF   |         | 2. Emergency Flood Prevention | 3. FR & T | 4. Other Federal (Enter fund) | 5. Non-Federal (Enter fund) | 6. Total |
|------------------------------------|------------------|-----------------------|---------------------------|-----------|----------|---------|-------------------------------|-----------|-------------------------------|-----------------------------|----------|
|                                    |                  |                       |                           |           | (a) 692  | (b) 302 |                               |           |                               |                             |          |
| Federal (NFS)                      | 1700             | 300                   |                           |           | \$27,000 |         |                               |           |                               |                             | 27,000   |
| Other Locality                     |                  |                       |                           |           |          |         |                               |           |                               |                             |          |
| Subtotal (NFS)                     | 1700             | 300                   |                           |           | 27,000   |         |                               |           |                               |                             | 27,000   |
| Non-Federal (State & County) State | 640              | 160                   |                           |           |          |         |                               |           |                               | 14,400                      | 14,400   |
| Indian Reservation                 |                  |                       |                           |           |          |         |                               |           |                               |                             |          |
| Private                            | 6760             | 635                   |                           |           |          |         |                               |           |                               | 57,150                      | 57,150   |
| Subtotal (Non-Federal)             | 7400             | 795                   |                           |           |          |         |                               |           |                               | 71,550                      | 71,550   |
| TOTAL                              | 9100             | 1095                  |                           |           | 27,000   |         |                               |           |                               | 71,550                      | 98,550   |

## D. Remarks

Sceding steep timbered north facing slopes where fire destroyed the timber canopy. Costs are for reseeding the burned areas from the air with native grass species.



RECEIVED

Seven Sisters Fire

JUL 19 1985

Div. of WS&MAW

Black Hills National Forest

The Seven Sisters Fire is located in Sec. 25, 35, and 36, T7S, R5E; Sec. 30 and 31, T7S, R5E; Sec. 1, 2, 3, 10, 11, 12, 13, 14, 15, 22, 23, 24, 25, and 26, T8S, R5E; Sec. 6, 7, 18, and 19, T8S, R6E. See attached map which shows exterior boundaries of the fire. The northern perimeter of the fire is about 0.5 miles south of Hot Springs, SD. The southern perimeter is FDR 331 (Sheps Canyon Road). 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 flatter ridges are mainly rangeland with scattered ponderosa pine.

The acreage breakdown by ownership is 1,700 acres NPS lands, 640 acres South Dakota State lands, and 6,800 acres private land.

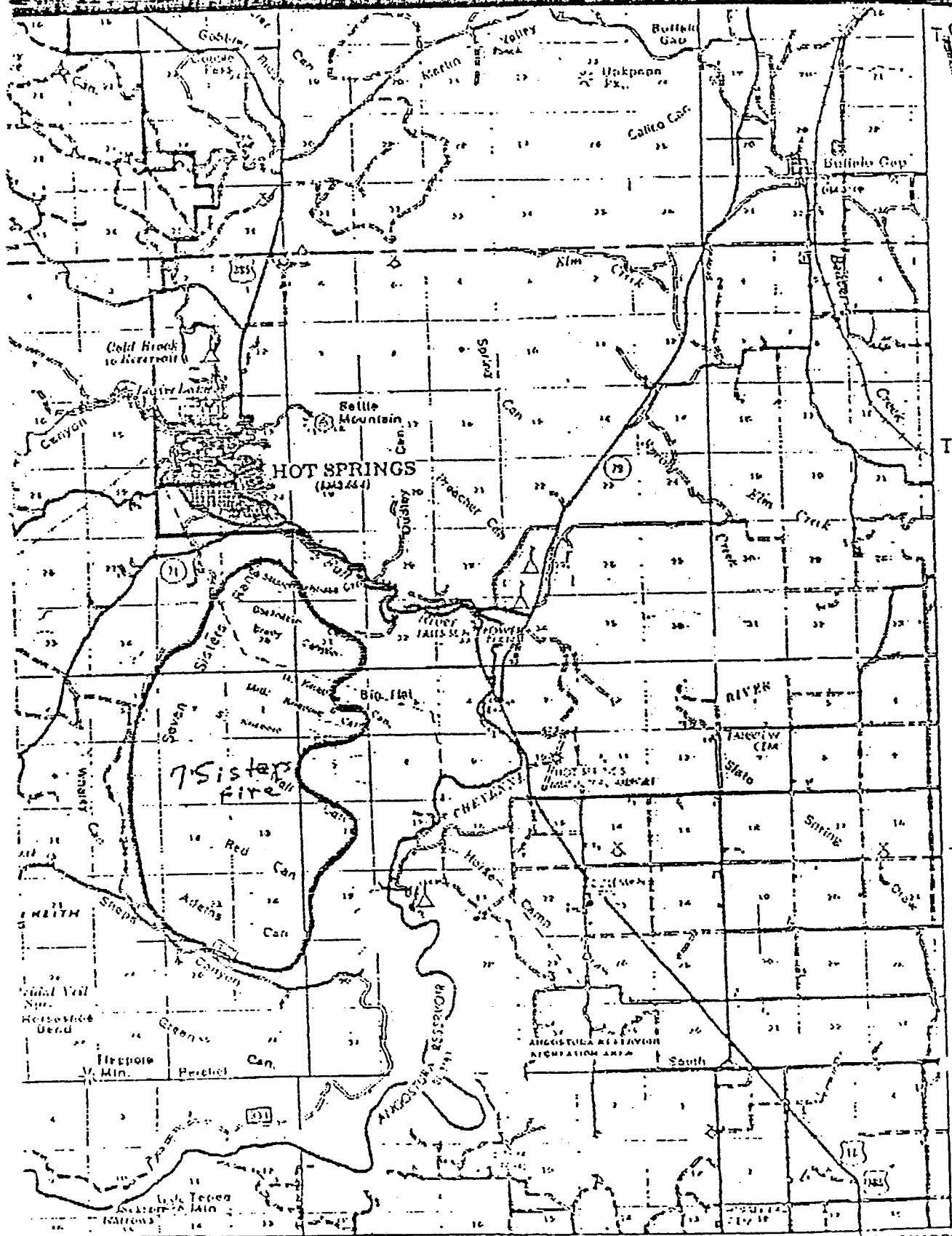
The fire burned severely on the northern and eastern timbered slopes. Approximately 300 acres of NPS lands on these slopes were severely burned with few or no needles left on the burned trees. The litter, duff, and understory vegetation was burned leaving bare soil and charred litter which turns to ash 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.

The proposed rehabilitation plan includes seeding 300 acres of NPS lands on very steep north and east aspects. These slopes burned severely and have little or no effective ground cover to reduce soil erosion.

The recommended seeding mixture follows:

|                     |            |
|---------------------|------------|
| little bluestem-    | 6 lbs/acre |
| sideoats grama-     | 3 lbs/acre |
| western wheatgrass- | 4 lbs/acre |
| blue grama-         | 2 lbs/acre |
| yellow sweetclover- | 2 lbs/acre |

There is about 160 acres of severely burned state land and 635 acres severely burned land in private ownership.



T.7S.

T.8S.

T.9S.

R.5E.

R.6E.

R.7E. TO CHADRON 38 MI

Notes

ACK 111 11 82

USDA - Forest Service

# SUMMARY OF EMERGENCY REHABILITATION NEEDS BY LANDOWNERSHIP

(Reference: FSH 2508.13)

Fire Name: Seven Sisters  
Date of Report: July 17, 1985

July 17, 1963

|                                    |      | B. Emergency Rehabilitation Needs |                  |                     |                          | C. Source of Emergency Rehabilitation Funds for Needed Work (\$) |         |         |                               |           |                               |                             |          |
|------------------------------------|------|-----------------------------------|------------------|---------------------|--------------------------|--|---------|---------|-------------------------------|-----------|-------------------------------|-----------------------------|----------|
|                                    |      | A. Acres Burned                   | (1) Land (acres) | (2) Channel (miles) | (3) Road & Trail (miles) | (4) Other  | 1. FFF  |         | 2. Emergency Flood Prevention | 3. FR & T | 4. Other Federal (Enter fund) | 5. Non-Federal (Enter fund) | 6. Total |
|                                    |      |                                   |                  |                     |                          |  | (a) 022 | (b) 302 |                               |           |                               |                             |          |
| Landownership                      |      |                                   |                  |                     |                          |  |         |         |                               |           |                               |                             |          |
| Federal (NFS)                      | 1700 | 300                               |                  |                     |                          | 15,000<br>27,000   |         |         |                               |           |                               | 15,000<br>27,000            |          |
| Other (agency)                     |      |                                   |                  |                     |                          |  |         |         |                               |           |                               |                             |          |
| Subtotal (NFS)                     | 1700 | 300                               |                  |                     |                          | 15,000<br>27,000   |         |         |                               |           |                               | 15,000<br>27,000            |          |
| Non-Federal (State & County) State | 640  | 160                               |                  |                     |                          |  |         |         |                               |           | 14,400                        | 14,400                      |          |
| Indian reservation                 |      |                                   |                  |                     |                          |  |         |         |                               |           |                               |                             |          |
| Private                            | 6760 | 635                               |                  |                     |                          |  |         |         |                               |           | 57,150                        | 57,150                      |          |
| Subtotal (Non-Federal)             | 7400 | 795                               |                  |                     |                          |  |         |         |                               |           | 71,550                        | 71,550                      |          |
| TOTAL                              | 9100 | 1095                              |                  |                     |                          | 15,000<br>27,000   |         |         |                               |           | 71,550                        | 98,550                      |          |

87,150

Seeding steep timbered north facing slopes where fire destroyed the timber canopy. Costs are for reseeding the burned areas from the air with native grass species.

also - Bob Winderstein - WL + Range! suggested pulling seed mix from 19th 10th, 12th ad most

