Date of Report: 6/09/2021

BURNED-AREA REPORT

PART I - TYPE OF REQUEST

A. Type of Report

☒ 1. Funding request for estimated emergency stabilization funds
☐ 2. No Treatment Recommendation

B. Type of Action

☒ 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)

☐ 2. Interim Request #___
☐ Updating the initial funding request based on more accurate site data or design analysis

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Horse Pasture

B. Fire Number: NDDPF-210061

C. State: ND

D. County: McKenzie County

E. Region: 1

F. Forest: Dakota Prairie

G. District: McKenzie RD

H. Fire Incident Job Code: P1NW7B

I. Date Fire Started: 04/03/2021

J. Date Fire Contained: 04/16/2021

K. Suppression Cost: $979k

L. Fire Suppression Damages Repaired with Suppression Funds (estimates):
1. **Fireline repaired (miles): 0.0**
2. **Other (identify): 0.0**

M. Watershed Numbers:

Table 1: Acres Burned by Watershed

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
101102050209	Squaw Creek	17,025	2,492	6.8%
101102050210	Appel Creek-Little Missouri River	34,732	2,156	16.2%

N. Total Acres Burned:

Table 2: Total Acres Burned by Ownership

OWNERSHIP	ACRES
NFS	734.3

OWNERSHIP	ACRES
NPS	3079.0
STATE	748.0
PRIVATE	86.6
TOTAL	4647.9

O. Vegetation Types: Ecological Sites

R058CY080ND-Loamy (322 Ac. 44%)

Soils are greater than 20 inches deep. Surface textures are loams and silty loams and form a ribbon less than 2 inches long. Subsoils range from silt loams to clay loams and form a ribbon less than 2 inches long. The slopes range from0to 25percent. This site occurs on well drained uplands that are upslope from Loamy Terrace or Loamy Overflow ecological sites are downslope from Limy Residual or Shallow Loamy sites. Dominant species are western wheatgrass, some green needlegrass, and blue grama with fringed sagewort and western snowberry.

R058CY079ND-Limy Residual (112 Ac. 15%)

The Limy Residual site is found on alluvial fans and hillslopes. When associated with fans, these areas are on relatively stable landforms below steep barren ridges that are higher on the landscape (e.g. badlands). When associated with hillslopes, this ecological site occurs on backslopes and footslopes. Soils are moderately deep to very deep, loamy throughout, with calcium carbonates occurring within 8 inches of soil surface. Slopes range from 0 to 25%. Vegetation in reference consists primarily of mid-statured rhizomatous cool-season grasses (e.g., western wheatgrass), short-statured warm-season bunchgrass (e.g., blue grama), and sedges.

R058CY080ND-Shallow Loamy (106 Ac. 14%)

The Shallow Loamy ecological site is found on convex shoulders of hillslopes and ridges in the badlands. The soils of this site are shallow with soft, sedimentary siltstone and mudstone bedrock parent material between 10 to 20 inches below the soil surface. The soils have a thin surface layer that is typically <4 inches thick. Surface textures range from silt loam to clay loam and form a ribbon less than 2 inches long. Soils on this site are well drained and typically have carbonates near the surface and are generally calcareous throughout. Slopes range from 3 to 70 percent. This site is above the Loamy and Limy Residual sites, and usually next to Shallow Sandy and Very Shallow sites on the landscape. Due to the limited acreage; in some places the surface and subsurface layers may have considerable higher clay contents or textures that range from Silty Clay Loams to Clays, and sedimentary bedrock consisting of shale that is within 20 inches of the soil surface.

P. Dominant Soils:

The top three most prevalent soil series by area within the Horse Pasture Fire perimeter on NFS lands were Boxwell (41%), Cabbart (17%), and Lonna (15%). Boxwell soils are derived from residuum weathered from mudstone on slopes of 5 to 30%. Cabbart soils are derived from loamy residuum weathered from siltstone, calcareous siltstone, and mudstone on slopes of 25 to 40%. Lonna soils are derived from slope alluvium derived from siltstone on slopes of 11%.

Q. Geologic Types:

The fire boundary is entirely within the Sentinel Butte Formation made up primarily of poorly consolidated mudstone, siltstone, and sandstone, and incidental lignite.

R. Miles of Stream Channels by Order or Class:

Table 3: Miles of Stream Channels by Order or Class

STREAM TYPE	MILES OF STREAM
PERENNIAL	
INTERMITTENT	15
EPHEMERAL	
OTHER	
(DEFINE)	

S. **Transportation System:**

Trails: *National Forest (miles):* 0 *Other (miles):* 0

Roads: *National Forest (miles):* 3.11 *Other (miles):* 1.1

PART III - WATERSHED CONDITION

A. Burn Severity (acres):

Table 4: Burn Severity Acres by Ownership

Soil Burn Severity	NFS	NPS	State	Private	Total	% within the Fire Perimeter
Unburned	26	773	102	9	911	21%
Low	695	2224	639	77	3636	78%
Moderate	13	81	101		101	2%
High						
Total	734	3079	748	87	4648	

B. Water-Repellent Soil (acres):

Due to the lack of high soil burn severity areas, water-repellency was not modeled or estimated using other means.

C. Soil Erosion Hazard Rating:

Original soil erosion hazard ratings were based on BARC data burn severity and are shown on Table 5.

Table 5: Acres of Soil Erosion Hazard Rating (SEHR) by Ownership

SEHR	NFS	Other
Low	721	3,824
Moderate	13	88
High		

D. Erosion Potential:

Due to the lack of high soil burn severity areas, erosion potential was not modeled or estimated using other means. The lack of high burn severity soils and majority low burn severity was observed during 25-May field visits to other burned areas on the LMNG.

E. Sediment Potential:

Due to the lack of high soil burn severity areas, sediment potential was not modeled or estimated using other means. The lack of high burn severity soils and majority low burn severity was observed during 25-May field visits to other burned areas on the LMNG.

F. Estimated Vegetative Recovery Period (years):

1-3 years

G. Estimated Hydrologic Response (brief description):

The Horse Pasture Fire was reported on Saturday, April 3, 2021 on the Little Missouri National Grassland, McKenzie Ranger District. It has burned into the North Unit of Theodore Roosevelt National Park. The fire, currently mapped at 5,000 acres, was 95% contained as of April 29th, 2021. Fuels were tall grass and brush. Soil burn severity was "unburned" or low on 98% and moderate on 2% of the fire area. Hydrologic response is expected to be insignificant due to the low severity grassland fire. However, the area does experience high precipitation events. The Horse Pasture area has a 30-minute 2-year rainfall interval of 0.7 inches; above 0.5 inches can lead to overland flow on burn areas. The low severity fire and current greenup reduces chance of runoff by onset of summer rainfall events that produce heavy rainfall

PART V - SUMMARY OF ANALYSIS

Introduction/Background

A. Describe Critical Values/Resources and Threats (narrative):

Table 6: Critical Value Matrix

Probability of Damage or Loss	Magnitude of Consequences		
	Major	Moderate	Minor
	RISK		
Very Likely	Very High	Very High	Low
Likely	Very High	High	Low
Possible	High	Intermediate	Low
Unlikely	Intermediate	Low	Very Low

1. Human Life and Safety (HLS): NA

2. Property (P): NANatural Resources (NR):

Native Plant Communities

Noxious weeds already present in the burned areas, or inadvertently introduced during fire suppression activities, have the potential with the available seed bed to establish and/or spread within burned areas. The area has relic native communities that with the fire have higher risk of encroachment from noxious weeds and invasive species crested wheatgrass. In addition, the area borders the Theodore Roosevelt National Park that the fire also spread. The grassland integrity on USFS ownership forms a contiguous ecological area with the National Park.

Risk Assessment – Threats to native plant communities

Probability of Damage or Loss: Likely - Based on burn severity and disturbance associated with fire line construction and rehabilitation during suppression operations.

Magnitude of Consequence: Moderate – Loss of native plant communities and spread of noxious weeds.

Risk Level: High – Invasive species treatment is needed for areas disturbed by fire suppression activities such as fire lines. Additional invasive species monitoring next year will determine if weeds spread is occurring in the burned area.

4. Cultural and Heritage Resources: NAEmergency Treatment Objectives:

Minimize the establishment and spread of noxious weed infestations that have the potential to occur in the next 12 months.

C. Probability of Completing Treatment Prior to Damaging Storm or Event: 50%

D. Probability of Treatment Success

Table 7: Probability of Treatment Success

	1 year after treatment	*3 years after treatment*	*5 years after treatment*
***Land** (Noxious weed treatment)*	80	85	85

E. Cost of No-Action (Including Loss):

The value of protecting the ecological integrity of native plant communities and soil productivity of the burned area from noxious weed infestation easily exceeds the cost of treatment and monitoring. Noxious weed establishment and spread would impact treatment costs in the future. If pre-emptive detection and suppression of weeds on this 51 acres is not carried out, and weeds become established in these areas during the first year after the fire, the footprint of the weed infestation would likely spread over subsequent years. As a coarse estimate the weeds, once established in areas made susceptible by the fires, may spread into adjacent areas at the rate of 14% per year. Using the base estimate treatment area, this infestation area could grow to 80 acres in the five years after initial establishment and cost $225/acre to treat. Thus, not addressing the risks equates to at an estimated cost of $18,000 in the long run.

F. Cost of Selected Alternative (Including Loss):
There remains a 20 percent chance that the proposed treatments for this work either may not be complete prior to damaging storm fail. As a gross estimate, the cost is the treatment estimate ($11,475) plus the loss (0.2 × $11,475) which equals $13,770.

G. Skills Represented on Burned-Area Survey Team:

☒ Soils	☒ Hydrology	☐ Engineering	☒ GIS	☒ Archaeology
☒ Weeds	☐ Recreation	☐ Fisheries	☐ Wildlife	
☐ Other:				

Team Leader: Nick Semenza
Email: nicholas.semenza@usda.gov **Phone(s)** (701)989-7311

Forest BAER Coordinator: Nick Semenza
Email: nicholas.semenza@usda.gov **Phone(s):** (701)989-7311

Team Members: *Table 8: BAER Team Members by Skill*

Skill	Team Member Name
Team Lead(s)	Nick Semenza
Soils	Jennie Jennings
Hydrology	Jennie Jennings
Engineering	
GIS	Phil Sjursen
Archaeology	Andrea Kruse
Weeds	Ryan Knutson
Recreation	
Other	

H. Treatment Narrative:

Land Treatments:
Objective:
The objective is to detect and suppress new weed infestations in the burned area. Left unchecked, it is likely that such weed infestations will increase post-fire. It is expected that most native vegetation will recover if weed invasions are minimized.

Method:
Using EDRR, treat the highest potential areas for spread onto relic native grassland. Vectors include the buffered road areas and around known noxious weed locations that can spread into native grassland the highest. Treatment will largely be done using ATV and UTV.

Channel Treatments: NA

Roads and Trail Treatments: NA

Protection/Safety Treatments: NA

I. Monitoring Narrative: NA

PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS

Line Items	Units	Unit Cost	# of Units	BAER $	Other $	# of units	Fed $	# of Units	Non Fed $	Total $
A. Land Treatments										
EDRR suppression-disturbed areas	Acres			$0	$0		$0		$0	$0
EDRR native grassland range	Acres	225	51	$11,475	$0		$0		$0	$11,475
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$11,475	$0		$0		$0	$11,475
B. Channel Treatments										
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Channel Treatments				$0	$0		$0		$0	$0
C. Road and Trails										
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road and Trails				$0	$0		$0		$0	$0
D. Protection/Safety										
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Protection/Safety				$0	$0		$0		$0	$0
E. BAER Evaluation										
Initial Assessment	Report			---	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				$0	$0		$0		$0	$0
F. Monitoring										
				$0	$0		$0		$0	$0
				$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				$11,475	$0		**$0**		**$0**	**$11,475**
Previously approved										
Total for this request				**$11,475**						

PART VII - APPROVALS

1. Bernie H. South — 6/9/2021

Forest Supervisor — Date

APPENDIX – Soil Burn Severity Map