USDA Forest Service FS-2500-8 (8/93)

Date of Report: August 6, 2000
Revised: _August_21, 2000

BURNED-AREA REPORT

(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

[XX] 1. Funding Request for Estimated WFSU-FW22 Funds

[ ] 2. Accomplishment Report

[ ] 3. No Treatment Recommendation

B. Type of Action

[XX] 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

A. Fire Name: Tobin Complex

B. Fire Number: P13507

C. State: Montana

D. County: Powder River

E. Region: 1

F. Forest: Custer

G. District: Ashland

H. Date Fire Started: 7/25/00

I. Date Fire Controlled: 8/4/00

J. Suppression Cost: $1.2 million

K. Fire Suppression Damages Repaired with WFSU-PF1 2 Funds:

1. Fireline waterbarred (miles): 0 currently; est. 13.42 miles, (30 feet wide) anticipated (0.07 mi Pvt and 13.35 NFS)

2. Fireline seeded (miles): 0 currently, 13.42 miles, (30 feet wide) anticipated (0.07 mi Pvt and 13.35 NFS) and 20 acres of staging areas, helispots, safety zones, drop points, porta-tanks, and camps)

3. Other (identify) Suppression guidelines provided upon request.

L. Watershed Number(s): Tobin Complex: 10090102070 (Daily; Tobin North Half and Tobin-3 Mile)

M. NFS Acres Burned: NFS: 8177 acres PVT 44 acres TOTAL: 8222 acres

Acres within Fire Perimeters: Daily 541 NFS; Tobin 7,638 NFS and 939 Private. Total Tobin Fire Complex: 8,223

N. Vegetation Types: Covertypes within burn perimeter

Fire Complex	Watershed	Wshed Acres	Acres Grasslands	% Grasslands	Acres Shrubland	% Shrublands	Acres Shrub-Grassland Complexes	% Shrub-Grasslands	Acres Tree-Grassland Complexes	% Tree-Grasslands	Acres Forestlands	% Forests	Acres Riparian	% Riparian	Acres Barren	% Barren	Acres Water
Tobin	**Tobin-Horse Cr N Half**	4407	1022	23%	455	10%	55	1%	710	16%	2049	46%	56	1%	60	1%	0
Tobin	**Tobin-3 Mile**	3222	985	31%	265	8%	70	2%	483	15%	1347	42%	17	1%	55	2%	0
Tobin	**Daily**	299	45	15%	8	3%	1	0%	89	30%	149	50%	7	2%	0	0%	0
Tobin Complex Overall		7928	2052	26%	728	9%	126	2%	1282	16%	3545	45%	80	1%	115	1%	0

0. Dominant Soils: Depths are mostly shallow to moderately deep. Particle size class are mostly fine loamy to loamy. Mineralogy classes are mixed. Dominate parent materials are slope alluvium and colluvium over residuum derived from softly consolidated interbedded silt, clay, and sandy shales. The dominate temperature regime is frigid. Dominant subgroups include Ustic Torriorthents, Ustic Haplargids, Lithic Haploborolls, Typic Argiborolls, Typic Haploborolls, and Typic Ustorthents.

P. Geologic Types: Interbedded silt, clay, and sandy shales.

Q. Miles of Stream Channels by Order or Class (includes crenulated/extended network):

Most streams within and adjacent to the burn area are intermittent.

Stream Orders:

Fire Name	Miles of Stream Order 1	Miles of Stream Order 2	Miles of Stream Order 3	Miles of Stream Order 4	Total Miles Stream
Tobin - Tobin	21	6			27
Tobin - Daily	1				1
Total					**28**

R. Transportation System (miles in burn perimeter):

	Trails	Roads	Total
NFS - Tobin	0	11.70	11.70
NFS - Daily	0	0	0
PVT	0	0.55	0.55
TOTAL	0	12.25	12.25

PART III - WATERSHED CONDITION

A. Fire Intensity (acres):

	Low	Moderate	High	Total
NFS	1909	2051	822	5718
PVT	33	4	0	37
TOTAL	2877	2055	822	5755

B. Water-Repellent Soil (acres):

About 50% of the burn exhibits a thin layer of hydrophobic conditions at the mineral soil surface. This layer is expected to brake down rapidly. Because of extremely low soil moisture conditions, most soils in the area exhibit to a limited degree some hydrophobic conditions unrelated to the burn.

NFS: 4089 acres PVT 22 acres TOTAL: 4111 acres

C. Soil Erosion Hazard Rating (acres):

	Low	Moderate	High	Total
NFS	490	1772	5915	8177
PVT	2	10	32	44
TOTAL	493 (6%)	1,782 (22%)	5,947 (72%)	8,222

D. Erosion Potential: 20 tons/acre

E. Sediment Potential: 900 cubic yards/square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period: 2-3 years (based on local knowledge of previous high intensity fire areas vegetative recovery with no treatment).

B. Design Chance of Success: N/A

C. Equivalent Design Recurrence Interval: 10 years

D. Design Storm Duration: 6 hours

E. Design Storm Magnitude: 3.15 inches

F. Design Flow: 4 cubic feet per second per square mile

G. Estimated Reduction in Infiltration: 70 percent

H. Adjusted Design Flow: 65 cubic feet per second per square mile

PART V - SUMMARY OF ANALYSIS

A. Describe Watershed Emergency:

The Tobin fire complex burned 8,222 acres. About 10-15% of the fire complex burned in an intense, fast moving crown fire through ponderosa pine forest. Large blocks of low and moderately burned areas are interspersed with localized areas that burned with high intensity. The fire severity (effects to soils) is moderate to low for the majority of the burn. High intensity burned areas (10-15%) exhibited high to moderate fire severity. Hydrophobic (water repellent) soil conditions exist at the mineral soil surface for about 50% of the burn. This surface layer is thin, which suggests it will break down rapidly over the winter and during spring green up. Because of extremely low soil moisture conditions, most soils in the area are exhibiting, to a limited degree, some “hydrophobic” properties unrelated to the burn.

Slope maps provide an indication of high potential for runoff and flash flood conditions. 70% of the burned area perimeter has slopes greater than 35%. 44% of the burned area perimeter have slopes greater than 60%. Steep slopes combined with a high percentage of the soils within the burn area being shallow to moderately deep with rapid to moderately rapid runoff potentials add to the naturally flash flood prone nature of the landscape. Until infiltration rates recover a risk exists for increased runoff and erosion beyond normal conditions.

The burned area is drained primarily by intermittent streams. These systems have evolved with debris flow events.

Local knowledge and observation of adjacent past fires indicate that ground cover will recover quickly in the first two growing seasons. Previous large fire erosion control seeding treatments were not successful in reducing emergency conditions; native vegetation regrowth was found to be more effective in providing ground cover. It is critical that this regrowth not be grazed this fall or next year.

The northern part of the Tobin fire burned about 44 acres of private lands. Agriculture developments for livestock grazing are common throughout the burned area. The general area is heavily used by local residents as well as others for a variety of recreational purposes. The Ponderosa Pine Ecosystems in eastern Montana has been identified as being at risk (Northern Region Overview), relative to these systems losing their functionality due to increased fuel loading. These areas are also some of the only public land available in Eastern Montana.

Due to the amount and type of human uses (sight seeing, hunting, etc) in the area, there are significant threats to public safety as a result of the fire. Hazard trees (burned trees with a high risk of falling) along roads and near structures pose a threat to public safety. There is an increased potential for damage to infrastructure, especially the road system, as a result of expected increases in runoff as a result of the fire. During extreme precipitation events, agricultural water facilities (such as irrigation and stock watering systems) and users downstream of the fire area are at increased risk due to flash flood events. This danger period will be the

greatest this fall and early next summer. It is critical that the road infrastructure be prepared for the increased flows.

Archeological sites are common throughout the burn. 2 sites (prehistoric) found within drainages in high intensity burn areas have been identified at risk. Sites in the Home Creek drainage is of immediate concern. These sites have the potential of being damaged from runoff events. They will need protection, possible recovery and monitoring.

Noxious weeds (15 acres Spotted Knapweed) have the potential spread and further degrade site potential / soil productivity. Spotted knapweed and leafy spurge spread is of immediate concern.

B. Emergency Treatment Objectives: The objective of emergency rehabilitation is to initiate action promptly for immediate rehabilitation of watersheds following wildfire to minimize the following potential effects, to the extent practicable, and in compliance with the Forest Land and Resource Management Plan (Forest plan):

1. Loss of Soil Productivity. Removal of the soil's protective cover increases the potential for accelerated soil erosion. Loss of surface soil horizons means loss of the nutrients, native seeds, and microorganisms that may affect the potential to achieve the desired future condition as stated in the Forest Plan.

2. Deterioration of Water Quality. Increased overland runoff results from destruction of the vegetative cover, development of water repellent soils, and consumption of organic litter. The increased runoff lowers water quality due to increased channel scour, sedimentation, and nutrient concentrations.

3. Threats to Human Life and Property. High water, sediment, debris flows, and soil mass movement are potential sources of damage to human health and safety, and property following wildfires.

The conditions that seem to create the more hazardous emergency watershed situations are:

- High-intensity fire, with long residence times.
- Site characteristics affected by high-intensity fire, such as the site factors that create water-repellent soils or loss of protective soil cover.
- On-site sediments that may be stored upslope of plant root crowns and organic debris, in depressions, and in other places. If the fire consumes the root crown and organic debris, then the sediments are released. If the fire also significantly increases the runoff efficiency, then excessive overland runoff can suspend and transport sediments that were stored on the slopes.

A variety of emergency treatments are recommended to significantly reduce the risk of emergency watershed conditions and threats to public health and safety. Treatment objectives designed to reduce the increased risk to public health and safety in this area include:

- increasing public awareness of hazards, including implementation of warning system by signage and possible temporary area closures
- hazard tree assessments and removal

Treatments designed to reduce the areas with increased risk to flooding, water quality and soil erosion/productivity include:

- mitigation of fire effects to the drainage aspects of the road system
- integrated pest management to control the spread of noxious weeds in the burn area
- mitigation of animal damage in high burn intensity areas through fencing

Treatments designed to mitigate minor facility loss include:

- mitigation of fire effects to minor facilities such as land line corners and re-staking, and road sign replacement

Treatments designed to reduce the risk to National Register Eligible properties from increased runoff and erosion potential in high intensity burn areas susceptible to runoff events or overland flow loss include:

- mitigation of fire effects to sites through monitoring and site stabilization through seeding and straw bale placement

Coordination and cooperation between private landowners and federal land managers is critical to the implementation and effectiveness of these treatments within and downstream of the burn area.

Methods: Team Leader, Kent Houston and team members, Jim Goodwin and Ron Hecker, took a reconnaissance flight of the fire complex. On the ground field visits to Padget Creek, Brian Creek, Cow Creek, O'Dell Creek, Ft. Howes, and Tobin Fire were also conducted. Other team members made several field trips.

Both the Tobin and Ft. Howes fire complexes were observed aerially and information was collected. Percent burned and unburned were determined by sixth order watershed. Of the burned areas, percents were estimated as to fire intensity.

Team members looked at some of the following appropriate treatment options when making their assessments. Recommended treatments can be found under the Assessment and Findings section of this report:

- **Plant Materials.** Seeding or planting of grass, forbs, shrubs, or trees when needed to prevent unacceptable erosion, to prevent permanent impairment to ecosystem structure and function, or to prevent detrimental invasion by non-native plants. Natural recovery by native species is preferred. Removal or control of undesirable plants can be accomplished where needed to prevent permanent impairment of ecosystem structure and function.

- **Structures.** Structural measures when needed to prevent unacceptable erosion, to minimize unacceptable degradation of water quality, or to protect treated or recovering areas from uses that will cause erosion or interfere with recovery.

- **Hazard Removal, Warning, and Controls.** Stabilization or removal of physical hazards caused or aggravated by the fire that threaten life or property when there are no other protection options. Signing or other measures can be used to limit immediate threats to public safety or limit public access in order to protect treated or recovering areas.

- **Facility Replacement.** Replacement of destroyed or damaged minor facilities, such as signs or guardrails, where human health or safety is at risk and there are no other protection options.

- **Heritage Resources.** Consultation with Tribes, State historic preservation offices, and others, as well as the actions needed to stabilize and prevent unacceptable degradation of critical or significant cultural resources.

Land Treatments:

Purpose: To minimize soil loss, help maintain soil productivity, increase infiltration, and reduce runoff and expected increases in peak streamflows.

Treatment 1: Grazing on burned pastures will be deferred for at least 1 growth period (until seed set in year 2001, to allow vegetative recovery in the burn area. This is a critical part of this BAER plan, since the plan is not calling for emergency "seeding".

Effectiveness: Deferred grazing within the burn area will increase the effectiveness of natural revegetation.

Treatment 2: Integrated Pest Management (IPM) will be used to control the spread of noxious weeds in the burn area for three years following the fire. A combination of biological, and chemical techniques will be used. The inclusion of Noxious Weed Management is to prevent the aggressive spread and competition of the weeds after fire. The species found are Spotted Knapweed with known adjacent locations of Leafy Spurge. Rapid expansion and increased densities are expected from existing populations. Dozer's and fire crews may have introduced knapweed seeds from fire traffic through infested areas. Also, the Fire Camp in Ashland was infested with knapweed. Pest management has been addressed previously through NEPA analysis.

Effectiveness: Noxious weed treatments must occur annually over at least three years after the fire to be effective.

Purpose: Reduce the risk of recovery failure, in high fire intensity areas, due to animal damage.

Treatment 1: Reconstruct (19 miles) burn damaged fence in high fire intensity areas. Livestock use in high burn intensity areas, even after one season of deferment, could cause erosion or interfere with recovery. Since a reseeding effort is not part of this BAER plan, keeping livestock off of the burned areas is extremely important. This is a minimum standard fence designed to temporarily keep livestock off of the burned area.

Effectiveness: Fences can be effective in keeping livestock off high burn intensity areas allowing for maximum regrowth potential.

Channel Treatments:

See Cultural Resources below.

Roads Treatments:

Purpose: Reduce the risk of transportation system drainage failure that could increase erosion, sedimentation, and cause downstream damage. Soils in the burned area are all classified as being "poor" road fill material. Existing road structures are composed of this poorly rated material.

Treatment 1: Armor (approximately 192 federal and 16 private) culvert inlets and outlets, and rolling dips that are expected to receive increased flows and/or have minimal ground cover protection below outlet as a result of intense burning.

Effectiveness: Armoring is effective immediately following installation and will remain effective over time in the burn area. Scour at inlet and outlet is reduced, although culvert capacity/efficiency is not expected to change. With the soils being mostly fine loamy to loamy material and the increased flows due to the lack of vegetation, armoring is needed where we are channeling this increased flow to dissipate energy reducing the erosion at these sites. With out armoring at the inlets and outlets of the drainage structures, the erosive soil (which these structures are built in) erodes away causing the whole drainage structure to fail.

As stated in the Water/Road Interaction Technology Series, relief culverts provide drainage and reduce maintenance in highly erodible or rutttable soils not conducive to reliable surface cross drain function. The outlet must be protected from erosion.

Treatment 2: Inspect and clean culverts (approximately 12 miles federal and 1 mile private) (storm patrol).

Effectiveness: Patrol can be effective to clear and maintain culvert entrances during storms.

Treatment 3: Install additional drainage capacity (culverts (approximately 24 federal and 2 private) and rolling dips (approximately 96 federal and 8 private)) to accommodate increased runoff as a result of the fire.

Effectiveness: Additional drainage capacity is very effective immediately following installation and will remain effective over time in the burn area. Effectiveness is limited by the ability to quickly and accurately determine the increased size of culvert necessary to accommodate increased peak flows.

Purpose: Reduce the risk to human life from burned “hazard” trees along roads and trails.

Treatment 1: Survey roads, and trails within moderate to high intensity burn areas for hazard trees. To the degree landowners allow, remove those trees identified as hazardous to public safety.

Effectiveness: Assessment and removal of hazard trees is believed to be a very effective means to protect public safety along roads and trails.

Treatment 2: Remove identified hazard trees within moderate to high intensity burn areas. To the degree landowners allow, remove those trees identified as hazardous to public safety. Ensure that timely removal is implemented on highest priority roads. Ensure safe tree removal operations within hazard tree and windfall prone areas. Ensure that proper closures and/or flaggers are employed. Ensure that merchantable hazard trees are felled with no bucking, lopped and scattered. Areas of high high traffic use, pile brush rather than scattering. Non-merchantable hazard trees within identified salvage areas are to be felled, bucked, lopped and scattered. In non-salvage areas, fell, buck, lop and scatter.

Effectiveness: Assessment and removal of hazard trees is believed to be a very effective means to protect public safety along roads and trails.

Treatment 3: Install warning and/or temporary closure signs due to hazard tree conditions.

Effectiveness: This treatment is believed to be an effective means to reduce human health and safety considerations in high risk hazard tree areas, until hazards have been removed.

Facilities:

Purpose: Reduce the risk to facilities from sedimentation due to runoff events..

Treatment 1: After first or second runoff event, clean sediment out of three maintained reservoirs . To the degree landowners allow, clean out sediment trapped in maintained reservoirs as follows:

Dearborn Reservoir	T3S R46E	S22
Andersen Reservoir	T6S R45E	S4
Jellison Reservoir	T4S R46E	S3

Effectiveness: Cleaning out sediment from runoff after the first or second runoff event is believed to be a very effective means to mitigate impacts from burn area runoff.

Purpose: Restore Forest road signs.

Treatment 1: Inspect and replace road signs damaged or destroyed by fire.

Effectiveness: Replacing road signs is an effective means to assist in orientation of workforce that will be implementing burn area rehabilitation efforts.

Cultural Resources:

Purpose: Reduce the risk to Natural Register Eligible properties from increased runoff and erosion potential in high intensity burn areas susceptible to runoff events or overland flow.

Treatment 1: Evaluate, monitor, protect, and/or recover two cultural properties identified within drainage ways within high burn intensity areas (3 years). These sites include prehistoric campsites.

Effectiveness: Monitoring sites relative to potential runoff events can be effective in reducing damage to cultural properties.

Treatment 2: Provide protective measures such as bank stabilization and/or seeding as appropriate for sites pending additional monitoring. Initial treatments of straw bale placement (with wood stakes) above and below site in gentle meandering stream systems will be applied along with seeding (24PR95-Home, 24PR 607-Home). Sites near steeper slopes will be seeded.

Effectiveness: Straw or hay bale stabilization and/or seeding is believed to be an effective means to mitigate site deterioration from runoff events. If these measures fail, full scale data recovery may be necessary.

Other:

Purpose: Reduce the risk to public health and safety.

Treatment 1: Provide public information (brochures, public meetings, personal contacts, etc.) to increase the knowledge about hazards that exist from the recent fire in the area, such as hazard trees.

Effectiveness: Can be highly effective in reducing risk to public safety and mitigating effect to structural damage. Provides some level of effectiveness in the event of a rare, but extreme climatic event.

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

The Tobin fire area sits in an area very prone to localized but sometimes very intense rainfall with a maximum climatological probability of occurrence from mid July through late August. More widespread precipitation events, but at lower rainfall intensities, are most common over that area from late April through early June and again in September and early October.

Assuming the first major damage-producing storm occurs in July, the estimated probability of completing treatments before that time is shown below:

Land: 25 % Cultural: 60% Roads: 50% Weeds: 40% Other: 80%

D. Probability of Treatment Success

Probability of treatment success can be controlled by planning, design and quick implementation of appropriate and effective treatments. Probability of treatment success is also dependant on climatic conditions, which cannot be controlled. Probability of treatment success is estimated for the basic categories of treatments below.

	Years after treatments		
	1	**3**	**5**
Land & Cultural	50	70	90
Facilities	50	70	90
Roads	70	80	90
Other	90	90	90

E. Cost of No Action (Including Loss): $4,197,073

F. Cost of Selected Alternative (Including Loss): $216,647

G. Skills Represented on Burn Area Survey Team:

Kent Houston, Soil Scientist
Kim Reid, Rangeland Management Specialist
Jim Goodwin, Rangeland Technician
Ron Hecker, Planning
Scott Studiner, Rangeland Management Specialist

Jeff DiBenedetto, Ecologist
Mark Aughtman, Surveying Technician
Brenda Christensen, Engineer
Dennis Sanbak, Silviculturalist
Arlin Krogstad, Engineer
Halcyon Lapoint, Archeologist

Team Leader: Kent Houston
Phone: (307) 527-6241 email: khouston@fs.fed.us

Team Member: Kim Reid
Phone: (406) 657-6200 ext. 233 email: kreid@fs.fed.us

District Ranger: Elizabeth McFarland
Phone: (406) 784-2350 email: emcfarland@fs.fed.us

Tobin Fire Complex
Post-fire Burn Area Emergency Rehabilitation
Monitoring Plan

Proposed activities

(1) Monitor ground cover/vegetation. The vegetative recovery will be measured at different scales. Satellite imagery change detection will help assess recovery. Approximately 5 will be run to compare the vegetative cover on different severity and treatments in late summer 2000, in early summer 2001, and again in late summer 2001. Estimated cost to collect and analyze the data is **$ 2215** ($180 baseline imagery; $180 followup imagery supplies $100; salary $1600 (8 persondays @ $200/day); mileage/perdiem

(2) Monitor cultural treatments. Monitor 2 cultural sites (prehistoric campsites) and identify any necessary mitigation measures. ($600 salary (3 persondays); mileage/perdiem $200) The total is **$600**

(3) Monitor effectiveness of noxious weed infestations and new starts. Known and suspected weed locations will be monitored annually for three years. Treatment effectiveness, species, density and location will be addressed. With expected spread of weeds, three years of annual monitoring is to be done. Estimated annual cost is $ 675 ($600 salary (3 persondays); mileage/perdiem $75) The three year total is **$2205**

(4) Monitor for animal damage. High intensity burn areas will be monitored for one year to ensure livestock do not enter those areas until sufficient perennial ground cover has been established. Estimated annual cost is **$ 675** ($600 salary (3 persondays); mileage/perdiem $75)

(5) Monitor implementation. A key component to interpreting the larger-scale data is to determine the extent to which the proposed treatments were implemented as planned. The total is **$1000**

PART VII - APPROVALS

The Forest considered a recommended option as compared to a no action option. The recommended treatment option is shown in Part VI. The recommended option emphasizes treatments that will be most effective immediately after implementation (e.g. road drainage and hazard tree removal) and does not propose treatments that are less effective in the first season (e.g. seeding).

The Custer National Forest does not have sufficient resources locally to implement the recommended treatments in a timely fashion. Contracting will be needed. This will require additional funding, beyond what is shown in Part VI, to accommodate this logistical support.

/s/ Nancy T.Curriden **August 15, 2000**
Nancy T. Curriden date
Forest Supervisor

_____ _____
Dale Bosworth date
Regional Forester

Costs associated with potential loss of on-site and off-site resource values -
Forage, Timber, Cultural, Soil Productivity, Noxious Weeds

SILC2 Imagery & BAER Fire Intensity Info	Watershed	Acres Grasslands	Acres Shrubland	Acres Shrub-Grassland Complexes	Acres Riparian	Subtotal	%Burn	Burned Ac	Forage Value @ $0.54/Ac*	Acres Tree-Grassland Complexes	Acres Forestlands	Subtotal	%Burn	Burned Ac	Timber Value @ $750/Ac	Timber and Forage Value by Watershed
									$0.54						$750	
Ft. Howes-Stag	**King**	2296	1297	11	18	3622	65%	2354	$1,271	1094	5253	6347	65%	4126	$3,094,163	$3,095,434
Ft. Howes-Stag	**O'Dell**	4375	851	513	574	6313	65%	4103	$2,216	1422	9965	11387	65%	7402	$5,551,163	$5,553,378
Ft. Howes-Stag	**Horse Cr**	1681	368	128	222	2399	55%	1319	$713	409	609	1018	55%	560	$419,925	$420,638
Ft. Howes-Stag	**Cow Creek**	4012	1596	276	318	6202	70%	4341	$2,344	1457	4195	5652	70%	3956	$2,967,300	$2,969,644
Ft. Howes-Stag	**Brian Cr**	392	188	61	83	724	65%	471	$254	300	1943	2243	65%	1458	$1,093,463	$1,093,717
Ft. Howes-Stag	**Padget Cr**	1978	659	74	295	3006	65%	1954	$1,055	855	4108	4963	65%	3226	$2,419,463	$2,420,518
Ft. Howes-Stag	**Newell & Chromo**	916	652	23	2	1593	75%	1195	$645	217	863	1080	75%	810	$607,500	$608,145
Subtotal	**Subtotal**	15650	5611	1086	1512	23859		15738	**$8,499**	5754	26936	32690		21537	**$16,153,725**	$16,162,224
Ft. Howes-Morris Cr	**Morris Cr**	7	5	0	0	12	65%	8	$4	4	18	22	65%	14	$10,725	$10,729
Ft. Howes-Hog Butte	**Hog Butte**	105	25	40	1	171	65%	111	$60	0	11	11	65%	7	$5,363	$5,423
Ft. Howes-Stevens	**Stevens**	33	0	133	0	166	55%	91	$49	167	234	401	55%	221	$165,413	$165,462
Ft. Howes-Taylor	**Taylor**	352	142	83	2	579	65%	376	$203	171	292	463	65%	301	$225,713	$225,916
Ft. Howes-Stag Spot	**Stag Spot**	8	26	0	0	34	65%	22	$12	17	7	24	65%	16	$11,700	$11,712
Ft. Howes Complex Overall	**Total**	16155	5809	1342	1515	24821		16347	**$8,828**	6113	27498	33611		22096	**$16,572,638**	**$16,581,465**

Tobin	**Tobin-N Half**	1022	455	55	56	1588	70%	1112	$600	710	2049	2759	70%	1931	**$1,448,475**	**$1,449,075**
Tobin	**Tobin-3 Mile**	985	265	70	17	1337	65%	869	$469	483	1347	1830	65%	1190	$892,125	$892,594
Tobin	**Daily**	45	8	1	7	61	80%	49	$26	89	149	238	80%	190	$142,800	$142,826
Tobin Complex Overall	**Total**	2052	728	126	80	2986		2029	**$1,096**	1282	3545	4827		3311	**$2,483,400**	$2,484,496
Grand	**Total**								**$9,924**						**$19,056,038**	**$19,065,961**

***Forage Value @ $0.54/Ac: Assumes 2.5 Ac/head month divided by 1 Ac times the current grazing fee of $1.35/head month = $0.54/Acre**

Loss of Soil Productivity:

900 cubic yards/sq mile (20T/Ac) times $5/cubic yard delivered = $4500 x 61 sq miles (39,323 burned ac) **= $274,500 Ft. Howes Complex** and $4500 x 9 sq miles (5755 burned ac) = **$40,500 Tobin Complex** (based on local cost estimate of $125/25 cubic yards delivered)

Loss of Property: Cultural 11 sites-Ft. Howes Complex and 2 sites Tobin Complex at $1000/sq meter to excavate and data recovery at 1/3 sample of 0.6 acres @ each site--(2428 sq meters)/site = **$8,902,667 Ft. Howes Complex and $1,618,667 Tobin Complex**

Loss of Native Perennial Plant Functionality due to Noxious Weed Infestation:

Lands infested with noxious weeds have higher erosion potentials, lower habitat values for native animal species, crowd out native plant species, and impact recreational opportunities by infesting campsites. $75/Acre X 38,442 Ac = $2,883,150 Ft Howes Complex and 5,341 Ac = $400,575 Tobin Complex

Summary	**Ft Howes**			**Tobin**	
Forage		$8,828			$1,096
Timber		$16,572,638			$2,483,400
Soil		$274,500			$40,500
Cultural		$8,902,667			$1,618,667
Nx Weed		$2,883,150			$400,575
Total		**$28,641,783**			$4,544,238

Tobin Fire Complex			NFS LANDS			PRIVATE LANDS			
Line Items	Units	Unit Cost $	Number of Units	FFFS-FW22$	Other $	Number of Units	FFFS-FW22$	Other $	Total $
A. Land Treatments									
Deferred Grazing	acre			$0					$0
IPM-Chemical*	acre	$60	23	$1,380					$1,380
IPM-Biological	acre	$1,000	8	$8,000					$8,000
Fence	mile	$3,599	19	$68,381					$68,381
B. Road Treatments**									
Culvert & Rolling Dip Armoring (12 mi x16/mi)	each	$300	192	$57,600					$57,600
Storm Patrol	miles	$100	12	$1,200					$1,200
Add'l Culvert Capacity	each	$1,000	24	$24,000					$24,000
Add'l Rolling Dips	each	$300	96	$28,800					$28,800
Hazard Tree Removal-includes signing for temp road closure or flagmen [30% of nf rds/5% pvt rds]	miles	$1,300	4	$5,200					$6,500
Closures/Warning Signs									
Materials (6' carsonite triflex posts @$15 ea, custom decals @$4 ea, Driver @$109, Pilothole driver @$135)	each	$23	20	$460					$460
Labor (3 persondays)	job	$300	1	$300					$300
C. Facilities									

D. Heritage Resources									
Site Stabilization (weed seed free straw, seed, wood stakes - both up and down from site; 24PR95, 24PR607 Tobin)	site	$600	2	$1,200					$1,200
Seed Steeper Sites	site	$162	2	$324					$324
E. Other									
Public Information	each	$1,000		$1,000					$1,000
F. BAER Evaluation/Adm Support									
Survey/assess. team	job	$1,000	1	$1,000					$1,000
G. Monitoring Plan									
Ground Cover	job	$3,615	1	$3,615					$2,215
Cultural Sites* **	job	$5,100	1	$5,100					$600
Noxious Weeds* **	job	$2,025	1	$2,025					$2,025
Animal Damage* **	job	$2,025	1	$2,025					$675
Implementation * **	job	$4,800	1	$4,800					$1,000
Total				$216,647			$10,612		**$216,647**

***Redtop-15 ac plus 20% for perimeter spread times three years treatment**

****From R1 Engineering Cost Estimating Guide Handbook 2/2000**

--16 Culverts-Dips/mile (4 culverts and 12 dips/mile); assume that 2 culvert and 4 dips /mi exit and 2 culverts and 8 dips/mi add'l are needed

*****Indicates a three year total cost (noxious weed acreage represents acres treated in three years)**