USDA-FOREST SERVICE

FS-2500-8 (6/06)
Date of Report: 6/30/2016 (amended 07/28/16)

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

[x] 1. Funding request for estimated emergency stabilization funds
[ ] 2. Accomplishment Report
[ ] 3. No Treatment Recommendation

B. Type of Action

[x] 1. **Amended** Initial Request (Best estimate of funds needed to complete stabilization measures)

[ ] 2. Interim Report ___
[ ] 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: Marina

B. Fire Number:CA- INF-000992

C. State:CA

D. County: Mono

E. Region: R5

F. Forest: Inyo

G. District: Mono Lake_

H. Fire Incident Job Code: P5KBOW

I. Date Fire Started: 6/24/2016

J. Date Fire Contained: July 3,2016

K. Suppression Cost: 3m

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): Approximately 3 miles rehabed.
2. Fireline seeded (miles):
3. Other (identify):

M. Watershed Number: #180901010404, Dechambeau/Frontal Mono Lake

N. Total Acres Burned: 654
NFS Acres(457) Other Federal ( ) State (71) Private (126)

O. Vegetation Types: Sage, bitterbrush, Pinyon Pine, Aspen

P. Dominant Soils: Stecum-Charcol families,Nanakin family

Q. Geologic Types:Lakes beds, quartz monzonite of mono lake, biotite bearing quartzite of log cabin roof pendenant).

R. Miles of Stream Channels by Order or Class:
Perennial:.5 miles; Intermittent: Ephemeral:.66 miles

S. Transportation System

Trails: . miles Roads:1.48 (level 2) miles(NFS)

PART III - WATERSHED CONDITION

A. Burn Severity (acres): __ V. Low 55 (low) 527 (moderate) 134 (high)

B. Water-Repellent Soil (acres): 600

C. Soil Erosion Hazard Rating (acres):
__ (low _104___(moderate) 550 (high)

D. Erosion Potential: 8.5 tons/acre

ERMiT allows users to predict the probability of a given amount of sediment delivery to the base of a hillslope following variable burns on forest, rangeland, and chaparral conditions in each of five years following wildfire. The ERMiT model can be accessed at http://forest.moscowfsl.wsu.edu/fswepp/
ERMiT Model Assumptions and Inputs:

- Slope length was 300 feet for all ERMiT runs, given the long slope lengths above Hwy. 395
- Soil surface texture was sandy loam
- Soil Rock Content was 40%/Volume
- There is a low (20%) probability the rates of erosion will exceed the amounts shown in the preceding table in the first year following the fire.

Dry ravel was observed in Post Office Creek and oversteepened drainage areas. on loosely consolidated soils on steep slopes (>50%) under dry conditions immediately after a fire. It can often produce higher soil loss rates than that created by rainfall events, especially during a low rainfall year. Dry ravel is an ongoing process that increases after a fire because the vegetation that was holding the soil in place on the hillside is removed. Dry ravel in steep in-gorge areas can "super charge" sediment loading in stream channel, greatly increasing the amount of available sediments for transport.

Wind erosion in the Eastern Sierra is a major erosional process. Wind erosion mobilizes ash and fine sediment and deposits them in swalls and drainages. This was observed during the BAER assessment. This material is highly mobile and avaiable for transport during storm events. Dust and ash can affect visibility along Hwy. 395 during high wind events.

Conclusions:

- There is a high probability that rates of soil erosion and sediment delivery to stream channels will be significantly higher in moderate and high soil burn severity areas.
- High intensity, short duration summer thundershowers are storm events of concern. Additionally, longer duration medium intensity storms over the winter months are like to generate erosion and flooding within and downstream from the burned area.
- In addition to fire, existing ground disturbance (roads, SCE powerpole replacement disturbance) influence soil erosion and watershed response to precipitation events within the burned area.

Soil Burn Severity and ancilliary characteristics:

Forested: Burned forested areas were mapped ranged from low to high soil burn severity. Extensive removal of forest floor ground cover occurred in moderate and high soil burn severity areas. Generally, soil heating effects were low over most of the area. Some needle cast is likely to occur in the low and moderate soil burn severity polygons (mostly low areas) and recovery of slope stability and watershed hydrologic response will be accelerated where this occurs.

Shrub: Most of the shrub vegetation within the burned area was mapped as low or moderate soil burn severity. Although these areas had areas of bare ground before the fire, removal of ground cover was often high and it is expected that erosion and sediment delivery to stream channels from these slopes will be high. Vegetative recovery is likely to occur through sprouting of shrubs and establishment of grasses and herbaceous vegetation. Recovery of watershed hydrologic response depends on many factors and is likely to take at least 3-5 years.

Grass, Bare Ground and Rock Outcrop: Grass, bare ground and rock outcrop areas within the burn were mapped as unburned or low burn severity. Soil heating in these areas was very low and, although minimally affected by the fire, recovery of watershed response is expected to occur rapidly.

E. Sediment Potential: 5,376 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years):	3-5
B. Design Chance of Success, (percent):	80
C. Equivalent Design Recurrence Interval, (years):	5
D. Design Storm Duration, (hours):	.5
E. Design Storm Magnitude, (inches):	..47
F. Design Flow, (cubic feet / second/ square mile):	57
G. Estimated Reduction in Infiltration, (percent):	92
H. Adjusted Design Flow, (cfs per square mile):	180 See below for additonal info

PART V - SUMMARY OF ANALYSIS

Introduction:
The Marina Fire started the morning of June 24,2016 west of Mono Lake on the Mono Lake Ranger District. The fire burned approximately 654 acres west of Mono lake and mostly above state highway 395.

The soil burn severity (SBS) map shows approximately 92% burned at high and moderate soil burn severity. The rest of the fire was either low soil burn severity or unburned. It is very important to understand the difference between *fire intensity* and *burn severity*, and *soil burn severity* as defined for watershed condition evaluation in Burned Area Emergency Response BAER analyses. Fire intensity or burn severity as defined by fire, fuels, or vegetation specialists

may consider such parameters as flame height, rate of spread, fuel loading, thermal potential, canopy consumption, tree mortality, etc. For BAER analyses, mapping is not simply vegetation mortality or above-ground effects of the fire – soil burn severity considers additional surface and below-ground factors that relate to soil hydrologic function, runoff and erosion potential, and vegetative recovery. Areas of high and moderate soil burn severity are present throughout the fire. Areas of high and moderate soil burn severity are at risk due to flooding and sedimentation affecting roads, water quality, and downstream infrastructure.

Based on historic precipitation patterns, it can be expected that Monsoon rains are the first runoff producing events following the Marina Fire. The risk of flooding and erosional events will increase as a result of the fire, creating hazardous conditions within and downstream of the burned area. These hazardous conditions may be worsened in the case of a rain-on-snow event, where long-duration rainstorms falling on a shallow snowpack can produce very high peak flows.

The fire was divided into sub-watersheds with "pourpoints" established at the bottom of burned watersheds, or where values at risk were located. Watershed runoff response is referenced to these points.

Soils/Erosion Response
Soils in the fire area have a sandy non-cohesive surface texture, with various amounts of gravel and cobble. Erosion response is heavily influenced by soil burn severity, hillslope geomorphology, slope and surface texture. The burn affected soil aggregate stability, canopy cover, ground cover and infiltration rates. Before the fire, most of the forest areas had protective ground cover in the form of litter, duff or ground vegetation. Shrub dominated areas had ground cover mainly within the "dripline" of the shrubs, withbare ground between the shrubs and grasses. Riparian areas had protective ground cover consisting of leave and needle litter and duff. In areas of moderate and high burn severity , it is highly likely that increased rates of soil erosion and sediment delivery to stream channels will occur, for two or three years after the fire, particularly on steep slopes that contained shrubs and are slow to recover.

Pre-fire slope stability and recovery of watershed hydrologic response is dependent on many factors and typicaly occurs within 3-5 years following the fire. Recovery of high burn severity areas is generally slower because little or no ground cover remains, the potential for needle cast is low and soils may be impacted by fire effects. High burn severity in riparian areas should recover faster than hillslopes given the higher water table and the ability of riparian vegetation to rapidly resprout.

Watershed Response:
The fire occurred within the Dechambeau/Frontal Mono Lake watershed (HUC 12). . Sub watersheds in the fire area were delineated, Watershed 1 for the subwatershed near the southern end of the fire and Post-Office Creek, for geographical reference and hydrologic modeling during the BAER assessment.

Post-Office Creek near the northern perimeter of the fire is a perennial stream. Post-Office Creek flows into Mono Lake below Hwy. 395 "Watershed 1 is a snowmelt driven ephemeral stream. Watershed 1 is susceptible to avalanches during high snow events.

Hydrologic modelling was Hydrologic modeling was conducted for the fire area and all the watersheds modeled have an expected increase in the Q5 discharge compared to pre-fire conditions. In "Watershed 1" we expect an increase in Q5 discharge by 100% more than the pre-fire conditions. This is due to the amount of high and moderate soil burn severity in the watershed.

The fire experience a rainfall event on July 2. The weather station at Lee Vining recorded a total of .56" of rainfall over a 4-hour+ period of time (2:30 pm to 6:50 pm). The strongest intensity was between 3:20 and 4:10 P.M. where .23"was recorded over a 30 minute time frame. This is equivalent to a 1 year storm event per NOAA Atlas 14 for Lee Vining (90% confidence interval). Localized rilling was observed on steep slopes in the fire area. No effect to Hwy. 395 was observed.

See Table 1 for the results of the hydrologic modeling.

Table 1. Hydrologic modeling for select watershed in the Marina Fire.

Marina Fire

Design Flow for 5 year storm (South Lahontan/Colorado Desert Region)

			Pre-Fire Peak Flow in cubic feet per second (cfs)				Soil Burn Severity (acres)				In Cubic Feet per Second (cfs)						
Pour Point Analysis Watersheds	Drainage Acres	Drainage Area (mi2)	Q2	Q5	Q10	Q25	Unburned	Low	Moderate	High	Pre fire Q5	Q from unburned	Q from low	Q from moderate	Q from High	Post fireTotal Q5	Change in Q5 Flow
Post Office Creek	1505	2.35	16	92	233	621	1456	14	20	14	92	89	1	3	6	99	7%
Watershed 1	347	0.54	8	44	111	296	223	9	111	27	44	28	1	35	23	88	100%
All Fire	716	1.12	11	64	160	427	0	55	527	134	64	0	5	118	80	202	219%
														Total Post Fire Flow:			

From: Methods for Determining Magnitude and Frequency of Floods in California, Based on Data through Water Year 2006
By Anthony J. Gotvald, Nancy A. Barth, Andrea G. Veilleux, and Charles Parrett; 2012

*Change in flow is the increase in flow resulting from the reduction in soil infiltration after a fire based on a paper by Terry Henry.
Acres of unburned and low soil burn severity are modeled at Q5, acres of moderate soil burn severity are modeled at Q10 and acres of high soil are modeled at Q25. A weighted average is then calculated to arrive at post fire Q5. #REF!

*Spreadsheet prepared by David McComb US Forest Service

Watershed	Total Acres	Unburned Acres	Low Severity Acres	Moderate Severity Acres	High Severity Acres
Watershed 1	347	223	9	111	27
Post Office Creek	1505	1456	14	20	14
All Fire Totals	716	0	54.8 (7%)	527.4 (74%)	133.8 (19%)

Table 2 displays the amount of burn severity and the percentage of watershed burned throughout the fire area.

Water Quality

The perennial stream Post-Office Creek will have periods of water quality degradation after significant precipitation events occur, most likely during the first year after the fire. Post-Office Creek flows into Mono Lake. Ash, fine soils and organic debris will enter the streams and create high levels of turbidity and dissolve sediment in the water. Mono Lake will likely experience turbidity adjacent to where Post-Office Creek enters the Lake. These episodes will be at a peak when storm runoff from slopes is occurring. As storm runoff slows and ceases, water quality will improve. This effect can continue for 1-2 days after a large storm event

Geology/geologic response:

Observed rock fall below steep rockout crop areas along road 1n107 and large boulders in "Watershed 1" drainage below 1n107. Post-fire rock fall was evident along Hwy. 395. A prominent narrow canyon is present in "Watershed 1" below 1N107 and above Hwy. 395; below the narrow canyon is an alluvial fan that diverts flow in several directions including directly onto Hwy. 395.

Rock Fall: Rock fall occurred under pre-fire conditions below steep rockout crop areas along road 1n107 and large boulders were observed in "Watershed 1" drainage below. Post-fire rock fall was evident along Hwy. 395. CalTrans placed "K-Rails" along a portion of the west shoulder of Hwy. 395, which has stopped some of the post-fire rock fall from falling onto Hwy. 395. Although helpful for some of the post-fire rock fall, the "K-Rails" will not "catch" all rock fall and large rocks can potentially move the "K-Rails," impacting Hwy. 395 and below. Rock fall will continue at an increased rate for the next 3-5 years following the fire due to loss of groundcover and will increase temporarily during runoff events. The risk for rock fall occurrence as a result of the fire is considered to be **Very High.**

Landslide: There are no previously mapped landslides recorded within the burn area, and evidence of past landslides were not observed. Based on the geologic information available, the risk of a potential landslide occurrence as a result of the fire is considered **Low**.

Avalanche: Numerous avalanche chutes are present within the burn area. CalTrans maintains avalance trigger equipment at the top of the slopes outside of the burn area. Avalanches already occur within the burn area, the impacts of the fire on avalanche occurrence is **Unknown**.

Debris Flow: Evidence of recent pre-fire debris flows within the burned area were not observed.

"Watershed 1" - A prominent narrow canyon is present in "Watershed 1" below 1N107 and above Hwy. 395; below the narrow canyon is an alluvial fan that diverts flow in several directions including directly onto Hwy. 395. Slopes in "Watershed 1" are generally 30 to 90 percent. The ephemeral stream channel within "Watershed 1" is charged with sediment and rocks. An initial assessment indicates with the steep slopes and loss of groundcover, an above normal runoff event will mobilize material in the charged channel and likely result in a debris flow and deposit material on the alluvial fan, on Hwy. 395 and below onto roads 1N44 and 1N56A.

Improving existing flow control paths and structures along Hwy. 395 by clearing debris and rocks from ditches and culverts, adding a snorkel to the culvert, and directing flow along the fan below "Watershed 1" may help add carrying capacity to the flow paths in the event of a runoff event. Even with the added carrying capacity to flow control structures, the risk for debris flow occurrence in "Watershed 1" as a result of the fire is considered to be **Very High** two years following the fire and will decrease in year three.

Post Office Creek - A low percentage (3.26%) of the Post Office Creek watershed burned in the fire. In general, the slopes burned within this watershed were between 0 and 60 percent. The risk for debris flow occurrence in Post Office Creek as a result of the fire is considered to be **Very Low**.

Slope Between Watershed 1 and Post Office Creek- A majority of this area burned at high and moderate severity. Avalanche chutes are present along this slope and the majority of slopes range from 60 to 90 percent. Post-fire dry ravel was observed within the chutes, charging them with sediment. Improving existing flow control paths and structures along Hwy. 395 by clearing debris and rocks from ditches and culverts, and adding snorkels to culverts, may help add carrying capacity to the flow paths in a runoff event. Even with the added carrying capacity to flow control structures, an initial assessment indicates with the steep slopes, loss of groundcover, and sediment charged channels, an above normal storm event will likely produce a debris flow. A debris flow would deposit material on Hwy. 395 and below and potentially in the California State Parks Old Marina day-use recreation area. The risk for debris flow occurrence along the Slope Between Watershed 1 and Post Office Creek as a result of the fire is considered to be **Very High** two years following the fire and will decrease in year three.

A. Describe Critical Values/Resources and Threats:

*The risk matrix below, Exhibit 2 of Interim Directive No.: **2520-2010-1** was used to evaluate the Risk Level for each value identified during Assessment. Only values at risk that had a risk of Intermediate or above are discussed.*

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**

Threats to Life/safety and Property

National Forest Roads: There are approximately 1.7 miles of system roads Roads within the fire are maintenance level (ML) 2. Approximately 1.4 miles of the roads go through moderate severity and .24 miles go through high burn severity. High and moderate burn severity occurred above the roads also. These roads are native surface on decomposed granite which are very susceptible to erosion. Uncontrolled runoff can result in off-site damage and potential negative impacts to the transportation system. A secondary consequence of post-fire runoff to the transportation system is increase adverse effect of storm water runoff and decreased control of storm water runoff delivering high volumes of water and sediment onto adjacent hillslopes above Hwy. 395. Forest roads 01N107 and 01n107 B and C are directly above Highway

395, uncontrolled runoff off these roads on hillslopes above the highway can produce negative effects. .In addition, Southern California Edison (SCE) maintains powerpoles along the these roads, access is needed to maintain the power poles which provide power to surround communities such as Lee Vining and Bridgeport, Ca.

Forest Road 01N107 has multiple ephemeral stream crossings that drain the fire area. The surrounding hillslopes in the area of concern burned at high and moderate severity (see table 2 above). In some cases the entire watershed burned above the crossings. Numerous ephemeral drainages cross the road through unimproved low water crossing or shallow dips in the road. Post-fire conditions and predicted watershed response indicate increased runoff, excessive sedimentation, will occur on this road impacting existing roadway function.

Forest road 1N56A is below the fire but could be impacted by enhanced runoff and debris from Watershed , causing localized rilling and debris deposition.

Emergency Determination:

Imminent hazards to the road system vary from nuisance sediment and rock fall to sediment and debris overwhelming the road and incision on the stream crossing and low spots, leading to a partial or total loss of the road template.

Probability of Damage or Loss: Likely

Magnitude of consequences: moderate

Risk Level: High

State Highway 395: Approximately 1.3 miles of Highway 395 runs through the fire area.
Hwy. 395 is the main throughfare through the eastern sierra. This area is particularly critical as it traverses narrowly along the west side of Mono Lake and there is no easy way to bypass this section of the road. If this road is closed due to post-fire effects it essentially cuts off traffic from the northern part of Mono County including the nearby community of Mono City which residence live in and commute to Lee Vining.
The re-route is through Hawthorne, Nevada and Benton, California and adds an extra hour or so to a trip, north or south.

Caltrans just completed a project along part of road through the fire area to mitigate rock fall. This is expected to mitigate some of the post-fire rock fall risk. During the BAER assessment many large rocks were observed in the ditch and behind k-rails protecting the highway.

The BAER team delineated a subwatershed that drains directly onto Hwy. 395 (Watershed 1). Approximately 44% of this watershed burned. We expect a post-fire peak flow at Q5 to be 100% (double) the pre-fire peak flow in this watershed.

Allan Gallegos, geologist from the Sierra National Forest, is going to come over Saturday July 9 to do an more intensive rock fall, and debris flow evaluation/assessment of the fire. If he recommends additional stabilization treatments the Forest will prepare an Interim report.

It is a major impact to tourism and commerce if this highway is closed for a period of time.

Emergency Determination:

Imminent hazards to people from accelerated runoff, debris and rock fall. This could also lead to a temporary closure of Hwy. 395.

Probability of Damage or Loss: Likely

Magnitude of consequences: Major

Risk Level: Very high

Post Office Creek (Tioga Lodge): Post Office Creek flows through the Tioga Lodge on Private lands. 59 acres of Post Office Creek burned out of a total of 1505 acre watershed. Tioga Lodge has pipes and various other infrastructure in the Creek at could receive impacts from ash and sediment. Based on the hydrologic modelling, the BAER team expects a 7% increase in Q5 peak flows from pre-fire conditions. The BAER team does not expect damaging impacts to infrastructure in the Tioga Lodge area due to higher peak flows in Post Office Creek.

The BAER team identified treatments to mitigate the potential for minor flooding and sedimentation by aligning flow and debris deflectors' upslope of the resort buildings using either sandbags or other deflection methods (berms, etc.) to divert the majority of water and sediment away from the buildings. The BAER team met with local NRCS representatives at Tioga Lodge on July 1, 2016 to discuss findings and recommend treatments that the NRCS could convey to the resort owner. The NRCS made contact with the resort owner that day and would follow up with recommendations for treatments at a later date. The BAER team will provide further information to the NRCS to facilitate the consultation with the resort owner by providing treatment prescriptions, burn area mapping and results of hydrologic modeling and will be available for further assistance.

Emergency Determination:

Hazards of ash and debris in Post-Office Creek impacting infrastructure in the Creek, also hillslope runoff and rock fall impacting structures on the property.

Probability of Damage or Loss: Likely

Magnitude of consequences: Moderate

Risk Level: High

Old Marina Recreation area – State Park: Enhanced runoff, and debris from Watershed 1 could impact the ingress and egress and parking area at the Old Marina State Park. impacting site or temporarily block access. This is a State fee site and is a very popular way for visitors to experience Mono Lake. At the parking area, visitors can take a boardwalk and walk to the lake shore.

Emergency Determination:

Runoff and debris limiting ingress and egress into the State Park.

Probability of Damage or Loss: Possible

Magnitude of consequences: Moderate

Risk Level: Intermediate

Old Avalanche Bypass Road– (County) 1N44: The culvert draining the catch basin at the bottom of Watershed 1 drains on this road. Expected enhanced runoff and debris could impact this road causing accelerated erosion on the road and deposition of debris temporarily limiting access. Caltrans is proposing to divert addition storm flows from Watershed 1 into this catch basin and through the culvert.

Emergency Determination:

Runoff and debris limiting access on this road.

Probability of Damage or Loss: Likely

Magnitude of consequences: Moderate

Risk Level: High

Threats to Natural and Cultural Resources

Off Highway Vehicles (OHV's) are a threat to natural recovery from invasion if noxious weed spreading into the fire area, reduction in soil productivity, from Off-Highway Vehicle incursion.
OHV's can cause erosion, compaction and alter hydrologic function which precludes or reduces vegetation re-establishment after a fire. OHV's can act as a vector for invasive species introduction when seeds are attached to tires and deposited on bare ground.

Vegetative recovery, and soil productive are at risk from OHV incursion along the the Forest system roads, especially where the Forest boarders private lands,Los Angeles Department of Water and Power Lands where natural vegetative barriers burned and where Southern California Edison (SCE) replaced burned power poles as they created additional disturbance. Suppression operations created dozer lines and pull offs off-road creating highly visible areas of disturbance. These areas are currently being rehabilitated as part of suppression rehabilitation. However, the disturbance will be highly visible for several years even after the rehabilitation.

Emergency Determination:

Probability of damage or loss: Likely

Magnitude of Consequences: Moderate

Risk Level: High

Big Horn Sheep habitat: It was determined that designated critical habitat for the endangered Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*) was located approximately one mile west of the fire's perimeter. This habitat was not directly affected by the fire. Currently, virtually all bighorn use is focused at higher elevations near Lundy Lake which is located approximately five miles northwest of the burned area. It is highly unlikely that the fire or suppression efforts had any impact on this species. As a courtesy, the U. S. Fish and Wildlife Service (Reno office) was notified and no immediate concerns were expressed.

Sage Grouse Habitat: Suitable habitat for the Forest Service sensitive sage-grouse (*Centrocercus urophasianus*) is present both to the north and east of the burned area, however no suitable habitat was affected by the fire.

Emergency Determination:

Probability of damage or loss: Unlikely

Magnitude of Consequences: Minor

Risk Level: Very Low

Ecosystem Stability and Vegetation Recovery

Invasive weeds: A washing station was set up during the fire, but was not in place for the first several days of the fire. The fire vehicles were most likely not washed before entry to the fire area during that time. There were a least two

dozers used on the fire, from outside the local area. Several invasive species are known from the forest, particularly cheatgrass, which is common especially in the lower elevation parts of the fire. It will likely spread into the recovering shrub and pinyon vegetation in the fire area, but there is no effective control for this species, so no treatment is proposed. New species of weeds may have been introduced by unwashed fire suppression vehicles, but these will not be evident for at least several months when the seeds germinate

Inventory: Botanical surveys that intersect portions of the Marina Fire were conducted in 2004, 2006, 2008, and 2012. The 2008 survey followed the powerline road that bisects the fire area running roughly north to south at about 6800 feet elevation. Noxious weeds found during surveys include *Bromus tectorum* (cheatgrass), *Bassia hyssopifolia* (fivehorn smotherweed), *Rumex crispus* (curly dock), and *Salsola tragus* (Russian thistle). The cheatgrass occurrence was found along the powerline road, while the other species were located along the Highway 395 corridor.

The fire burned in sagebrush, pinyon-juniper woodland, mountain mahogany, and subalpine forest. In general, lower elevation areas and area with higher fire severity are more vulnerable to invasion by nonnative plants. Highway 395 runs through part of the Marina Fire and serves as a weed corridor for the species listed above as well as other weed species that commonly infest right of ways (e.g. white sweetclover). The powerline road also serves as a vector for weeds and is of particular concern as cheatgrass is known to occur there, providing a seed source for newly disturbed habitat. Dozer lines could serve as weed corridors and should be surveyed after germination next spring. It is unlikely that equipment used in the fire was cleaned before use, and could introduce weed species not present prior to fire suppression activities. Other weed species found within the Mono Basin that have potential for introduction to disturbed areas within the Marina Fire footprint include perennial pepperweed, woolly mullein, herb sophia, Russian olive, saltcedar, spotted knapweed, tumblemustard, and yellow salsify. Saltlover, Dalmation toadflax, and bull thistle are also of concern due to the habitat types present.

Emergency Determination:

Probability of damage or loss: Likely

Magnitude of Consequences: Moderate

Risk Level: High

No TES or sensitive plant species are found in the fire area therefore additional analysis or treatments are not needed.

Cultural Resources:

No threat to cultural resources exists due to the post-fire environment. Potential impacts to cultural resources will be evaluated during project implementation.

B. Emergency Treatment Objectives:

Threats to Life and Property

Protect route infrastructure by minimizing erosion of the road surface, provide for water control and reduce excessive flooding on Highway 395 and sediment delivery on Forest Road 1n107 and 1N107C

Threats to Critical Natural and Cultural Resources

To prevent OHV incursions from damaging critical values along 01N107 and provide for native vegetative recovery.

Threats to Ecosystem Stability

Determine if new invasive species have been introduced due to suppression activities

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

Land **N/A** % Channel __ % Roads/Trails **80** % Protection/Safety **85** %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	70	80	90
Channel			
Roads/Trails	80	90	95
Protection/Safety	85	95	100

E. Cost of No-Action (Including Loss): See Spread sheet below (actions are justified)

F. Cost of Selected Alternative (Including Loss):

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Todd Ellsworth

Email: tellsworth@fs.fed.us Phone: 760-937-2033 FAX:

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:

Noxious/Invasive weed early detection and rapid response: Survey 1.5 miles of dozer line,,1 mile of hand line, plus 1.5 mile of improved roads (level 2 roads within the fire perimeter), and other disturbed areas (area unknown) in the fire

area for species listed above and eradicate small infestations by pulling weeds by hand. Plants will be disposed of in large plastic bags, and taken off site. A Forest-wide Weed EA is currently under development which would allow a broader range of treatment activities, including herbicide methods.

Weed Surveys and Rapid Response Costs				
Item	**Unit**	**Unit Cost**	**# of Units**	**Cost**
1 GS-11 botanist	Days	$355	5	$1775
1 GS-7 weed technicians	Days	$196	5	$980
Supplies	Each	$500	1	$500
Vehicle gas mileage	Miles	$0.50	350	$175
Total Cost				**$3430**

Channel Treatments:

N/a

Roads and Trail Treatments:
Improve drainage by installing rolling dips (3-5) along approximately ¾ mile section of 01N107 – Install rock aprons (by hand) on the downhill side of the rolling dips to prevent incision of the road during runoff events. Remove outside berm in several locations and create a low water crossing and critical dip in watershed 1 to allow water to pass and not go down the road. The Forest will likely rent a backhoe or excavator for part of the work as the existing engineering backhoe is in use on other very high priority projects. This is reflected in a higher cost.

Road	Risk	Treatment	Cost
01N107	High	Restore drainage function, remove outside berm in critical areas (about 40 locations), construct critical dip on ephemeral stream crossings and one other low area on the road. Cost includes equipment rental for 2 weeks ($5080), operator for 10 days ($2820), mobilization of equipment from Lancaster, CA ($1000), and on-site watershed staff guidance and heritage monitor ($945).	$9845
1N107 B and C	High	Place 1 or 2 rolling dips on both these roads to prevent runoff from going on to 1N107 and concentrating flow.	$1500

Protection/Safety Treatments:

OHV patrol: OHV incursion on 01N107, 01N107 B and C and will be reduced by providing for increased OHV patrol in this area, especially on high use weekend the rest of the summer and fall. Contacts with the public will emphasize the need to stay on existing roads and motorized trails to facilitate fire recovery. Strategic placement of carsonsite closed area signs will help keep motorized traffic on system routes.

OHV Patrol and Carsonite signs				
Item	**Unit**	**Unit Cost**	**# of Units**	**Cost**
1 GS-5 Tech	Days	$150	2	$300

1 GS-9 OHV technician	Days	$285	2	$530
Supplies(signs,)	Each	$30	5	$150
Vehicle gas mileage	Miles	$0.50	200	$100
Total Cost				**$1,080**

Interagency Coordination: There is a need to continue the interagency coordination initiated during the BAER assessment. This involves communication and coordination with other federal, state and local agencies with jurisdiction over lands where life and property are at risk from post-fire conditions. Actions include but are not limited to cooperating with other agencies on hazard notification systems, exchanging information and coordinating the BAER implementation plan as needed when subsequent recovery plans are developed by other agencies. Follow-up field trips and meetings are anticipated with Caltrans, Sheriffs department and the National Weather Service. Caltrans will need to be consulted during implementation of erosion control on Road 01N107, which may need lane closures or temporary traffic control.

Interagency Coordination				
Item	**Unit**	**Unit Cost**	**# of Units**	**Cost**
1 GS-12 Forest BAER coordinator	Days	$451	6	$2709
Vehicle gas mileage	Miles	$0.50	200	$100
Total Cost				**$2,809**

Special Use Permit and Specialists time for clearances: The NWS and Caltrans expressed a desire to place a telemetered tipping bucket rain gauge above the fire area to fine tune rainfall event triggers that could produce adverse runoff events and/or debris flows onto Hwy. 395. The BAER Team Hydrologic Technician is went on a field trip on July 6 to determine suitable sites for a rain gauge and a suitable site was located.

In addition, Caltrans is likely going to complete drainage and earth work to help protect Hwy. 395 both in their right of way and on National Forest Lands. This work requires a quick review by some Forest specialists working with the Caltrans specialists. Catrans estimates they are going to spend $1.8 million on post–fire stabilization.

SUP and Specialist time				
Item	**Unit**	**Unit Cost**	**# of Units**	**Cost**
3 GS-11 Specialists (Heritage, SUP, Botany)	Days	$385	10	$3,850
Vehicle gas mileage	Miles	$0.50	250	$125
Total Cost				**$3,975**

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.)

Forest personnel will conduct a Level 1 Effectiveness monitoring of the road treatments to check that treatments are present and functioning properly. The purpose is to ensure the action is meeting site-specific objectives or if there is a need for follow-up or re-treatment. Monitoring will be conducted after storm events, and is estimated at 3 days total. The report would include photographs and a recommendation on whether additional treatments are necessary. If the monitoring shows the treatment to be ineffective at stabilizing the road and there is extensive loss of road bed or infrastructure an interim report will be submitted. A several page monitoring report would be completed after the site visit.

PART VII - APPROVALS

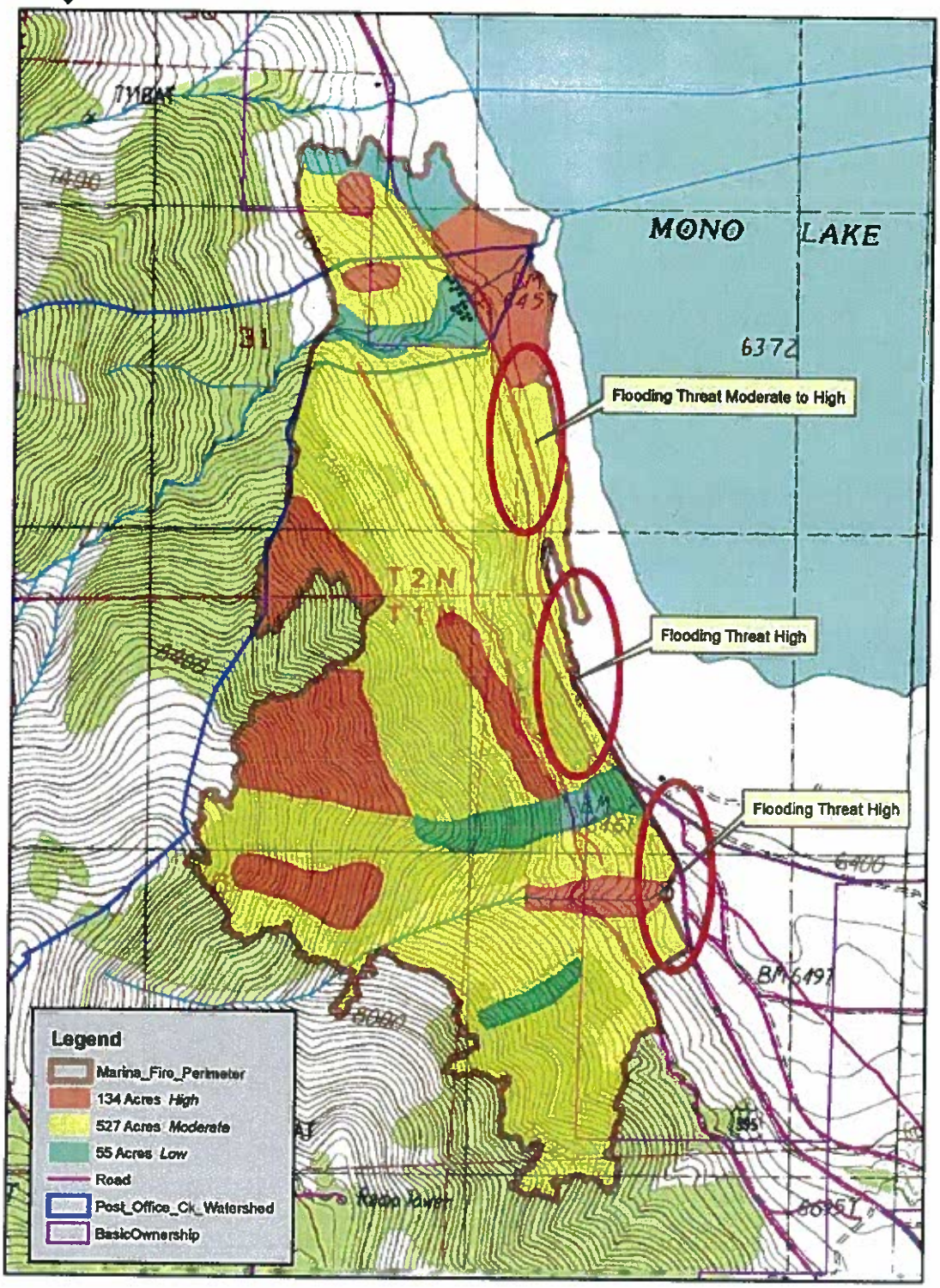
1. _____ 7/28/16
Forest Supervisor (signature) Date

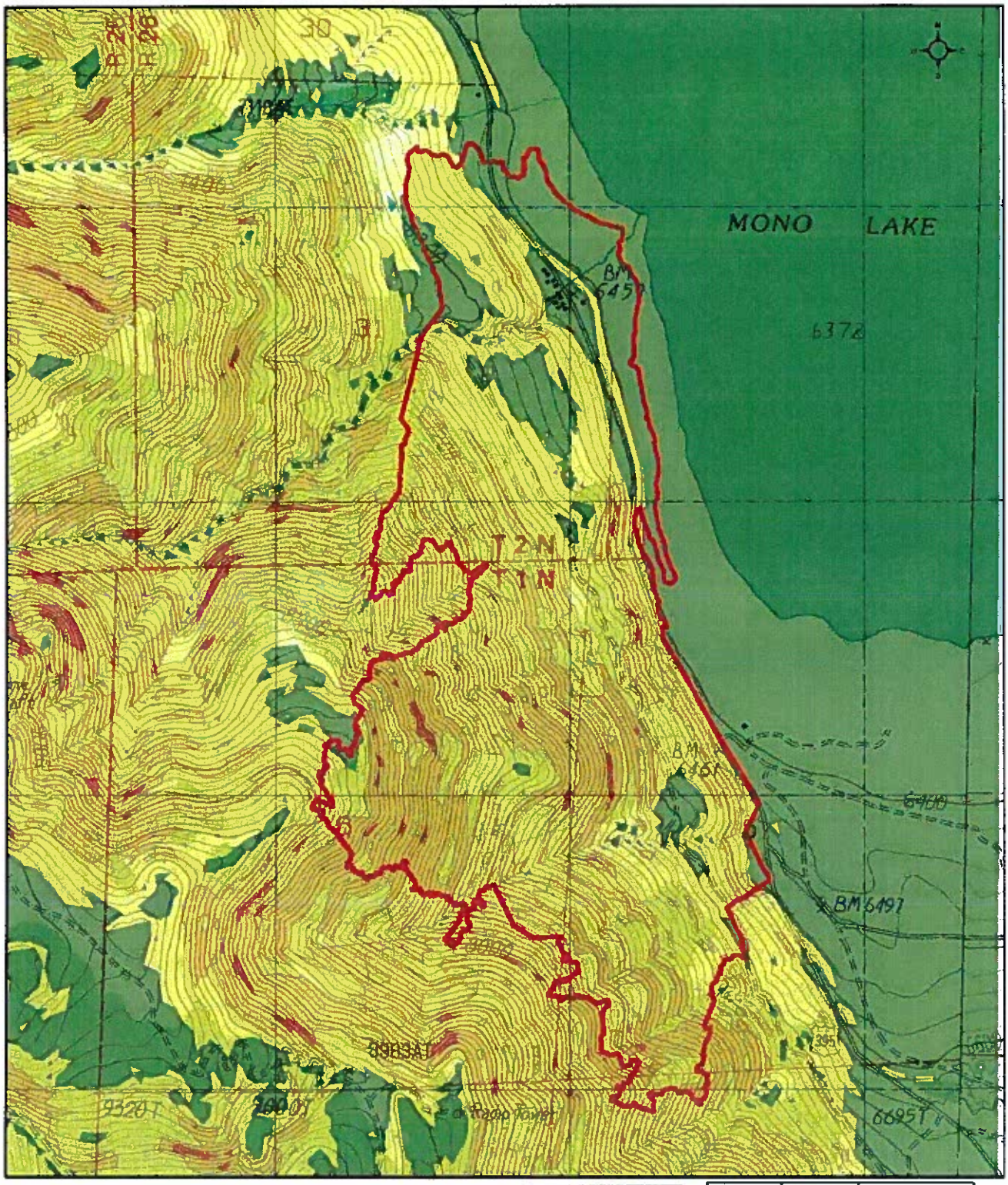
2. Barnie J Grant 7/29/2016
Regional Forester (signature) Date

Part VI – Emergency Stabilization Treatments and Source of Funds **Amended Initial**

			NFS Lands			Other Lands				All
		Unit	# of		Other	# of	Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	BAER $	$	units	$	Units	$	$
A. Land Treatments										
Weed detection	days	686	5	$3,430	$0		$0		$0	$3,430
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$3,430	$0		$0		$0	$3,430
B. Channel Treatments										
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
				$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										
01N107	Mi	9845	1	$9,845	$0		$0		$0	$9,845
01N107 B+C	Mi	1500	1	$1,500	$0		$0		$0	$1,500
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road & Trails				$11,345	$0		$0		$0	$11,345
D. Protection/Safety										
OHV Patrol (signs	day	540	2	$1,080	$0		$0		$0	$1,080
Interagecy Coord	day	451	6	$2,706	$0		$0		$0	$2,706
SUP-Specialists	Day	385	10	$3,850	$0		$0		$0	$3,850
Gas - mileage	Mile	0.5	450	$225	$0		$0		$0	$225
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Structures				$7,861	$0		$0		$0	$7,861
E. BAER Evaluation										
BAER Team	ea	4000	1	$4,000			$0		$0	$0
BAER implementation	day	400	2	$800						$800
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				$800	$0		$0		$0	$800
F. Monitoring										
Road	day	500	3	$1,500	$0		$0		$0	$1,500
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$1,500	$0		$0		$0	$1,500
G. Totals				$24,936	$0		**$0**		**$0**	**$24,936**
Previously approved										
Total for this request				**$24,936**						

Post-Fire Flooding and Potential Debris Flows
High Threat Areas - Highway 395
Marina Fire Area





0 0.125 0.25 0.5 Miles

Slope Within the Marina Fire

Shown as Percent Slope

Slope Percent

- 0-30
- 30-60
- 60-90
- >90

Slope Percent	Acres	Percent of Fire Area
0-30	105	16%
30-60	292	45%
60-90	251	38%
>90	7	1%
Total	655	100%

Fire Name	Marina Fire
Location	Inyo National Forest-Mono Lake RD
Date	7/5/2016

SUMMARY		
	Total Treatment Cost	$ 16,500
	Expected Benefit of Treatment	$ 34,700
	Implied Minimum Value (IMV)	#VALUE!

MAP ZONE A

Value Type	**Value at Risk**	**Implied Value and/or Benefit Cost**
Life and Safety	**Yes**	
Non-Market: Cultural Values	No	
Non-Market: Ecological Values	No	
Market Values: Direct	**Yes**	$ 7,750
Market Values: Loss of Use	**Yes**	$ 70,000
	Total Market Resource Value	$ 77,750
	Proposed Treatment	$ 13,000
	Reduction in Probability of Loss	0.40
	Expected Benefit of Treatment	$ 31,100
	Exp B/C Ratio of Treatment for Market Resources Only	2.4
Implied Minimum Value (IMV) of Protecting Non-Market Resource Values		$ -

MAP ZONE B

Value Type	**Value at Risk**	**Implied Value and/or Benefit Cost**
Life and Safety	No	
Non-Market: Cultural Values	No	
Non-Market: Ecological Values	**Yes**	
Market Values: Direct	**Yes**	$ 5,000
Market Values: Loss of Use	**Yes**	$ 4,000
	Total Market Resource Value	$ 9,000
	Proposed Treatment	$ 3,500
	Reduction in Probability of Loss	0.40
	Expected Benefit of Treatment	$ 3,600
	Exp B/C Ratio of Treatment for Market Resources Only	1.0
Implied Minimum Value (IMV) of Protecting Non-Market Resource Values		**Justified**

MAP ZONE C

Value Type	**Value at Risk**	**Implied Value and/or Benefit Cost**
Life and Safety	No	
Non-Market: Cultural Values	No	
Non-Market: Ecological Values	No	
Market Values: Direct	No	$ -
Market Values: Loss of Use	No	$ -

		Total Market Resource Value	$ -
		Proposed Treatment	$ -
		Reduction in Probability of Loss	
		Expected Benefit of Treatment	$ -
		Exp B/C Ratio of Treatment for Market Resources Only	
	Implied Minimum Value (IMV) of Protecting Non-Market Resource Values		$ -

	Value Type	**Value at Risk**	**Implied Value and/or Benefit Cost**
MAP ZONE D	Life and Safety	No	
	Non-Market: Cultural Values	No	
	Non-Market: Ecological Values	No	
	Market Values: Direct	No	$ -
	Market Values: Loss of Use	No	$ -
		Total Market Resource Value	$ -
		Proposed Treatment	$ -
		Reduction in Probability of Loss	
		Expected Benefit of Treatment	$ -
		Exp B/C Ratio of Treatment for Market Resources Only	
	Implied Minimum Value (IMV) of Protecting Non-Market Resource Values		$ -

	Value Type	**Value at Risk**	**Implied Value and/or Benefit Cost**
MAP ZONE E	Life and Safety	No	
	Non-Market: Cultural Values	No	
	Non-Market: Ecological Values	No	
	Market Values: Direct	No	$ -
	Market Values: Loss of Use	No	$ -
		Total Market Resource Value	$ -
		Proposed Treatment	$ -
		Reduction in Probability of Loss	
		Expected Benefit of Treatment	$ -
		Exp B/C Ratio of Treatment for Market Resources Only	
	Implied Minimum Value (IMV) of Protecting Non-Market Resource Values		$ -

	Value Type	**Value at Risk**	**Implied Value and/or Benefit Cost**
MAP ZONE F	Life and Safety	No	
	Non-Market: Cultural Values	No	
	Non-Market: Ecological Values	No	
	Market Values: Direct	No	$ -

	Market Values: Loss of Use	No	$ -
		Total Market Resource Value	$ -
		Proposed Treatment	$ -
		Reduction in Probability of Loss	
		Expected Benefit of Treatment	$ -
		Exp B/C Ratio of Treatment for Market Resources Only	
	Implied Minimum Value (IMV) of Protecting Non-Market Resource Values		$ -

	Value Type	**Value at Risk**	**Implied Value and/or Benefit Cost**
MAP ZONE G	Life and Safety	No	
	Non-Market: Cultural Values	No	
	Non-Market: Ecological Values	No	
	Market Values: Direct	No	$ -
	Market Values: Loss of Use	No	$ -
		Total Market Resource Value	$ -
		Proposed Treatment	$ -
		Reduction in Probability of Loss	
		Expected Benefit of Treatment	$ -
		Exp B/C Ratio of Treatment for Market Resources Only	
	Implied Minimum Value (IMV) of Protecting Non-Market Resource Values		$ -

	Value Type	**Value at Risk**	**Implied Value and/or Benefit Cost**
MAP ZONE H	Life and Safety	No	
	Non-Market: Cultural Values	No	
	Non-Market: Ecological Values	No	
	Market Values: Direct	No	$ -
	Market Values: Loss of Use	No	$ -
		Total Market Resource Value	$ -
		Proposed Treatment	$ -
		Reduction in Probability of Loss	
		Expected Benefit of Treatment	$ -
		Exp B/C Ratio of Treatment for Market Resources Only	
	Implied Minimum Value (IMV) of Protecting Non-Market Resource Values		$ -

	Value Type	**Value at Risk**	**Implied Value and/or Benefit Cost**
MAP ZONE I	Life and Safety	No	
	Non-Market: Cultural Values	No	
	Non-Market: Ecological Values	No	

	Market Values: Direct	No	$ -
	Market Values: Loss of Use	No	$ -
		Total Market Resource Value	$ -
		Proposed Treatment	$ -
		Reduction in Probability of Loss	
		Expected Benefit of Treatment	$ -
		Exp B/C Ratio of Treatment for Market Resources Only	
	Implied Minimum Value (IMV) of Protecting Non-Market Resource Values		$ -

	Value Type	**Value at Risk**	**Implied Value and/or Benefit Cost**
	Life and Safety	No	
	Non-Market: Cultural Values	No	
	Non-Market: Ecological Values	No	
	Market Values: Direct	No	$ -
	Market Values: Loss of Use	No	$ -
		Total Market Resource Value	$ -
MAP ZONE J		*Proposed Treatment*	$ -
		Reduction in Probability of Loss	
		Expected Benefit of Treatment	$ -
		Exp B/C Ratio of Treatment for Market Resources Only	
	Implied Minimum Value (IMV) of Protecting Non-Market Resource Values		$ -