STAFF REVIEW

ENVIRONMENTAL ANALYSIS REPORT

January 15, 1977
Date Ranger Needs Report

2240 - 2520
File Designation

Moquitch Fire Revegetation
Project Name

North Kaibab
District

Route To:

Timber	____	Recreation & Lands	____
Fire Control - Multiple Use	MM	Engineer	____
Range - Wildlife	____	Business Management	____

Return To: Mgmt Staff Returned: 1/4/77

Routed: 1/4/77 Return By: 1/14/77

Revegetation Plan & Sub-Staff Comments attached

Comments:

I agree with this decision. I hope [illegible]

07-8300-1 (3/73)

Check Each of Following; If Not Applicable, So Indicate.	Date, Initials, Documentation Date Designation, and Remarks
1. Proposal has been discussed with:	
A. Grazing Permittee	November 1976
B. Special Use Permittee	
C. Timber Sale Operator	
D. Miners (Operating Claims)	
E. Adjacent Landowners	
F. Bureau of Reclamation	
G. Federal Power Commission	
H. State Game & Fish Department	
I. Fish & Wildlife Service	
J. Federal Communication Commission	
K. County Commissioners	
L. County & State Highway Department	
M. FAA	
N. USGS	
O. Bureau of Land Management	
P. State Engineer (Water Rights)	
Land Status and Classification Check	
3. Press Release Necessary to Explain Purpose of Proposal to Public	

TITLE PAGE

2240 - 2520

Functional Designation

ENVIRONMENTAL ANALYSIS REPORT

Moquitch Fire Revegetation

Name of Project

North Kaibab Ranger District, Kaibab National Forest

Region 3
Forest Service
Department of Agriculture

Report Prepared By Tommy S. Bickle Date December 27, 1976

Recommended For Approval By Herman D. Avant Date 1/3/77

District Ranger

Recommended For Approval By _____ Date _____

Forest Supervisor

DETERMINATION NOT TO FILE AN ENVIRONMENTAL IMPACT STATEMENT

The Moquitch fire revegetation project has been reviewed and it has been determined that it will not be necessary to file an Environmental Impact Statement as required by Section 102 (2) (c) of the National Environmental Policy Act. This determination is based on the following considerations.

1. The proposed action cannot be considered to be a major federal action.

2. The proposed action does not constitute a significant environmental impact. Outside of a possible short term effect on planted pine seedlings the project will have only favorable impact on the environment.

3. The action is not thought to be highly controversial.

LEONARD A . LINDQUIST
Forest Supervisor

MOQUITCH FIRE REVEGETATION PROJECT

I DESCRIPTION

On June 20 - 23 the Moquitch Fire occured; it burned approximately 1300 acres within the ponderosa pine type. After the fire, a portion of the steep slopes and the fire line was seeded with an erosion control mix. Also, natural regeneration of pine was considered good. However, the salvage logging operation destroyed the vast majority of the erosion control seeding and much of the natural pine regeneration. Timber purchaser payments for the salvage logging totaled $66,831.23. After the logging, and after much of the natural regeneration of pine was distroyed, 524 acres of the burn area was planted to pine seedlings at a cost of $113,500.

Sheet and rill erosion is occuring, especially on the steeper slopes. To attempt to stabilize the soil and protect the watershed it is proposed to seed the burned area with a mixture of forbs and grasses. Two different seed mixes will be used, one for the steeper slopes and one for the gentler slopes where erosion potential is not as high. The seed mix for the steeper slopes contains more perennials while the mix for lesser slopes contains more annuals. The perennial species used are bunch grasses rather than sod formers and should not compete to any degree with the pine seedlings. While the erosion control forbs and grasses and the pine seedlings are becoming established, protection of the area from domestic livestock will be accomplished by the grazing management system and the closing of water sources within and very near the burn.

II ENVIRONMENTAL EFFECTS AND ECONOMIC ANALYSIS

The seeding, if successful, should greatly increase soil stability and protect the water-shed. Forage for both wildlife and livestock will increase. If proper precautions are not taken, increased grass production, especially sod formers, could possibly compete with the planted pine seedlings. Also revegetation of the area could serve as an attraction to livestock and wildlife. This could effect the revegetation success of grasses and forbs and could result in some loss of pine seedlings by trampling and browsing. However, by using the proper seed mix and closing permenant water near and in the burn, cattle browsing and trampling, and competition to pine seedlings from grass, can be greatly minimized or eliminated. The browsing effect should be minimal anyway because the pine seedlings are far less palatable to cattle than seeded grass species. (See cordinating requirements)

Economic impacts are very localized and basicly affect functions within the Forest Service. By reducing soil loss, long term sustained yield of economically important factors such as soil stability, soil fertility, water-shed, timber production, forage production and wildlife will be enhanced. However the $113,500 invested in the pine seedlings could be jepordized somewhat.

III FAVORABLE ENVIRONMENTAL EFFECTS

The revegetation of the burn area will have a favorable effect on soil stability, on soil fertility and physical watershed conditions. The resulting improved quality and quanity of forage for wildlife and livestock, long term timber production, and natural beauty aspects will be benificial also.

IV ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

There is the possibility that seeding the area could slow the growth of pine. However succession will continue to occur and pine will again dominate the site; it just may take a very slight amount of time longer. There is also the possibility that pine production may not be slowed at all. One thing is certain, if soil is allowed to erode from this site, then all resources, including timber, could be adversely affected.

V ALTERNATIVES TO THE PROPOSED ACTION

A. Do Nothing:

This alternative may favor timber production for the short term, providing soil loss is not severe. However if any appreciable amount of soil is lost even timber production will suffer, along with water yeild, water quality, and forage producting capibility. Therefore, this alternative was not considered the most desirable course of action.

B. Seed the Burn With Annuals Only

This alternative would help to stabilize the soil, but annuals cannot begin to offer slopes the amount of protection that perennials can, because their protection is not as effective and is not year around.

VI RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG TERM PRODUCTIVITY

Because grasses and forbs offer the soil protection that pine seedlings and bare ground alone cannot, the long term productivity of the area will benefit. Except for very long periods of time, or perhaps even geologic time, the soil on the site is not renewable. Soil is the basic resource upon which the renewable resources depend, and to sacrifice or jepordize this basic resource for short term gain of a renewable resource would be unsound resource management.

VII IRREVERSIBLE AND IRRETRIVABLE COMMITMENT OF RESOURCES

There will be no irreversible or irretrivable commitment of the resources involved in the proposed action.

VIII CONSULTATIONS WITH APPROPRIATE FEDERAL AGENCIES AND REVIEW BY STATE AND LOCAL AGENCIES DEVELOPING AND ENFORCING ENVIRONMENTAL STANDARDS

A member of the Arizona Game and Fish Department was consulted at the time of the fire. He was asked if in his opinion the burns needed to be seeded to provide food for wildlife. His recommendation was that it did not need to be seeded to provide food for wildlife of the area. He did not, however, comment on what might happen to the soils and watershed.

IX MANAGEMENT REQUIREMENT AND CONSTRAINTS

A. Provide that two different seed mixes be used. The seed mix on the lesser slopes will consist of annuals and short lived, light rooted perrenials. The seed mix on the greater slopes will include annuals, but will also include long lived and heavy rooted perennials to help stabilize those slopes. (See "Slope Class Maps", and "Seeding and Flight Pattern Map" in appendix)

1. Lesser Slopes - Seed Mix I - 570 acres

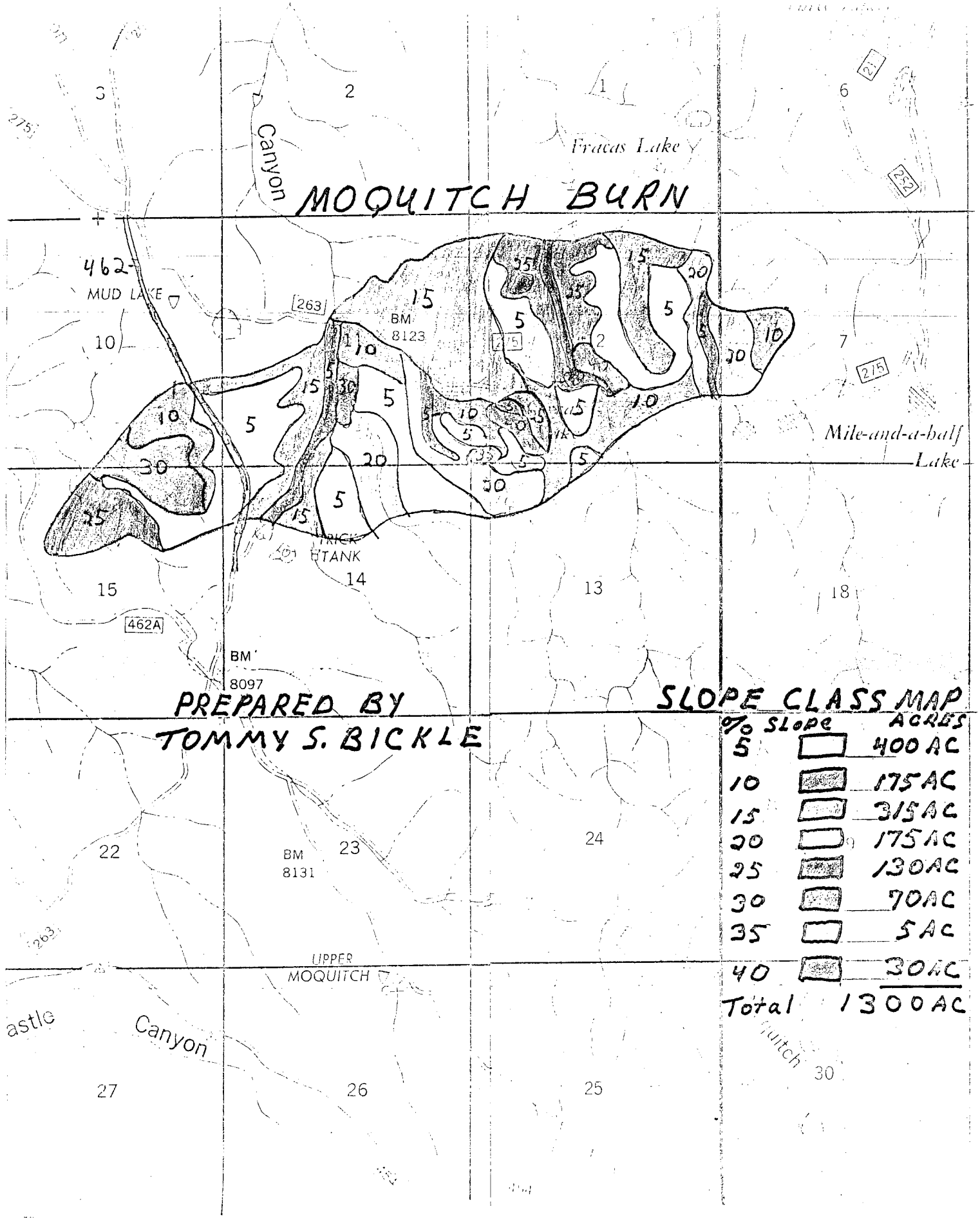
Yellow Blossom Sweet Clover	2 lbs/acre
Timothy	2 lbs/acre
Canadian Wildrye	4 lbs/acre
Hairy Vetch	4 lbs/acre

2. Greater Slopes - Seed Mix II - 730 acres

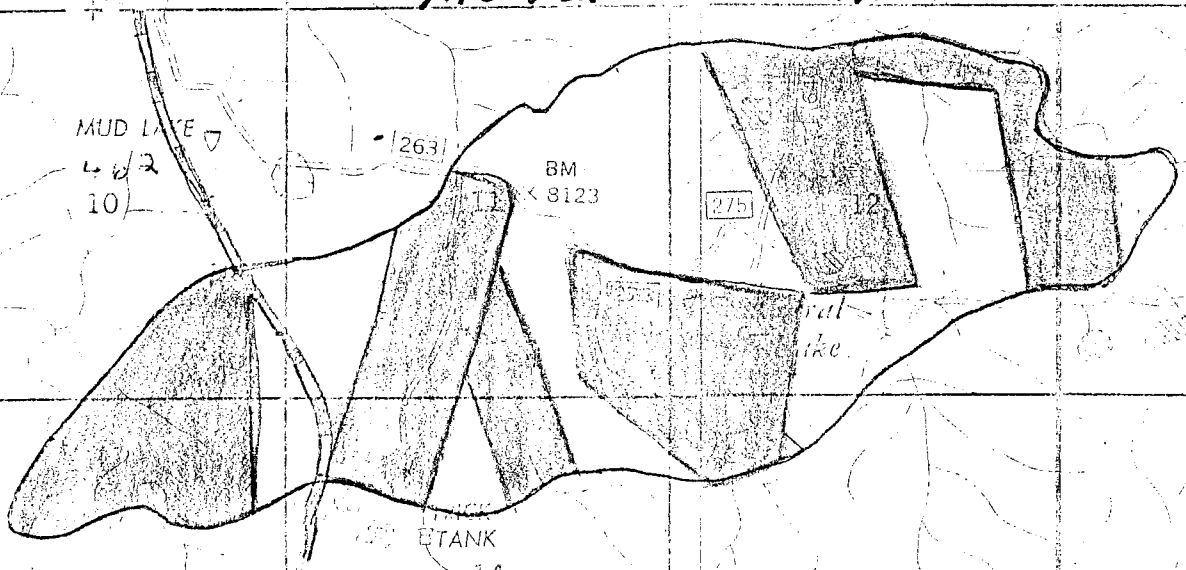
Yellow Blossom Sweet Clover	1.5 lbs/acre
Timothy	1 lbs/acre
Hairy Vetch	4 lbs/acre
Smooth Brome	3 lbs/acre
Orchard Grass	1.5 lbs/acre

B. Seed the burn on an early snow so later snows can cover the seed and push them into the loose spring soil.

C. The first year (1977) the north pasture of the Central Summer Allotment will be rested so there will be no livestock use on the burn. The following year (1978) Fracas Lake to the east of the burn, Mud Lake to the west of the burn and Corral Lake within the burn will be closed off to livestock. This will keep the majority of the cattle away from the burn and only light use should occur. The third year (1979) the pasture will be rested again. This will allow for total non-use two years out of the three and only occasional light use during the third.


MOQUITCH BURN
Fracas Lake
Canyon
MUD LAKE
462
263
215
BM
8123
TRICK TANK
Mile-and-a-half Lake
462A
BM
8097
PREPARED BY
TOMMY S. BICKLE
SLOPE CLASS MAP
% SLOPE
ACRES
5 400 AC
10 175 AC
15 315 AC
20 175 AC
25 130 AC
30 70 AC
35 5 AC
40 30 AC
Total 1300 AC
BM
8131
UPPER MOQUITCH
Canyon

MOQUITCH BURN

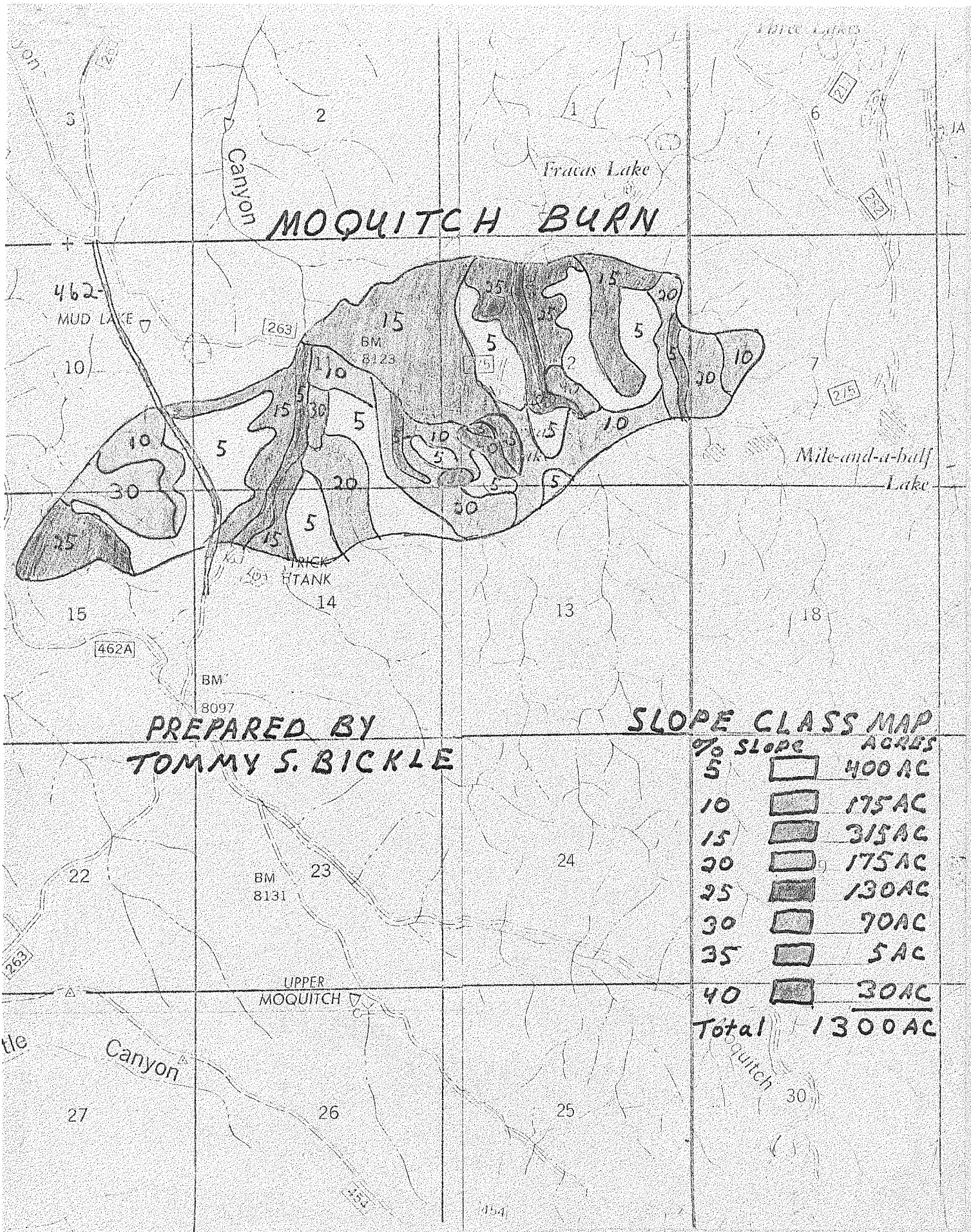


PREPARED BY
TOMMY S. BICKLE

FLIGHT PATTERN AND SEEDING MAP

SEED MIX I 570AC
(LESSER SLOPES)

SEED MIX II 730AC
(STEEPER SLOPES)

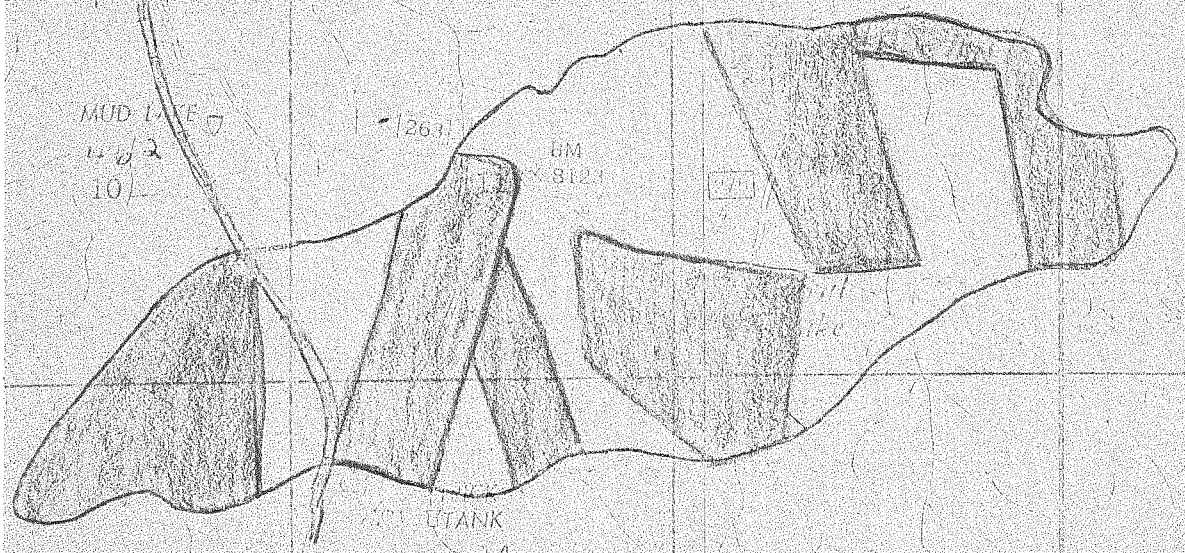


PREPARED BY
TOMMY S. BICKLE

SLOPE CLASS MAP

% SLOPE	ACRES
5	400 AC
10	175 AC
15	315 AC
20	175 AC
25	130 AC
30	70 AC
35	5 AC
40	30 AC
Total	1300 AC

MOQUITCH BURN



PREPARED BY
TOMMY S. BICKLE

FLIGHT PATTERN AND SEEDING MAP

SEED MIX I 570AC
(LESSER SLOPES)

SEED MIX II 730AC
(STEEPER SLOPES)

2510

MOQUITCH FIRE REVEGETATION PLAN

NORTH KAIBAB RANGER DISTRICT

KAIBAB NATIONAL FOREST

Completed and Updated by Tommy S. Bibb Date 12-30-76
District Range & Wildlife Staff

Recommended by Herman D. Avant Date 1/3/77
District Ranger

Approved by _____ Date _____
Forest Supervisor

1. Introduction

The Moquitch Fire occurred June 20-23, 1974; it burned approximately 1300 acres within the ponderosa pine type. Following the fire, erosion control seeding of the slopes and fire lines was accomplished. Ground disturbance associated with the fire salvage operation scarified and planted the on-site ponderosa pine seeds. Natural regeneration of the pine is considered fair to good. The salvage logging operation destroyed the majority of erosion control seeding efforts.

Sheet erosion and rilling continues to occur over this sizeable man-caused conflagration area. To suppress further soil loss and/or deterioration, it is proposed to reseed the entire acreage of the Moquitch fire during early January, 1977

2. Physical Condition of the Burned Area

a. Aspect - All aspects are represented to some degree, but the predominate aspect is West.

b. Topography - Mostly moderately sloping terrain with a few steep slopes adjacent to drainages. Elevations range from 8,000 feet to 8,250 feet. Slopes range from 0 to 40 percent. Below is a table showing the slope classes and the amount of acreage in each class. (See also slope class map in E.A.R.)

% Slope (Ave)	Acres
5	400
10	175
15	315
20	175
25	130
30	70
35	5
40	30

570 (575)

730 (735)

c. Geology - The rock type in this area is limestone.

d. Soils - The burn area is situated mainly on one soil. This soil is deep (40+) to bedrock and has a fine texture subsoil. It has a high water storage capacity, moderate erodibility and a low erosion hazard. Soil capability to produce vegetation is high while sensitivity is low. The majority of the soils have a low runoff potential. The soils associated with the steeper slopes (30% and greater) will have a moderate to high runoff potential and a high erosion hazard.

e. Original Cover - Approximately 1,200 acres were ponderosa pine with scattered small patches of aspen. A few open parks are within the burned area.

f. Channel Debris Loads - An increase in debris loads can be expected to move down the channels until a protective vegetative cover is returned to the burn area. Of the 1300 acres of burned area, approximately 730 acres are in the critical slope range and need immediate treatment. Potential for high runoff is lower on the remaining 570 acres due to the gentler slopes and absorbent soil type.

3. Flood Factors

a. Channel Conditions

(1) Channels should accommodate any flows from the area, which would not be great except for a low frequency high intensity storm of extended duration.

(2) Restrictions and obstructions - There are none in this area.

(3) Controls - None in the area, except for a few water spreaders in Warm Springs Canyon which would not be affected unless there is a very unusual storm.

b. Climate

(1) Storm magnitude and duration expected on a ten year frequency. The maximum daily rainfall intensity is 2.9 inches.

(2) Rainfall intensities expected on a ten year frequency. Probable maximum is 1.9 inches in 30 minutes.

4. Probable Antecedent Soil Moisture.

Rainfall at Jacob Lake Weather Station, which is six miles from the fire area received 3.04 inches of moisture in September, 1972, and 8.44 inches in October, 1972, without serious flooding. This would indicate that the soil in the area is absorbent and floods from this area are infrequent.

5. Developments subject to hazard of flood and sediment deposition damage, their value and significance.

In the opinion of the team, there is no threat of flood damage to transportation systems, urban areas, industrial developments, agricultural developments or military installations because of this fire.

6. Potential Damage to National Forest Resources and Site Productivity

a. Fish Habitat - no local damage.

b. Timber Production

Damage Class	Acres	Damage Per Acre	Total
5	200	1,480	$296,000
4	550	700	375,000
3	450	440	198,000
		TOTAL	$869,000

c. Forage for livestock - Loss of 260,000 pounds of annual production. Probable damage without reseeding = $10,000

d. Wildlife habitat - Loss of some wildlife snags and some Kaibab Squirrel habitat - probable damage from this: $100,000

e. Soil - Cost of soil loss is incalculable because it is irreplaceable.

TOTAL DAMAGE - One to two Million Dollars

f. Watershed - Water quality and quanity will be lessened.

7. Revegetation Methods & Specifications

As the soil surface has long since sealed and as mechanical site preparation would adversely affect the established tree seedlings; revegetation will be accomplished via aerial seeding when the site has a snow cover and the outlook for additional snow can be anticipated - January 1977, has been selected.

a. Areas of Lesser Slopes, approximately 570 acres.

Seed Mix I

Seed Prescription, Rate & Costs

1.	Yellow blossom sweet clover @ 2 lbs/acre - 1100 lbs @ .50 =	$ 550.00
2.	Timothy @ 2 lbs/acre - 1,100 lbs @ .50 =	550.00
3.	Canadian Wild Rye @ 4 lbs/acre - 2,200 lbs @ .75 =	1,650.00
4.	Hairy Vetch @ 4 lbs/acre - 2,200 lbs @ .45 =	990.00
	12 lbs/acre Sub Total =	$3,740.00

b. Steeper Slopes & Drainage Area - 730 Acres

Seed Mix II

Seed Prescription, Rate & Costs

1.	Timothy @ 1 lb/acre - 700 lbs @ .50 =	$ 350.00
2.	Smooth Brome @ 3 lbs/acre - 2,200 lbs @ .60	1,320.00
3.	Orchard Grass @ 1.5 lbs/acre - 1,100 @ .85	935.00
4.	Yellow Blossom Sweet Clover @ 1.5 lbs/acre - 1,100 lbs @ .50	550.00
5.	Hairy Vetch @ 4.0 lbs/acre - 2,900 @ .45	1,300.00
	11 lbs/acre Sub Total =	$4,455.00
	TOTAL	$8,195.00

8. Aircraft Specifications

a. Fixed wing aircraft or helicopter equipped with electric motor driven seeder.

b. Job will be bid on the acre basis and 1300 acres will be established as the final and total acreage of the job.

c. Aerial contractor will provide all services and supplies to accomplish aerial application of the seed.

d. Forest Service will provide on-the ground C.O.R., 2 men at the airport to load the seeder and the flags and flagmen.

e. The project will be curtailed at such time as winds and/or other weather phenomena prevents the even spread of 35 seeds/square foot over the flight patterns and one flight pattern is homogenous with the next.

f. The aircraft will be calibrated by the contractor; test strips will be run until the COR is satisfied the unit is delivering the specified rate per acre. Costs of calibration and demonstration will be born by the contractor.

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

Kaibab NF

NOV 8 1976
REC'D.
D. R. | CLERK
A. A. | P. C.
T. M. | LIBR
ENG | FILE
RGE | DESTROY
W. L.
REC. LDS
FIRE

OCT 18 1976
USFS

REPLY TO: 2521 Treatment of Burned Areas

SUBJECT: Moquitch Burn Seeding Project

TO: Range Staff via Watershed Staff

On October 6, 1976 I made a close on-site inspection of the Moquitch Burn. The following are my findings and recommendations.

1. There is soil movement taking place at the present time. Due to the amount of rock in the soil, severe damage has not occurred.

2. There have been no heavy rain storms in the area since the fire.

3. Rilling, debris dams, and runoff channels have formed on most of the steeper hillsides and on some of the gentler slopes.

4. With the present lack of ground cover, a heavy rainstorm will cause severe damage to the watershed. The topsoil that is left at the present time will be washed downstream behind the many dams left in the channels from the logging operation. These dams will breach and severe channel scouring will result.

5. It was stated that $113,000 was a lot of money to risk with a grass seeding project. The productivity and stability of the watershed is much more of a risk since the soil will be gone forever and no amount of money short of hauling topsoil will restore the productivity. The amount of money needed to stop the gullying will be tremendous, much greater than the cost to replant trees.

6. The average precipitation at Jacob Lake, the closest station, during the months of July and August are 2.61, 2140 inches respectively. The fire ocurred in June 1974. Below is the amount of precipitation from then to now:

	JULY	AUGUST
1974	4.02	.2
1975	5.64	1.14
1975	2.15	-

Even though the 1975 total for July was above the average, there has not been a heavy amount of precipitation over the fire. These types of events are very difficult to predict.

7. Economically and morally it is not worth risking the non-renewable resource for the sake of a few seedlings.

8. The area should be reseeded with grass for watershed and site productivity protection.

Earle W. Franks

EARLE W. FRANKS
Forest Hydrologist

Moquitch Resg:

We should proceed with this long overdue project.

Soil movement is evident over the entire area. However, to quantify it would require a great deal of time and money; at least 2 years and $40,000.

Loss of seedlings due to grass competition is highly unlikely, as is the need to mechanically site prep areas planted to grass. The recommended species are all bunch grasses or forbs. Sod formation would take years.

J Gas