USDA-FORESTSERVICE FS-2500-8 (6/06)

Date of Report: November 7, 2007

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. Initial Request (Best estimate of funds needed to complete eligible 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: Grass Valley

B. Fire Number: CA-BDF-10566

C. State: CA

D. County: San Bernardino

E. Region: 05

F. Forest: 12

G. District: Mountaintop Ranger District

H. Fire Incident Job Code: P5D1RW

I. Date Fire Started: October 22, 2007

J. Date Fire Contained: October, 29 2007

K. Suppression Cost: $6,650,000 to date

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 2.6 (Dozer) and 7.8 (Hand line)
2. Fireline seeded (miles): None
3. Other (identify): None

M. Watershed Number: 180902080104, 180902080105

N. Total Acres Burned: 1,241
NFS Acres(**852**) Other Federal (0) State (0) Private (389)

O. Vegetation Types: Pine-dominated mixed conifer forest, Coulter pine forest, ponderosa pine forest, California black oak woodland, canyon live oak woodland, big-cone Douglas fir, scrub oak shrubland, and lower montane mixed chaparral.

P. Dominant Soils: Soil Map Units within the Grass Valley Burned Area (from SBNF Soil Survey)

Symbol	Map Unit Name	Acres
AeD	Oak Glen family-Riverwash association, 2 to 30 percent slopes	10
DaF	Pacifico-Wapi families complex, 30 to 50 percent slopes	2
DaG	Wapi-Pacifico families-Rock outcrop complex, 50 to 75 percent slopes	487
DcDE	Morical-Brader families association, 2 to 30 percent slopes	10
DnG	Trigo family-Lithic Xerorthents, warm complex, 50 to 75 percent slopes	11
MbE	Morical-Wind River families complex, 15 to 30 percent slopes	500
MbF	Morical-Wind River families complex, 30 to 50 percent slopes	221

Q. Geologic Types: Jurassic to Cretaceous age Quartz Monsonite of Pleasant View Ridge.

R. Miles of Stream Channels by Order or Class: Perrenial Streams – 0 miles, Intermittent Streams – 2.65 miles.

S. Transportation System

Trails: 1 miles Roads: 3 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 856 (low) 315 (moderate) 70 (high)

B. Water-Repellent Soil (acres): 386

C. Soil Erosion Hazard Rating (acres): 0 (low) 520 (moderate) 722 (high)

D. Erosion Potential: 13 tons/acre

E. Sediment Potential: 389 cubic yards / square mile one year following burn from Grass Valley Creek below the fire (normal level is 175 cu. Yd./sq. mi.)

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): 10

D. Design Storm Duration, (hours): 6

E. Design Storm Magnitude, (inches): 4.4

F. Design Flow, (cubic feet / second/ square mile): Using Rowe et al. Method
For Grass Valley Creek below fire boundary.

Peak discharge: equal or exceeded peak discharge	Normal watershed peak discharge (cfs/sq mi)
Q 2	15
Q 10	52
Q 25	162

G. Estimated Reduction in Infiltration, (percent): 30

H. Adjusted Design Flow, (cfs per square mile): Using Rowe et al. Method
For Grass Valley Creek below fire boundary.

Peak discharge: equal or exceeded peak discharge	1 year post burn peak discharge (cfs/sq mi)	Percent of prefire
Q 2	20	133% or 1.33 x normal
Q 10	60	115% or 1.15 x normal
Q 25	184	113% or 1.13 x normal

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats: The following table summarizes values at risk and emergency deterrminations identified by the BAER Assessment team. The Soils, Hydrology, Geology, Engineering, Archaeological, Wildlife, and Botanical Specialist Reports, available in the project file, describe in detail threats and emergency conditions for values at risk in the burned area.

Summary of values at risk and emergency determinations.

Values at Risk	Threat	Determination
Life		
Public Safety	Potential for sediment and debris laden flooding and debris flows. Hazard trees within burn area.	**Emergency** exists within and downstream of fire area.
Public Health	Potential contamination of the municipal water supply in Grass Valley Creek and Grass Valley Lake from hazardous waste in burned or partially burned residential debris.	**Emergency** exists within and downstream of fire area.
	Lake Arrowhead – Water Quality	Emergency does not exist.
Property		
Private Residences	Potential for sediment and debris laden flooding and debris flows. Loss of water control. Hazard trees within burn area.	**Emergency** exists within fire area.
Private Roads	Potential for damage within the burn area from debris flows. Loss of water control. Potential for blockage and/or loss of road infrastructure.	**Emergency** exists within and downstream of fire area.
Forest Service Roads	Potential for loss of road infrastructure and road base.	Emergency does not exist.
Forest Service Trail	Potential for loss of trail tread.	Emergency does not exist.

Values at Risk	Threat	Determination
Water Tanks	Potential for damage from debris flows.	Emergency does not exist.
Communication Station	Potential for damage to facilities from debris flows.	Emergency does not exist.
Power Lines	Potential for damage to facilities from debris flows and hazard trees.	**Emergency** exists with respect to hazard trees.
Sanitation Station	Potential for damage to facility and infrastructure.	Emergency does not exist.
Grass Valley Lake	Potential for increased sedimentation into grass vallley lake thus reducing holding capacity.	Emergency does not exist.
Golf Course	Potential for increased sediment delivery to fairways and greens of golf course.	Emergency does not exist.
Silverwood Lake State Recreation Area	Potenitail for increased sediment delivery to Silverwood Lake State Recreation Area.	Emergency does not exist.
Resources		
Soil Productivity	Loss of soil productivity as a result of increased erosion.	Emergency does not exist.
Water Quality	Ash and fine sediment could adversely affect water quality during the first major storm events after the fire and some temporary sedimentation to the channel could occur.	**Emergency** exists with respect to water quality in Grass Valley Lake and the upper reaches of Grass Valley Creek.
Archaeological Sites	Loss or damage to site from increased erosion or sediment delivery. Increased potential for vandalism to sites.	**Emergency** exists due to the potential for increased vandalism as a result of lack of vegetative recovery.
Riparian Dependant Species	Increased loss of water control, increased erosion and sediment delivery, and contanimation of water from hazardous material. Introduction of noxious weeds.	**Emergency** exists for the arroyo toad, mountain-yellow legged frog, red-legged frog, and aquatic and riparian habitat.
Aquatic Species	Increased loss of water control, increased erosion and sediment delivery, and contanimation of water from hazardous material.	**Emergency** exists for aquatic species within Grass Valley Creek.
Bald Eagle Roost Site	Post-fire impacts associated with increased flows and debris flows.	**Emergency** exists due to increased access into night roost sites.
California Spotted Owl Nest Stand	Post-fire impacts associated with increased flows and debris flows. Increased access into nest stands due to removal of vegetation.	**Emergency** exists due to increased access into nest stands.

Values at Risk	Threat	Determination
Native Vegetative Recovery	Increased access into burn area and introduction/expansion of noxious weeds could negeatively impact native plant recovery.	**Emergency** exists due to potential for increased access into areas denuded of vegetation and high potential for invasion of noxious weeds.
Rare Plants	Habitat alteration due to increased sediment delivery, increased flows, introduction of noxious weeds, and impacts to native vegetative recovery.	**Emergency** exists due to potential for increased access into areas denuded of vegetation and high potential for invasion of noxious weeds.

Life

Public Safety:
As a result of burned structures within the Grass Valley Fire burn area and slopes ranging from 40 to 65 percent, threats to public safety were identified by the BAER Assessment team that constitute an emergency from the increased potential for sediment and debris laden flooding, debris flows, and hazard trees within the Grass Valley Fire Area. There is also increased risk to public safety at the crossing of Forest Road 2N33 and Grass Valley Creek due to the potential for increased flows which may overtop the concrete ford.

Public Health:
Large volumes of burned residential remains are located on steep slopes and tributary drainages to Grass Valley Creek and adjacent to Grass Valley Lake in the Grass Valley Lake residential area. 179 homes on private land in this area were completely consumed by the fire and pose a major threat to water quality and aquatic and terrestrial wildlife to the lake and downstream of the burned homes.

It is possible that along with the large amounts of solid waste available for transport off-site into adjacent drainages that lead to Grass Valley Creek and Grass Valley Lake, there are hazardous materials usually found within burned structure debris that can migrate off-site. This condition potentially poses a serious threat to water quality and aquatic habitat in Grass Valley Creek and Grass Valley Lake if burned structure materials are not contained on site and eventually removed from the watershed.

The California Integrated Waste Management Board (CIWMB) has stated that ash and debris from residential structures consumed by wildfires may contain concentrated amounts of heavy metals, such as arsenic, barium, beryllium, copper, chromium, cadmium, lead and zinc (CIWMB, 2007). Further, according to the CIWMB, the occurrence of these metals in burned residential debris has been demonstrated in the “Assessment of Burned Debris Report for the Cedar and Paradise Fires, San Diego County, CA” dated December 2003.

It is also known that asbestos remains are found in burned debris and poses a threat when disturbed and airborne. Common household products found in burned structures are usually present such as pesticides, fertilizers, paints and thinner, automobile products and other petroleum based products. Considering the steep drainages found within the burned structures that presently have debris within the channels and the high probability off-site migration, the large volumes of burned structure debris left as a result of the Grass Valley fire and the information described above, if the debris is not contained and removed from the watershed, contamination of Grass Valley Creek and Grass Valley Lake could occur as a result of the first major storm events in the fire area.

The BAER assessment team met with Marc Lippert (LACSD), Ryan Gross (LACSD), and John Rutledge (ALA) to address concerns with the potential impacts to Lake Arrowhead as a result of the Grass Valley Fire. Lake Arrowhead is a municipal water supply that recieves water from Grass Valley Lake through a tunnel which is controlled by Lake Arrowhead Community Services District and the Arrowhead Lake Association. Potential

threats to Lake Arrowhead were identified as increased sediment delivery, potential for debris to move through the tunnel into Lake Arrowhead, and potential for mobilization of hazardous materials into Lake Arrowhead.

These threats are adressed or reduced by the following:

- San Bernardino County Fire Hazmat Divisions removal of hazardous materials in the Grass Valley Fire Area scheduled to strat on Friday, November 9, and projected to be completed by the middle of the following week.
- The recommendation to install sediment containment structures such as silt fences on parcels where debris could be mobilized. Coordination with NRCS is critical.
- Two sediment basins (recently cleaned out by Lake Arrowhead Country Club), which will catch sediment prior to delivery into Grass Valley Lake.
- Lake Arrowhead Country Club golf course will act as a depositional zone for sediment.
- Water quality testing for Grass Valley Lake is also recommended.
- Ensuring the gate which controls flows into the tunnel that delivers water to Lake Arrowhead is maintained and properly funtioning.

There is potential for loss of available water to Lake Arrowhead from Grass Valley Lake, however, LACSD does have a well water system and access to state water through the Crestline Lake Arrowhead Water Association's (CLAWA) system.

Property

Private Residences and Road System:

Threats exist to property as result of the Grass Valley Fire due to increased potential for sediment and debris laden flooding, debris flows, and hazard trees within burn area. Site specific observation were identified in the Geology Technical Specialist BAER Report in project file. The residential community in Grass Valley includes a series of roads and houses that are in close proximity upon slopes that range from 40 to 65 percent. The road system is drained via numerous drop inlet culverts that discharge into what appear to be natural and man made drainage swales that eventually drain into Grass Valley Creek. Most of the roads are insloped and carry water to the culverts along inside ditches. Because much of the hardscape, landscaping, and residential drainage structures are destroyed, and because hydrophobic soils developed from the fire, increased flows on slopes and onto the road system can be expected. Burned residences mantle the slopes with debris above roads, that could wash down, inundate, and plug the drainage system. Flows could be diverted down roads and cause erosion and possible blockage and/or loss of portions of the road infrastructure. Two specific sites were observed where potential damage to the road system may occur as noted specific observations of the geologist report; however other locations of potential damage are likely present throughout the sub-division (Geology Technical Specialist Report, Grass Valley Slide Fire Project). In addition, loss of water control could cause additional soil erosion and increase sedimentation to Grass Valley Lake and Grass Valley Creek.

Power Lines:

Threats to power line within the Grass Valley Fire constitute an emergency as a result of hazard trees which could fall across power lines.

Resouces

Water Quality:

Grass Valley Creek can experience unusually high and sudden peak flows as the headwater areas are heavily developed and runoff efficiency is significantly increased by the effects of housing and road developments and associated storm water control infrastructure. Infiltration rates are reduced by the influence of hardened, impervious surfaces such as roads, house roofs, driveways and parking areas along with engineered storm drains, resembling urban runoff. Below the fire area the creek is found in a natural setting with little development and has seasonal or intermittent surface flows. The stream is usually dry in the summer months along the lower reaches above the Mojave River.

The East Fork of the West Fork Mojave River headwaters found in a relatively undeveloped portion of the fire area provides surface water to Silverwood Lake reservoir, and important domestic water supply of the local Southern California area.

Stream flows in Grass Valley Creek/East Fork of West Fork Mojave River sustain riparian vegetation important to aquatic species and wildlife, water quality/quantity and provide channel structure and integrity. Burn severity, predicted post fire peak flows and sediment yields are discussed in the Grass Valley Fire BAER Hydrology Report of the Grass Valley Project File.

Beneficial uses of water are identified and protected by the California State Water Quality Control Board by regulation as found in Basin Plans. Beneficial uses are: Non-Water Contact Recreation, Water Contact Recreation, Wildlife habitat, Groundwater Re-charge, Municipal water supply, warm-water/cold water aquatic habitat, Freshwater and Spawning.

The effects of the Grass Valley Fire may cause degradation to some beneficial uses of Grass Valley Creek if pollution to waterways from burned structure remains occurs. Other adverse effects to water quality such as post-fire ash and increased sediment delivery are expected to be light to moderate and short term in duration, however, there will be short periods of moderate to severe ash loading after the first severe storm events within and below the fire area. After the first post-fire winter this effect should be reduced. Post-fire sediment loads into Grass Valley Creek are expected to move downstream and disperse along the lower gradient and depositional reaches along the lower reaches above the Mojave River confluence.

Adverse effects of the fire to the East Fork of the West Fork Mojave River in terms of beneficial uses is slight, as the 90 % of the burn area (only 287 acres of the fire) in the watershed is low severity and extensive forest canopy cover still exists. Light increases of flow and sediment/ash will occur, however, there will be little change above normal. The watershed will not be affected by pollution from burned structures as none of the structures existed in the watershed.

Grass Valley Creek is the primary watershed affected by the Grass Valley fire as the majority of the burned area exists within the watershed including the most severely burned areas. Forest lands and private lands within the watershed that burned will moderately increase peak flows and sediment yields to Grass Valley Creek. The amounts are relatively small as compared to pre-fire watershed responses. Ash and fine sediment will adversely affect water quality during the first major storm events after the fire and some temporary sedimentation to the channel could occur. It is anticipated that these impacts will be moderate and short term in nature and mostly affect the reaches of the creek 1-3 stream miles below the fire.

Further downstream, these effects will be reduced over the length of the drainage before the confluence with Mojave River, as the stream reaches are lower in gradient and have an ability to distribute additional sediment loads throughout the reach. Due to the relatively low sediment and ash yields contributed by the fire it is expected that additional sediment deposition above normal will be generally light to moderate and have minimal effects to beneficial uses of water. The reaches below the fire area will likely sustain near term sedimentation, however, these effects will be short in duration as this reach usually transports sediment easily to lower reaches during peak flow events. Urban runoff in the upper watershed contributes to sharp and rapid peak flows that help scour the channel below the fire of fine sediments and steeper gradients in the reach maintain higher flow velocities that also move sediments downstream.

An abandoned mine site north of the Grass Valley Lake residential area was surveyed. The mine site has been filled to create a level platform. A large culvert was placed above the flat and since the inlet has filled in with sediment, causing flows from the drainage above to migrate around the inlet and onto the flat of the mine site. A gully has formed over the mine flat area and flows off the steep edge onto a steep, severely burned slope. A very deep and unstable gully has formed below the mine site that readily transports sediment to Grass Valley Creek. The drainage above the mine site was severely burned and increased stream flow onto the mine site is likely during storm events. This condition may aggravate ongoing site erosion at the mine flat and increase sediment delivery to Grass Valley Creek. It is unknown what exists in the fill materials at the mine site that may contain contaminants, several large piles of discarded asphalt were seen at the site.

Archaeological Sites:

The BAER-related records search for the National Forest lands indicated two archaeological sites and two prehistoric isolates within the burn area and five sites located adjacent to the fire perimeter (CA-SBR-916,

SBR-917, SBR-4291, SBR-4293, SBR-4294H). Two surveys have been conducted within the fire perimeter. There are areas in the fire perimeter that have a high potential for cultural resources.

The two sites located within the burn area are CA-SBR-471 and CA-SBR-10441. Site SBR-471 was first recorded in 1967 as a small prehistoric activity area (50' x 50') with a millingstone, debitage, broken quartzite nodules, a scraper, and darkened soil. A 2003 update of the site indicated no evidence of these or any other cultural material, likely due to numerous disturbances that have occurred in this location. No cultural materials were observed during the current field visit. Site SBR-10441 was recorded in 2003 as a prehistoric plant processing activity area (95 m x 30 m) with millingstones and handstones. All these artifacts as well as an additional granitic millingstone fragment (in two pieces) were relocated during the current field visit.

Both of these sites and the one isolate within the burn area are not directly impacted by the fire and do not appear to be at risk from potential erosion or debris flows resulting from the vegetation burnoff. The sites however, may be subjected to damage from unauthorized OHV activity as the vegetation has burned off and vehicles may more easily access these areas. The other groundstone isolate is located on private property and the location was not assessed for the current effort.

Wildlife Species and Habitat

The fire area supports some very important and unique habitats and occurrences of rare wildlife species. In the fire area, there are two nest stands for California spotted owls (Forest Service Sensitive) and bald eagle night roosts (Forest Service Sensitive). There is modeled habitat for California red-legged frogs (federally-threatened), arroyo toads, and southwestern willow flycatchers in the fire area and downstream from the fire. Grass Valley Creek downstream of the fire supports arroyo chub and trout. Trout may have been present in the portion of Grass Valley Creek in the fire area. Silverwood Lake downstream of the fire area also supports numerous sport fish species. The Grass Valley fire area was also known to support San Bernardino flying squirrels (Forest Service Sensitive). The bicolor rainbeetle (Forest Service Watchlist species) is known from about ¼-mile from the fire and is likely to have occurred in the fire area.

These habitats and species are at risk to further losses, disturbances, and degradation from post-fire impacts of sediment delivery and loss of water quality in aquatic systems and scouring of riparian vegetation. The greatest risk to all of these habitats and species (and many other wildlife species in the fire area) are the cumulative effects of fire, post-fire watershed impacts, and the potential long-term disturbance and habitat impacts from increased access by people and OHVs.

The potential introduction of non-natural debris and environmental toxins into the aquatic habitat as a result of delivery of burned household materials into Grass Valley Creek is a critical concern. Amphibians, aquatic macro-invertebrates, and fish are extremely susceptible to death, deformity, and illness from environmental toxins because of the pervious nature of their skin and because of their dependence on aquatic environments for all stages of life. Recent habitat and macro-invertebrate assessments in Grass Valley Creek determined that it supports some of the most pristine riparian and aquatic habitats that have been sampled by the surveyors in the San Bernardino Mountains in terms of riparian vegetation, macro-invertebrate abundance and diversity, and water quality. Terrestrial species are also at risk from drinking contaminated water.

Arroyo Toad: It has been determined that an emergency exists for arroyo toad downstream in Deep Creek as a result of post-fire effects of the Grass Valley Fire. The most likely source of the emergency condition would be from environmental contaminants, non-native debris, and introduction of noxious weeds. Other typical post-fire watershed responses would not create an emergency for this species at the known occurrence (Grass Valley Creek upstream of the Highway 173 crossing).

Mountain Yellow-Legged Frog: It has been determined that an emergency exist for mountain yellow-legged frog habitat in Grass Valley Creek as a result of post-fire effects of the Grass Valley Fire (for the same reasons as arroyo toads). No emergency exists in the East Fork of the West Fork Mojave River.

California Red-Legged Frog: It is my determination that an emergency does exist for California red-legged frogs in Grass Valley Creek as a result of post-fire effects of the Grass Valley Fire (for the same reasons as arroyo toads). No emergency exists in the East Fork of the West Fork Mojave River.

Southwestern Willow Flycatcher and Least Bell's Vireo: It has been determined that an emergency does not exist for southwestern willow flycatcher or Least Bell's vireo and suitable habitat as a result of the fire and post-fire effects of the Grass Valley Fire.

California Spotted Owl: It has been determined that an emergency does exist for California spotted owl habitat as a result of the fire and increased potential of noxious weeds.

Bald Eagle: It has been determined that an emergency exists for bald eagle habitat as a result of the fire and increased access.

Aquatic and Riparian Species: It has been determined that an emergency exists for aquatic and riparian habitat in Grass Valley Creek as a result of the fire and post-fire effects of the Grass Valley fire due to the unknown potential impacts of environmental contaminants and non-natural debris. No emergency exists in the East Fork of the West Fork Mojave River.

Botanical Species and Habitat:

No listed Threatened or Endangered plant species are known or expected to occur within or near the burned area. One R5 Sensitive plant species, yellow owl's clover, is known to occur within and adjacent to the burned area. Palmer's mariposa lily, also listed as an R5 Sensitive species, occurs within ½ mile of the burned area and may occur undetected in the burned area. Five SBNF Watch-list species occur within or near the burned area: ocellated Humboldt lily, round-leaved boykenia, Tehachapi ragwort, Mojave phacelia, and Parish's yampah. All of these Sensitive and Watch-list species are associated with riparian habitat or vernally-wet swales along ephemeral or intermittent drainages.

Invasive weed species including Spanish broom and everlasting peavine are known to occur within the burn area and along access routes leading to the burn. Yellow star thistle, Himalayan blackberry, and black locust are known from mapped locations less than three miles away. Also, multiple invasive weed species are known from the general area including cheatgrass, bull thistle, storksbill, common lambsquarters, sweet clover, Russian thistle, tansy mustard, and tumble mustard likely occur within the burned area. All of these species pose a threat of introduction and/or aggressive spread post-fire.

Botanical values identified are 1) stability and viability of Sensitive and Watch-list plant populations impacted by fire and fire suppression, and 2) general native vegetation, the recovery of which is threatened by post-fire weed invasion and illegal off road vehicle exploration enabled by the newly open structure of the burned landscape.

Emergency situation exists with respect to vegetative recovery as a result of areas denuded of vegetation and the threat of post-fire weed introduction and spread. Increased off-highway vehicle access to areas denuded of vegetation will impede vegetative recovery. The unknowing introduction and dispersal of invasive weeds into areas disturbed by fire suppression and rehabilitation has the potential to establish large and persistent weed populations. In addition, it is highly likely that existent weed infestations will increase in the burn area, due to their accelerated growth and reproduction and a release from competition with natives. These weed populations could affect the structure and habitat function of native plant communities within the burn area. It is expected that most native vegetation would recover if weed invasions are minimized.

There is not an emergency situation for the continued existence of yellow owl's clover, Palmer's mariposa lily or any of the Watch-list species known from within the fire area. Based on conditions found in the field survey and references on the specific fire ecology of each species and mitigating factors described above, these populations face only minor threats related to the Grass Valley Fire.

B. Emergency Treatment Objectives:

- Land Treatments – Reduce likelihood of the establishment of noxious weeds into the Grass Valley Fire Area.
- Road and Trail Treatments – Reduce threat to aquatic and riparian dependant species in Grass Valley Creek, reduce threats to users of Forest Road 2N33, reduce threat to vegetative recovery due to uncontrolled vehicle access.
- Protection and Safety Treatments – Ensure continued interagency communication and coordination with San Bernardino County Fire Hazardous Materials Division, and NRCS of potential post fire values at risk.
- Ensure native vegetative recovery is facililtated, thus reducing threats to archaeoligical sites, wildlife species/habitat, and botanical species/habitat.

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

Land **90** % Channel **N/A** % Roads/Trails **90** % Protection/Safety **90** %

D. Probability of Treatment Success

	Years After Treatment		
	1	3	5
Land	90%	90%	90%
Channel	N/A	N/A	N/A
Roads/Trails	90%	90%	90%
Protection/Safety	90%	90%	90%

E. Cost of No-Action (Including Loss): $2.95 million

F. Cost of Selected Alternative (Including Loss): $492,470

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Marc Stamer, Scott Tangenberg (Co-Team Leader)

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Core Team

Eric Schoder – Soil Scientist
Carolyn Napper – Soil Scientist
Scott Eliason – Botanist
Uyen Doan – Archaeologist
Kelly Ebert – Roads Engineer
David Longstreth(Cal Fire) –Geologist
Casey Shannon – Hydrologist
Robin Eliason – Wildlife Biologist
Greg Napper – Roads Engineer
Jordon Zylstra – GIS
Curtis Brundage(San Bernadino County Fire) – Hazardous Materials Division

Adjunct Team

Jonathan Cook-Fisher – Recreation Greg Crawford – Fire Patrol
Erwin Fogerson (San Bernardino County Public Works) – Flood and Transportation
David Kotlarski - Forester

H. **Treatment Narrative:** The following table summarizes the treatment request to mitigate the emergencies to values at risk.

Values at Risk	Treatment	Cost
Life		
Public Safety	Installation of signs at Forest Road 2N33/Grass Valley Creek Crossing	$1,140
	Hazard tree removal	$1,600
	Interagency Coordination	$2,625
Public Health	Interagency Coordination	See above for Public Safety
Property		
Private Residences	Interagency Coordination	See above for Public Safety
Private Roads	Interagency Coordination	See above for Public Safety
Power Lines	Hazard tree removal/Interagency Coordination	See above for Public Safety
Resources		
Water Quality	Interagency Coordination	See above for Public Safety
Archaeological Sites	Closure of Forest Road 2N34 and 2N34A within the fire area.	$27,125
Riparian Dependant Species	Noxious weed detection surveys.	$4,470
Aquatic Species	Interagency Coordination	See above for Public Safety
Bald Eagle Roost Site	Closure of Forest Road 2N34 and 2N34A within the fire area.	See Archaeological Sites above.
California Spotted Owl Nest Stand	Closure of Forest Road 2N34 and 2N34A within the fire area.	See Archaeological Sites above.
Native Vegetative Recovery	Noxious weed detection surveys and closure of Forest Road 2N34 and 2N34A within the fire area.	See Archaeological Sites above.
Rare Plants	Noxious weed detection surveys and closure of Forest Road 2N34 and 2N34A within the fire area.	See Archaeological Sites above.

Land Treatments:

- **Noxious Weed Detection Surveys:** Surveys will begin in 2008 during the flowering periods of weed species. Because of differences in flowering times for all potential species, two visits may be required during the growing season. Completion of surveys in riparian areas, dozerlines, drop points, safety zones, and known invasive and sensitive plant populations will be the first priority. The second survey priorities will be along roads, handlines, and staging areas. Surveys of the general habitats in the burned area will be the lowest priority. All locations of weed species will be mapped, using the San Bernardino NF "weed species to map" list. Surveys will be completed using the NRIS protocol available at the national website: http://fsweb.ftcol.wo.fs.fed.us/frs/rangelands/index.shtml. Results will be entered into the NRIS database. Noxious weed detection survey plan is attached as Appendix A.

Treatment Cost:

Channel Treatments: N/A

Roads and Trail Treatments:

Unit	Unit Cost	#Units	Total
1-GS-11 botanist	390/day	3 days	$1,170
4-GS-05 botanists	150/day	5 days	$3,000
Vehicle mileage	0.60/mile	500miles	$300
TOTAL COST			**$4,470**

- This treatment entails work primarily addressing the capacity of dips that catch surface runoff and direct flows to existing overside drains. The dips need to be enhanced in dimension to handle increased flows and sediment movement. Incidental to this work are activities such as: Clean blockage of drainage ways such as overside drains; removing ruts and gullies and restoring needed inslope or outslope. Improving the existing drainage facilities will insure they are as effective and efficient as possible to handle the anticipated post-burn flows.

Treatment Cost:

Unit	Unit Cost	# of Units	Total
Installation of dips	$1,500/each	5	$7,500
Total			**$7,500**

Protection/Safety Treatments:

- **Interagency Cooridination/Interim Reporting:** Interagency coordination started during the fire and continued throughout the BAER Assessment. Continuing interagency coordination is critical to ensuring effective, expediant implementation of post-fire treatments with cooperators.

Treatment Cost:

Unit	Unit Cost	#Units	Total
GS-11	$375/day	7 days	$2,625
Total			**$2,625**

- **System Road Closure:** Implementing a system road closure on Forest Road 2N34 and 2N34A through the fire to mitigate threats vegetative recovery, reduce vandalism to archaeological sites, and reduce the potential for the establishment of noxious weeds. To effectively implement the closure two gate locations were identified. Fencing to reinforce gates and to reduce impacts along the fire perimeter that were denuded of vegetation. Regulatory, Closure, and Warning signs will also be placed at key points of entry into the fire area. This closure will also be supported by a forest order for enforcement.

Treatment Cost:

Unit	Unit Cost	#Units	Total
Two Inch Pipe Gate	$4,000 each	2	$8,000
Fencing Material	$5,000 each	1 mile	$5,000
Type II Crew	5,000/day	2 days	$10,000
Archeological monitor	400/day	2 days	$800
Closure Signs	$300 each	4	$1,200
Regulatory Signs	$500 each	4	$2,000
Protection Life Signs	$500 each	2	$1,000
Total			**$28,000**

- **Warning Signs - Forest Road 2N33/Grass Valley Creek:** Threats to life and public safety exist at the crossing of Forest Road 2N33 and Grass Valley Creek as a result of increased potential for the creek to top the road crossing during storm events. To mitigate the emergency the BAER assessment team proposes the installation of warning signs on the approaches of Forest Road 2N33/Grass Valley Creek Junction to alert the public of potential flooding hazards.

- **Treatment Cost:**

Unit	Unit Cost	# Units	Total
Waring Signs	$300/each	4 each	$1,200
Recreation Technition	$240/day	1 days	$240
Total			**$1,440**

- **Hazard Tree Removal:** Hazards trees within the the fire area that pose a threat to home owners and property were identified by the Mountaintop Ranger District Forester. Removal of these trees will mitigate potential falling hazards to private structures, roads, and power lines. Hazard tree removal costs include one skid steer for 2 days to clear any hazard trees that have to be dropped across private roads or property. .

Treatment Costs:

Unit	Unit Cost	# Units	Total
1 Faller (Class C)	$800/day	2 days	$1,600
Skid Steer	$110/hour	20 hours	$2,200
Total			**$3,800**

I. Monitoring Narrative:

This monitoring is specifically designed to answer the question: Did BAER treatments provide the needed protection and rehabilitation of the burned area? The effectiveness monitoring efforts identified for the Grass Valley Fire include: 1) Monitoring to confirm that road closure to prevent impacts to native vegetative recovery and cultureal sites is successful; 2) Monitoring to deterimine if hazardous material/debris containment and removal conducted on private property is effective in minimizing downstream impacts; 3) Monitoring the effectiveness of road treatments installed to ensure system roads handle expected increases in post-fire runoff.

Monitoring Costs:

Treatment	Unit Cost	# Units	Total
System road treatments	$280/day	14 days	$3,920
Road closure	$250/day	26 days	$6,500
Hazardous material/debris removal	$6,350/year	1 year	$5,150
Total			**$15,570**

J. Recommendations:

Interagancy Coordination – Forest personnel should continue to coordinate with San Bernardino County HAZMAT and NRCS to ensure debris from burned homes is expeditiously removed. HAZMAT should be cleaned up before rain storms mobilize hazardous debris and transport it downstream to Grass Valley Creek and Grass Valley Lake.

Private Land Debris Removal – County agencies, State agencies, and Private homeowners should remove debris from burned homes before the first significant winter rain event. Prior to debris removal, measures should be taken to ensure that debris remains on the hillslope, and is not washed downslope into Green Valley Lake or Green Valley Creek. Debris retention should be accomplished using the model described in Project Specifications for the Angora Fire Structural Debris Removal, Lake Tahoe, California (Thalhamer, 2007). Silt fences or straw wattles should be placed downslope of burned structures to retain debris that may be mobilized by rain events. Once debris retention structures are in place, debris cleanup should proceed as quickly as possible to prevent downstream contamination.

Part VI – Emergency Stabilization Treatments and Source of Funds **Interim #**

			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										
Noxious Weed Detecion Surveys	each	4470	1	$4,470	$0		$0		$0	$4,470
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$4,470	$0		$0		$0	$4,470
B. Channel Treatments										
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Channel Treat.				$0	$0		$0		$0	$0
C. Road and Trails										
Improve Road Drainage	each	1500	5	$7,500	$0		$0		$0	$7,500
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road & Trails				$7,500	$0		$0		$0	$7,500
D. Protection/Safety										
Road Closure				$0	$0		$0		$0	$0
Gates	each	4000	2	$8,000	$0					$8,000
Signs	each	420	10	$4,200	$0					$4,200
Fencing	mile	5000	1	$5,000	$0					$5,000
Type 2 Crew	day	5000	2	$10,000	$0		$0		$0	$10,000
Arch Monitor	day	400	2	$800	$0		$0		$0	$800
3N34 Xing Warning Signs	each	360	4	$1,440	$0					$1,440
Hazard Tree Removal	day	1900	2	$3,800	$0					$3,800
Impementation Coord	day	375	7	$2,625						$2,625
Interagency Coord.	day	375	7	$2,625	$0					$2,625
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Structures				$38,490	$0		$0		$0	$38,490
E. BAER Evaluation										
Salary	each	34224	1	$34,224			$0		$0	$0
Vehicles	each	1686	1	$1,686						$0
Travel/Perdiem	each	3681	1	$3,681						$0
Supplies/Helicopter	each	500	1	$500						$0
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				$40,091	$0		$0		$0	$0
F. Monitoring										
Hazmat Contain/Removal	each	5150	1	$5,150	$0		$0		$0	$5,150
Sys Road Treat.	each	3920	1	$3,920	$0					
Road Closure Treat.	each	6500	1	$6,500	$0					
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$15,570	$0		$0		$0	$5,150
G. Totals				$66,030	$0		**$0**		**$0**	**$55,610**
Previously approved										
Total for this request				**$66,030**						

PART VII - APPROVALS

1.	/s/ Max Copenhagen Deputy Forest Supervisor (signature)	November 8, 2007 Date
2.	/s/ Vicki A. Jackson (for) Regional Forester (signature)	November 13, 2007 Date

Appendix A

NOXIOUS WEED DETECTION SURVEY PLAN

Fire Name: Grass Valley Month/Year: October 2007
Author: Scott Eliason
Author Duty Station: BDF, Big Bear Ranger Station

A. Background

Reducing the introduction and spread of non-native invasive species has been identified as a Forest Service Strategic Goal for 2003-2008. Spanish Broom (*Spartium junceum*), everlasting peavine (*Lathyrus latifolius*), cheatgrass (*Bromus tectorum*), common lambsquarters (*Chenopodium album*), bull thistle (*Cirsium vulgare*), tansy mustard (*Descurainia sophia*), storksbill (*Erodium cicutarium*), sweet clover (*Melilotus alba*/*officinalis*), Russian thistle (*Salsola tragus*), and tumble mustard (*Sisymbrium altissimum*) are known to occur within the burn area and along access routes to the burn. In addition, yellow starthistle (*Centauria solstitialis*), Himalayan blackberry (*Rubus armeniacus*) and black locust (*Robenia pseudoacacia*) are known from locations less than three miles away. Several plant dispersal corridors such as Forest roads, trails, dozerlines, and waterways occur within and leading into the fire area. In addition, seed could have been transported into the burn on suppression equipment and supplies. Fire is known to enhance the establishment and spread of all weed species present.

B. Management Concerns

Noxious weed invasions interfere with habitat recovery and ecosystem health within burned areas and fire suppression sites (*e.g*. hand and dozer lines, drop points, and staging areas). In particular, noxious weeds hinder the recovery of habitat by aggressive colonization, nutrient competition, allelopathy, and reduction of water quality and quantity.

C. Objectives

To determine if the fire and associated ground disturbing activities have caused the establishment and spread of noxious weeds to the extent that eradication efforts are necessary. Early detection dramatically increases the likelihood of successful treatment. If weeds are detected, a supplemental request for BAER funds will be made for eradication and subsequent effectiveness monitoring.

D. Parameters

Noxious weed presence, location, density, population size, and persistence

E. Locations

In and along roads, trails, dozerlines, handlines, drop points, safety zones, riparian areas, and adjacent to known sensitive and invasive plant populations

F. Weed Detection Survey Design and Methodology

Surveys will begin in 2008 during the flowering periods of weed species. Because of differences in flowering times for all potential species, two visits may be required during the growing season. Completion of surveys in riparian areas, dozerlines, drop points, safety zones, and known invasive and sensitive plant populations will be the first priority. The second survey priorities will be along roads, handlines, and staging areas. Surveys of the general habitats in the burned area are not warranted. Surveys will be floristic in nature, and all locations of weed species (Appendix A) will be mapped using the protocol for the NRIS invasives database and the field form at Appendix C.

Surveying will include documentation and hand pulling new weed occurrences at the time of inspection. New weed occurrences will be pulled to root depth, placed in sealed plastics bags, and properly disposed.

Documentation of new infestations will include:

- Floristic surveys of focus areas
- Mapping perimeters of new/expanded infestations
- Filling out Weed Element Occurrence Form (Appendix C)
- Treatment method
- Dates of treatment
- Entering data into National Resource Information System (NRIS) database
- Evaluating effectiveness of treatment in subsequent inspections

G. Reporting
A Weed Detection Survey Report will be submitted to the regional BAER coordinator and the Mountaintop District Ranger. If weed introduction and spread has occurred, an interim BAER report will be completed to request eradication funding. Reporting costs are included in figures below.

H. Costs: Weed Detection Surveys for One Year =$4470.00
Weed detection surveys to determine whether ground disturbing activities related to the Grass Valley Incident and the fire itself have resulted in the expansion of invasive weeds is requested for the first year post-containment.

FY 2008	
GS-11 botanist ($390/day x 3 days)	=$ 1170.00
4-GS-05 botanists ($150/day x 5 days)	=$ 3000.00
Vehicle mileage (500 miles @0.60/mile)	=$ 300.00
TOTAL for weed detection surveys for FY08	=$ 4470.00

I. Personnel
SBNF staff will be used for surveys

J. Responsible Staff
Scott Eliason, Mountaintop District Botanist

K. Follow-up Actions
Design and implement follow-up treatments as needed. Plan for integrated weed management and NEPA analysis using non-BAER funding.

APPENDIX A

Weed Species to Map

***Acroptilon repens*	Russian knapweed
***Ageratina adenophora*	Eupatory
***Ailanthus altissima*	Tree of heaven
**Arundo donax*	Giant reed grass
A***Asphodelus fistulosus*	Asphodel
***Atriplex semibaccata*	Saltbush
**Brassica tournefortii*	African mustard
***Carduus pycnocephalus*	Italian thistle
**Centaurea solstitialis*	Yellow star thistle
**Centaurea maculosa*	Spotted Knapweed
***Centaurea melitensis*	Tocalote
***Cirsium vulgare*	Bull thistle
***Conium maculatum*	Poison hemlock
**Cortaderia selloana*	Pamapas grass
** Delairea odorata*	German Ivy
** Dipsacus sativus*	Teasel
****Dimorphotheca sinuata*	African daisy
A*Eichornia crassipes*	Water hyacinth
***Elaeagnus angustifolius*	Russian olive
***Eucalyptus globulus*	Blue gum
***Ficus carica*	Fig
**Foeniculum vulgare*	Fennel
****Fumaria officinalis*	Fumitory
***Hedera helix*	English ivy
A*Hydrilla verticillata*	Hydrilla
**Lathyrus latifolius*	Perrenial sweetpea
**Linaria genistifolia* ssp. *dalmatica*	Dalmatian toadflax
A*Ludwigia* sp.	Water primrose
A*Myriophyllum aquaticum*	Parrotfeather
***Nicotania glauca*	Tree tobacco
****Olea europaea*	Olive
***Pennisetum clandestinum*	Kikuyu grass
***Pennisetum setaceum*	Fountain grass
****Picris echioides*	Bristly ox-tongue
****Piptatherum miliaceum*	Smilo grass
***Potamogeton crispus*	Curlleaf pondweed
****Prunus cerasifera*	Cherry plum
A*Retama monosperma*	Bridal broom
***Ricinus communis*	Castorbean
***Robinia pseudoacacia*	Black locust
**Rubus discolor*	Himalayan blackberry
****Salsola tragus*	Russian thistle
****Salsola paulsenii*	Barbwire Russian thistle
****Saponaria officinalis*	Bouncing bet

****Schinus molle*	Peruvian pepper tree
**Spartium junceum*	Spanish broom
**Tamarix ramosissima*	Saltcedar
****Tribulus terrestris*-	Puncture vine

CAL-IPC List Categories

*Severe: Most Invasive Wildland Pest Plants; documented as aggressive invaders that displace natives and disrupt natural habitats.

**Moderate: Wildland Plants of Lesser Invasiveness; plants that spread less rapidly and cause a lesser degree of habitat disruption

***Limited: Wildland Plants of Limited Invasiveness; plants that have a limited distribution and impact on natural habitats or species for which there is not adequate information to describe its threat to wildlands

A Red Alert: Plants with potential to spread explosively, infestations currently localized or small

Table constructed from CAL-IPC invasive plant species listing of 2006: www.cal-ipc.org

APPENDIX B

Invasive Weed Profiles

Bromus tectorum- Cheatgrass
Cheatgrass is an erect winter or spring annual grass. The species grows quickly in the spring and often matures and sets seeds before most other species. In undisturbed sites, cheatgrass will most commonly spread along soil cracks and work its way outward into the natural community. Cheatgrass can persist in unpredictable environments because seed germination is staggered from August until May. The change induced by cheatgrass in the fire cycle frequency is probably the species' greatest competitive advantage. Cheatgrass infested areas burn at a much greater frequency, every 3-5 years. At this frequency, native shrubs and perennial grasses cannot recover and after a few wildfire cycles a cheatgrass monoculture develops. This monoculture further increases the frequency of fires and increases the dominance by cheatgrass in the area.

Chenopodium album- Common lambsquarters
Common lambsquarters is an early seral annual herb which often becomes dense and crowded within a few post disturbance years, and thin as succession advances. It is most likely to persist in communities that retain unlittered soil and open canopies into late succession, such as Pinyon/Juniper woodlands.

Circium vulgare - Bull Thistle
Bull Thistle is a water-loving biennial herb that displaces native riparian vegetation along creeks and in meadows. It grows a deep root and a basal rosette the first year of its life. It bolts, flowers, sets seed, and dies in its second year. It is adapted to seasonally moist, well-drained, deep soils. It thrives on light and moderate mechanical soil disturbance.

Descurainia sophia -Tansy mustard
Tansy mustard is an exotic, cool season annual or biennial. Tansy mustard stands often become dense and crowded within a few post disturbance years, and thin as succession advances. It is most likely to persist in communities that retain unlittered soil and open canopies into late succession, such as Pinyon/Juniper woodlands.

Erodium cicutarium –Cuteaf filaree
Cutleaf filaree occupies a variety of habitats, from desert to riparian as a pioneer on disturbed sites. In riparian communities, it indicates recent or frequent disturbances. Cutleaf filaree seed in the litter layer remains viable following light fire, and seed just under the litter layer remains viable following moderate fire.

Melilotus albalofficinalis -Sweet clover
Sweet clover is native to the Mediterranean area through central Europe to Tibet. Seeds have hard, impermeable seed coats, and may remain dormant in soil seed banks for years. Where soil-stored seed is present, burning is stimulatory, resulting in abundant seed germination and seedling establishment.

Salsola tragus -Russian thistle
Prevalence of Russian thistle in the semidesert range of western states is due to its drought tolerance and long-distance method of seed dispersal. Russian thistle typically blooms from July to October. However, this plant is indeterminate and continues to flower and produce seed until temperatures drop below freezing. Considered very invasive, Russian thistle competes with native species and obstructs stream channels, roadways, and can become a fire hazard. It dominates areas during drought conditions or when competing vegetation is removed. Russian-thistle typically colonizes a burn site within 1 to 3 years.

Sisymbrium altissimum-Tumble mustard
Tumble mustard is an exotic winter annual or biennial with a thick taproot. As a shade-intolerant, invasive species, tumble mustard can thrive in early postfire environments. While in the rosette stage, tumble mustard may be top-killed by fire. If the root crown is not damaged, tumble mustard rosettes can sprout new basal leaves from the root crown. While fire is likely to kill some seed, its overall effect to the tumble mustard seed bank is probably negligible.

***Spartium junceum* -** Spanish broom
Spanish broom is a Mediterranean shrub with colorful bright yellow flowers, which has become widely naturalized in rocky road cuts and in nearby chaparral. This is a plant of very high concern due to its aggressive invasion response following wildfire. Because Spanish broom builds up a tremendous seed bank awaiting fire for germination, wildfires produce high seedling densities and promote broom spread.

Lathyrus latifolius- everlasting peavine
Perennial sweet pea is a rhizomatous, deep-rooted legume that climbs through the use of tendrils and can attain heights of 5-7 feet if support is available. When no support is nearby, the plant forms a viney mat 18-30 inches thick. In either case, a well established stand forms a dense mat of vegetation. The flowers range from deep purple, to white or pink and bloom from mid-June to mid-August. Sweet pea has a deep (several feet) and extensive, perennial, sprouting root system that is likely to allow it to survive even severe fire.

Linaria genistifolia* ssp. *dalmatica- Dalmation toadflax
Dalmatian toadflax has a tolerance to low temperatures and coarse soils. A mature plant can produce up to 500,000 seeds annually, and they can remain dormant for up to ten years. Dalmatian toadflax produces seed from July to October. Once established, high seed production and the ability for vegetative reproduction allow for rapid spread and high persistence. Toadflax has a deep (several feet) and extensive, perennial, sprouting root system that is likely to allow it to survive even severe fire. Toadflax is also capable of establishing either from on-site seed, or seed dispersed into a burned area. It is unclear what the effects of fire are on toadflax seed.

Tamarix ramosissima - Saltcedar
Saltcedar plants are spreading shrubs or small trees, 5-20 feet tall, with numerous slender branches and small, alternate, scale-like leaves. The pale pink to white flowers are small, perfect and regular, and arranged in spike-like racemes. As an aggressive colonizer that is able to survive in a wide variety of habitats, saltcedar often forms monotypic stands, replacing willows, cottonwoods, and other native riparian vegetation. The stems and leaves of mature plants secrete salt, forming a crust above and below ground that inhibits other plants. Saltcedar is also an enormous water consumer. A single large plant can absorb 200 gallons of water a day. Saltcedar spreads by seed and also resprouts vigorously from roots if the top portion of the plant is damaged or removed. It can also readily establish from cuttings, if buried in moist soil.

Appendix C

USDA Forest Service
Weed Occurrence Form
Region_5_ Forest: San Bernardino District: Mountaintop

Species:_____ **Date**: _____ID confidence____% ID Auth: Hickman et al., 1993

Project	Current land use:
Surveyor	Current/potential threats:
Directions to site:	Other biota: None
	Existing EO? Yes No # .
	Entire extent of pop mapped? Y N
	Photographer
Site descrip:	Repository
	Vouch spec # Repository
	Look-alike species: None
	Research needs
(circle) **Point Polygon Line**	
GPS Unit: XT GeoEx3 Ipaq1 Ipaq2 Mag # __ Thales Other	Conserv/Mngt concerns
GPS Staff ID:	# _____ **individuals, genets** est, precise
Unique ID #: #____pts/poly4EO	Vigor? vfeeble feeble normal vigor exvirg N/A Method:
Northing: Easting:	(circle) Disease Predation Herbivory None Explain
Elevation (feet):	
Quad name:	Distribution/Density: prominent common scattered patchy rare
T-R-S: T R S ¼ of ¼ of	**Gross (Total) area:** est, precise **Infested** (Weed cover only) **area** :
Slope Min. _____% Max % Aspect (°):	**Cover: Sp**._____% Grd_____%
Substrate:	**Phenology** method: est, count
Soil text: sand, loam, silt, clay, other	% seedlings % leaf % bud
Moisture regime: mesic xeric hydric	% flwr %immat frt % mature frt

Soil moisture: dry moist saturated inundated seasonal seepage other	% dispersing seed % senescent
	Treated before: Y N
Horz dist. to H2O vert.	**Method of treatment:**
Light expos: full sun part shade full shade	Fr suc: Exlt Gd Marg Pr Unkn Fair None
Veg series:	Germ suc: Exlt Gd Marg Pr Unkn Fair None
Ass. tree/shrubs:	Repro: Exlt Gd Marg Pr Unkn Fair None
Canopy: _____% Shrub: % Forb: _____%	Dispersal: Exlt Gd Marg Pr Unkn Fair None
Assoc plants (include other non-natives):	Estab: Exlt Gd Marg Pr Unkn Fair None
	Veg suc: Exlt Gd Marg Pr Unkn Fair None
	Fl suc: Exlt Gd Marg Pr Unkn Fair None
	General observations
Disturbance:	Condition: Exlt Gd Marg Pr Unkn Fair None
	Quality: Exlt Gd Marg Pr Unkn Fair None
	Defense: Exlt Gd Marg Pr Unkn Fair None
	Rank: Exlt Gd Marg Pr Unkn Fair None
	Viability: Exlt Gd Marg Pr Unkn Fair None