

Date of Report: February 23,2007

BURNED-AREA REPORT

(Reference FSH 2509.13)

PART I - TYPE OF REQUEST**A. Type of Report**

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

B. Type of Action

- ☐ 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)
☒ 2. **Interim Request #4**
☒ Updating the initial funding request based on more accurate site data or design analysis
☐ Status of accomplishments to date
☐ 3. Final Report (Following completion of work)

PART II - BURNED-AREA DESCRIPTION

- A. Fire Name: Derby Mountain B. Fire Number: MT-GNF-000047
C. State: Montana D. County: Sweet Grass/ Stillwater
E. Region: Northern F. Forest: Gallatin/Custer
G. District: Big Timber/Beartooth H. Fire Incident Job Code: P1C4YP
I. Date Fire Started: August 22, 2006 J. Date Fire Contained: 95% to date
K. Suppression Cost: \$20.74 million to date (includes suppression rehab)
L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline rehabilitated (miles): 230 miles of dozer line rehabilitated to date
2. Fireline seeded (miles): in process 3. Other (identify): na
M. Watershed Number: 10070002, 10070004, 10070005
N. Total Acres Burned:207,115
NFS Acres (71,114 est.) Other Federal (7,020 est.) State (5,486 est.) Private (123,495 est.)
O. Vegetation Types: Mixed grass/shrubland (50% of fire area) and ponderosa pine, lodgepole pine and Douglas fir forests (50%).

P. Dominant Soils: Heavy clay with landslide potential in southeast areas; remainder are medium textured soils weathered from interbedded sandstones and shales.

Q. Geologic Types: Cretaceous sandstone and shales; Livingston group; thinly interbedded sandstone and shales; some Tertiary Intrusive rocks

R. Miles of Stream Channels by Order or Class: NA

S. Transportation System:

OWNERSHIP	ROADS	TRAILS
Sweet Grass and Stillwater County	85	0
Gallatin and Custer National Forest	91	66
Bureau of Land Management	5	0
Montana School Trust Land	4	0
Grand Total	185	66

PART III - WATERSHED CONDITION

A. Burn Intensity and Severity: See Derby Fire Burned Area Map for burn intensity.

BURN INTENSITY (Fire effects on overstory vegetation)

OWNERSHIP	FOREST LAND			RANGE LAND		OTHER (Rockland, water, etc)	TOTAL
	HIGH	MOD	UN- BURNED	BURNED	UN- BURNED		
Private- Sweet Grass and Stillwater County	23957	8242	6293	66130	18497	376	123495 (60%)
Gallatin and Custer National Forest	35138	10561	11748	10326	1883	1458	71114 (34%)
Bureau of Land Management	3205	818	340	2420	194	43	7020 (3%)
Montana School Trust Land	869	465	516	3330	296	10	5486 (3%)
Grand Total	63169 (31%)	20086 (10%)	18897 (9%)	82206 (40%)	20870 (10%)	1887 (<1%)	207,115

SOIL BURN SEVERITY (Fire effects on groundcover and soils)

OWNERSHIP	SEVERITY			UN-BURNED	OTHER (Rockland, water, etc)	TOTAL
	HIGH	MOD	LOW			
Private- Sweet Grass and Stillwater County	1459	20117	77608	23937	374	123495 (60%)
Gallatin and Custer National Forest	5777	28784	22111	13188	1255	71114 (34%)
Bureau of Land Management	263	3360	2898	457	42	7020 (3%)
Montana School Trust Land	10	718	3986	763	9	5486 (3%)
Grand Total	7509 (4%)	52979 (26%)	106603 (51%)	38345 (19%)	1680 (<1%)	207,115

Note: all grassland soils are rated as "Low" soil burn severity.

B. Water-Repellent Soil (acres): 8,645

C. Soil Erosion Hazard Rating (acres):

- 142,479 (low) 12,681 (moderate) 12,035 (high)
 D. Erosion Potential: 26.5 ton/acre (2 year return-interval storm)
 E. Sediment Potential: 3,768 cubic yards / square mile (2 year return-interval storm)

PART IV - HYDROLOGIC DESIGN FACTORS

- A. Estimated Vegetative Recovery Period, (years): 2 yr grass/shrub understory
 B. Design Chance of Success, (percent): 80%
 C. Equivalent Design Recurrence Interval, (years): 5 yr (burn storm interval)
 D. Design Storm Duration, (hours): 6hr and 1 hr
 E. Design Storm Magnitude, (inches): 1.5 (6hr); 0.92 (1hr)
 F. Design Flow, (cubic feet/second/square mile): 11.3 CSM
 G. Estimated Reduction in Infiltration, (percent): 30%
 H. Adjusted Design Flow, (cfs per square mile): 14.6 CSM

PART V - SUMMARY OF ANALYSIS

A. CRITICAL RESOURCE VALUES AND THREATS

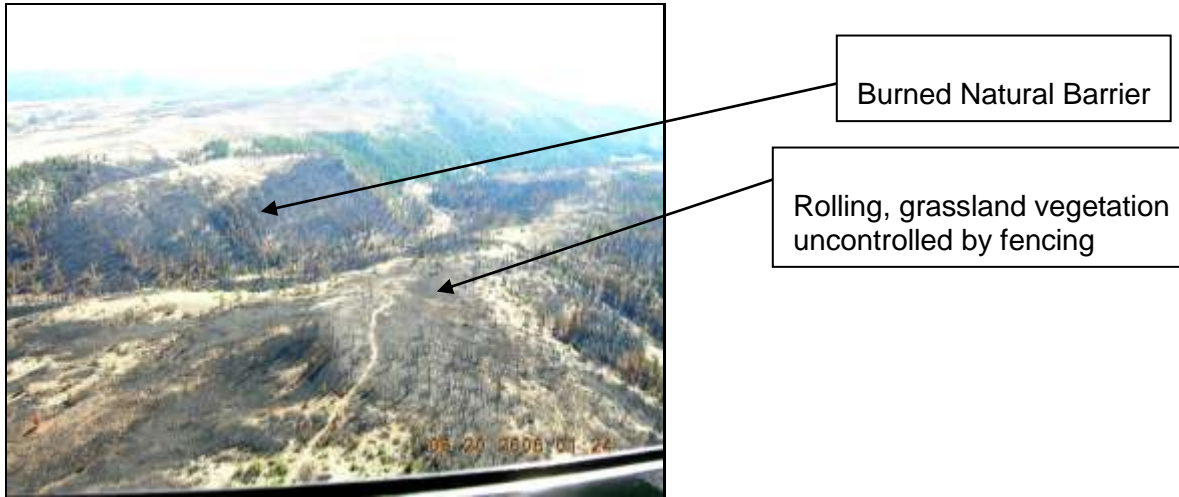
This interim request addresses only additional interim needs for fencing for treatment protection and drainage dip construction specified, but not requested in earlier 2500-8 reports.

The Derby fire burned across 207,115 acres from high-elevation public forest land to low elevation private rangeland. The primary values at risk on public land are transportation routes (roads and trails), rangeland forage and sensitive fish populations. The primary values at-risk on private land include transportation routes (roads), rangeland forage, and homes and outbuildings. The primary threats to both ownerships include post-fire flood flows, erosion and sedimentation, lack of livestock control for rangeland recovery and extensive weed spread potential from existing weed infestations.

Peak flow potential for several of the Derby fire watersheds has increased substantially. In some of the most burned watersheds a given rain event is projected to have substantially higher runoff. For example in Derby Gulch the 5 year (return interval) burned storm flow event is estimated at 322 cfs which is the same as the 50 year (return interval) unburned storm of 322 cfs. Peak flow increase potential is greatest in smaller watersheds where individual storm cells can impact a higher percentage of a watershed. In the larger watersheds in the fire area, such as Bridger Creek and Upper and Lower Deer Creeks, peak flow increase due to relatively frequent storm flow events is much less. Much of the fire area has relatively low winter snowpack accumulation which combined with the peak flow desynchronization of earlier melt on south facing slopes limits snowmelt stream flow increase from the Derby fire. Due to the predominance of high soil burn severity, steep slopes, and erosive soils, particularly in the Derby, Deer, and Bridger Creek areas, significant erosion and stream-sediment delivery is possible.

Vegetation and Soil Productivity: Invasive Plant Species: The fire burned over 82,000 acres of rangeland across all ownerships. The National Forests do not have control over adjacent landowner grazing management, and controlling boundary fence-lines have burned. This is illustrated by the attached burn map which shows high-intensity or grassland burn across nearly the entire National Forest boundary. Forest land is surrounded on three sides by working ranches and rangeland vegetation types extend well within the boundary. Natural barriers of forest have burned and though some of the

topography is quite rugged, most areas near the Forest boundary are rolling slopes formerly covered by a mixture of forest and rangeland vegetation.



Northern Derby Fire - Illustrative Burned Area

Soils were not significantly damaged by the fire, but almost the entire area burned, leaving most soils bare of vegetation. Bare soils will revegetate rapidly if left undisturbed, but will probably be damaged if grazed before vegetation recovers. Burned riparian areas are also at risk, because these attract cattle use, and many have no remaining buffering vegetation. The values at-risk include rangeland forage, soil productivity, and terrestrial and aquatic habitat.

Earlier requests specified about 60 acres of native grass seeding to provide critical competition with established infestations on Forest Service land. Both the Gallatin and Custer National Forests have invasive species treatment environmental assessments.

Roads and Trails: Many of the roads in the Derby fire area were designed and built without adequate drainage or stream crossing culvert capacity. Post-fire flooding will compound the potential risk to these sites. Maintenance has been poor, and some areas having potential for increased stream flow. Ditches may contribute significant debris to culvert inlets, with probable plugging. Failure of culverts could contribute to flooding and sediment to streams and aquatic systems unless proper drainage is re-established. This is critical in the first two years until vegetation re-establishment reduces sediment, debris, and water movement.

B. EMERGENCY TREATMENT OBJECTIVES

Vegetation and Soil Productivity: Invasive Plant Species One land treatment and one recommendation have been identified for burned area emergency response on National Forest; livestock exclusion from burned area via temporary fence constructed on the Forest boundary, and permitted livestock deferment for two years.

- Fence-line:** Soils and vegetation will recover rapidly if left relatively undisturbed. Therefore no hillslope treatments are recommended, with one exception (60 acres of seeding). See attached map for seeding location. Exclusion of disturbance is needed to protect the treatment from cattle grazing. The objective of this treatment is to discourage grazing disturbance by cattle and wildlife during the recovery period. About 43 miles of boundary fence are in the burned area and are now ineffective because of damage to posts, wire, or supporting structures. However, only 6.5 miles is requested to protect this seeded area. Sampling indicated almost all the rangeland protective fence was burned and many natural barriers are no longer effective. Temporary fencing should be constructed to prevent resource damage during recovery.

- **Livestock Deferment:** This is projected to be two growing seasons, with the first growing season beginning the spring of 2007. Sometimes post-freeze light grazing can be allowed after the first growing period depending upon the recovery of vegetation. However, since cattle tend to browse woody species in the fall where hardwood draws exist, continued deferment rather than allowing light late season grazing is generally preferable to allow these vegetation types to get a jump-start on recovery. Continued deferment in late fall also prevents mechanical injury to these vegetation types from livestock shading in these areas. Deferment also allows for litter accumulation to protect soils.

Roads and Trails: The objective of the road and trail treatments is to protect these travel routes and downstream aquatic systems from the consequences of post-fire flow events likely in the first two years. Without treatment, these sites and routes will be at high risk of washing out, losing the investment in the travel route while also contributing sediment to the aquatic ecosystem. Previous requests addressed increasing capacity by up-sizing culverts and armoring inlets and outlets. The purpose of the present treatment is to improve drainage across the road template by installing drainage dips to carry excess water across without excess erosion.

C. Probability of Completing Treatment Prior to Damaging Storm or Event

Land 90
 Channel 90
 Roads 90

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land			
Boundary Fence Treatment	90	90	100

E. Cost of No-Action (Including Loss):_ \$15,443,000 (all BAER treatments)

F. Cost of Selected Alternative (Including Loss): \$4,182,117

G. Skills Represented on Burned-Area Survey Team:

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input checked="" type="checkbox"/> Geology	<input checked="" type="checkbox"/> Range
<input checked="" type="checkbox"/> Forestry	<input checked="" type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input checked="" type="checkbox"/> Engineering
<input type="checkbox"/> Contracting	<input type="checkbox"/> Ecology	<input checked="" type="checkbox"/> Botany	<input checked="" type="checkbox"/> Archaeology
<input checked="" type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input checked="" type="checkbox"/> GIS

Team Leader: Henry Shovic Email: hshovic@fs.fed.us Phone:406-587-6714 FAX:406-587-6758

H. TREATMENT NARRATIVE

- **Vegetation and Soil Productivity: Invasive Plant Species:** About 43 miles of boundary fence are in the burned area and are now ineffective because of damage to posts, wire, or supporting structures. Temporary fencing should be constructed to prevent resource damage during recovery. See the attached map for location and extent of the fence and seeded area. *The 6.5 miles of temporary is requested to protect this seeded area.*

Roads and Trails: Proposed road BAER emergency treatments to the road and trail systems include a number of improvements to handle potential increases in erosion and stormflow events. Fourteen different road segments need some level of emergency treatment. Road specifications were developed for reconditioning 31 miles of road, installing 124 drain dips, installing overflow dips at culverts, removing 9 culverts, replacing, installing or replacing (upsizing) 30 culverts, re-conditioning several drainage structures, seeding 19 acres around drainage structures, and partial decommissioning (re-contouring) 2.8 miles of roads that have steep grades, erosive soils, and spill in to the stream system. *Previous requests asked for 48 of the specified 124 drainage dips. **This request is only for the remaining 76 dips not previously funded.***

I. MONITORING NARRATIVE

PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS

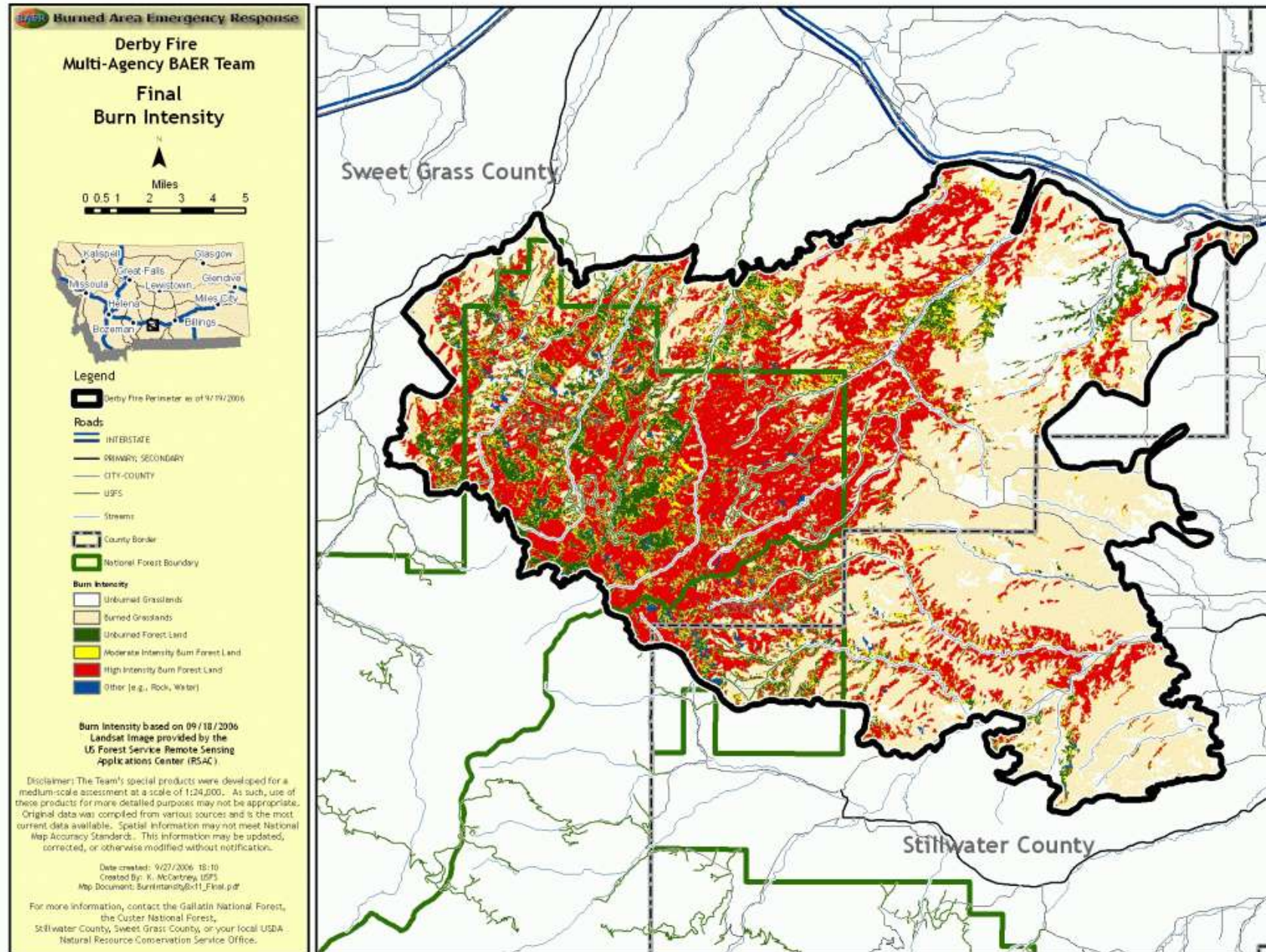
Interim Request #4 - SEE the table below.

PART VII - APPROVALS

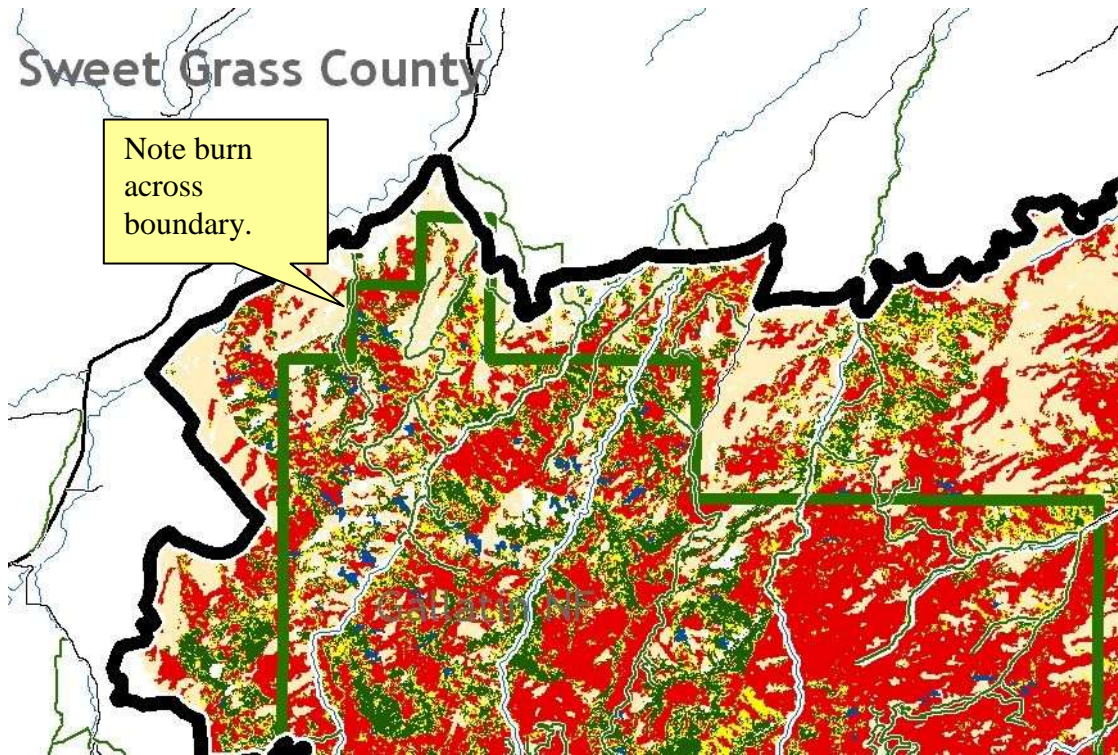
1. _____
Gallatin Forest Supervisor (signature) Date
2. _____
n/a (no treatments)
Custer Forest Supervisor (signature) Date
3. _____
Regional Forester (signature) Date

DERBY BAER 11/09/2006			NFS Lands					Other Lands			All
Interim Request #3		Unit	# of		Other		# of	Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	BAER \$	\$		units	\$	Units	\$	\$
A. Land Treatments *											
Boundary Fence - Temporary	Miles	4000	6.5	\$26,000	\$0			\$0		\$	\$
<i>Subtotal Land Treatments</i>				\$26,000	\$0			\$0		\$0	
B. Channel Treatments *											
<i>Subtotal Channel Treatments</i>											
C. Roads and Trails*											
Drainage Excavation, type drain dips	Ea	290	76	\$22,040							
<i>Subtotal Road and Trail Treatments</i>				\$22,040							
D. Protection/Safety											
E. BAER Evaluation											
F. Monitoring											
Aerial Monitoring											
<i>Subtotal Monitoring</i>											
G. Totals								\$0		\$	\$
Previously approved				\$1,455,007							
Total for this request				\$48,040							

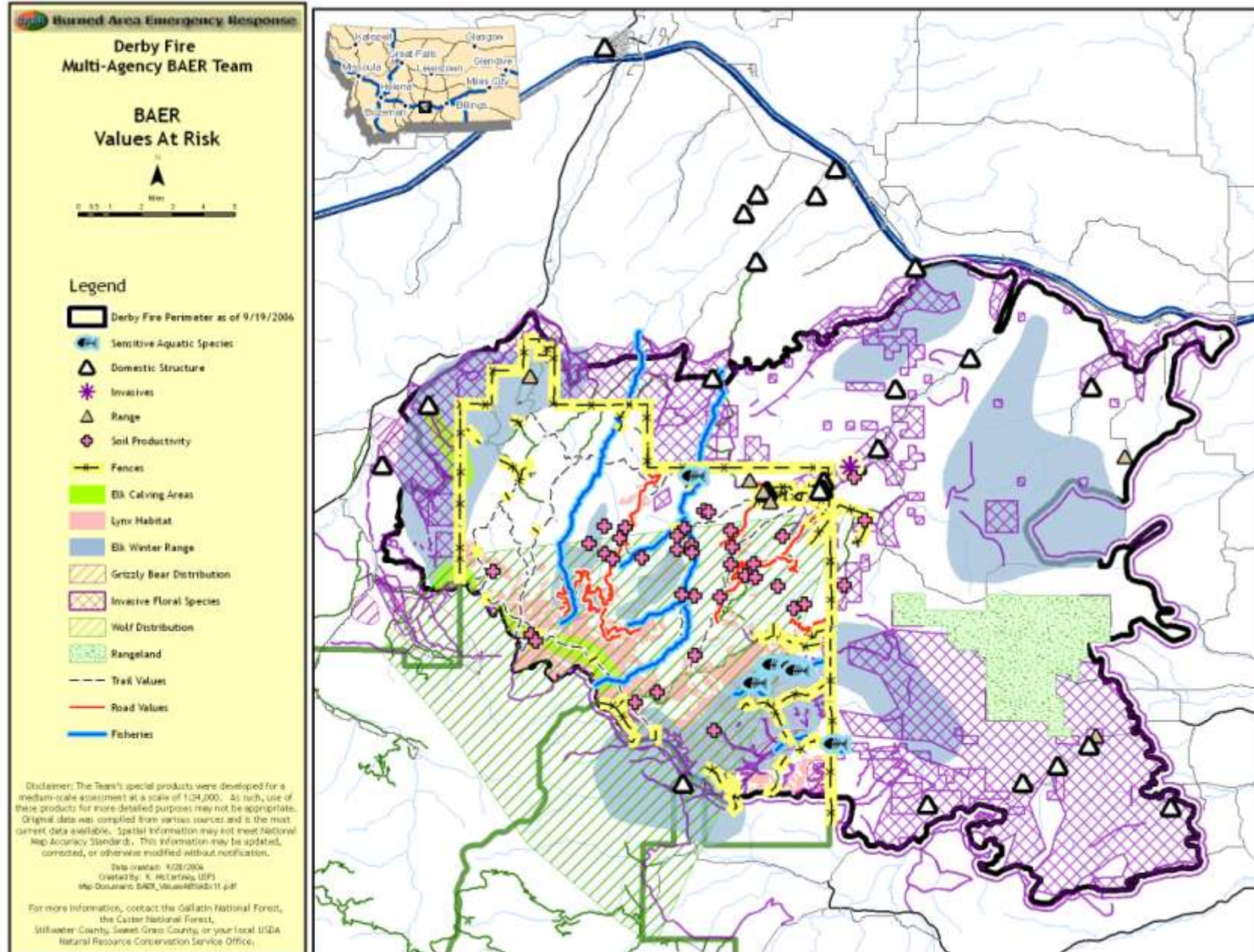
Derby Fire Burned Area Map



Derby Fire Burned Area Map Closeup



Derby Fire Values at Risk



Derby Fire Values at Risk Closeup of Seeded Area Protection Fence

