USDA-FOREST SERVICE FS-2500-8 (7/00)

Date of Report: 8/26/05

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

[ ] 1. Funding request for estimated WFSU-SULT funds
[X] 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 or design analysis
[ ] Status of accomplishments to date

[X] 3. Final Report (Following completion of work)

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Alpine Lake Fire

B. Fire Number: MN-SUF-249

C. State: MN

D. County: Cook

E. Region: 9

F. Forest: Superior

G. District: Gunflint

H. Date Fire Started: 8/6/2005

I. Date Fire Contained: 8/19/2005

J. Suppression Cost: $2,536,845

K. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 0
2. Fireline seeded (miles): 0
3. Other (identify): No scratch lines were used. All disturbances (hose lay lines, helispots) are being rehabed during mop up.

L. Watershed Number: 09030001020 (Sea Gull Lake Watershed)

M. Total Acres Burned: 1335
NFS Acres(1135 approx.) Other Federal ( ) State ( ) Private ( ) County (200 approx)

N. Vegetation Types: Predominantly jack pine, and aspen-birch, with scattered red and white pine in uplands; grass, sedges, brush, and occasional black spruce, cedar and tamarack in wetlands.

O. Dominant Soils: Entire burn is within Landtype Association (LA) 21. High percentages of this LA have shallow soils, often shallow to bedrock, with bedrock outcropping common. Materials are primarily loamy till

with small areas of sandy outwash on the uplands, and peat in the lowlands. Component Ecological Landtypes (ELTs) in this LA include upland ELT #s 13 (Deep Loamy Dry Coarse), 16 (Shallow Loamy Dry), 17 (Very Shallow Loamy Droughty, 18 (Extremely Shallow Loamy Droughty), and wetland ELT #s 2 (Lowland Loamy Wet) and 6 (Lowland Organic Acid to Neutral).

P. Geologic Types: Burn area lies within the Saganaga Intrusives, which are included in the Vermilion Geomorphic Province. This is a bedrock dominated landscape. These areas are underlain by massive granitic rocks that contain occasional zones of partly assimulated volcanics or sediments. The most pronounced structure is a fairly well developed set of faults with directions of failure trending to the NW and NE. The faults provide zones of weakness that have been exploited by weathering and glacial erosion, creating lake basins. Large lakes tend to be located at the junctions of faults or groups of faults.

Q. Miles of Stream Channels by Order or Class: Streams within the burn area: approximately 0.95 miles of order 1 stream, consisting of 0.75 miles along the stream which flows from Grandpa Lake to Sea Gull Lake, 0.1 mile along the stream flowing form Larry Lake into Diamond Lake, and 0.1 mile along the stream flowing from an unnamed pond into the extreme south end of Red Rock Lake. The fire also burned the following approximate linear distance of lake shoreline: Sea Gull Lake (1.75 lineal miles), Alpine Lake (0.25 lineal miles), Red Rock Lake (1.0 lineal miles), and Grandpa Lake (0.1 lineal miles).

R. Transportation System

Trails: 0 miles Roads: 0 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 40 (low) 30 (moderate) 30 (high)

B. Water-Repellent Soil (acres): 0

C. Soil Erosion Hazard Rating (acres):
___ (low) ___ (moderate) ___ (high)

D. Erosion Potential: ____ tons/acre

E. Sediment Potential: ____ cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 1

B. Design Chance of Success, (percent): ____

C. Equivalent Design Recurrence Interval, (years): ____

D. Design Storm Duration, (hours): ____

E. Design Storm Magnitude, (inches):

F. Design Flow, (cubic feet / second/ square mile): ____

G. Estimated Reduction in Infiltration, (percent): ____

H. Adjusted Design Flow, (cfs per square mile): ____

PART V - SUMMARY OF ANALYSIS

A. Describe Watershed Emergency:
The Alpine Lake Fire burned 1335 acres in the Boundary Water Canoe Area Wilderness. The fire burned through forested uplands and wetlands and resulted in a mosaic of burn severity throughout the burn area (see attached burn severity map). Potential 'values at risk' determined by the assessment team included hazard trees near campsites, degraded water quality at nearby resort water sources, and infestation of non-native invasive plant species (NNIS). Inspection of the burned area resulted in the determination that only the risk of NNIS infestation constituted an emergency.

Consultation with the Superior National Forest (SNF) wilderness rangers working as Resource Advisors on the fire revealed that no campsites contained hazard trees. Professional judgement of the SNF Forest Hydrologist determined that the water supply risk was not an emergency. This determination is based on the following factors. The burn affected a very small percentage of the overall watershed. The burned area showed few signs of soil movement following a nearly 2 inch rainstorm. Lastly no water quality problems have been reported following prescribed burning in the watershed over the past 5 years.

The values at risk due to NNIS invasion are ecosystem function and wilderness character. Currently, the BWCAW has relatively low levels of NNIS infestation, and these are primarily limited to disturbed sites such as campsites, portages, and old resort sites. However, because of the fire, the burned area could be invaded by NNIS, resulting in degraded ecosystem function, impacts to native plant communities, and impacts to the wilderness character of the area.

There are several possible NNIS sources that could infest the burned area. At least two campsites either on or near the fire perimeter are known to have non-native invasive plant infestations, and there are also infestations at Seagull Guard Station, Gull and Seagull Lake boat launches, and helispots along the Gunflint Trail. The non-native invasive plants include: spotted knapweed, purple loosestrife, common tansy, Canada thistle, bull thistle, oxeye daisy, and yellow hawkweed. Although the spotted knapweed infestations were all mowed, and none of the infestations are large, it is still possible that weed seeds could have gotten picked up on boots, packs, or gear and transported into the burned area, or transported by wind (for the thistles and yellow hawkweed). Furthermore, Saganaga and Seagull Lakes are both infested with spiny water-flea, and it is possible that this invasive aquatic animal could have been transported to other nearby lakes during air tanker operations.

B. Emergency Treatment Objectives:
The type of treatment that is recommended for the burned area is detection or checking for presence/absence for NNIS. In 2006, susceptible sites, such as areas with moderate or severe burn intensities, exposed bedrock, south facing slopes, firelines, and helispots within the burn, would be the primary focus for the detection work. Standard weed inventory protocols would be followed for the detection. Two visits to the burned area would be needed, one for early season species and one for late season species. For any new infestations, the GPS location and infested area would be recorded. New infestations would be hand-pulled and eradicated. If NNIS species are detected and eradicated in 2006, then monitoring would be proposed for 2007 to assess effectiveness.

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

Land **n/a** % Channel **n/a** % Roads **n/a** % Other **n/a** %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	80	80	80
Channel			
Roads			

Other			

E. Cost of No-Action (Including Loss): The cost of eradicating an NNIS infestation could easliy approach 5 times the cost of detection requested in this report. There is also the cost of the potential loss of wilderness character and ecological function due to a significant infestation of NNIS.

F. Cost of Selected Alternative (Including Loss): $7300

G. Skills Represented on Burned-Area Survey Team:

[x] Hydrology	[x] Soils	[ ] Geology	[ ] Range	[x] District Ranger
[ ] Forestry	[ ] Wildlife	[ ] Fire Mgmt.	[ ] Engineering	[x] Wilderness Ranger
[ ] Contracting	[ ] Ecology	[x] Botany	[ ] Archaeology	[ ]
[ ] Fisheries	[ ] Research	[ ] Landscape Arch	[ ] GIS	

Team Leader: Luke Rutten, Forest Hydrologist, Chippewa National Forest

Email: lrutten@fs.fed.us Phone: 218 335-8666 FAX: 218-335-8643

Team Member: Robert Wagner, Soil Scientist (BAER Trainee)
Others Consulted/Involved in IDT field review: John Wytanis (District Ranger, SNF Tofte Ranger District, and SNF Leadership Team Representative on the Alpine Fire); Tim McKenzie, Sara Erickson, and Julie Richard (Resource Advisors for Wilderness); Jack Greenlee (SNF Plant Ecologist and NNIS Coordinator); and Robert Berrisford (SNF Forest Hydrologist).

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.)

Land Treatments:

Note that our funding request does not include typical BAER soil stabilization or erosion control treatments. Our evaluation suggests the threat of erosion does not constitute an emergency or an unnatural loss of wilderness resource.

The type of treatment that is recommended for the burned area is “detection” or checking for presence/absence for NNIS. In 2006, susceptible sites, such as areas with moderate or severe burn intensities, exposed bedrock, south facing slopes, firelines, and helispots within the burn, would be the primary focus of this treatment. Standard weed inventory protocols would be followed during detection. Two visits to the burned area would be needed, one for early season species and one for late season species. For any new infestations, the GPS location and infested area would be recorded. New infestations would be hand-pulled and eradicated. If NNIS species are detected and species eradicated in 2006, then monitoring to assess treatment effectiveness will be proposed for 2007.

Channel Treatments: n/a
Roads and Trail Treatments: n/a
Structures: n/a

I. **Monitoring Narrative:**

(Describe the monitoring needs, what treatments will be monitored, how they will be monitored, and when monitoring will occur. A detailed monitoring plan must be submitted as a separate document to the Regional BAER coordinator.)

Part VI – Emergency Rehabilitation Treatments and Source of Funds by Land Ownership

			NFS Lands				Other Lands			All
Line Items	Units	Unit Cost	# of Units	WFSU SULT $	Other (Assmnt) $	# of units	Fed $	# of Units	Non Fed $	Total $
A. Land Treatments										
NNIS Monitoring (see Appendix A)				$7,300	$0		$0		$0	$7,300
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$7,300	$0		$0		$0	$7,300
B. Channel Treatments										
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Channel Treat.				$0	$0		$0		$0	$0
C. Road and Trails										
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road & Trails				$0	$0		$0		$0	$0
D. Structures										
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Structures				$0	$0		$0		$0	$0
E. BAER Evaluation										
Rutten GS11 Step1		24.22	20.5		$497		$0		$0	$497
Rutten OT		36.33	18.5		$672		$0		$0	$672
Berrisford GS12 Step10		20.25	37.73		$764		$0		$0	$764
Berrisford OT		11	56.6		$623		$0		$0	$623
Greenlee GS11 Step4		8	26.64		$213		$0		$0	$213
Rutten POV mileage		730	0.108		$79		$0		$0	$79
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Evaluation				$0	$2,848		$0		$0	$2,848
F. Monitoring										
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$0	$0		$0		$0	$0
G. Totals				**$7,300**	**$2,848**		**$0**		**$0**	**$10,148**

Part VII. ACCOMPLISHMENT REPORT

Non native invasive species (NNIS) detection and eradication were conducted in the Alpine Fire area in the BWCAW during Summer 2006. Inventories to detect NNIS were originally scheduled for late July, 2006. However, the Cavity Lake Fire started nearby on July 14, and safety considerations resulted in the Alpine Fire work being postponed until August 8, 2006. The Cavity Lake Fire re-burned a small strip on the western end of the Alpine Fire, but the area affected was small enough that it did not interfere with the NNIS detection work. This work took place on the following dates: August 8 – August 9, and August 15 – August 18.

The methods for NNIS detection involved walking different parts of the burned area to detect new weed infestations. If NNIS were found, they were pulled by hand. It was not feasible to inspect every acre of the burned area, so a sampling scheme was devised to detect NNIS. Sites with a higher likelihood of having a weed infestation (for example, sites with some potential impacts from fire suppression activities like firelines, safety zones, sling load sites) were the first priority, followed by the two campsites within the fire perimeter,

followed by areas within the burn interior where fuels burned but there was no other human-related disturbance.

The NNIS infestation levels in the area burned by the Alpine Fire were low. Fifteen new NNIS sites totaling .003 acres were found. None were found along firelines, probably because very little ground disturbance occurred along firelines other than brush cutting, limited tree cutting, and hoselays. In one safety zone, small infestations of bull and Canada thistles were found (Fig. 1). However, in the other safety zones and slingload sites (Fig. 2), no NNIS infestations were found. A few new NNIS sites were found in the general burned area (Fig. 3, 4).

Figure 1. Safety zone with small bull and Canada thistle infestations.

Figure 2. Slingload site where no NNIS were found.

Figure 3. Canada thistle infestation.

Figure 4. Canada thistle infestation. Note abundant shrub regrowth.

Most of the new NNIS sites found in the general burn area were in the vicinity of known infestations at campsites. For example, Seagull Lake campsite 29 (within the burn perimeter on the south side of the fire) was the site of an old lodge and has four different invasive plants: bull thistle, Canada thistle (Fig. 5, 6), cypress spurge (Fig. 7), and oxeye daisy. The Canada and bull thistle infestations are the largest at 0.002 and 0.001 acres, respectively. Seven new thistle populations were found in the burned area in the vicinity of campsite 29; all were first year plants that were just getting established and had not flowered yet.

All the NNIS sites found within the burned area were hand pulled. Twenty infestations (both new infestations and previously known infestations) totalling 0.007 acres were treated. Flowering or fruiting Canada thistle plants were placed in trash bags and hauled out of the BWCAW (Fig. 8).

There were several lessons learned as the result of this project:

- As expected, the burned area makes a good seedbed for weeds.
- It is pretty easy to find and control young thistle plants in the burned area. Much of the area is fairly open, and first year thistle plants do not have well established root systems. Early detection and eradication of NNIS is much more cost effective than trying to eradicate established plants.
- Invasive plants that are wind dispersed appear to be the most likely to establish in a burned area.
- If conditions and resources permit, known populations of wind dispersed weeds should be controlled in the same year as a fire occurs – this would eliminate a likely seed source. For example, if we had treated the thistle at campsite 29 last August after the Alpine Fire, there would probably have been fewer thistle seeds available to infest the burned area.
- Rapid shrub re-sprouting and re-growth is occurring in parts of the burned area (e.g. see Fig. 4) with deeper soils. Shrub and tree canopy regeneration would develop conditions unfavorable to many NNIS and help limit their abundance over the long term. Shrub and tree regeneration will be monitored over the next several years confirm its influence on NNIS infestation levels.

Figure 5. Canada thistle at campsite 29.

Figure 6. Canada thistle at campsite 29 after treatment.

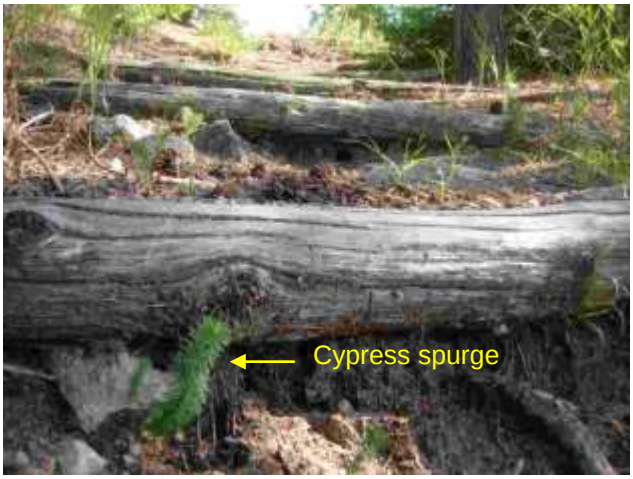

Figure 7. Cypress spurge on steps at campsite 29.

Figure 8. Bagged weeds ready to be hauled out of BWCAW

PART VII - APPROVALS

1. /s/ James W. Sanders — August 26, 2005
   Forest Supervisor (signature) — Date

2. /s/ John Phipps (for) — September 6, 2005

Regional Forester (signature) Date