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FS-2500-8

(8/93)

USDA-FOREST SERVICE

Date of Report: March 1, 1995

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

- ☐ 1. Funding request for estimated EFFF-FW22 funds
- ☒ 2. Accomplishment Report
- ☐ 3. No Treatment Recommendation

B. Type of Action

- ☐ 1. Initial Request (Best estimate of funds needed to complete eligible rehabilitation measures)
- ☐ 2. Interim Report
 - ☐ Updating the initial funding request based on more accurate site data and design analysis
 - ☐ Status of accomplishments to date
- ☒ 3. Final report - following completion of work

PART II - BURNED-AREA DESCRIPTION
(East Harker Complex)

- A. Fire Name: Trojan # 2 B. Fire Numbers: 48070
- C. State: UTAH D. County: Utah
- E. Region: 04 F. Forest: UINTA
- G. District: SPANISH FORK
- H. Date Fire Started: 9/10/94 I. Date Fire Controlled: 9/15/94
- J. Suppression Cost: \$819,259
- K. Fire Suppression Damages Repaired with EFFF-PF12 Funds:
- 1. Fireline waterbarred (miles) 4.35
 - 2. Fireline seeded (miles) 4.35
 - 3. Other (identify) _____
- L. Watershed Number: 012, (011)
- M. NFS Acres Burned: 2,085 Total Acres Burned: 2,900
Ownership type:
(120 A.) State () BLM (695 A.) PVT () _____
- N. Vegetation Types: Sagebrush-grass, Oakbrush, Mountainbrush, Douglas-fir-White fir, Spruce-fir, Aspen, Tall Forb, and Reseeded.
- O. Dominant Soils: Gravelly and stoney loams, clay loams, and shallow lithic soils.
- P. Geologic Types: Oquirrh Formation, consisting of sandstones and limestones
- Q. Miles of Stream Channels by Order or Class: Not applicable

R. Transportation System:

Trails: .25 miles

Roads: 3.0 miles

PART III - WATERSHED CONDITION

- A. Fire Intensity (acres): 522 (low) 696 (moderate) 1,682 (high)
- B. Water-Repellent Soil (acres): NONE
- C. Soil Erosion Hazard Rating (acres):
290 A. (low) 435 A. (moderate) 2,175 A. (high)
- D. Erosion Potential: 28.62 tons/acre
- E. Sediment Potential: 15,930 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

- A. Estimated Vegetative Recovery Period: 3 years
- B. Design Chance of Success: 85 percent
- C. Equivalent Design Recurrence Interval: 25 years
- D. Design Storm Duration: .67 hours (actual storm)
- E. Design Storm Magnitude: 1.28 inches (actual Storm)
- F. Design Flow: .31 cubic feet per second per square mile
- G. Estimated Reduction in Infiltration: 1,000 percent
- H. Adjusted Design Flow: 1,844 cfs (actual approximate measurement)

PART V - SUMMARY OF ANALYSIS

A. Describe Watershed Emergency: This fire burned over very steep mountain slopes in direct view of residents of the city of Mapleton, Utah, who are very concerned about this situation. A fire that burned a portion of this fire area 5 years ago produced 4 floods during the period prior to and just after treatment of the burned area, one of which delivered mud and water into the basement and garage of a residence located nearby. The rehabilitation work completed on the previous fire consisted of aerial reseedling which was very successful in retarding runoff and erosion once it became established, about a year following the completion of work. The local residents are very anxious to have this work done to protect "their" mountain from erosion, flooding, and to improve the aesthetic values of Maple Mountain (Spanish Fork Peak) directly visible from their homes. The area is also important big game summer and winter range.

B. Emergency Treatment Objectives: Restore desirable vegetative cover through an ecosystem management approach to improve watershed conditions within one to three years. Integrate proposed ecosystem management objectives and provide management and developments that implement the following:

1. Protect human life and property.
2. Reduce soil erosion, sediment production, and flood damage.
3. Improve onsite infiltration and water quality.
4. Revegetate the watershed with a diversity of species that provide for rapid watershed protection as well as meeting wildlife habitat needs.
5. Improve aesthetic quality of the burned area.

C. Probability of Completing Treatment Prior to First Major Damage-Producing Storm:

Land 40 % Channel NA % Roads NA % Other %

D. Probability of Treatment Success

	<----Years after treatment----->		
	1	3	5
Land	75	85	100
Channel	-	-	-
Roads	-	-	-
Other	-	-	-

E. Cost of No-Action (Including Loss): \$3,678,828

F. Cost of Selected Alternative (Including Loss): \$66,429*
 * Includes all sources of treatment funding.

G. Skills Represented on Burned-Area Survey Team:

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input type="checkbox"/> Geology	<input checked="" type="checkbox"/> Range
<input type="checkbox"/> Timber	<input checked="" type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input type="checkbox"/> Engineering
<input type="checkbox"/> Contracting	<input type="checkbox"/> Ecology	<input type="checkbox"/> Research	<input type="checkbox"/> Archaeology
<input checked="" type="checkbox"/> Aesthetics	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____

Team Leader: Paul H. Skabelund

Phone: 342-5126 Electronic Address: R04F18A

H. Treatment Narrative:

Describe the emergency treatments, where and how they will be applied, and what they are intended to do. This information helps to determine qualifying treatments for the appropriate funding authorities. For seeding treatments, include species, application rates and species selection rationale.

The Trojan #2 wildfire began Saturday, September 10, 1994, from an unknown cause, on private property (Trojan Powder Plant) on the Wasatch Front south of Mapleton, Utah. The majority of the acreage was burned between 11:58 p.m. and 2:00 a.m. on the 11th. Before being controlled, the fire consumed an estimated 2,085 acres of National Forest System Lands and a total acreage estimated at 2,900 acres. The burn was of high intensity and destroyed nearly all vegetation and litter on about 58% of the total burn area. The burned area is extremely steep with up to 120% slopes and an average slope of 70-80%. Elevations on the burned area range from 4,800' to 9,700' in a distance of about 2 miles. Erosion hazard on these burned over slopes ranges from high to extreme.

The Middle Slide drainage which feeds directly onto an alluvial fan on private lands at the mouth of the canyon, burned in 1989 as the Middle Slide Canyon Fire and about 2/3 of that drainage burned again as a part of this fire. One home valued at \$160,000 and several out buildings valued at \$30,000 are located along the lower edge of the fan. The fan itself is mostly a poorly vegetated pasture area. The Mapleton lateral of the Strawberry Highline Canal also skirts the lower edge of the fire and several other residences and farm buildings are located in the proximity below the canal.

The watershed was in a stable condition prior to the fire, including that portion that had been burned and reseeded. Steep, deep flood channels had been entrenched in the glacial and colluvial deposits which covered the canyon

bottoms from head to mouth but these channels do not appear to have been impacted by large scale flooding during historic times. Some minor flooding occurred during the spring snowmelt periods in the flood years of 1952 and 1983 and evidence exists of debris flows during the 1930's, probably resulting from heavy grazing use at the time, but no serious damage resulted from these events, due to its undeveloped condition at the time.

The fire has created the potential for heavy flooding should heavy thunderstorms occur before the healing process is complete, which is estimated at 3 years. Four floods occurred from Middle Slide Canyon within a year of the time that the Middle Slide fire burned. The estimated peak flow for a 25-year, 6 hour storm prior to the burn is only .3 c.f.s. Two of the forementioned floods occurred within three weeks of the burn, and before any rehabilitation work was completed. The first flood deposited an estimated 15,294 cubic yards of sediment, or 15,931 cu. yds./sq. mi. on the alluvial fan at the mouth of Middle Slide Canyon. The second flood followed 3 days later on September 20, and produced a peak estimated at 1,770 c.f.s. or 1,844 c.f.s./ sq. mile. This flood originated from storms measured at just over 1 inch in the valley.

On May 30, 1990, after the Middle Slide fire rehabilitation work was completed a third flood event occurred from Middle Slide Canyon. The peak was estimated at approximately 700 c.f.s. A fourth flood occurred on September 25, 1990. This flood was of much smaller magnitude and was handled by the Middle Slide Flood Diversion that had been constructed by the SCS under the Emergency Watershed Protection program. The peak was estimated at approximately 140 c.f.s., but the flow lasted for nearly two hours. A substantial amount of fine sediment and ash carried on thru the diversion channel and were deposited atop the sediments deposited by the May 1990 event. There are no feasible debris basin sites located on National Forest System Lands. The two other canyons burned over in the Trojan #2 fire have locations outside the National Forest where debris basins could be constructed but there does not appear to be a need for them as there appears to be ample opportunity for flood flows from these drainages to deposit their debris load before the remaining water fraction enters the Strawberry Highline Canal.

The fire burned a variety of vegetation types. The hottest portions of the burn were in heavy fuels (oakbrush and conifer) in Crowd, Big Slide, and Middle Slide Canyons. The oakbrush, aspen, and most of the perennial shrubs, forbs, and grasses will resprout and the area will gradually recover naturally but it will be several years before an effective litter cover is reestablished. The south-facing slopes currently have some cheatgrass and other undesirable plant species. Without seeding these slopes, undesirable plant species could encroach on this portion of the watershed. During that time erosion and flood hazards will remain high. Reseeding areas of moderate and high burn intensity with grasses and forbs could hasten recovery of these slopes by increasing ground cover and replacing the burned litter.

A portion of the burned area is critical winter range for deer and elk. The remainder of the area serves as transitional range for these two species as well as important summer range for both. No livestock are permitted in the burn area.

The Utah Division of Wildlife resources is interested in cooperating in restoration of the burned area as they own 120 acres of big game winter range

immediately adjacent to the National Forest boundary and the entire burn area is important big game winter and summer range. They have tentatively agreed to furnish big sagebrush and white-stemmed rabbitbrush seed for aerial seeding of the 502 acres of south facing, low elevation slopes on National Forest System land. In return the Forest Service proposes to fly their seed on the 120 acres of Division land.

Much of the information provided in this report has been garnered from previous experience in preparation of the Emergency Burn Rehabilitation Report for the Middle Slide Fire and the subsequent installation and monitoring of that project which was completed on the north portion of this burned area in 1989.

Summer thunderstorms constitute the main threat from a watershed standpoint. Therefore it is proposed that land treatment measures (aerial seeding) be delayed until after the major threat of such storms has passed (early October). This will reduce the chance of seed being washed downslope and also the threat that seed will germinate early and drought out during hot, dry weather. The previous fire in the same vicinity experienced a number of flood events prior to the initiation of the rehabilitation effort on that burn. Experience has shown that even though flooding can proceed such rehabilitation efforts, good results from aerial seeding can still be achieved, and watershed values can be largely restored within 3 years. There is a real opportunity for serious flood events to continue in subsequent years if the watershed is left untreated.

Following is an estimated breakdown of vegetation types that burned: reseeded (7%), sagebrush-grass (15%), tall forb (1%), oakbrush (34%), mountainbrush (20%), spruce-fir (5%), white-fir/Douglas-fir (15%), and aspen (3%).

This proposal includes only one treatment method as practical to re-establish watershed cover on the burned area in a reasonable time frame. Aerial seeding proved to be effective in the fire rehabilitation effort on the Middle Slide fire in 1989. Both moderately and severely burned slopes that are too steep to treat by other physical means will be aerial seeded to stabilize the watershed and improve forage and habitat for wildlife. Two seed mixes (See Table 1) are proposed, each of which will be supplemented to the extent possible with species provided from other funding sources to provide wildlife habitat and to meet proposed ecosystem management objectives.

A total of 1782 acres of National Forest system lands are proposed for aerial seeding. This includes 1,280 acres to be seeded with the proposed north slope and high elevation seed mix at an estimated cost of \$25.10 per acre, or a total of \$32,128. An additional 502 acres of south facing and lower elevation slopes are proposed for treatment at a cost of \$31.81 per acre, of a total of \$15,969. Together the total seeding cost are estimated at \$48,097. This does not include costs of sagebrush and white-stemmed rabbitbrush to be donated by UDWR (~\$7,200) or the cost of cicer milkvetch to be added to the mix using wildlife funds (\$2,108). Total estimated cost of the proposal including other funding is \$57,405.

Debris basins were considered for construction at the mouths of Big Slide and Crowd Canyons, but the main threat of flood from these drainages would be the possible breakage of the Strawberry Highline Canal when it is carrying irrigation water. Most likely this will not happen as there is no immediate threat to residences below these drainages and there is considerable distance

between the mouths of these canyons and the canal. A flood diversion structure was built by the SCS to alleviate the threat of flooding at the mouth of Middle Slide Canyon after the 1989 fire. It should be retained for another 5 years to protect the residences and other facilities that exist in that area.

The importance of the aesthetics on the burned area to the residences of Mapleton City was recently brought out in Town Hall meetings during the fire. Treatment of the area could hasten recovery of the aesthetic values. The burned area is an immediate backdrop to the city of Mapleton and has the highest sensitivity level of any area classified for visual values under the Forest Plan.

Table 1. NORTH FACING - HIGH ELEVATION SEED MIX

Species	lbs/Ac PLS	\$/lb	Acres	lbs	Total Cost
<u>Elymus trachycaulus</u>	2.0	2.00	1,280	2,560	\$ 5,120.00
<u>Agropyron intermedium</u>	2.0	1.20		2,560	3,072.00
<u>Dactylis glomerata</u> Potomac	3.0	1.40		3,840	5,375.00
<u>Phleum pratense</u>	1.5	0.80		1,920	1,536.00
<u>Bromus inermis</u> Manchar	2.0	1.60		2,560	4,096.00
<u>Medicago sativa</u> ladak	1.5	1.40		1,920	2,688.00
TOTAL	12.0			15,360	\$ 21,887.00 or \$17.10 / acre

SOUTH FACING - LOWER ELEVATION SEED MIX

Species	lbs/Ac PLS	\$/lb	Acres	lbs	Total Cost
<u>Agropyron cristatum</u> Ephraim	2.0	1.40	502	1,004	\$1,405.60
<u>Agropyron intermedium</u>	1.0	1.20		502	602.40
<u>Pseudoroegneria spicata</u> Goldar	1.0	7.50		502	3,765.00
<u>Dactylis glomerata</u> Paiute	2.0	1.50		1,004	1,506.00
<u>Poa ampla</u>	1.0	5.25		502	2,635.50
<u>Bromus inermis</u> Lincoln	1.0	1.26		502	632.52
<u>Medicago sativa</u> ladak	2.0	1.40		1,004	1,405.60
<u>Artemisia tridentata</u> *	.2	40.00		100	4,000.00*
<u>Chrysothamnus nauseosus</u> *	.2	32.00		100	3,200.00*
<u>Astragalus cicer</u> **	1.0	4.20		502	2,108.40**
FS BAER TOTAL	10.0			5,020	\$11,952.62 or \$23.81 / acre
UDWR TOTAL *	.4		622	200	8,920.00

**Ecosystem addition - FS Wildlife Funds

OTHER COSTS

AERIAL SEEDING - COST/ACRE = @ \$8.00 (Helicopter) x 1,782 = \$14,256

ACCOMPLISHMENT

Approval to expend \$49,687 to rehabilitate the Trojan #2 fire was received on September 27, eight days following the submission of the burn rehabilitation request. District personnel were still busy with fire control efforts and with preparations for rehabilitation of the East Harker Fire Complex, the largest known fire ever to occur on the Uinta Forest. Thus preparations for rehabilitation of this fire were slowed to some extent.

This fire was not yet declared out when the first flood producing storm hit the fire area on September 29. A Pacific cold front moved into Utah Valley early that morning, and by 4:30 p.m. .53" of rain had fallen at the Spanish Fork Powerhouse near the mouth of Spanish Fork Canyon (1 mile west of the lower southwest base of the burned area). At Springville about 4 miles northwest of the northwest edge of the fire, .55" fell during that same period. About 9 p.m. that evening a short, high intensity burst of rain fall hit the fire area. The amount of rainfall that fell on the fire during the approximately 20 minute burst is unknown, but .26" fell at the Spanish Fork Powerhouse and .35" fell in Springville.

This high intensity burst resulted in a flash flood and debris flow from lower portion of Big Slide Canyon. This was of lower magnitude, but very similar to the first flood event from the Middle Slide Fire area that occurred on September 17, just five years before. This situation could have been much worse, except that the upper 2/3's of the burn area received snow instead of rainfall.

Following this storm, the month of October continued to be cool and wet, as 5.26" of precipitation fell at the Spanish Fork Powerhouse during the next 20 days. Fortunately much of this occurred as snowfall with gradual melt conditions on the burn. On two different occasions daily precipitation amounts exceeded 1". Some additional minor flooding occurred from several of the canyons draining the fire area, but in only one instance did minor amounts of floodwater reach the Springville-Mapleton Highline Canal.

Seed for the rehabilitation was finally ordered on October 20. The low bidder was Wheatland Seed Company of Brigham City, Utah. The cost of the total order was \$24,850 or \$8,990 less than originally estimated. Two seed mixes were planned for and used. The North Facing - High Elevation mix cost \$15,022 and the South Facing - Low Elevation mix cost \$9,828. Seed costs per acre then were \$11.74 for the former mix and \$19.58 for the low elevation mix.

The seed was received on November 2, and arrangements were made with Helicopter Service Inc. of Bountiful, Utah to begin the reseeding on November 4. The wet and stormy October had resulted in up to a foot or more of snow accumulated on the burn area, with the prediction for more on the way. The determination was that the area would be seeded on the snowpack as it was probably there for the duration of the winter, at least on the northerly aspects.

November 4 dawned clear and cold as 4" of new snow had fallen on the staging area the day before. After considerable problems getting the seed to the selected helicopter staging area, seeding was initiated about mid morning. Seeding of the high elevation and north slopes was initiated first and seeding sites proceeded from the north edge of the fire towards the south. By mid afternoon problems were encountered with the seed hopper and operations were

shut down for repair of the seeding equipment. Helicopter seeding time that day amounted to only 4.6 hours which included 1.2 hours of ferry time for a total of \$3,335 expended.

The seeding equipment was repaired over the weekend and seeding resumed on Monday, November 7. This was a much better day for seeding operations, as it was much warmer and most of the snow had melted off of the south and west facing slopes. The remainder of the burn was seeded that day, utilizing 7.1 hours of helicopter time (1 hr. ferry time), for an additional \$5,148. The helicopter time thus amounted to 11.7 hours at a cost of \$8,483 to seed the total 1,902 acres which were treated. This amounts to 163 acres per hour and a cost of \$4.46 per acre. This will be reported on the Emergency Rehabilitation Treatment table as \$4.76 per acre as the seeding costs on the 120 acres of Wildlife Resources Land were bourn by the Forest Service in return for \$7,200 worth of seed furnished by the Division for seeding winter ranges on burned National Forest System lands.

Other costs incurred in the seeding effort included overhead and labor costs to load the seed and direct the seeding activities. These amounted to a total of \$2,010 or \$1.13 per acre. The separate costs of seeding the fire area with the two seed mixes are: North Facing - High Elevation = 1,280 acres @ \$17.63 per acre or a total of \$22,566; and South Facing - Lower Elevation = 502 acres @ \$25.47 per acre or \$12,785. The total cost for seeding 1,782 acres of National Forest System Lands was \$35,351 or \$19.84 per acre. This compares to the original estimated total of \$48,097.

In addition, 120 acres of burned over Division of Wildlife Resources Winter Range were seeded. The Division provided an estimated \$2,857 worth of seed for their land plus an estimated \$7,200 worth of white-stemmed rabbitbrush and big sagebrush seed to reseed the 502 acres of critical winter range burned on National Forest System Lands.

Costs for preparation of the initial burned area rehabilitation report have been charged back against BARE funding. For the 3-person rehabilitation team consisting of Paul Skabelund, Carol Nunn-Hatfield, and Ron Torgerson the cost amounted to \$1,110. In addition an estimated \$481 have been spent to prepare this final report, for a total report preparation cost of \$1,591.

The total cost of the formentioned BARE items is \$36,942. In addition the Utah Division of Wildlife Resources contributed an estimated \$10,057 worth of seed, bringing the total project cost to \$46,999.

PART VI - EMERGENCY REHABILITATION TREATMENTS AND SOURCE OF FUNDS BY LAND OWNERSHIP

Line Items	Units	Unit Cost \$	NFS Lands			Other Lands			All Total \$
			Number of Units	EFPS- FW22 \$	Other \$ Wild- life	Number of Units	State \$ UDWR ident.	\$ Other ident.	

A. LAND TREATMENTS

Aerial Seed - North Slope and High Elevation	A.	17.63	1,280	22,566				22,566
Aerial Seed - South Slope and Lower Elevation	A.	25.47	502	12,785	120	2,857		15,642
	A.	14.34	(502)			7,200		7,200

B. CHANNEL TREATMENTS

B. CHANNEL TREATMENTS

[illegible]

C. ROADS AND TRAILS

[C]. ROADS AND TRAILS

[illegible]

D. STRUCTURES

D. STRUCTURES

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E. BAER EVALUATION/ ADMINISTRATIVE SUPPORT

[illegible]

F. TOTALS	
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PART VII - APPROVALS

1. /s/ [Signature] /
Forest Supervisor - Uinta and Wasatch-Cache N.F.

3/01/95
Date

2. Regional Forester

Date _____



PHOTO 15 Doug Wheeler of Mapleton City inspects more flood debris deposited on the powerline road upstream about 100 yards from previous photo and at the same location which Photo 10 was taken. This flood event occurred the previous evening around 9:30 p.m. following a high intensity burst of rain amounting to .35 inches in a 20-minute period. 9/30/94 P.H.S.



PHOTO 16 Channel of Big Slide Canyon just upslope from the powerline road has been coated with a deposit of concrete-like flood debris. Compare to Photo 6 and 7 in Middle Slide Canyon 1989 Flood Report. 9/30/94 P.H.S.

Trojan 2 Fire Rehab Seed mix

1,280 ac.

P.L.S.

N. Facing - upper Elevation

LBS/AC.

502 ac.

P.L.S.

S. Facing - lower Elevation

LBS/AC

Smooth Brome Manchar	2	Intermediate Wheatgrass	2
Slender Wheatgrass	2	Crested Wheatgrass (Ephraim) Norden/Hycrest	2
Orchard grass	3	Alfalfa	1 1/2
Alfalfa	1 1/2	Smooth Broom (Lincoln)	1
Intermediate wheatgrass	2	Painte Orchard grass	2
Tall meadow Catgrass	1 1/2	Blue bunch wheatgrass (Goldar)	2
Timothy	1		10 1/2
	13 lbs		

G Desin w. Rye -
~~Haystack~~

Secur B.B. -

5/16 25

→ Sainfoin 1/2 - 1 lb
→ Poa ampla

4577

8920

57,405

Trojan 2 Fire Rehab. Seed Mix

Table 1.

N. Facing - upper elevation

Species		lbs/ac	\$/lb	\$/ac	lbs	Total/Cos
<u>Bromus inermis</u> (Manchar)	Smooth Brome	2	1.60	3.20	2560	\$4096
<u>Elymus trachycanthus</u>	Slender wheatgrass	2	2.00	4.00	2560	5,120
<u>Dactylis glomerata</u> (Potomac)	Orchardgrass	3	1.40	4.20	3,840	5,375
<u>Agropyron intermedium</u>	Intermediate Wheatgrass	2.0	1.20	2.40	2,560	3,072
<u>Phleum pratense</u>	Timothy	1.5	.80	1.20	1,920	1,536
<u>Medicago sativa</u> (Ladak)	Alfalfa	1.5	1.40	2.10	1,920	2,688
Total		12		\$17.10/ac		21,889
1,280 Ac. * \$17.10/ac		= \$21,889		+ 8.00/ac. helicopter		
				25.00/ac total		

S. Facing - Lower elevation

Species		lbs/ac	\$/lb	\$/ac	lbs	Total \$
<u>Poa ampla</u>		1.0	5.25	5.25	502	2,635.5
<u>Agropyron intermedium</u>	Intermediate Wheatgrass	1.0	1.20	1.20	502	602.4
<u>Agropyron cristatum</u> (Ephraim)	Crested Wheatgrass	2	1.40	2.80	1,004	1,405.1
<u>Bromus inermis</u> (Lincoln)	Smooth Brome	1	1.26	1.26	502	632.5
<u>Dactylis glomerata</u> (Paiute)	Orchardgrass	2	1.50	3.00	1,004	1506
<u>Pseudoroegneria spicata</u> (Goidar)	Bluebunch Wheatgrass	1	7.50	7.50	502	3,765
<u>Medicago sativa</u> (Ladak) (Nimrod)	Alfalfa	2.0	1.40	2.80	1,004	1,405
Total		10.0		\$23.81		11,952.1
502 Ac. * \$23.81/ac		= \$11,952.62		+ 8.00/ac Helicopter		
				\$31.81/ac total		

Ecosystem Seed Mix for S. Facing - Lower Elevation

Species		lbs/ac	\$/lb	\$/ac	
<u>Chrysothamnus nauseosus</u>		2	32	6.4	\$3,212.80
<u>Astragalus cicer</u>	Cicer Milkvetch	1.0	4.20	4.20	\$2,108.40
<u>Artemisia tridentata</u> (Vaseyana)	Rabbitbrush	.20	40.00	8.00	\$1,601.60
				+ 10,000 Bitterbrush Seedlings @ .35 ea. = 3,500	