Yosemite NP
RIM Fire
2013
BURNED AREA
EMERGENCY RESPONSE PLAN

Yosemite National Park

National Park Service

United States Department of the Interior

NATIONAL PARK SERVICE

Yosemite National Park
P.O. Box 577
Yosemite, California 95389

IN REPLY REFER TO:
D18 (YOSE-SUPT)

Memorandum

To: Regional Director, Pacific West Region
Attention: Nelson Siefkin, Regional Burned Area Emergency Response Coordinator

From: Superintendent, Yosemite National Park

Subject: Yosemite NP Rim Fire, Burned Area Emergency Response Plan

Through this memorandum I am submitting for approval the attached Yosemite National Park Rim Fire, Burned Area Emergency Response (BAER) plan. This plan has been written to address post-fire emergency stabilization issues that have been assessed as a result of the Rim Fire. The planned funding request for the three year time period provided by the Emergency Stabilization subactivity is in the amount of $386,078. As this request does not exceed $500,000, approval authority lies with the Regional Director.

In summary, the plan requests funding to protect critical resources including:

- Big Oak Flat Road (Highway 120)
- Sixty-seven miles of trails
- Monitoring and treatment for invasions of exotic plant species
- Critical cultural resources.

A separate request for competitive funding from the Burned Area Rehabilitation (BAR) subactivity is also being submitted. This request is in the amount of $265,890. We look forward to working with you to successfully compete for these funds.

We appreciate the assistance we received during this incident. The regional office has been instrumental in putting together the Rim Fire BAER team and assisting us with this process.

If you have any questions about this plan, please contact Gus Smith, Yosemite Fire Ecologist at 209-375-9596 or Jim Roche Yosemite Hydrologist at 209-379-1420 or Chris Holbeck Rim Fire BAER Team Leader at 402-661-1864.

Attachment

cc:
Richard Schwab, National Park Service Fire Management Program Center
Nelson Siefkin, Regional Burned Area Emergency Response Coordinator, Pacific West Regional Office
Sid Beckman, Regional Chief of Fire Management, Pacific West Regional Office
Linda Mazzu, Division Chief, Resources Management & Science, Yosemite National Park
Jim Roche, Park Hydrologist, Yosemite National Park
Gus Smith, Fire Ecologist, Yosemite National Park
Garrett Dickman, Botanist, Yosemite National Park

Burned Area Emergency Response Plan

2013 Rim BAER

Yosemite National Park

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BURNED AREA EMERGENCY RESPONSE PLAN

2013 RIM BAER

FIRE LOCATION AND BACKGROUND INFORMATION

Fire Name	**RIM BAER**
Fire Number	CA-YNP-000126
Agency Unit	Yosemite NP
Region	Pacific West
State	California
County	Mariposa/Tuolumne
Ignition Date/Manner	8/17/13
Acres NPS	77,183
Date Contained	Unknown
Date Controlled	Unknown

NATURE OF PLAN

I. Type of Plan (check one box below)

√	**Short-term Emergency Stabilization Plan**
	Long-term Rehabilitation
	Both Long and Short-term Rehabilitation

II. Type of Action (Check One box below)

√	**Initial Submission**
	Updating Or Revising The Initial Submission
	Supplying Information For Accomplishment To Date On Work Underway
	Final Report (To Comply With The Closure Of The EFR Account)

EMERGENCY STABILIZATION OBJECTIVES

- **Determine need for and to prescribe and implement emergency treatments**
- **Minimize Threats to Human Life, Safety, and Property**
- **Identify Threats to Critical Cultural & Natural Resources**
- **Promptly Stabilize and Prevent Unacceptable Degradation to Resources**

TEAM ORGANIZATION

BAER TEAM MEMBERS

POSITION	TEAM MEMBER / AFFILIATION
Team Leader	Chris Holbeck, NPS
Team Advisor, NIFC	Rich Schwab, NPS
Vegetation	Garrett Dickman, NPS
Hydrologist	Jim Roche, NPS
Geologist	Brian Rasmussen, NPS
Cultural Resources	Laura Kirn, NPS
Automated Geospatial Watershed Assessment	Richard Easterbrook, FWS Doug Wilder, NPS

Resource Advisors: (Note: Resource Advisors are individuals who assisted the BAER Team with the preparation of this plan. See the consultations Section of this plan for a full list of agencies and individuals who were consulted or otherwise contributed to the development of this plan.

Name	Affiliation	Specialty
Jun Kinoshita	YOSE CRM	Lead REA
Gus Smith	YOSE VRP	Fire Ecologist
Scott Gediman	YOSE	Public Affairs
Ken Watson	YOSE VRP	

Ed Walls	YOSE Maint	Facilities
Todd Ellsworth	USFS BAER	RIM BAER Lead
Dave Young	USFS BAER	Soils/Hydrology
Linda Mazzu	YOSE RM	Chief RM
Laura Kirn	YOSE CRM	Cultural Resource Manager
Nelson Siefkin	PWRO	BAER Coordinator
Kelly Martin	YOSE Fire	FMO
Ed Dunlavey	YOSE	Wilderness Manager
Steve Thompson	YOSE RM	Wildlife
Carol Knipper	YOSE RM	
Sue Beatty	YOSE RM	Vegetation
Joe Meyer	YOSE RM	Physical Science
Daniel Boughter	YOSE RM	Vegetation
Kent vanWagtendonk	YOSE Fire	GIS

CONSULTATIONS

***** SEE INDIVIDUAL RESOURCE ASSESSMENTS APPENDIX I , SECTION V, CONSULTATIONS**

BURNED AREA EMERGENCY STABILIZATION PLAN
EXECUTIVE SUMMARY

Rim Fire, Yosemite National Park
September 2013

Purpose and Policy

This Burned Area Emergency Response Plan is for lands in Yosemite National Park affected by the Rim Fire. Through this plan, Yosemite is requesting money from the Emergency Stabilization and Burned Area Rehabilitation funding activities. The plan complies with federal requirements and policies which include the Interior Departmental Manual, NPS Director's Orders, and NPS Reference Manual 18 - Wildland Fire.

Fire History and Behavior

The Rim Fire began August 17, 2013 on the Stanislaus National Forest in the Central Sierras of California and burned over 255,000 acres. Approximately 77,254 acres are on Yosemite National Park.

Two days of large fire growth occurred on August 22 (37,625 acres) and August 23 (51,793 acres). This is significant because days of large fire growth are typically areas of high burn severity. Both of these burning periods took place chiefly within the Stanislaus National Forest entering the western edge of Yosemite National Park on August 23 near Lake Eleanor. Fuel moisture was critically low thus the probabilities of ignition and fuel consumptions were exceedingly high. Fire control problems persisted on the eastern and northern flanks within the park until containment objectives were achieved for park lands around September 13. Even though the fire was burning during high indices, burn severity on most Yosemite lands were mostly moderate and low. Some of this can be attributed to the strategy and tactics applied during burn out operations. Plus fuel treatments around Mather, Hodgdon, and Crane Flats are demonstrated success stories. Other untreated areas also exhibit the ecological benefits of fire on western landscapes.

NPS Burned Area Emergency Response Team Call Out

Discussions for a BAER team began on August 29 between the National and Regional Offices and Yosemite Park managers. Preliminary lists of post-fire values at risk were identified. This is important in order to seek the right fit of specialists to build the team. The preliminary BAER values at risk included the City of San Francisco water supply, park infrastructure, cultural resources, and wilderness values. Park leadership also stressed the need for external cooperation and to pursue opportunities for integration with the USFS and Hetch Hetchy management teams.

The park was given a range of options for forming a scalable Burned Area Emergency Response Team. Recognizing that the park has talented resource specialists with BAER experience, Yosemite has the ability to prepare a plan on its own. If needed, they could supplement a Yosemite team with NPS specialists from around the region or the national BAER team. They were also given the option of bringing in the leadership of a Command or General Staff and also the option of ordering the National BAER team. Ultimately, park managers decided on ordering outside national caliber leadership and select specialists in post-fire modeling and geology. Chris Holbeck of the National BAER team was selected as team leader. An advance team was then deployed to scope out the response to build a scalable team based on values at risk and complexity. Yosemite and NPS personnel from within the region played prominent roles. The Resource Advising program developed by the park and the region contributed greatly to the effort.

A mid-assignment briefing was held for the superintendent, regional, and park staff on September 13, 2013. The close-out was conducted on September 19, 2013.

Values at Risk

Critical values at risk identified in the initial phases of the post-fire response included:

- Water quality from Hetch Hetchy reservoir, which is the primary water supply for the City of San Francisco
- Hetch Hetchy Housing at the reservoir
- Water delivery infrastructure
- Big Oak Flat Road (Highway 120)
- Big Oak Flat Entrance
- Aspen Valley, Baseline, Tioga and Evergreen Roads
- Mather Camp
- Housing and utilities and other infrastructure at Hodgdon Meadows
- Traditional cultural properties of the Tuolumne Band of MeWuk Indians
- Tuolumne Grove and Tuolumne Grove Road (Old Big Oak Flat Road)
- Wilderness values
- Cultural resources

These values as well as others are discussed in the assessment sections of this plan. Please keep in mind that the values at risk are further identified and refined up or down as a BAER team works its way through the assessment process and business model.

BAER Business Model

BAER teams conduct rapid assessments in order to identify values at risk and then prescribe emergency stabilization measures. BAER teams follow a four step business model.

- Issues
- Observations
- Findings (Assessments)
- Recommendations (Specifications)

It is important to follow this process and not jump ahead to the recommendations and treatment specifications before a value is properly assessed.

Primary Recommendations

Full descriptions of treatment recommendations and specifications are found in this plan. In summary, Yosemite National Park is requesting funding for the following treatments:

Emergency Stabilization Funding Activity

- Culvert cleaning to enhance capacity for increased watershed response
- Post-rain event road cleanup
- Hazard tree removal
- Trail clearing
- Cultural resource site assessments and stabilization
- Sand bags around two structures at the Hetch Hetchy dam administrative site
- Sand bags around a power transformer at the Entrance Station
- Warning signs

Burn Area Rehabilitation Funding Activity

- Interpretive signs
- Boundary fencing
- Invasive species detection monitoring and control

BURNED AREA EMERGENCY STABILIZATION PLAN
RIM FIRE
CULTURAL RESOURCE ASSESSMENT

I. OBJECTIVES

A. Assess potential threats to cultural resources for the purpose of recommending treatments to stabilize archeological sites, traditional cultural properties, and historic structures and landscapes from potential adverse effects of post-fire erosion or other landscape processes

B. , Assess potential for adverse effects to cultural resources from other emergency stabilization and rehabilitation actions.

C. Consult with the California State Historic Preservation Officer (SHPO), American Indian tribes and groups traditionally associated with Yosemite National Park lands and resources, and two Tribal Historic Preservation Officers (THPOs) to meet National Park Service statutory & regulatory requirements, agency policies, and agreements.

D. Prescribe treatments to avoid, minimize, or otherwise mitigate actual and potential adverse effects to cultural resources that may occur from post-fire effects and emergency stabilization treatments.

II. ISSUES

- Effects from post-fire flooding, debris flows, tree fall, or other severe erosion at significant cultural resources

- An elevated risk of unauthorized artifact collection due to denuded surfaces that increase artifact exposure

- Potential effects to cultural resources from implementation of proposed Emergency Stabilization treatments prescribed to address other values at risk

III. OBSERVATIONS

A. Background

A high diversity and complexity of cultural resources lie within the footprint of the Rim Fire. Many of these were burned over by the fire itself, and have the potential to be damaged by both the post-fire effects and the treatments designed to protect park infrastructure and other resources. These cultural resources include prehistoric and historic archeological sites (village sites, hunting sites, lithic scatters, isolated milling features, dumps, logging camps, homestead sites, structural ruins, etc.), remains of railroad logging systems, historic roads and trails, historic buildings and structures, cultural landscape resources, traditional cultural properties (TCPs), and other historic properties with religious and cultural significance to traditionally associated American Indian tribes and groups.

B. Emergency Response and Regulatory Notifications

NPS Resource Advisors (READ) were assigned to the incident on August 23rd and immediately enlisted support from USFS READ cultural resource specialists. Local cultural resource specialist READs were on the fire lines by August 26th to work with fire suppression actions on park lands. Within three days, three more archaeology READs had joined the team. Throughout the course of the incident, eight cultural resource specialist/archeologist READs worked on the NPS side.

The interagency Incident Command formally notified via email the California SHPO, the Tuolumne Band of Me-Wuk Indians, the Chicken Ranch Rancheria of Me-Wuk Indians, and the American Indian Council of Mariposa County, Inc. (aka Southern Sierra Miwuk Nation) of the emergency early in the week of August 19 , pursuant to 36 CFR 800.12 governing Emergency Situations. Once the fire crossed into Yosemite National Park, the NPS provided initial notification of the incident to the SHPO on Friday August 23 pursuant to the "natural disasters" stipulation in the park's *Programmatic Agreement regarding Planning, Construction, Operations, and Maintenance at Yosemite National Park*(1999 PA). The park also expanded on the USFS tribal contact efforts on Sunday, August 25 by notifying the seven traditionally-associated American Indian tribes and groups that the fire had crossed onto park lands. The NPS received early responses from three tribes and groups. The Bridgeport Indian Colony requested protection for spiritual places in and around Hetch Hetchy (including the Pate Valley pictograph site), the Tuolumne Band of Me-Wuk Indians expressed concern about bulldozer containment lines and concern about the Tuolumne Grove of Giant Sequoias, and the American Indian Council of Mariposa County (aka Southern Sierra Miwuk Nation) contacted the park several times regarding the status of Pate Valley, and plans for protecting this culturally significant area.

C. Resource Identification and Assessment Methods

The resource identification and assessment methods used existing cultural resources data on file at Yosemite National Park. Department of Interior policy only allows for the post-fire emergency stabilization protection of known or initially discovered sites unless the post-fire stabilization involves treatments that have the potential to adversely affect historic properties. In the latter case, if efforts to identify historic properties are not complete, surveys and tribal consultation will precede any stabilization treatments.

Cultural resource information for the burn area is not complete, however much information does exist. Standing historic structures have been identified, and most have been assessed for eligibility for listing in the National Register of Historic Places. Some cultural landscape resources have been identified, primarily in the Hetch Hetchy/Lake Eleanor area. Archeological survey coverage for the burn area is complete for road corridors, developed areas and many trail corridors; however, most wilderness locations remain unsurveyed outside of primary trail corridors and high-use visitor destinations. Two potential TCPs (Hodgdon Meadow and Crane Flat) exist within the burn area, and the highly significant Pate Valley site (with pictographs, human remains, archeological deposits, and ongoing traditional cultural uses) lies just outside the fire's eastern boundary.

The BAER cultural assessment was initiated on September 10 through GIS spatial analysis. This analysis overlaid spatial data for known cultural resources with the Burned Area Reflectance Classification (BARC) mapping to obtain risk assessments. Risk assessments were developed based on the mapped co-occurrence of known sensitive resources with areas estimated to have potential for increased river and stream bank erosion, tree fall, debris flow or flooding inundation, stream-crossing failure, structural collapse, and illegal collection (due to fire-related exposure). Field assessments were not possible given unsafe conditions, and are programmed for assessment as part of the BAER plan implementation in late

FY13 and FY14. The assessment will focus on: 1) archeological sites, 2) TCPs, 3) historic buildings, 4) historic roads, and 5) cultural landscape resources, all of which presented concerns for post-fire effects from increased runoff, erosion, tree fall, collapse, or illegal collection.

Twenty-six archaeological sites (many with religious and cultural significance to American Indian tribal groups), two historic buildings, one historic developed area, five historic roads and two potential TCPs were identified that could potentially be subject to post-fire effects and/or other post-fire emergency stabilization treatments. Further discussions are organized by resource type below:

Archeological Sites

Twenty-six sites are presumed to be at risk and are located throughout the Rim Fire burn area. The majority of these occur along perennial and intermittent streams, trails accessing Yosemite Wilderness, or park roads. These sites include prehistoric village sites and lithic scatters, two homestead sites, one large logging camp, and the ruins of a large railroad logging complex. No known burials are known to exist within the burned area. The quality and reliability of site documentation for these resources is generally good, and all of the sites have been or are expected to be relocated.

Concerns for these resources include erosion, flooding, debris-flow inundation, collapse (in the case of the railroad logging resource), looting, and ground disturbance associated with other post-fire emergency stabilization actions. Preliminary assessments of five of these sites indicate potential for intensive surface erosion, increased stream bank erosion and tree fall, especially those along Hetch Hetchy Road. Most remaining site assessments have been deferred until safety risks have been mitigated or are no longer present.

The following emergency stabilization treatment actions have the potential to affect archeological resources:

- Installation of warning signs on trails and roads
- Removal of floatable woody debris above and below culverts

The following measures have been put into place in order to protect archeological resources: All sign installation locations will be reviewed by an archeologist, and no new ground disturbance (i.e., post-holing) will occur in site areas. An archeologist or other cultural specialist will monitor removal of floating woody debris.

Historic Buildings

Two historic buildings at risk for post-fire effects are the Hetch Hetchy Duplex Cottage and Bunkhouse (both recommended eligible for listing in the national register). These were constructed in the late 1930s in the NPS Rustic Style. These buildings are part of the larger development associated with City and County of San Francisco construction and management of the Hetch Hetchy Reservoir, authorized by the 1916 Raker Act and the subject of intensive national debate about conservation of National Park wilderness areas. The duplex cottage (used by City and County of San Francisco) and the bunkhouse (used by the National Park Service) are at risk from increased stream flow / debris flow in a steep, intermittent drainage immediately east of the buildings (Figure 1).

These buildings will be protected from possible debris flow or flooding through installation of sandbags adjacent to the buildings and along the adjacent roadway. This will be a temporary installation (up to three years). Sandbags will be stacked three bags high, using neutral-colored burlap or other non-photo reactive bag material.

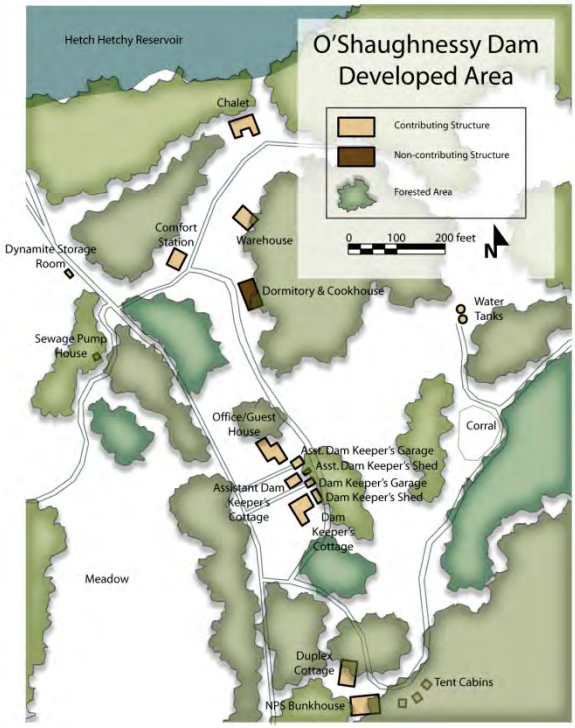

Figure 1. O'Shaugnnessy Dam (Hetch Hetchy) developed area, showing the at-risk duplex cottage and NPS bunkhouse in bottom center.

Prior to the Rim Fire, the Miguel Meadow developed area (Determined Eligible in 2013) included several historic buildings and features in a 160-acre inholding owned by the City and County of San Francisco (designated a Potential Wilderness Addition). This area was originally homesteaded by Miguel Errera in the late 1800s. Three buildings, the Miguel Meadow Fire Guard Station (Figure 2), associated woodshed and storage building, were built between 1934 and 1935 by the Civilian Conservation Corps (CCC) in the NPS Rustic Style as part of the larger City and County of San Francisco Hetch Hetchy developments. These buildings had been recently maintained by the NPS using methods and tools consistent with preserving wilderness values. This facility was served by a historic water system (constructed in the same period as the fire guard station) consisting of a rubble cistern and associated pipe adjacent to the creek, which supplied water to an above-ground fiberglass water tank supported by a rustic wood frame (Figure 3). Several resources dating from Errera's occupation were also present, including a barn (Figure 4, circa 1890, restored 1934), ruins of the original homestead cabin and pit privy, and associated trash features.

Most of the historic buildings and structures in Miguel Meadows have been confirmed lost. The only confirmed remaining structure is the non-historic pit toilet. Post-fire assessments are necessary to address any safety or hazardous materials issues associated with the fiberglass water tank, the homestead pit privy, and the cistern / well, and any other cultural resources that might remain in the location of the former barn, guard station, woodshed and storage building. No clean-up or treatment activities are specified at this time. However, any recommendations made after the assessment will be designed to avoid affecting remaining attributes of the cultural resource (including archeological ruins).

Figure 2. (right) Miguel Meadow Fire Guard Station

Figure 3. (left) Water tank at Miguel Meadow

Figure 4, Miguel Meadow Barn

Historic Roads

The five historic roads affected by the Rim Fire include the Hetch Hetchy Road (1914-1937, determined eligible for listing in the national register), the Lake Eleanor-Hetch Hetchy Road (1917-1917, recommended eligible), the original Great Sierra Wagon Road / Old Tioga Road (1882, listed in the national register), the Garnet Ridge Road (1920s, determined eligible for listing), the Old Big Oak Flat Road (1874, listed in the national register), and the current Tioga Road (1930s, determined eligible for listing). Portions of the Great Sierra Wagon Road, the Old Big Oak Flat Road, and the Lake Eleanor - Hetch Hetchy Road are now in designated Wilderness. These are either maintained and used as trails, or abandoned. Post-fire issues include tree/stump burnout and attendant destabilization, increased upslope and downslope sheet erosion, debris flows, flooding at stream crossings .

Threats of post-fire effects for these resources will be assessed by various means. The Hetch Hetchy road, and accessible portions of the Great Sierra Wagon Road (Aspen Valley Road section), Old Big Oak Flat Road, and Garnet Ridge Road have been assessed by archaeologist READs and facilities specialists for both cultural resource concerns and treatment needs related to their use as park infrastructure. Two emergency stabilization measures have the potential to affect these resources: monitoring and cleaning culverts, and removing floating woody debris upslope and downslope from culverts. Both of these actions will be implemented in a manner that protects historic road features.

Inaccessible sections of these, and the entire Lake Eleanor-Hetch Hetchy road, will be assessed as part of the planned Trails Infrastructure Assessment. These assessments will document any treatment needs, which will in turn be reviewed for any measures necessary to protect historic features Assessments and prescribed treatments must be completed within one year of the containment of the fire per Department of Interior policy. Therefore cultural resource specialists will work with the Park Forester, road crews and trails crews to establish safe passage and complete assessments and treatments.

Traditional Cultural Properties

Two potential Traditional Cultural Properties have been identified within the perimeter of the fire, at Hodgdon Meadow and Crane Flat Meadow. Post-fire threats to traditional cultural resources in these area are presently unknown, and will be determined in consultation with traditionally-associated tribes and groups. Ongoing tribal consultation will be necessary to determine potential for threats to cultural and religious values of other historic properties within the burned area.

One proposed emergency stabilization/treatment measure poses potential threats to these TCPs: removal of floating woody debris upslope and downslope of culverts along the Old Big Oak Flat Road through Hodgdon Meadow, and the Tioga Road through Crane Flat Meadow. Prior to implementation of this treatment, the NPS will host a site visit with traditionally-associated tribes and groups in order to review and discuss concerns in the field. Any necessary protection measures will be identified during this field visit. NPS archeologists will monitor the treatment implementation in order to ensure protection of sensitive cultural resources.

On Friday, September 20, the Tuolumne Band of MeWuk Indians held an Earth Healing Ceremony to address the damage from the Rim Fire. Representatives from the Stanislaus National Forest, Yosemite National Park, and the NPS Washington Office of Tribal Relations and American Cultures participated.

C. Findings

The remaining cultural resource assessments have been deferred until safety risks have been mitigated or are no longer present.

The emergency protection and rehabilitation measures specified in the BAER plan were reviewed for potential effects to cultural resources by an interdisciplinary NPS team on September 18 and 19, 2013. Where these actions have the potential to affect cultural resources, they are discussed in the resource-specific sections above. After review and integration of mitigating measures noted above, all proposed actions were determined to pose "no adverse effects" to historic properties in keeping with the 1999 PA. The park's Assessment of Effects determination was documented in the electronic Planning, Environment, and Public Comment (PEPC) record for the BAER plan.

Results of initial BAER assessments and treatment recommendations will be incorporated into the reporting required under the 1999 PA Stipulation IX governing Natural Disasters, documenting how the effects of disaster or emergency response operations on historic properties were taken into account.

NPS will continue consultation with traditionally-associated American Indian tribes and groups (including two THPOs), per the 1999 PA, Executive Order, and agency policies, in order to ensure protection of historic properties and other cultural resources with religious and cultural significance during emergency stabilization and rehabilitation actions. In addition, American Indian tribes and groups will be consulted as part of efforts to assess potential stabilization or treatment needs for the two potential TCPs and the 26 archeological resources.

IV. RECOMMENDATIONS

A. Emergency Stabilization:

1. Archeological Resources:
    - Conduct post-fire damage assessments at remaining documented but unsurveyed resources in FY14
    - Prescribe post-fire stabilization measures as necessary and appropriate, based on FY14 assessments
2. Historic Structures:
    - Conduct post-fire damage assessment at Miguel Meadows
    - Prescribe post-fire stabilization or safety/hazard abatement measures as necessary and appropriate
3. Historic Roads:
    - Conduct site-specific post fire damage assessments identified in analysis of BARC map and watershed modeling in FY14
4. Traditional Cultural Properties:
    - Conduct site visits to accessible cultural resources within burned area to assess post-fire stabilization or treatment needs

B. Management Recommendations – Non-Specification Related

1. Re-visit and update resource records on sites within the burned area

V. CONSULTATIONS

A. SHPO

B. Tribal

Laura Kirn – NPS YOSE (209) 379-1314
Contributing Agency Team Members: Jun R. Kinoshita, Archeologist

BURNED AREA EMERGENCY STABILIZATION PLAN

RIM FIRE

FENCING ASSESSMENT

I. OBJECTIVES

- Assess the fencing along the Yosemite National Forest and Stanislaus National Forest border.
- Prescribe treatments for fixing the fence

II. ISSUES and BACKGROUND

The Rim Fire burned around twenty miles of border between Yosemite National Park and the Stanislaus National Forest. Fencing lines most of this boundary. This fencing helps protects Yosemite natural and cultural resources from grazing by free-range cattle crossing over from the forest or private inholdings and helps ranchers from losing their cattle. The fence also helps hunters in the area recognize the park boundary to avoid accidental poaching.

At the time of the BAER assessment the status of fence between the two agencies was unknown. Reconnaissance around the park border at Ackerson Meadow showed some barbwire fence in place. Metal posts were still firmly seated while wooden posts were often burned. No fence is known to be damaged from suppression activities.

III. NON-SPECIFICATION RECOMMENDATIONS

1) The length of the boundary length should be assessed for damages.
2) Fence damage should be documented with GPS and the type of damage described.
3) The areas where cattle grazing is most prevalent, such as Ackerson Meadow, should be prioritized first for treatment
4) Yosemite and the Stanislaus should try to find a mutually agreeable solution to fixing the fence
5) Burn Area Rehabilitation may be an appropriate funding source to pursue, but funding for border fence repair falls outside of the scope of the Emergency Stabilization funding activity

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Written by: Garrett Dickman, DOI BAER Team Vegetation Specialist, Yosemite National Park, El Portal CA 95318 garrett_dickman@nps.gov 209-379-3282

BURNED AREA EMERGENCY STABILIZATION PLAN

RIM FIRE

TRAIL AND ROAD WARNING SIGN ASSESSMENT

I. OBJECTIVES

- Place signs on roadways informing drivers of hazards associated with driving in a recently burned area
- Place warning signs at trailheads informing hikers and stock users that they will be exposed to post-fire hazards upon entering the burn area

II. ISSUES and BACKGROUND

ROADS

Drivers may not be aware that upon entering the burn area they should be cautious that there is an above average likelihood that hazards such as vegetation debris, rocks, debris flows, hazard trees or localized flooding may be on the roadway as a result of the burn. For many visitors this may be the first time they have ever entered a recently burned area and may not necessarily expect additional hazards on the roads.

TRAILS

For many visitors exploring the trails in the Rim Fire this may be the first time they have ever entered a recently burned area. Trail users must be made aware of the additional hazards such as hazards trees, washed out sections of trail, and debris and fallen trees on the trail.

III. RECOMMENDATIONS

1) Place warning signs along roadsides where roads enter the burn area that warn of post-fire hazards along roadways.
2) Place signs at all trailheads where the trail enters the burn area that warn of post-fire hazards.
3) Work with the Stanislaus National Forest on sign placement for trails that cross boundaries between park and forest land , such as Carlon Falls and Kibbie Ridge.

IV. NON-SPECIFICATION RECOMMENDATIONS

1) Close rarely traveled roads until winter storms have brought down hazards trees
2) Official travel through rarely traveled roads should be limited to use only when necessary. Employees should check in and out with supervisors and local law enforcement officers.
3) Trails entering the wilderness area affected by the fire should remain closed until after winter storms have reduced the number of hazards trees.
4) Employees entering the closure area should notify supervisors and dispatch of travel plans. Wilderness travel plans should be filled out for all day and overnight trips.

5) Secondary communication devices, such as satellite phones, are recommended in this area due to spotty radio and cell phone coverage.

Written by: Garrett Dickman, DOI BAER Team Vegetation Specialist, Yosemite National Park, El Portal CA 95318 garrett_dickman@nps.gov 209-379-3282

BURNED AREA EMERGENCY STABILIZATION PLAN

RIM FIRE

TRAIL ASSESSMENT

I. OBJECTIVES

- Identify fallen snags and trees across trails in Yosemite National Park
- Cut 'wafers' or remove snags that have fallen on the trail to allow hikers and stock trail access
- Survey trail infrastructure in areas that burned at a high severity or trails with high severity burn that overslings the trail

II. ISSUES and BACKGROUND

The Rim Fire burned around 67 miles of trail in Yosemite National Park. Trees and snags that burned may fall across the trail and hinder passage by hikers and stock. Hikers and stock will either go over or around logs and debris. The degradation around the trails as people create informal trails around the debris is problematic. However it is a greater issue that in areas where the trails are jackstrawed with fallen trees and snags, long trees block passage or where the trail passes through hazardous terrain that hikers and stock may become lost trying to return to the trail. This places not only hikers and stock users at greater risk, but also may create more Search and Rescue Incidents.

Clearing trails of logs and debris immediately after the burn will reduce the risk of trail users getting lost or entering more hazardous terrain. As a back of the envelope estimate of the workload, when the Aspen Valley Road was cleared after the Rim Fire, 100 trees blocked passage for every 7 miles. It is likely the number is greater along wilderness trails as the Aspen Valley Road has had hazard trees removed for many years while wilderness trails do not have hazard trees removed. These hazard trees are likely to have fallen during this incident. Based on these estimates, there could be easily over 1,000 trees fallen on Yosemite's trails.

In areas along trails that burned at the high burn severity, the trail infrastructure may have been exposed to more stressors than they were designed for and have a higher probability of damage. Additionally those areas with high severity fire uphill of the trails may have a higher probability of damage because of destabilization of the slopes, and the potential for debris flows or higher erosion around structures supports. Wooden structures, of course, may have burned.

Trail infrastructure was not assessed while the BAER team was in the field due to the unacceptable level of risk of going into these areas. Prescriptions to fix any structures damaged by the fire were not possible. Reconnaissance of those structures most likely damaged by the

fire based on the BARC should be made in the spring of 2014 after more hazard trees have fallen.

III. RECOMMENDATIONS

1) Cut wafers out or remove trees and snags that fall on the trail to allow passage
2) Remove debris from the trail
3) Clear the three culverts on the Great Sierra Wagon Road/Long Gulch within the fire footprint
4) Place signs at all affected trailheads that warn of post-fire hazards
5) Assess infrastructure on trails that is most likely to be affected by the fire or by post-fire storms
6) Document any damage with GPS, photos, and site sketches. Prescribe treatments as necessary.

IV. NON-SPECIFICATION RECOMMENDATIONS

1) Keep wilderness trails affected by the Rim Fire closed until several large winter storms have knocked down snags and trees. This will reduce the number of trips necessary to complete the work and reduce risk to employees and visitors.

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BURNED AREA EMERGENCY STABILIZATION PLAN

RIM FIRE

VEGETATION RESOURCE ASSESSMENT

I. OBJECTIVES

- Identify invasive plant populations.
- Identify the pre- and post-fire invasive plant habitat / environments.
- Provide management recommendations for reducing impacts from invasive plants already common in the area and from introductions from outside the burned area.

II. ISSUES

- Impacts to the ecological integrity of native plant and wildlife communities within the natural burn area and around the fire perimeter where fire suppression activities occurred.
- Potential for the expansion of existing invasive plant populations and the introduction of novel invasive plants.
- Re-establishment of native, site-adapted vegetation in severely burned areas and in locations of fire suppression activities through natural processes.

III. BACKGROUND

A. Vegetation Resources

Yosemite National Park is a floristically diverse area, with approximately 1400 species of vascular plants contributing to 125 distinct vegetation alliances and associations (NatureServe 2007). The diversity and vegetation distribution patterns of the park likely stem from a diversity of controlling factors including topography, soil moisture, disturbance, glacial and anthropogenic history. The region has a Mediterranean climate of cool, wet winters and hot, dry summers, with most of the precipitation occurring from November to April. The elevation gradient of the area affected by the fire extends from 3,000 feet in the Poopenaut Valley to around 8,000 feet on Smith Peak, near Harden Lake, and Kibbie Ridge.

The majority of the burned acreage of the Rim Fire consisted of chaparral, yellow pine (ponderosa and Jeffrey pines), white fir, and red fir forests (Table 1). The vegetation types within the burn area are adapted to frequent fire but have an altered fire regime due to decades of fire suppression (FMP 2004). The change in fire return interval and burn intensity may initiate habitat type conversion after fires. During habitat type conversion is has been noticed that in other Yosemite fire, that period of conversion is marked by a period of invasion by non-native invasive plants

While parts of Yosemite were logged in the turn of the century, many distinguished trees grow within the footprint of the fire. The most unique vegetation community affected by the fire was the stand of giant sequoias at the Tuolumne Grove. At the time of this assessment it was still too hazardous to evaluate the condition of the trees. Near Hodgdon Meadows, what may be the largest sugar pine (*Pinus lambertiana)* in the world is within the fire footprint. Resource Advisors (READs) visited the tree after the fire and scraped away a foot of burning duff and debris

Table 1. Dominate vegetation types found within the Rim Fire.

Vegetation Type	Elevation range (feet)
Barren	NA
Riparian	NA
Meadow	NA
Conifer reproduction	900-4,000
Chaparral (Ceanothus/Manzanita)	1,600-5,000
California Black Oak	4,000-6,000
Live Oak	2,500-5,000
Ponderosa Pine	3,000-5,500
White Fir	5,500-7,500
Jeffrey Pine-Western White Pine	7,000-9,000
Red Fir	6,500-9,000

C. Invasive Plants

Many non-native invasive plants are well adapted to establish and expand their populations after fires (Brooks et al. 2004). A few invasives are adapted to alter fire regimes and are considered among- the most influential agents in changing ecosystem structure and function because they not only compete with native species, but they "alter the fundamental rules of existence for all organisms in the area" (Vitousek 1990). For example, the highly invasive annual cheat grass (*Bromus tectorum*), changes the fire return interval, fire intensity, and seasonality of fires by producing a dense mat of fine, highly flammable fuels (D'Antonio and Vitousek 1992). These changes in the fire regime can lead to habitat type conversion from a native community to a non-native community of annual grasses after cheat grass hinders recovery of the native plants (Young et al., 1987; Melgoza et al., 1990; Keeley 2006). Habitat type conversion is occurring the length of the western slopes of the Sierra Nevada as fires and invasive species alternately cycle through the ecosystem (Keeley et al., 2003).

Low elevation communities are more vulnerable to invasion than high elevation communities (Randall et al., 1998; Weaver et al., 2001; Underwood et al., 2004) in part due to a much longer history of anthropogenic disturbance (Marler 2000) and to changes in regional processes (Cahill et al., 1996; McCarty 2001). The physiological correlates of elevation (e.g. radiation, mean annual minimum temperature) that were once a barrier to many invasives are breaking down due to large scale regional processes such as nitrogen deposition and climate change (Cahill et al., 1996; McCarty 2001). Nitrogen deposition has been shown to increase the rate of invasion from annual grasses, annual grass biomass, fuel continuity and hence total fuel loading (Weiss 1999; Vesquez et al., 2008). This further increases the competitive ability of cheat grass (Vesquez et al., 2008), and higher elevation communities are now increasingly at risk (Schwartz et al., 1996).

Table 2: High priority invasive species known to grow in the Rim Fire footprint prior to the fire.

Scientific Name	Common Name	Impact	Threat	Difficulty to control
Bromus tectorum	Cheat grass	High	High	High
Centaurea solstitialis	Yellow star-thistle	High	High	Medium
Cirsium vulgare	Bull thistle	Medium	High	Medium
Holcus lanatus	Common velvet grass	Medium	High	Medium
Hypericum perforatum	St. John's wort	Medium	Medium	High
Leucanthemum vulgare	Oxeye daisy	Medium	High	High
Rubus armeniacus	Himalayan blackberry	High	High	High

D. Findings

Invasive Plants

The volume of invasive plant vectors is large for this fire and there is a large potential for invasive plants to move not only from anywhere from within the fire perimeter but from anywhere in the country as firefighters from every region have assisted with the fire. A weed wash station was established at Drew Meadows early in the operation, though its use was inconsistent. Heavy equipment was required to wash at the station prior to entering the incident. All other vehicles were required to wash only after the incident. Personnel often moved throughout the fire between USFS land and NPS land. No weed wash was required of the

vehicles when moving between the different land agencies. In addition to vehicles, fire fighters can easily transport seed on their clothing, equipment and boots.

Additionally, the incident command post was located in Drew Meadows, a known location for many invasive plants. Some of those species, such as Italian thistle (*Carduus pycnocephalus*) and Medusa head are known to be highly invasive. If Medusa head (*Taeniatherum caput-medusae*) is found in Yosemite after the Rim fire, it will be the first known location in the park (Figure 3).

Table 3. Invasive plants found in the Drew Meadow Incident Command Post not normally found in the Rim Fire footprint.

Scientific Name	Common Name
Taeniatherum caput-medusae	Medusa head
Toralis arvensis	Sock sticker
Avena fatua	Wild oats
Carduus pycnocephalus	Italian thistle

IV. RECOMMENDATIONS

The survey for and control of invasive plants within the Rim Fire is recommended on three factors:

1) Large established invasive plant populations occurred in the area prior to the fire

2) Habitat suitability for invasive plants is high throughout the burn area due to natural and anthromorphic disturbance

3) The large number of fire fighters from across the country increase the chance of novel populations becoming established. Additionally, firefighters moved constantly between areas where there was invasive plants and where there was no invasive plants. Due to the number of resources at risk and the intensity of the fire, Resources Advisors did not focus on invasive plant related issues.

Therefore, it is recommended that managers control known invasive plants within the fire suppression perimeter(s) and within the Rim Fire and all areas used during fire operations. Use integrated invasive management techniques (mechanical or herbicides) as appropriate to prevent the establishment and spread of present and novel invasive plant populations within the fire area (IPMP 2010).

1. Survey the burn area in spring 2014 beginning in May. Maintain records (documentation, maps, photos, GPS Coordinates, voucher specimens) of invasive plants present in the affected area. Prioritize survey efforts based on the probability of invasive plant occurrence (Table 4), and all locations noted in the Suppression Repair Plan.

2. Treat invasive plants according to the Yosemite Invasive Plant Management Plan (2010). Treatments, storage, transportation and application must also adhere to manufacturer's label directions, federal regulations.
3. Drew Meadows should be treated for invasive plants. It has been used for a fire base camp many different times and will continue to be used as a base camp. Treating the invasive plants at Drew Meadows reduces the risk of novel populations establishing in Yosemite during the next fire. It is recommended that this be implemented as part of closing the camp and negotiated in future emergency lease agreements.
4. Apply control treatments prior to seed set. Mature seed heads should be collected, bagged and properly disposed.
5. Record treatment areas using GPS. Maintain records on species, location, extent of infestation, treatment method and detection and treatment dates in a centralized database. Report herbicide treatments to county, state, and federal pesticide departments.
6. Periodically survey, all identified sites and apply appropriate treatments for up to three years.

Table 4. Probability of invasive plant occurrence is dictated by disturbance type, vector and habitat. Surveys should be directed by this table. It includes the amount of survey effort, and the specific features surveyed.

Probability of invasive plant occurrence	Survey effort for features	Disturbance, Vector, or Habitat	Features
Highest	All features surveyed		-Any combination of high and medium probability features, e.g. Dozer line through a wet area
High	All features surveyed	Fire operations	-Dozer lines -Hand lines -Drop points -Sling sites -Retardant drops -Spike camps
		Transportation corridors	-Roads -Trails
		Perennial disturbance	-Campgrounds -Dumpsters -Parking lots -Residential areas
Medium	Targeted and stratified	High quality habitat	-Wet areas (e.g. streams, seeps) -Meadows -Recently opened canopy -Exposed mineral soil
Low	Inspected periodically	Low quality Habitat	-Dry areas -Closed canopy forest -No recent human disturbance

V. NON-SPECIFICATION RECOMMENDATIONS

Monitor for Special Status Species

Because the fire burned through potential habitat for special status species, surveys for these plants are recommended. If rare plants are detected, document each occurrence and take voucher specimen collection as needed and appropriate.

Assess fire effects in high severity areas

Additional fire effects monitoring on the plant succession of the high severity areas, particularly those within the high severity areas of the Ackerson Fire, can provide additional direction for fire management of these areas. As some of the high severity areas will likely be dominated by chaparral in the early successional stages occur near the community, close attention to this vegetation type is warranted.

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BURNED AREA EMERGENCY STABILIZATION PLAN

RIM FIRE

WATERSHED RESOURCE ASSESSMENT

OBJECTIVES

- Assess overall soil and watershed changes caused by the fire, particularly those that pose substantial threats to human life and property, and critical natural and cultural resources. This includes evaluating changes to soil conditions, hydrologic function, and watershed response to precipitation events

- Identify potential flood and erosion source areas and sediment deposition areas

- Identify potential threats to life, property, and critical natural and cultural resources in relation to flooding, debris flows, erosion, sediment deposition, and fire retardant application

- Develop treatment recommendations, if necessary

- Identify future monitoring needs, if necessary

ISSUES

- Risks to human life and property from floods, mudflows and debris flows within and downstream of the Rim Fire

- Risks to domestic and irrigation water supply due to post-fire watershed conditions

- Risks to critical natural and cultural resources including historic and prehistoric cultural resources

OBSERVATIONS

Background

The purpose of a burned area assessment is to determine potential values at risk resulting from post-fire emergency watershed conditions. Identification of values at risk

occurs through consultation with individuals, state and federal agencies, and through field investigation. Not all values initially identified are determined to be at risk. If emergency watershed conditions are found, and values at risk are identified and confirmed, then the magnitude and scope of the emergency is mapped and described, values at risk and resources to be protected are analyzed, and treatment prescriptions are developed to protect values at risk. The most significant factor leading to emergency watershed conditions is loss of ground cover, which leads to erosion and changes in hillslope hydrologic function in the form of decreased infiltration and increased runoff. Such conditions lead to increased flooding, sedimentation and deterioration of soil condition. Values at risk are human life, property, and critical natural and cultural resources located within or downstream of the fire that may be subject to damage from flooding, ash, mud and debris deposition, and hillslope erosion.

Physiography/Geology/Climate

The Rim fire burned 255,858 (as of 7/13/2013) acres on USFS, NPS, and private lands. On NPS lands the Rim Fire burned 76,723 (as of 7/13/2013) acres in the watersheds of Eleanor Creek, Tuolumne River, Middle Fork of the Tuolumne River, the South Fork of the Tuolumne River, and a small portion of the Merced River. The area is located in the upper foothills to higher elevations of the Sierra Nevada Mountains west of Yosemite Valley. Elevations range from approximately 3,000 feet above sea level (ASL) in the Poopenaut Valley to 7,700 feet ASL near Smith Peak at the northern fire boundary. Slopes range from nearly flat in valley areas to near vertical on canyon walls.

The area is underlain chiefly by granitic rocks of the Sierra Nevada. The Sierra Nevada Range of mountains stretch 400 miles from near Tehachapi Pass in the south to Fredonyer Pass in the north. Yosemite lies in the heart of this ‘range of light’ so named for the light granitic rocks that are so apparent in the upper elevations of the park. The granitic bedrock was emplaced as molten rock deep in the crust from the late Jurassic to mid-Cretaceous (96-130 million years ago) a result of extensive volcanic activity. Small amounts of older metasedimentary rocks are present in the western portion of the fire perimeter (Huber et al., 1989).

Subsequent uplift and erosion of this large granitic batholith over the past 15 million years has resulted in the modern Sierra Nevada mountain range, a broad ramp 50-80 miles wide tilting upwards to the east where crest elevations reach 14,000 feet above sea level. Extensive glaciation over the past two million years has sculpted much of the distinctive valleys visible in Yosemite today (Huber, 1987). The area within the burn perimeter is largely unglaciated except for the Tuolumne River Canyon to Early Intake and Eleanor Creek to just downstream of Lake Eleanor.

Unglaciated areas within the burn perimeter contain more deeply weathered granitic bedrock and deeper soils than comparable glaciated terrain. This leads to greater groundwater storage and streams such as South Fork Tuolumne River, Middle Tuolumne River, and North Crane Creek usually flow year round as a result. This also means that more sediment is available for transport via hillslope and fluvial processes

relative to areas that have been recently glaciated.

The climate of Yosemite National Park is dominated by distinct wet (winter) and dry (summer) seasons. Large synoptic fall and winter storms sweep in from the Pacific Ocean from October through April providing the majority of the annual precipitation. While these events can produce many inches of water, the intensity is often very low and the resultant runoff is driven by the proportion of the basin receiving snow rather than rain. Occasional warm winter storms bring rain to the highest elevations in the park causing 'rain-on-snow' events that often results in significant flooding. At least five such floods have been recorded since river gaging began on the Merced River in 1916, the most recent of which was in 1997.

Summer precipitation is limited to isolated often high intensity thunderstorms derived from northward excursions of the southwest monsoon. Average precipitation in the burn area ranges from 35.5 inches at the lowest elevations (Hetch Hetchy) to 42.8 inches near Gin Flat. Snowline is generally around 5700 feet ASL. Areas above this elevation tend to remain snow-covered throughout the winter. Below this elevation, significant snowfall can occur in the burned area, though it generally melts completely between storm events.

Summers tend to be very warm and dry reaching the mid-90's (Fahrenheit) at the lower elevations, mid-eighties at the upper elevations. Winters are generally mild with lows in the 20's and highs in the 40's at the lower elevations, and 5-10 degrees cooler at the higher elevations.

Soil Burn Severity

Soil burn severity mapping is intended to reflect the degree of effects caused by the fire to soil characteristics that affect soil health and hydrologic function, and hence erosion rate, and runoff potential. It is not a map of vegetation consumption. In mapping soil burn severity, the team evaluated field-observable parameters such as the amount and condition of surface litter and duff remaining, soil aggregate stability, amount and condition of fine and very fine roots remaining, and surface infiltration rate (water repellency). Water repellency was evaluated by observing the length of time a water drop remained beaded on the soil. If water repellency was present, the depth and thickness of this water repellant layer was also measured. Ash and soil color may also indicate how intense the heat was and how long it remained at a given place (residence time). These parameters are compared to similar soils under unburned conditions to estimate the degree of change caused by the fire.

While soil burn severity is not based primarily on fire effects to vegetation, the team used post-fire vegetative condition as one of the visual indicators in assessing soil burn severity. In some cases there may be complete consumption of vegetation by fire, with little effect on soil properties, such as in a shrub ecosystem. Dense vegetation, with a deeper litter and duff layer, results in longer heat residence time, hence more severe effects on soil properties. For example, deep ash after a fire usually indicates a deeper

litter and duff layer prior to the fire, which generally supports longer residence times. This promotes loss of soil organic cover and organic matter which are important for erosion resistance, and the formation or exacerbation of water repellent layers at or near the soil surface. The results are increased potential for runoff and soil particle detachment and transport by water, wind, and gravity. This would be mapped as high soil burn severity.

Conversely, sparse or light pre-fire vegetation such as grasses or sparse shrubs usually have negligible litter layer and surface fuels and experience extremely rapid consumption and spread rates, with very little heat residence time at the soil surface. The result is very little alteration of soil organic matter and little or no change in soil structural stability. Water repellency, usually present under shrubs before the fire, may or may not be exacerbated by the fire. Areas between shrubs or grass crowns usually had very little fuel to burn, thus only experienced brief radiant heat as the flashy grasses and sparse shrubs burned. In these cases, soil burn severity would be low.

In between these extremes, the moderate class of soil burn severity is far more diverse in observed soil conditions and can include various vegetation types, ranging from forests to shrub communities. In the case of a forest, the litter layer may be largely consumed, but scorched needles and leaves remain in the canopy and will rapidly become mulch. This is important in re-establishing protective ground cover and soil organic matter. This factor can result in the classification of the area as moderate, rather than high. Generally, however, there will also be less destruction of soil organic matter, roots, and structure in an area mapped as moderate. In a shrub ecosystem, even where pre-fire canopy density was high, litter layer is generally thin, and while the shrub canopy may have been completely consumed by the fire, the soil structure, roots, and litter layer may remain intact beneath a thin ash layer. Above ground indicators such as size of unconsumed twigs remaining to help the team determine how long the heat may have persisted on the site. If only root stubs and large diameter twigs remain, it was likely a more intense fire with longer heat residence time, and combined with other observations of soil conditions may result in a call of high soil burn severity. More common in chaparral is a condition of remaining small diameter twigs, indicating a flashy fire with short residence time. Combined with other observations of soil conditions this usually resulted in a classification of moderate soil burn severity even though the canopy was partially consumed.

Soil Erosion/Debris Flow

Soil erosion potential following a fire is generally increased over pre-fire potential. This is largely due to loss of soil cover (forbs, grass, leaf, and needle litter), surface horizon soil organic matter responsible for structural stability, and in some cases, increased water repellency at or near the soil surface. The amount of increase over pre-fire condition is related to the degree of soil changes. The degree of soil alteration influences the potential of post-fire soil erosion and debris flow process.

The factors most affected by fire are: 1) the amount of effective soil cover, 2) the

inherent susceptibility to soil particle detachment by wind, water, or gravity (a function of soil texture and structural stability), and 3) the surface infiltration rate. Areas of high soil burn severity can be expected to show a larger increase in sediment production than an area of low soil burn severity due the concomitant decrease in soil cover, increase in susceptibility of soil particle detachment, and decrease in the infiltration capacity of the soil. It is important to understand pre-fire erosion behavior when assessing post-fire erosion, since some areas have water repellant surfaces and inherently high erosion potential even before the fire.

Watershed Response

Overland flow occurs as a result of rainfall that exceeds soil infiltration capacity and the storage capacity of depressions. On the unburned forest floor, overland flow is often absent, though when it does occur flow is forced to follow a myriad of interlinking paths that constantly change as organic material (litter and duff layers) and inorganic material (rock) are encountered. Consumption of the forest floor by fire alters the path of overland flow by reducing the overall length of the flow path, resulting in the concentration of flow into a shorter flow path. This concentration of overland flow increases the hydraulic energy of the flow and can result in rill erosion. At the watershed scale, the reduction of hillslope flow path lengths and the formation of rills that have a high water conveyance capacity reduce the times of concentration or the amount of time for overland flow to reach a defined point within the watershed.

Overland flow is also increased if there is an increase in water repellency (hydrophobicity) of the soils because of the fire. This can reduce infiltration and increase overland flow (runoff). Infiltration curves for water repellent soils reflect increasing wettability over time once the soil is placed in contact with water. Water repellency decreases (hence infiltration increases) with time as the substances responsible for hydrophobicity begin to break down, thereby increasing wettability. In general, fire-induced hydrophobicity is broken up or is sufficiently washed away within one to two years after a fire. The thicker and deeper the water repellant layer, the longer it will take to dissipate. However, once soil cover and vegetative canopy begin to recover, this persistent water repellency becomes less significant to the runoff response because the litter and canopy quickly restore protection of soil and obstruction of overland flow, thus enhancing infiltration and reducing energy for runoff and erosion.

Raindrops striking exposed mineral soil with sufficient force can dislodge soil particles. This is known as splash erosion. These dislodged particles can fill in and seal pores in the soil thereby reducing infiltration. Further, once soil particles are detached by splash erosion they are more easily transported in overland flow. Surface erosion is defined as the movement of individual soil particles by a force (wind, water, or gravity), and is initiated by the planar removal of material from the soil surface (sheet erosion) or by concentrated removal of material in a downslope direction (rill erosion). Surface erosion is a function of four factors: 1) susceptibility of the soil to detachment, 2) magnitude of external forces (raindrop impact or overland flow), 3) the amount of protection available by material that reduces the magnitude of the external force (soil cover), and 4)

management practices that can reduce erosion.

On-the-ground field observations within and downstream of the burned area were conducted to determine potential watershed response. Channel morphology related to transport and deposition processes were noted, along with channel crossings and stream outlets. Observations included condition of riparian vegetation and the volume of sediment and wood stored in channels and on slopes that could be mobilized.

FINDINGS

In order to assess the degree of threat to values at risk from post-fire watershed conditions, several environmental aspects need to be evaluated including: soil burn severity, erosion and debris flow potential, and watershed response.

Soil Burn Severity

The Rim Fire burned 76,723 acres (as of 7/13/13) within the boundary of Yosemite National Park. In cooperation with USFS, the Burned Area Reflectance Classification (BARC) map (e.g. Hudak et al, 2004) was adjusted by ground truthing to create a Soil Burn Severity Map (Parsons et al, 2010). The fire was still burning when the BARC map was acquired, and the total acres represented in this section do not represent the total burned area at the conclusion of the fire. The Soil Burn Severity Map of lands in Yosemite National Park shows that 5,089 acres (6.6 %) has high soil burn severity, 22,739 acres (29.6 %) has moderate soil burn severity, 27,989 acres (36.4 %) has low soil burn severity, and 20,905 acres (27.2 %) has low/unburned soil burn severity. High and moderate soil burn severity have the greatest impact to watershed response and low and low/unburned have minimum impact to watershed response, therefore high and moderate will be only be considered in this watershed analysis. Table 1 shows soil burn severity by watershed delineation.

Table 1. Soil burn severity by watershed for NPS lands within the fire perimeter.

Watershed	Total Acres within Fire Perimeter	Acres of High Severity	Acres of Moderate Severity	Acres of Low Severity	Acres of Low Unburned
Eleanor Creek	15,009	**632**	**5,226**	5,516	3,636
Tuolumne River	17,737	**879**	**3,968**	5,457	7,433
Middle Tuolumne River	15,804	**2,390**	**6,118**	5,169	2,127
South Fork Tuolumne	27,834	**1,188**	**7,413**	11,792	7,440

River					
Merced River	339	**0**	**14**	55	269
Total	76,723	**5,089**	**22,739**	27,989	20,905

Eleanor Creek
A total of 15,009 acres out of 58,791 acres (25.5%) burned in the Eleanor Creek Watershed. Within the burned area, 632 acres (4.2 %) have high soil burn severity and 5,226 acres (34.8 %) have moderate soil burn severity. Overall, 10% of the watershed on NPS lands exhibits moderate and high soil burn severity.

Tuolumne River
A total of 17,737 acres burned in the Main Stem of the Tuolumne Watershed and of those 879 acres (5.0 %) have high soil burn severity and 3,968 acres (22.4 %) have moderate soil burn severity.
The Tuolumne River watershed contributing to Hetch Hetchy Reservoir is 291,653 acres. The Rim fire burned 5,192 acres or 1.8% of the watershed. Of this, 82 acres were high soil burn severity, 344 acres were moderate soil burn severity, 1,194 acres were low soil burn severity, and 3,572 was unburned to very low soil burn severity.

Middle Tuolumne River
A total of 15,804 acres out of 30,573 acres (51.7%) burned on NPS lands in the Middle Tuolumne Watershed. Within the fire perimeter, 2,390 acres (15.1 %) have high soil burn severity and 6,118 acres (38.7 %) have moderate soil burn severity. Overall, 28% of the watershed on NPS lands exhibits moderate and high soil burn severity.

South Fork Tuolumne River
A total of 27,834 acres out of 34,161 acres (81.5%) burned on NPS lands in the South Fork of the Tuolumne Watershed. Within the fire perimeter, 1,188 acres (4.3 %) have high soil burn severity and 7,413 acres (26.6 %) have moderate soil burn severity. Overall, 25% of the watershed on NPS lands exhibits moderate and high soil burn severity.

Merced River
A total of 339 acres burned in the Merced River watershed and of those less than 1 acre (<0.3 %) has high soil burn severity and 14 acres (4.1 %) have moderate soil burn severity. Given the low percentage of high and moderate soil burn severity, the overall small area burned by the Rim Fire, and the lack of values at risk below burned slopes, the Merced River will not be analyzed further.

<u>Erosion Potential</u>

The potential for erosion has increased in the burned areas of the Rim Fire. Typically, the most significant increases occur in areas of high and moderate soil burn severity,

especially in areas where slopes are greater than 35 degrees (Table 2). Areas of high soil burn severity are present most prominently in the Middle Tuolumne and South Fork Tuolumne drainages and are largely within the footprint of the 1996 Ackerson Fire. Other areas of high soil burn severity are sparsely distributed in the South Fork Tuolumne and near North Mountain. In addition to sediment, large areas of ash and organic debris will be mobilized via streams and overland flow during the first fall storms.

Table 2. Acres of high and moderate soil burn severity on slopes greater than 35 degrees.

Watershed	Acres
Eleanor Creek	113
Tuolumne River	171
Middle Tuolumne River	16
South Fork Tuolumne River	32

Eleanor Creek
Areas above Lake Eleanor Reservoir will likely exhibit negligible to low erosion potential post-fire given that only 3% of the burned area was mapped as moderate to high soil burn severity. Localized areas of moderate to high erosion potential exist just north of the lake and in the Kibbie Creek drainage. Large areas downstream of the lake experienced moderate and high soil burn severity suggesting that these areas have moderate to high potential for increased erosion.

Tuolumne River
Soil burn severity in the portion of the watershed above O'Shaughnessy Dam and Hetch Hetchy Reservoir was classified as largely unburned/low or low. Given that only 8% of the burned area fell into the moderate and high soil burn severity classes and that much of this area is highly dispersed, the probability of increase erosion potential post-fire is negligible to low.

Large contiguous areas of moderate to high soil burn severity on the south side of the Tuolumne River Canyon below Hetch Hetchy Reservoir may result in an elevated potential for post-fire erosion. Given relatively low slope values in this area, erosion potential is estimated to be moderately to highly elevated.

Middle Tuolumne River
Large contiguous areas of moderate to high soil burn severity throughout the lower portion of this watershed suggest a high potential for increased erosion. Lower slope values may ameliorate the response so overall erosion potential is estimated to be moderate to high.

South Fork Tuolumne River
Pockets of moderate and high soil burn severity may cause localized increased potential for erosion. However, much of these areas are widely distributed in the watershed and interspersed by substantial areas of unburned and low soil burn severity. Overall, the erosion potential for the watershed is expected to be moderate.

Debris Flow Potential

Field evidence of debris flows is lacking in areas observed in the Eleanor Creek, Main Stem of the Tuolumne River, Middle Tuolumne River, and the South Fork of the Tuolumne watersheds. Steep areas within the burn perimeter are dominated by Cretaceous granitic rocks that are highly competent and resistant to debris flow formation. Spatially limited glacial sediments near steep stream channels present the greatest potential source for debris flows where they could erode and bulk steep stream channels. Therefore, the potential of debris flows arising as a result of post-fire watershed conditions within burned perimeter of the Rim Fire is greater than pre-fire conditions, though the probability remains low for all watersheds.

Watershed Response

The effect of wildfires on storm runoff is well documented. Wildfires typically cause an increase in watershed responsiveness to precipitation events. Burned watersheds can quickly yield runoff due to the removal of protective tree and shrub canopies and litter and duff layers, thus producing flash floods. Burned areas often respond to typical storm events in a much flashier way. The amount of water yield increase is variable and it is often orders of magnitude larger than pre-fire events. These impacts are predominantly true in watersheds that experienced significant consumption of the vegetation community and moderate to high soil burn severity effects. Fires may increase the number of runoff events as well because it generally takes a smaller storm to trigger runoff until vegetation begins to recover. Peak flow increases from the fire may also be augmented by floatable and transportable material within the active channels.

Throughout the fire area, vegetation recovery is largely dependent on climatic cycles. If wet winters occur, vegetation recovery could be rapid, with forbs and grasses providing ground cover similar to that observed in unburned areas throughout the fires. By the second winter season, forbs, grasses, and re-established shrubs should provide sufficient cover to reduce any increase in watershed response to near pre-fire levels. Once sprouting vegetation begins to produce brushy crowns and a duff/litter layer, watershed response will be reduced further. However, if winters are dry, vegetation

recovery will be slow, and thus the establishment of ground cover and shrub communities will be slow, and watershed response will remain slightly elevated over pre-fire conditions.

A consequence of increase runoff, erosion, sediment and debris delivery is a short-term degradation of water quality as ash, sediment, and burned organic debris are delivered to streams and reservoirs within and downstream of burned areas. The impacts of this effect depend largely on the vegetative recovery times in combination with storm characteristics in the same time period.

The primary watershed response of the Rim fire is largely dependent on the amount of area classified as moderate to high soil burn severity. From Table 1, the largest percentage of moderate and high soil burn severity within the burn perimeter is in the Middle Tuolumne (54%), followed by Eleanor Creek (39%), the South Fork Tuolumne (31%), and the main stem Tuolumne (27%). Modifying this response is the patchiness of soil burn severity and watershed slopes.

Eleanor Creek
Watershed response above Lake Eleanor is expected to be negligible to low overall given the low proportion of the watershed that exhibits moderate to high soil burn severity (3%). Localized moderately elevated watershed response may be expected from slopes to the northeast of the lake and near Kibbie Creek due to concentration of higher soil burn intensity in these areas.

Watershed response outside of the area draining to Lake Eleanor will vary according to slope and soil burn severity. The north slopes of North Mountain could exhibit moderate to high watershed response given greater slopes and spatially contiguous high and moderate soil burn severity. Elsewhere, watershed response is expected to be low given low slopes and discontinuous patches of moderate soil burn severity.

Tuolumne River
Soil burn severity in the portion of the watershed above O'Shaughnessy Dam and Hetch Hetchy Reservoir was classified as largely unburned/low or low. Given that only 8% of the burned area fell into the moderate and high soil burn severity classes and that much of this area is highly dispersed, the probability of increased watershed response post-fire is negligible to low.

Large contiguous areas of moderate to high soil burn severity on the south side of the Tuolumne River Canyon below Hetch Hetchy Reservoir may elevate watershed response post-fire. Given relatively low slope values in this area, the probability of increased watershed response post-fire is moderate to high.

Middle Tuolumne River
Large contiguous areas of moderate to high soil burn severity throughout the lower portion of this watershed suggest a high potential for increased watershed response. Lower slope values may ameliorate the response so overall post-fire watershed

response is estimated to be moderate to high.

South Fork Tuolumne River
Pockets of moderate and high soil burn severity may cause localized increased watershed response. These areas are widely distributed in the watershed and interspersed by substantial areas of unburned and low soil burn severity. Therefore, the overall erosion potential for the watershed is expected to be moderate.

Values at Risk

All areas within the burned area and downstream of the burned area were evaluated for Values at Risk due to post-fire watershed conditions. A USFS BAER team covered Forest Service Lands which are downstream of NPS lands. This assessment covers Yosemite National Park lands burned in the Rim Fire and discusses Values at Risk on NPS lands. A separate report has been prepared by the USFS covering lands burned on USFS lands and downstream Values at Risk.

In regards to flooding from post-fire watershed conditions, Standard Operating Procedures (SOP) for BAER evaluations and treatments are only considered for up to 25-year storm events. The ability for BAER to prescribe temporary treatments that withstand storm events greater than a 25-year magnitude becomes problematic. The nature of BAER activities allows for rapid assessment and rapid implementation of treatments to protect human lives, property, and critical natural and cultural resources. Design of treatments and implementation of treatments beyond 25-year storm events usually requires complex engineering and implementation that exceeds the rapid implementation of such treatment. In 1997, Yosemite and surrounding areas received a large rain on snow event which flooded the Merced River and its tributaries and the magnitude of this event is considered to be approximately an 80-year storm event. During this 1997 event Eleanor Creek, Main Stem of the Tuolumne River, Middle Tuolumne River, and the South Fork of the Tuolumne River flooded, however no structures (homes, bridges, etc.) were flooded or lost. Given that there was no loss of structures on these streams in 1997, and no new structures have been installed near the streams since 1997, it is anticipated that no loss of structures will occur from a 25-year event, the limit for which BAER SOP's can prescribe and implement treatments. The NPS at Yosemite and other cooperators provided the DOI BAER Team a list of perceived Values at Risk which include:

- Municipal Watersheds of Hetch Hetchy Reservoir and Lake Eleanor Reservoir.

- Post-fire damage to Big Oak Flat Road, Tioga Road, Tuolumne Grove Road, Aspen Valley Road, Wilderness portion of Great Sierra Wagon Road, Baseline Road, Hetch Hetchy Road, and Garnet Ridge Road.

- Historic Structures in Miguel Meadow and along Frog Creek, Hodgdon Meadow Sewage Treatment Plant , Hetch Hetchy Housing (owned by NPS), Eleanor Housing (owned by SFPUC), and the Entrance Station at Big Oak Flat Road.

- Campgrounds at Lake Eleanor.

- Gaging stations at Lake Eleanor and below Hetch Hetchy.

Evaluation of Values at risk consisted of site field visits, aerial reconnaissance, and professional judgment to determine risk to identified structure or water body. In some cases Values at Risk are not owned by the NPS and are not eligible for Emergency Stabilization Funding. However, if a risk is identified, a treatment is recommended under Non-Funded Management Recommendations and provided to the given cooperator.

Hetch Hetchy Reservoir: Only 1.8% of the watershed draining to Hetch Hetchy Reservoir falls within the Rim Fire perimeter. Eight percent of this area (0.14% of the watershed) received moderate to high soil burn severity, and 23% (0.41% of the watershed) received low soil burn severity. The remaining area within the fire perimeter was either unburned or received very low soil burn severity. Given the highly dispersed nature of the burn within the watershed and very small amounts of moderate and high soil burn severity, risk to Hetch Hetchy Reservoir from increased post-fire watershed response and erosion is negligible to low.

Lake Eleanor Reservoir: Nine percent of the watershed draining to Lake Eleanor Reservoir falls within the Rim Fire perimeter. Twenty-nine percent of the burned area received moderate and high soil burn severity. Much of this area is located near the extreme western shore of the reservoir. Given relatively low slope values in the area, it is expected that the probability of localized increased watershed response and erosion potential is moderately increased. Overall, however most of the burned area is patchy and of low soil burn severity resulting in an estimated negligible to low impact from post-fire watershed response and erosion potential.

Hetch Hetchy Road: The Hetch Hetchy Road is a right-of-way maintained by SFPUC which owns and maintains the structures associated with the road. The burned slopes above the road will have a moderate to high watershed response due to the large contiguous areas of high and moderate soil burn severity. The areas of this road below burned slopes are at risk to post-fire watershed conditions and will discharge rock, sediment, and woody debris to the road surface and culverts. Pre-storm culvert and inboard ditch cleaning and post storm monitoring and cleaning is recommended as a Non-Funded Management Recommendation.

Big Oak Flat Road: This road is at risk to post-fire watershed conditions and two treatments Specifications (10 and 11) are recommended to protect this road. Culverts were inspected upstream and downstream of road surface along all areas that had burned slopes uphill from the road. Slopes and channels on the upstream side of the road were inspected for floatable woody debris that could be transported downhill and potentially block culvert entrances. The inboard ditch along the road surface was also inspected for debris blockage and water transport capacity.

Approximately four miles of the road are below slopes burned by the Rim Fire from the park boundary near the Big Oak Flat entrance station to Hazel Green Creek. Along this section of road, 14 culverts (not including grated cross-drain culverts) were inspected and seven culverts need cleaning at their entry or exit points. Obstructions include soil or wood at the entry or exit points, though no culverts were completely occluded. Inspected culverts are shown are shown on the Big Oak Flat Road Treatment Map. Several grated cross-drain culverts were inspected and appeared to be clean; however a more detailed evaluation of these grated culverts should be performed while cleaning the other culverts. On average, five large storm events occur in this area yearly and Specification 10 provides for pre-storm cleaning of the seven partially blocked culverts and provides for five post-storm cleanings of all culverts and inboard ditches below burned slopes for FY 2014.

Slopes and channels upstream of culverts were examined for floatable woody debris that could mobilize and plug entrances to culverts. In the case of Big Oak Flat Road, floatable woody debris does not pose a threat to the culverts as most of the wood has been completely consumed by the Rim Fire or is in stable locations and no treatment for floatable woody debris is recommended.

In much of the area examined uphill of the road in burned areas there are rocks, soil, woody debris, and ash that may be transported on to the road surface during large storms which may block passage of the road, particularly if the grated cross-drain culverts are plugged during a storm event. Specification 11 provides for 5 road clearing events to keep transportation lanes open to traffic in the event that debris enters the road surface and poses a risk to motorists.

Tioga Road: This road is at risk to post-fire watershed conditions and three treatments are recommended to protect this road (10, 11, and 12). Culverts were inspected upstream and downstream of road surface along all areas that had burned slopes uphill from the road. Slopes and channels on the upstream side of the road were inspected for floatable woody debris that could be transported downhill and potentially block culvert entrances. The inboard ditch along the road surface was also inspected for debris blockage and water transport capacity.

Approximately five miles of the road are below slopes burned by the Rim Fire from Crane Flat to approximately one mile east of Smoky Jack Creek. Along this section of road, 24 culverts were inspected and ten culverts need cleaning at their entry or exit points. Obstructions include soil or wood at the entry or exit points and no culvert is completely occluded. Culvert C-14 has an abandoned water line passing through the culvert and it is recommended to remove this pipe. Inspected culverts are shown on the Tioga Road Treatment Map and Specification 10 provides for a pre-storm cleaning of the ten partially blocked culverts. On average, five large storm events occur in this area yearly and Specification 10 also provides for five post-storm cleanings of all culverts and inboard ditches below burned slopes for FY 2014.

Slopes and channels upstream of culverts were examined for floatable woody debris

that could mobilize and plug entrances to culverts. Two culverts, C-10 and C-14 are recommended for woody debris removal 200 feet upstream of the culvert. Specification 12 provides for removal of woody debris from these streams prior to the fall/winter storms.

In much of the area examined uphill of the road in burned areas are rocks, soil, woody debris, and ash that may be transported on to the road surface during large storms which may block passage of the road. Specification 11 provides for five road clearing events to keep transportation lanes open to traffic in the event that debris enters the road surface and poses a risk to motorists.

Tuolumne Grove Road: This road is at risk to post-fire watershed conditions and three treatments are recommended to protect this road (10, 11, and 12). Culverts were inspected upstream and downstream of road surface along all areas that had burned slopes uphill from the road. Slopes and channels on the upstream side of the road were inspected for floatable woody debris that could be transported downhill and potentially block culvert entrances. The inboard ditch along the road surface was also inspected for debris blockage and water transport capacity.

Approximately six miles of the road are below slopes burned by the Rim Fire from Hodgdon Meadow to Crane Flat. Along this section of road, four culverts were inspected and all four culverts need cleaning at their entry or exit points. Between North Crane Creek and Crane Flat, no culverts were inspected due to hazard tree concerns. Obstructions include soil, gravel, riparian vegetation and wood at culvert entry or exit points and no culvert was completely occluded. Inspected culverts are shown on the Tuolumne Grove Road Treatment Map, and Specification 10 provides for a pre-storm cleaning of the four partially blocked culverts. On average, five large storm events occur in this area yearly and cleaning of four culverts after these storm events for FY 2014 is provided in Specification 10. Because the inboard ditch is in bad repair, and the very limited quantity of cross-drain culverts, it is recommended not to clean the inboard ditch until more cross drain culverts can be installed to properly drain the road.

Slopes and channels upslope of culverts were examined for floatable woody debris that could mobilize and plug entrances to culverts. Three culverts on Hodgdon Meadow, Hazel Green, and North Crane Creeks are recommended for woody debris removal 200 feet upstream and downstream of the culvert. Specification 12 provides for removal of woody debris from these streams prior to the fall/winter storms.

In much of the area examined uphill of the road in burned areas are rocks, soil, woody debris, and ash that may be transported on to the road surface during large storms which may block passage of the road. Specification 11 provides for five road clearing events to keep transportation lanes open to traffic in the event that debris enters the road surface and poses a risk to motorists.

Aspen Valley Road: This road is at risk to post-fire watershed conditions and two treatments Specifications (10 and 11) are recommended to protect this road. Culverts

were inspected upstream and downstream of road surface along all areas that had burned slopes uphill from the road. Slopes and channels on the upstream side of the road were inspected for floatable woody debris that could transport downhill a potentially block culvert entrances. The inboard ditch along the road surface was also inspected for debris blockage and water transport capacity.

Approximately six miles of the road are below slopes burned by the Rim Fire from the "Y" below the inholdings to the park boundary. Along this section of road, 27 culverts were inspected and 15 culverts need cleaning at their entry or exit points. Obstructions include soil or wood at the entry or exit points, and no culvert was completely occluded. Inspected culverts are shown are shown on the Aspen Valley Road Treatment Map. Specification 10 provides for a pre-storm cleaning of the 15 partially blocked culverts and the entire six miles of inboard ditch. On average, five large storm events occur in this area yearly and Specification 10 also provides for five post-storm cleanings of all culverts and inboard ditches below burned slopes for FY 2014.

Slopes and channels above culverts were examined for floatable woody debris that could mobilize and plug entrances to culverts. In the case of Aspen Valley Road, floatable woody debris does not pose a threat as most of the wood has been completely consumed by the Rim Fire or is in stable locations and no treatment for floatable woody debris is recommended.

In much of the area examined uphill of the road in burned areas are rocks, soil, woody debris, and ash that may be transported on to the road surface during large storms which may block passage of the road. Specification 11 provides for five road clearing events to keep transportation lanes open to traffic in the event that debris enters the road surface and poses a risk to motorists.

Great Sierra Wagon Road: This road was not inspected for post-fire road related threats due to excessive hazard trees. This historic road, now used as a wilderness trail from Aspen Valley to White Wolf, was largely undamaged during the 1997 and earlier floods. Post-fire watershed conditions should pose a minimal threat to the road. Specification 6 provides for cleaning of three historic culverts within the fire perimeter that were identified using archeological survey information. Cleaning would be done by hand crews as this trail is in designated wilderness.

Baseline Road: This road was inspected from the park boundary in to about one mile. The road is in poor condition with no culverts or functional inboard ditches. Post-fire watershed conditions could damage this road further; however there are no BAER treatments that could alter this condition and no treatments are recommended.

Historic Structures in Miguel Meadow: The historic structures at Miguel Meadow were observed during aerial reconnaissance. The main patrol cabin and barn were destroyed in the Rim Fire. The remaining structures are not at risk from post-fire watershed conditions.

Historic Structures along Frog Creek: The cabin along Frog Creek was observed from aerial reconnaissance and the structure was intact. The structure is not at risk to post-fire watershed conditions and is well above any flooding that could occur.

Big Oak Flat Entrance Station: The structures were evaluated for post-fire watershed conditions and are not at risk to flooding because the area is elevated above any watercourses that drain from the burned slopes with the exception of the power transformer station owned by PG&E. The transformer station has several old roads that intersect and direct flow toward the station. It is recommended that PG&E place sandbags around this structure to divert flow away. A Non-Funded Management Recommendation provides details of sandbag placement to protect this structure.

Hodgdon Meadow Sewage Treatment Plant: The treatment plant was examined for post-fire watershed flooding. Most of the treatment plant structures are well above any flooding of Hodgdon Meadow Creek with the exception of the non-functional treatment block house. The block house is built upon the historic active floodplain (100-year). An interview with Dave Mathews, Yosemite water treatment specialist, revealed that the block house contains no water treatment chemicals, despite the fact that on the outside of the building there is a placard stating that perchloric acid is stored inside. All equipment inside the block house is reportedly elevated above the floor with the exception of a hazmat cabinet which rests on the floor. The contents of the hazmat cabinet are unknown. The examination of this structure did not include looking inside and is contents were verbally described by Dave Mathews. Although flooding of the structure is very unlikely it is recommended to remove all chemicals from the building as a Non-Funded Management Recommendation.

Hetch Hetchy Housing: The Hetch Hetchy housing area has six buildings, two tent cabins, and a road that leads to a corral. Two cabins and the tent cabins are built in a poor location relative to the small stream that discharges between structures 2106 (tent cabin) and the trail crew bunkhouse (Figure 1) and then between the bunkhouse and building 2100. A cross-drain culvert drains the road to the corral onto an open area which drains down the corral road past building 2100.

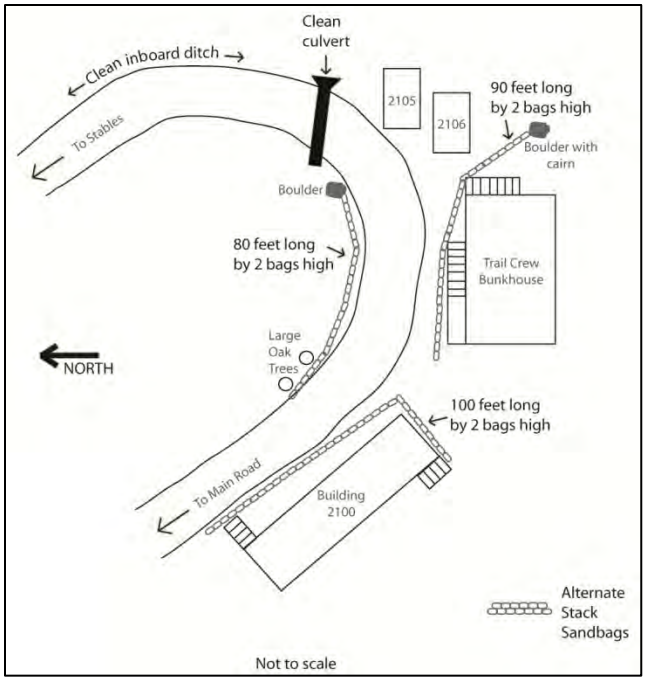

Figure 1. Diagram of Hetch Hetchy cabin area at risk to nuisance flooding.

The only structures at risk to post-fire watershed conditions in this area are the trail crew bunkhouse and building 2100. The watershed above this area shows mostly low to unburned soil burn severity. The vegetation canopy is mostly intact and the small stream still has high complexity due to unburned vegetation and exposed rock and boulders. Post-fire watershed conditions pose a limited threat to two cabins in the area from nuisance flooding. A sandbag treatment is recommended to protect the bunkhouse and building 2100. The tent cabins (building 2105 & 2106) are elevated above ground surface and not at risk.

Campgrounds at Lake Eleanor: Three unnamed primitive campgrounds are located along the shore of Lake Eleanor. Locally, the campgrounds are referred to as “Eleanor”, “South Peninsula”, and “Frog Creek”. Only Frog Creek has a large watershed above the campground. The other two campgrounds are on peninsulas along the lake away from drainages. Only a small portion of the Frog Creek watershed is burned and will have a very low watershed response. Very little infrastructure exists at these campgrounds which include developed trails and bear boxes. Given the location of the campgrounds, limited infrastructure, and low watershed response, these campgrounds are considered to be not at risk to post-fire watershed conditions.

Eleanor Housing (owned by San Francisco Public Utilities Commission): Four structures were examined at Eleanor housing area, a bunkhouse, a ranger station, and two boat houses. The structures are built against a steep slope and no streams discharge to this area. Upslope from this area in the higher elevations and lower gradient slopes, moderate soil burn severity predominates. In the lower areas with steep slopes low to unburned soil burn severity predominates and the canopy cover is intact. Additionally, the slopes have a high degree of complexity because of the intact vegetation and large

boulders. Watershed response in the upper elevations will be low to moderate due to the soil burn severity and low gradient slopes and watershed response in the lower slope area will be low to unchanged. Given the lack of defined channels leading to the structures, a large buffer of intact vegetation with low to unburned soil burn severity and complex slope topography between the upper slopes and the structures, the structures are not at risk to post-fire watershed conditions. However, the structures appear to be at risk to rock fall as many large boulders, including one smaller boulder resting against the bunkhouse, occupy the area immediately around the structures. This is a preexisting condition and the fire should not exacerbate this situation since the steep slopes are mostly unchanged by the fire. It is recommended that the structures in this area be evaluated for potential rock fall as a hazard to occupants as a Non-Funded Management Recommendation.

Gaging stations at Lake Eleanor and below Hetch Hetchy: There are two gage stations on and below Lake Eleanor and operated and maintained by the USGS. The gage station on the lake is well away from burned slopes and not at risk to post-fire watershed conditions. The gage station below Lake Eleanor along Eleanor Creek has burned slopes less than 35 degrees on both sides of the valley and the total contributing watershed area is small. Soil burn severity on the upper slopes is moderate on both sides of the valley, and low to unburned on lower slopes and the valley floor. Watershed response at the gage will be low given low angle slopes and low soil burn severity buffering the upper slope moderate soil burn severity. Given these conditions the gage station is not at risk to post-fire watershed conditions.

The gage station below Hetch Hetchy Reservoir along the Tuolumne River has steep slopes on both sides of the valley. Soil burn severity on the slopes above this gage is low or unburned and total contributing watershed area is small and watershed response will be negligible to low. Given its location relative to mostly unburned slopes, the gage station is not at risk.

Critical Natural Resources

No critical natural resources were identified in or downstream of the burned areas of the Rim Fire on NPS lands.

Critical Cultural Resources

As of completion of this report, no critical cultural resources have been identified for emergency stabilization treatments. Assessments will continue past completion of this report which may lead to treatments to protect sites from post fire watershed conditions.

RECOMMENDATIONS

Emergency Stabilization

Monitor and Clean Culverts (Specification 10)
Specification 10 monitors and cleans culverts along five roads including Aspen Valley, Big Oak Flat, Old Big Oak Flat, and Tioga roads. Also, a culvert and inboard ditch need cleaning at the Hetch Hetchy cabins. Additionally, the specification cleans the inboard ditch along Aspen Valley Road prior to the fall/winter roads.

Aspen Valley Road: There are twenty-seven culverts (including cross-drains) located along Aspen Valley Road (See Aspen Valley Road Treatment Map) below burned slopes. Fifteen of the culverts need the entry or exit point cleaned prior to fall/winter storms. No culverts are known to be completely plugged. Additionally, the inboard ditch (six miles) needs to be cleaned prior to fall/winter storms. After large storm events, the culverts and inboard ditch should be inspected to insure proper function and cleared as necessary. This specification provides for pre-storm cleaning and post-storm monitoring and cleaning for five large storm events for fiscal year 2014 based on the average amount of large storms for this area. Pre-storm cleaning will require a hand crew for culvert cleaning and a back-hoe and dump truck to clean the inboard ditch and post-storm clean-up will require the same. Spoils should be removed from site and stored in an appropriate area well away from drainages. At least four culverts have historic rock work on downstream side and an archeologist should preview anticipated work.

Big Oak Flat Road: There are fourteen culverts (not including grated cross-drains) along Big Oak Flat Road (See Big Flat Road Treatment Map) below burned slopes. Seven of the culverts need cleaning at the entry and/or exit point prior to fall/winter storms. No culverts are known to be completely plugged. Additionally, the few grated cross-drain culverts should be inspected and cleaned during the pre-storm cleaning of the larger culverts. In some cases the exit point is far below the road, making cleaning more difficult. The inboard ditch does not need cleaning prior to fall/winter storms. After large storm events, all culverts and inboard ditch should be inspected to insure proper function and cleared as necessary. This specification provides for pre-storm cleaning and post-storm monitoring and cleaning for five large storm events for fiscal year 2014 based on the average amount of large storms for this area. Pre-storm cleaning will require a hand crew and sawyer. Post-storm cleaning will require a hand crew. Spoils should be placed well away drainages in areas downslope from any culverts. Culverts may be historic and an archeologist should preview anticipated work.

Tuolumne Grove Road: There are three culverts (not including cross-drains) along Old Big Flat Road below burned slopes (See Tuolumne Grove Road Treatment Map) and all three needs cleaning above and below the culvert entry and exit points which include removing riparian vegetation as far as equipment can reach to allow flow prior to fall/winter storms. The three creeks are Hodgdon Meadow Creek, Hazel Green Creek, and North Crane Creek. Culverts (including cross-drain) between North Crane Creek and Crane Flat were not inspected due to hazard trees. After large storm events, all culverts and inboard ditch should be inspected to insure proper function and cleared as necessary. This specification provides for pre-storm cleaning and post-storm monitoring and cleaning for five large storm events for fiscal year 2014 based on the

average amount of large storms for this area. Pre-storm cleaning will require a back-hoe and dump truck and post storm cleaning will require the same. Spoils should be removed from site and stored in an appropriate area well away from drainages. Culverts may be historic and an archeologist should preview anticipated work.

Tioga Road: There are twenty-four culverts (including cross-drains) below burned slopes along Tioga Road (See Tioga Road Treatment Map). Ten of the culverts need cleaning at the entry and/or exit point prior to fall/winter storms. The inboard ditch does not need cleaning prior to fall/winter storms. No culverts are known to be completely plugged. After large storm events, all culverts and inboard ditch should be inspected to insure proper function and cleared as necessary. This specification provides for pre-storm cleaning and post-storm monitoring and cleaning for five large storm events for fiscal year 2014 based on the average amount of large storms for this area. Pre-storm cleaning will require a hand crew, and post-storm cleaning will require a hand crew. Spoils should be removed from site and stored in an appropriate area well away from drainages. Culverts may be historic and an archeologist should preview anticipated work.

Hetch Hetchy Cabins: Clean culvert inlet and inboard ditch above cabins along road to corral prior to fall/winter rains (see map in Structure Protection Specification WS-4). The culvert is not fully plugged. After large storm events, the culverts and inboard ditch should be inspected to insure proper function and cleared as necessary. This specification provides for pre-storm cleaning and post-storm monitoring and cleaning for five large storm events for fiscal year 2014 based on the average amount of large storms for this area. Ditch cleaning will require a back-hoe and dump truck, and culvert cleaning will require a laborer.

Remove Road Debris (Specification 11)

Aspen Valley Road: Monitor after storm events and clear debris as necessary. Approximately six miles of road from the park boundary to the 'Y' in the road below Aspen Valley are below burned slopes of the Rim Fire (See Aspen Valley Road Treatment Map). This specification provides for five road cleaning events for fiscal year 2014 based on the average amount of large storms for this area. Materials expected to be removed are woody debris, mud, and rock. Equipment needed includes a dump truck with blade, front loader, and two laborers. Debris should be removed from site and stored in a stable location away from streams.

Big Oak Flat Road: Monitor after storm events and clear debris as necessary. Approximately four miles of road from the park boundary to Hazel Green Creek are below burned slopes of the Rim Fire (See Big Oak Flat Road Treatment Map). This specification provides for five road cleaning events for fiscal year 2014 based on the average amount of large storms for this area. Materials expected to be removed are woody debris, mud, and rock. Equipment needed includes a dump truck with blade, front loader, and two laborers. Debris should be removed from site and stored in a stable location away from streams.

Tuolumne Grove Road: Monitor after storm events and clear debris as necessary. Approximately six miles of road from Hodgdon Meadow to Crane Flat are below burned slopes of the Rim Fire (See Tuolumne Grove Road Treatment Map). This specification provides for five road cleaning events for fiscal year 2014 based on the average amount of large storms for this area. Materials expected to be removed are woody debris, mud, and rock. Equipment needed includes a dump truck with blade, front loader, and two laborers. Debris should be removed from site and stored in a stable location away from streams.

Tioga Road: Monitor after storm events and clear debris as necessary. Approximately five miles of the ten miles of road from the Crane Flat intersection of the Big Oak Flat and Tioga Roads are below burned slopes of the Rim Fire (See Tioga Road Treatment Map). This specification provides for five road cleaning events for fiscal year 2014 based on the average amount of large storms for this area. Materials expected to be removed are woody debris, mud, and rock. Equipment needed includes a dump truck with blade, front loader, and two laborers. Debris should be removed from site and stored in a stable location away from streams.

Remove Floatable Woody Debris (Specification 12)

Tioga Road: Most culverts on Tioga Road have been surveyed for road repair and have culvert numbers painted on the road (See Tioga Road Treatment Map). At culvert C10 and C14 remove woody debris greater than two feet in length upstream of the culverts for 200 feet to the Wilderness boundary. Only remove woody debris that is in the channel and twenty feet above the high water mark to each side of the channel. Recommended is a four person hand crew with a sawyer, a small dump truck, and an equipment operator. Haul woody debris away from the creek and store in a stable area away from streams.

Tuolumne Grove Road: On Hodgdon Meadow Creek, remove woody debris greater than two feet in length 100 feet upstream of culvert and twenty feet above the high water mark on each side of the creek (See Tuolumne Grove Road Treatment Map). On the downstream side remove woody debris greater than four feet downstream 100 feet of culvert in the channel only. On Hazel Green Creek remove woody debris two feet in length 200 feet upstream of culvert and twenty feet above high water mark on each side of the creek. On North Crane Creek remove woody debris two feet in length 200 feet upstream of culvert and twenty feet above high water mark on each side of the creek. Recommended is a four person hand crew with a sawyer, a small dump truck, and an equipment operator. Haul woody debris away from creek and store in a stable area away from streams.

Structure Protection (Specification 13)

Hetch Hetchy Cabins: Install three rows of sandbags, one ninety feet long stacked two high along the Trail Crew Bunkhouse, one eighty feet long stacked two high along stables road making sure the small ditch is captured by the sandbags, and one 100 feet long row stacked two bags high along building 2100 (See Map in Structural Protection Specification 13). Stack sandbags as if building a brick wall by alternating placement.

Approximately 720 sandbags will be needed at this site and 280 extra are provided for maintenance.

NON-FUNDED MANAGEMENT RECOMMENDATIONS

Big Oak Flat Entrance Station: Refer to Figure 2 below. Place one row of sandbags wrapped around the transformer shed with a total length of fifty feet stacked three high. Stack sandbags as if building a brick wall by alternating placement. Approximately 200 sandbags will be needed at this site.

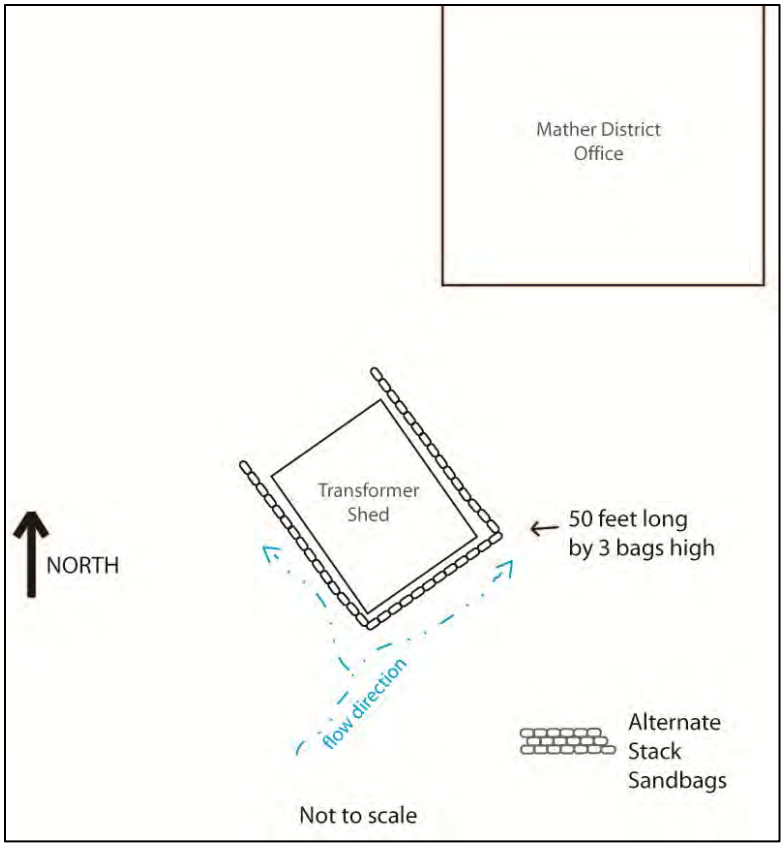

Figure 2. Diagram of PG&E Transformer Shed at Big Oak Flat Entrance Station.

Hetch Hetchy Road: The areas of this road below burned slopes are at risk to post-fire watershed conditions including discharge of rock, sediment, and woody debris to the road surface and culverts. Pre-storm culvert and inboard ditch cleaning and post storm monitoring and cleaning is recommended.

Water Treatment Block House at Hodgdon Meadows: All equipment inside the block house is reportedly elevated above the floor with the exception of a hazmat cabinet which rests on the floor. Although flooding of the structure is very unlikely it is recommended that all chemicals be removed from the building as a precaution for two years after the fire.

REFERENCES

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Watershed Assessment Written by
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2013 RIMBAER

INTERAGENCY BURNED AREA EMERGENCY STABILIZATION PLAN

SUMMARY OF ACTIVITIES

TREATMENT SPECIFICATION	Fiscal Year			ES SPECIFICATION TOTAL	BAR SPECIFICATION TOTAL
	2014	2015	2016		
1 Implementation Leader	$7,200	$3,600		$10,800	
2 Plan Preparation	$80.505			$80,505	
3 Cultural Resource Evaluation	$57,400			$57,400	
4 Install Warning Signs on Trails	$10,770			$10,770	
5 Install Warning Signs on Roads	$16,152			$16,152	
6 Clear Trails	$98,428			$98,428	
7 Trail Infrastructure Evaluation	$10,620			$10,620	
8 Invasive Plant Monitoring	$22,220			$22,220	
9 Invasive Plant Control (BAR)	$88,630	$88,630	$88,630		$265,890
10 Monitor and Clean Culverts	$39,880			$39,880	
11 Remove Road Debris	$22,080			$22,080	
12 Remove Floatable Woody Debris	$12,023			$12,023	
13 Structure Protection	$5,200			$5,200	
TOTAL	$471,108	$92,230	$88,630	**$386,078**	**$265,890**

INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Implementation Leader	**PART D Spec-#**	1
NFPORS TREATMENT CATEGORY*		**FISCAL YEAR(S) (list each year):**	2014, 2015
NFPORS TREATMENT TYPE *		**WUI? Y / N**	No
IMPACTED COMMUNITIES AT RISK	N/A	**IMPACTED T&E SPECIES**	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

A. General Description: Fund a project leader to coordinate and oversee the implementation of the Rim Fire Burned Area Emergency Response (BAER) Plan for Yosemite National Park. This specification provides for funding for a total of 2 pay periods in FY2014 and 1 pay period in Fy2015 to implement the BAER Plan.

B. Location/(Suitable) Sites: Much of the work will center within the Rim Fire burned area, treatment areas are distributed throughout the fire and will need to be administered on a watershed basis.

C. Design/Construction Specifications: The project leader is responsible for the oversight of the BAER Plan. The leader will implement each treatment to achieve efficient use of funds, personnel, equipment, and contracts. The leader will oversee monitoring, program review, proposed plan revisions, supplemental funding requests and will complete annual and final accomplishment reports in accordance to NPS BAER Policy and Guidelines. The leader will monitor work to ensure compliance with all relevant Federal laws and regulations, which include but are not limited to NEPA and NHPA mitigation requirements and all OSHA regulations and safety standards. The leader will manage the BAER Plan budget and track expenditures by specification and coordinate projects to ensure events occur in their proper order.

D. Purpose of Treatment Specifications (relate to damage/change caused by fire): The purpose is to provide quality control and accountability over project implementation.

E. Treatment consistent with Agency Land Management Plan (identify which plan): Actions proposed in the DOI RIM FIRE BAER Plan have been reviewed by the Yosemite NP Interdisciplinary Team and comply with policy and regulations.

F. Treatment Effectiveness Monitoring Proposed: The Implementation Leader will conduct review of projects, financial accountability, and oversight and provide written and electronic monitoring reports as prescribed within DOI policy and the BAER plan.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	**COST / ITEM**
$32.00 x40% = $45/hr x 160 hrs (2 PP) = $7,200 for FY2014	$7,200
$32.00 x40% = $45/hr x 80 hrs (1 PP) = $3,600 for FY2015	$3,600
TOTAL PERSONNEL SERVICE COST	$10,800
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
	$0
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	$0
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
	$0
TOTAL MATERIALS AND SUPPLY COST	$0

TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
	$0
TOTAL TRAVEL COST	$0
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
TOTAL CONTRACT COST	

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISH MENTS	PLANNED COST
2014	10/1//2013	9/30/2014	NPS	Project	$10,702	1	$7,200
2015	10/1/2014	9/30/2015	NPS	Project	$3,662	1	$3,600
						TOTAL	**$10,800**

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	P, E
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Plan Preparation	**PART D Spec-#**	2
NFPORS TREATMENT CATEGORY*		**FISCAL YEAR(S) (list each year):**	2013
NFPORS TREATMENT TYPE *		**WUI? Y / N**	No
IMPACTED COMMUNITIES AT RISK	N/A	**IMPACTED T&E SPECIES**	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

A. General Description: Fund the development of this BAER Plan.

B. Location/(Suitable) Sites: Yosemite National Park.

C. Design/Construction Specifications: A BAER Plan consistent with Law, Regulation and Policy that addresses Values at Risk, documents and prescribes treatments to protect those VARs.

D. Purpose of Treatment Specifications (relate to damage/change caused by fire): To develop a BAER Plan consistent with Law, Regulation and Policy that addresses Values at Risk, documents and prescribes treatments to protect those VARs.

E. Treatment consistent with Agency Land Management Plan (identify which plan):

F. Treatment Effectiveness Monitoring Proposed:

LABOR, MATERIALS AND OTHER COST:

Name	Base 8 w/ benefits	OT	Travel	Hotel M&IE	Total
Holbeck 9-6/21	88hrsX43hrX1.4= $5,297	134hrsX65hr= $8,710	SUV-$800 Gas-$300 Air-$600	5Hotel-100=$500 5M&IE-71=$355 Camp M&IE-$50	
Wilder 9-6/21	88hrsX43hrX1.4= $5,297	134hrsX65hrs= $8,710	SUV-$800 Gas-$300 Air$600	5Hotel-100=$500 5M&IE-71=$355 Camp M&IE-$50	
Easterbrook 9-7/21	88hrsX44/hrX1.4= $5,420	134hrsX66hr= $8,844	Air-$400	5Hotel-100=$500 5M&IE-71=$355 Camp M&IE-$50	
Schwab 9-6/18	0	112hrsX82hr= $9,184	Air-$800	3Hotel-100=$300 3M&IE-71=$213 Camp M&IE-$50	
Rasmussen 9-6/21	88hrsX34hrX1.4- $4,188	134hrsX51hr= $6,834	GSA vehicle- $500	5Hotel-100=$500 5M&IE-71=$355 Camp M&IE-$50	
Roche 9-8/19	64hrsX33hrX1.4= $2,956	74hrsX49hr= $3,626	0	0	
Dickman 9-16/18	24hrsX25hrX1.4= $840	18hrsX37hr= $666	0	0	
Kirn	0	10hrsX65hr=	0	0	

9-14		$650			
	$23,998	$47,224	$5,100	$4,183	$80,505

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISH MENTS	PLANNED COST
2013	9/6/2013	9/30/2013	NPS	Project	$	1	$
						TOTAL	**$80,505**

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	P, E,T
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Cultural resource evaluation	**PART D Spec-#**	3
NFPORS TREATMENT CATEGORY*		**FISCAL YEAR(S) (list each year):**	2014
NFPORS TREATMENT TYPE *		**WUI? Y / N**	N
IMPACTED COMMUNITIES AT RISK	N/A	**IMPACTED T&E SPECIES**	N/A

WORK TO BE DONE (describe or attach exact specifications of work to be done):

A. General Description:

This specification addresses cultural resources at risk from impacts from fire, fire suppression, and post-fire related effects, such as increased runoff, erosion, tree fall, collapse, or illegal collection. These sites were unsafe for field assessment as part of the initial BAER effort and have been postponed until Spring 2014. A cultural resource assessment would focus on: 1) archeological sites, 2) traditional cultural properties, 3) historic buildings, 4) historic roads, and 5) cultural landscape resources. Site visits to these locations would allow staff to assess potential damage to cultural resources and prescribe treatments for the stabilization of the sites and structures from adverse effects from post-fire erosion, fire related effects, and emergency stabilization and rehabilitation actions. Park managers would consult with California State Historic Preservation Officer, American Indian tribes and groups, Tribal Historic Preservation Officers prior to prescribing treatments to minimize or mitigate post-fire related effects to cultural resources.

B. Location (Suitable) Sites:

26 archaeological sites
2 traditional cultural properties
2 historic buildings
1 historic developed area
5 historic roads
A map is not included to protect the location of the culturally sensitive resources

C. Design/Construction Specifications:

Assess and prescribe treatments to archaeological sites according to consultation with State Historic Preservation Officer, American Indian tribes and groups and Tribal Historic Preservation Officers

D. Purpose of Treatment Specifications (relate to damage/change caused by fire:

Assessment is necessary to evaluate the risk to cultural resources from the effects of post-fire flooding, debris flows, severe erosion, looting of exposed artifacts, and emergency stabilization. Treatments would be commensurate with the risk at each site.

E. Treatment consistent with Agency Land Management Plan:

36CFR part 800

F. Treatment Effectiveness Monitoring Proposed:

Evaluate sites and prescribe treatments as appropriate

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	**COST / ITEM**
GS-11 Project manager @ $45/hour x 80 hours x 1 year	$3,600
GS-11 HLA @ $45/hour x 40 1 year	$1,800
GS-11 Data manager@ $45/hour x 80 hours x 1 year	$3,600
GS-9 Arch field lead @ $33/hour x 400 hours x 1 year	$13,200
GS-7 Arch tech @ $24/hour x 400 hours x 1 year	$9,600
GS-5 Arch techs @ $16/hour x 400 hours x 2 people x 1 year	$12,800
WG-6 Sawyer @ $20/hour x $240 hours x 1 year	$4,800
GS-12 Tribal liaison @ $50/hour x 40 hours x 1 year	$2,000
GS-6 Tribal consult assistant @ $17/hour x 80 hours x 1 year	$1360
TOTAL PERSONNEL SERVICE COST	**$52,760**

EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
	$0
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	$0
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
Miscellaneous equipment @ $500	$500
Annual GPS license $100 per unit x 2 units	$200
TOTAL MATERIALS AND SUPPLY COST	**$700**
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
Vehicle @ $600 per month x 3 months	$1,800
24 days backcountry per diem per 5 people @ $20/day	$2,400
TOTAL TRAVEL COST	**$4,200**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
	$0
TOTAL CONTRACT COST	**$0**

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISH MENTS	PLANNED COST
FY 14	04/15/2014	09/30/2014	F	Arch sites	$1,545	36	$55,600
						TOTAL	**$57,400**

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	P/E/M
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Install warning signs on trails	**PART D Spec-#**	4
NFPORS TREATMENT CATEGORY*		**FISCAL YEAR(S) (list each year):**	2014
NFPORS TREATMENT TYPE *		**WUI? Y / N**	N
IMPACTED COMMUNITIES AT RISK	N/A	**IMPACTED T&E SPECIES**	N/A

WORK TO BE DONE (describe or attach exact specifications of work to be done):

A. General Description: Install warning signs to inform visitors and employees about the risk from post-fire rock fall, hazard trees, blockage of trails by fallen trees, and washed out trails.

B. Location (Suitable) Sites: All trailheads that lead into the Rim Fire burn area. Refer to the map for the specific locations. Trailheads include:

- Aspen Valley
- Carlon Falls
- Crane Flat
- South Fork Tuolumne River
- Tuolumne Grove
- Crane Flat
- White Wolf
- Poopenaut Valley
- Hetch Hetchy Entrance
- Smith Peak
- Hetch Hetchy Reservoir
- Lake Eleanor
- Kibbie Ridge

C. Design/Construction Specifications:
Trail Construction and Maintenance Handbook. Signs should be attached to existing posts when possible. Avoid mounting signs to historic or rustic trail signs. Avoid archaeological sites for sign placement. Consult with cultural resource staff prior to sign placement.

D. Purpose of Treatment Specifications (relate to damage/change caused by fire: Danger to visitors and employees exists from rock fall and hazard trees.

E. Treatment consistent with Agency Land Management Plan: Public safety

F. Treatment Effectiveness Monitoring Proposed: Functional trail surface and drainage structures; logs cleared from hiking trails. Signs should be reassessed in one year and pulled if possible.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	**COST / ITEM**
WG-9 Sign maker @ $38/hr x 80 hrs x 1FY	$3,040
WG-5 Sign installation @ $22/hr x 80 hrs x 1FY	$1,760
WS-9 Sign designer @ $48/hr x 40 hours x 1FY	$1,920
TOTAL PERSONNEL SERVICE COST	**$6,720**
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
	$0
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	$0
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
Sign construction material	$3,750
TOTAL MATERIALS AND SUPPLY COST	**$3,750**
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	

(1) vehicles @ $600 per month x .5month	$300
TOTAL TRAVEL COST	**$300**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
	$0
TOTAL CONTRACT COST	**$0**

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISH MENTS	PLANNED COST
FY 14	02/15/2014	09/30/2014	F				$10,770
						TOTAL	**$10,770**

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	P/E/M
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Install warning signs on roads	**PART D Spec-#**	5
NFPORS TREATMENT CATEGORY*		**FISCAL YEAR(S) (list each year):**	2014
NFPORS TREATMENT TYPE *		**WUI? Y / N**	Y
IMPACTED COMMUNITIES AT RISK	Hodgdon, Crane Flat	**IMPACTED T&E SPECIES**	N/A

WORK TO BE DONE (describe or attach exact specifications of work to be done):

A. General Description: Install warning signs informing visitors and employees about risks from post-fire rock fall, hazard trees, and potential flooding. Sections of Big Oak Flat and Tioga Road are overslung by the burn area and may have debris fall on the road creating a hazard for drivers.

B. Location (Suitable) Sites: All primary and secondary roads leading into the burn area. These include:

- Big Oak Flat Road at Big Oak Flat
- Big Oak Flat Road at Merced Grove
- Tioga Road at NatureBridge campus
- Tioga Road near Siesta Lake
- Hetch Hetchy at Hetch Hetchy Entrance
- Baseline Road at park entrance
- Aspen Valley at park entrance
- Cherry Lake at park entrance

C. Design/Construction Specifications:
Road signs should conform to NPS and Federal Department of Transportation standards and address public safety for rock fall, hazard trees, and localized flooding during storm events. Archaeologists should review and approve all sign installations to ensure protection of archaeological and historic resources.

D. Purpose of Treatment Specifications (relate to damage/change caused by fire: Danger to visitors and employees exists from rock fall, hazard trees, and flooding due to post-fire watershed conditions

E. Treatment consistent with Agency Land Management Plan: Public safety

F. Treatment Effectiveness Monitoring Proposed: Signs to remain for one year.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	**COST / ITEM**
WG-9 Sign Maker @ $38/hr x 160 hrs x 1FY	$6,080
WG-5 (3) Laborers (traffic control and sign placement) @ $22/hr x 80 hrs x 1FY	$5,280
GS-11 Archeologist @ $45/hr x 40 hr x 1FY	$1,800
TOTAL PERSONNEL SERVICE COST	**$13,160**
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
	$0
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	$0
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
Sign materials @ 20%	$2,692
TOTAL MATERIALS AND SUPPLY COST	**$2,692**
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
(1) vehicle @ $600 per month x .5month	$300
TOTAL TRAVEL COST	**$300**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
	$0

TOTAL CONTRACT COST	**$0**

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISH MENTS	PLANNED COST
FY 14	02/15/2014	09/30/2014	F				$16,152
						TOTAL	**$16,152**

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	P/E/M
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Clear trails	**PART E Spec-#**	6
NFPORS TREATMENT CATEGORY*		**FISCAL YEAR(S) (list each year):**	2014
NFPORS TREATMENT TYPE *		**WUI? Y / N**	N
IMPACTED COMMUNITIES AT RISK	N/A	**IMPACTED T&E SPECIES**	N/A

WORK TO BE DONE (describe or attach exact specifications of work to be done):

A. General Description: Clear fallen trees within the perimeter of the burn area and maintain trail drainage structures. Around 67 miles of trails were impacted by the fire. Based on clearance work on the Aspen Valley Road, 100 trees were cleared within seven miles of road. Therefore, it is estimated that at least 1,000 trees will need to be cleared or have access cut through the trees along trails to improve safety and prevent hikers from getting lost. Additionally in the 3.4 mile section of trail between Aspen Valley and the burn perimeter along the Great Sierra Wagon Road there are three historic culverts that need to be cleaned of debris.

B. Location (Suitable) Sites: Trails leading into the Rim Fire burn area. Including:

- Aspen Valley Rd to Old Big Oak Flat Road
- Aspen Valley to Tamarack Flat
- Carlon Falls
- Cottonwood Creek to Smith Meadow
- Gin Flat to Crane Flat
- Hazel Green Creek
- Hetch Hetchy Entrance to Aspen Valley
- Hetch Hetchy Entrance to Smith Meadow
- Hetch Hetchy to Gravel Pit Lake
- Kibbie Lake to Kibbie Ridge
- Lake Eleanor to Cherry Lake
- Lake Eleanor to Miguel Meadows
- Lake Eleanor to Kibbie Lake
- Long Gulch/Old Sierra Wagon Road
- Miguel Meadows to Laurel Creek to Hetch Hetchy
- Miguel Meadows to North Mountain
- Old Big Oak Flat Road
- Poopenaut
- Smith Meadow to Smith Peak
- Smith Meadow to White Wolf

Wilderness, facilities, and cultural resource staff should prioritize trails for clearing. Some trails may not be cleared based on the findings of those staff.

C. Design/Construction Specifications:
Trail Construction and Maintenance Handbook.

A. D. Purpose of Treatment Specifications (relate to damage/change caused by fire: Protect hikers from getting lost by keeping them on trail instead of going around fallen logs. Protect recreational opportunities and water quality by maintaining trail drainage structures that clog from fire runoff and clear fallen fire-damaged trees to keep hikers and stock on hardened trail surface.

E. Treatment consistent with Agency Land Management Plan: CE 2007-007

F. Treatment Effectiveness Monitoring Proposed: Functional trail surface and drainage structures; logs cleared from hiking trails

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	**COST / ITEM**
WS-5 Project supervisor @ $41/hr X 160 hours X 1 person	$6,560
WG-6 sawyers/swampers @ $22/hr X 480 hours x 6 people	$63,360
TOTAL PERSONNEL SERVICE COST	**$69,920**
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
	$0
	$0

TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
Materials and Supplies @ 10%	$8,948
Stock support (feed, packers, etc.)	$9,000
TOTAL MATERIALS AND SUPPLY COST	**$17,948**
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
(2) vehicles @ $1200 per month x 3 months	$7,200
Backcountry per diem @ $20 per person per day x 7 people x 24 days	$3,360
TOTAL TRAVEL COST	**$10,560**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
	$0
TOTAL CONTRACT COST	**$0**

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISH MENTS	PLANNED COST
FY 14	04/15/2014	09/30/2014	F				$98,428
						TOTAL	**$98,428**

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P/E/M
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Trail Infrastructure Assessment	**PART D Spec-#**	7
NFPORS TREATMENT CATEGORY*		**FISCAL YEAR(S) (list each year):**	2014
NFPORS TREATMENT TYPE *		**WUI? Y / N**	N
IMPACTED COMMUNITIES AT RISK	N/A	**IMPACTED T&E SPECIES**	N/A

WORK TO BE DONE (describe or attach exact specifications of work to be done):

A. General Description: Assess trail infrastructure within the Rim Fire that burned at a high intensity or where the fire burned at a high intensity above the trail. Yosemite has placed a large investment in the infrastructure of the trails (such as retaining walls and bridges). High intensity fire at these locations could damage that infrastructure. Trails in these sites are more susceptible to debris flow, blowouts, fallen trees, or failure. Field assessments of the infrastructures was not possible while the BAER team was onsite as the these locations were unsafe to visit. Trail blazes will be GPSed and documented by field crews. Locations prescribed for treatments will need to be documented thoroughly to assist with evaluation of the prescription. Damaged areas will need to be geo-referenced, photographed, and a site map drawn.

B. Location (Suitable) Sites:
The sections of trail that will need to be evaluated include:

- Areas of trail with high severity burn or trail overslung by high severity burn.
- Trail bridges
- Culverts
- Retaining walls over steep embankments and switchbacks.

Areas that should be assessed include

- Switchbacks above Hetch Hetchy
- Switchbacks above Lake Eleanor to the north and south
- Switchbacks above Smith Peak
- Miguel Meadows
- Bridge on bald mountain trail
- Bridge below tamarack flat
- Carlon Falls

C. Design/Construction Specifications:
Trail Construction and Maintenance Handbook.

A. D. Purpose of Treatment Specifications (relate to damage/change caused by fire: Assess trail infrastructure from post-fire damage and prescribe treatments

E. Treatment consistent with Agency Land Management Plan: CE 2007-007

F. Treatment Effectiveness Monitoring Proposed: Functional trail surface and drainage structures

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	**COST / ITEM**
WG-5 surveyor @ $22/hr X 160 hours x 2 people	$7,040
GS-7 data manager @ $20/hour x 80 hours x 1 person	$1,600
TOTAL PERSONNEL SERVICE COST	**$8,640**
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
Miscellaneous materials @ $500	$500
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	**$500**
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
Annual GPS license @ $200 x 2 units	$400

TOTAL MATERIALS AND SUPPLY COST	**$400**
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
1 vehicle @ $600 per month x 1 month	$600
Backcountry per diem @ $20 per person per day x 2 people x 12 days	$480
TOTAL TRAVEL COST	**$1,080**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
	$0
TOTAL CONTRACT COST	**$0**

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISH MENTS	PLANNED COST
FY 14	04/15/2014	09/30/2014	F				$10,620
						TOTAL	**$10,620**

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P/E/M
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Invasive Plant Monitoring	**PART D Spec-#**	8
NFPORS TREATMENT CATEGORY*		**FISCAL YEAR(S) (list each year):**	2014
NFPORS TREATMENT TYPE *		**WUI? Y / N**	N
IMPACTED COMMUNITIES AT RISK	N/A	**IMPACTED T&E SPECIES**	N/A

WORK TO BE DONE (describe or attach exact specifications of work to be done):

A. General Description: The purpose of this specification is to identify the establishment and monitor the spread of invasive plants. The most cost effective strategy for dealing with invasive plant infestation after a disturbance event is early detection and rapid response. Monitoring for invasive plants should begin in spring 2014. Priority should be given to areas impacted by fire suppression activities and areas with known invasive plant infestations. Yosemite Resource Management and Science (RMS) staff will conduct the monitoring. An inventory of invasive plants, including species, location, and extent of the infestation will be completed and treatments will be prescribed to control the invasion and spread.

B. Location (Suitable) Sites: Assess known locations of invasive plants. Monitor other areas based on vehicle use, heavy equipment impacts, and any fire suppression activities. Areas prone to invasive plant establishment are:

- Major roads: Tioga Road, Big Oak Flat Road, Hetch Hetchy Road
- Secondary Roads: Crane Flat Lookout, Aspen Valley, Garnet Mountain, Tuolumne Grove, Merced Grove, Cherry Oil Road, Gin Flat, and Harden Road
- Dozer lines and handlines
- Safety zones
- Parking and staging areas
- Spike camps and campgrounds
- Helispots and sling sites

C. Design/Construction Specifications:

1. Survey for presence / absence of invasive plants during the spring. The survey will be conducted either on foot or vehicle.
2. Survey and map invasive plants (both existing seed bank species and introduced) using GPS.
3. Enter GPS data in geospatial database for use in planning for treatment.
4. Sampling should determine the species composition, density and quantify the area affected
5. Initiate integrated pest management strategies to control / mitigate establishment and spread of noxious plants as prescribed the Yosemite Invasive Plant Management Plan EA Update 2010. Treatments will require submission for supplemental funding.

D. Purpose of Treatment Specifications (relate to damage/change caused by fire: Purpose is to detect and control the invasion and spread of non-native invasive plant species and prescribe treatments that will control the spread into susceptible burn areas. Assessment is necessary to determine whether vegetation treatments are necessary to meet management goals and objectives to maintain native plant community composition, structure and fire return intervals. Early detection and control will help minimize the establishment of non-native invasive species within the burn area.

E. Treatment consistent with Agency Land Management Plan: Completion of Emergency Stabilization treatments are described in, and are consistent with the Yosemite Invasive Plant Management Plan EA Update 2010

F. Treatment Effectiveness Monitoring Proposed: Control and detection of non-native invasive plants in burned areas will be monitored according to the strategy outlined in the specification. Control will be considered successful upon determination that non-native invasive plants have been controlled and have not spread beyond their pre-fire locations. Monitoring is required to determine whether vegetative recovery of habitat has, as anticipated, occurred. Additional treatments may be proposed if monitoring determines that the criteria for re-vegetation success are not achieved.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	**COST / ITEM**
GS-11 Program manager @ $45/hour x 80 hours	$3,600
GS-9 Data manager @ $33/hour x 80 hours	$2,640
GS-7 (2) botanists @ $24/hour x 160 hours	$7,680
GS-6 (2) botanists @ $20/hour x 160 hours	$6,400
TOTAL PERSONNEL SERVICE COST	**$20,320**
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
	$0
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	$0
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
Miscellaneous field supplies @ $500 per year	$500
(2) annual GPS license $200 per unit	$400
TOTAL MATERIALS AND SUPPLY COST	**$900**
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
(1) vehicles @ $600 per month x 1 month	$600
10 days backcountry per diem per 2 people @ $20/day	$400
TOTAL TRAVEL COST	**$1,000**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
	$0
TOTAL CONTRACT COST	**$0**

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISH MENTS	PLANNED COST
FY 14	05/15/2014	09/30/2014	F	gross infested acres	$100	230	$22,220
						TOTAL	**$22,220**

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	P/E/M
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

INDIVIDUAL SPECIFICATION **BAR**

TREATMENT/ACTIVITY NAME	Invasive Plant Control	**PART D, SPEC #**	9
NFPORS TREATMENT CATEGORY*		**FISCAL YEAR(S) (list each year):**	2014, 2015, 2016
NFPORS TREATMENT TYPE *		**WUI? Y / N**	N
IMPACTED COMMUNITIES AT RISK	N/A	**IMPACTED T&E SPECIES**	N/A

WORK TO BE DONE (describe or attach exact specifications of work to be done):

TREATMENT TO BE CONSIDERED UNDER BAR FUNDING

A. General Description:
Control known invasive plant infestations in areas impacted by the Rim Fire. Use integrated pest management techniques (herbicides and mechanical) as according to the Invasive Plant Management Plant EA Update (2010) to prevent the spread and establishment of invasive plants within the areas affected by the Rim Fire.

B. Location (Suitable) Sites: Known invasive plant populations in the proximity of the fire area. These occur primarily along road systems and within previously disturbed areas where fire access and suppression activities occurred (dozer lines, hand lines, roads safety zones, parking areas and off- road trafficked areas).

C. Design/Construction Specifications: Treatments will be implemented in accordance with the following:
1. Locate known infestation areas within and adjacent to fire perimeter
2. Immediately survey additional areas where invasive plants are likely to occur, primarily disturbed areas in the proximity of the fire area that are subject to invasive plant vectors.
3. When invasive plants are in proper treatment phenology as prescribed in the Invasive Plant Management Plan, using backpack sprayers or compressor truck-mounted hoses. Applicators must be familiar with native plant species and must avoid spraying them to the greatest extent practicable.
4. If possible apply control treatments prior to seed-set. Any mature seed heads should be collected and bagged for disposal.
5. Monitor site for effectiveness of initial treatment and for germination of successive cohorts of weeds.
6. When subsequent cohorts of invasive plants are encountered, treat as described in specification number 2.
7. Repeat steps 2-4 until plants are no longer in proper treatment phenology.

D. Purpose of Treatment Specifications: Control invasive plants to minimize spread into non-infested areas of the burn. Invasive plants cause plant community destabilization, unnatural increased fire cycles, reduction in species diversity, and overall watershed degradation.

E. Treatment Consistent with Agency Land Management Plan: Yosemite National Park Invasive Plant Management Plan EA Update 2010

F. Treatment Effectiveness Monitoring Proposed: Biologists will perform monitoring of invasive plant sites to ensure control methods are meeting management objectives. This is especially important for invasive plant populations that are sprayed to ensure effectiveness of herbicide application. Results are incorporated by park staff into long-term integrated pest management programs. Initiate follow-up treatments if additional non-native species or large populations are discovered.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	**COST / ITEM**
GS-11 Program manager @ $45/hour x 160 hours x 3 years	$21,600
GS-9 Data manager @ $33/hour x 240 hours x 3 years	$23,760
GS-7 Crew Leader @ $24/hour x 400 hours x 3 years	$28,800
GS-6 Crew Leader @ $20/hour x 400 hours x 3 years	$24,000
GS-5 (8) Spray Crew @$15/hour x 400 hours x 3 years	$144,000
TOTAL PERSONNEL SERVICE COST	**$242,160**
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	**COST / ITEM**
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	**$0**
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	**COST / ITEM**

Herbicide @ $1000 per year x 3 years	$3,000
Miscellaneous supplies @ $750/ year x 3 years	$2,250
TOTAL MATERIALS SAND SUPPLY COST	**$5,250**
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	**COST / ITEM**
Backcountry per diem @ $20/person/day x 8 people x 16 days x 3 years	$7,680
(2) vehicles @ $600 each/month x 3 months x 3 years	$10,800
TOTAL TRAVEL COST	**$18,480**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	**COST / ITEM**
	$0
TOTAL CONTRACT COST	$0

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLI SHMENTS	PLANNED COST
FY 14	05/15/2014	09/30/2014	F	Gross infested acres	$1,800	50	$88,630
FY 15	05/15/2015	09/30/2015	F	Gross infested acres	$1,800	50	$88,630
FY 16	05/15/2016	09/30/2016	F	Gross infested acres	$1,800	50	$88,630
						TOTAL	**$265,890**

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1.	Estimate obtained from 2-3 independent contractual sources.	
2.	Documented cost figures from similar project work obtained from local agency sources.	P
3.	Estimate supported by cost guides from independent sources or other federal agencies	
4.	Estimates based upon government wage rates and material cost.	P/E/M
5.	No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Monitor and Clean Culverts	**PART D Spec-#**	10
NFPORS TREATMENT CATEGORY*		**FISCAL YEAR(S) (list each year):**	2014
NFPORS TREATMENT TYPE *		**WUI? Y / N**	
IMPACTED COMMUNITIES AT RISK	Yosemite National Park	**IMPACTED T&E SPECIES**	None

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

A. General Description: Clean and monitor culverts along roads in Yosemite National Park impacted from post-fire watershed conditions as a result of the Rim Fire to protect lives, property, and natural resources.

B. Location/(Suitable) Sites: Culverts below burned areas of the Rim Fire on Aspen Valley Road, Big Oak Flat Road, Tuolumne Grove Road, Tioga Road, and a culvert on road to corral at Hetch Hetchy cabins.

C. Design/Construction Specifications:

Aspen Valley Road: There are twenty-seven culverts (including cross-drains) located along Aspen Valley Road (See Aspen Valley Road Treatment Map) below burned slopes. Fifteen of the culverts need the entry or exit point cleaned prior to fall/winter storms. No culverts are known to be completely plugged. Additionally, the inboard ditch (six miles) needs to be cleaned prior to fall/winter storms. After large storm events, the culverts and inboard ditch should be inspected to insure proper function and cleared as necessary. This specification provides for pre-storm cleaning and post-storm monitoring and cleaning for 5 large storm events for fiscal year 2014 based on the average amount of large storms for this area. Pre-storm cleaning will require a hand crew for culvert cleaning and a back-hoe and dump truck to clean the inboard ditch and post-storm clean-up will require the same. Spoils should be removed from site and stored in an appropriate area well away from drainages. At least four culverts have historic rock work on downstream side.

Big Oak Flat Road: There are fourteen culverts (not including grated cross-drains) along Big Oak Flat Road (See Big Flat Road Treatment Map) below burned slopes. Seven of the culverts need cleaning at the entry and/or exit point prior to fall/winter storms. No culverts are known to be completely plugged. Additionally, the few grated cross-drain culverts should be inspected and cleaned during the pre-storm cleaning of the larger culverts. In some cases the exit point is far below the road, making cleaning more difficult. The inboard ditch does not need cleaning prior to fall/winter storms. After large storm events, all culverts and inboard ditch should be inspected to insure proper function and cleared as necessary. This specification provides for pre-storm cleaning and post-storm monitoring and cleaning for 5 large storm events for fiscal year 2014 based on the average amount of large storms for this area. Pre-storm cleaning will require a hand crew and sawyer. Post-storm cleaning will require a hand crew. Spoils should be placed well away drainages in areas downslope from any culverts. Culverts may be historic.

Tuolumne Grove Road: There are four culverts (including cross-drains) along Old Big Flat Road below burned slopes (See Tuolumne Grove Road Treatment Map) and all four needs cleaning above and below the culvert entry and exit points which include removing riparian vegetation as far as equipment can reach to allow flow prior to fall/winter storms. The three creeks are Hodgdon Meadow Creek, Hazel Green Creek, and North Crane Creek, and a single cross-drain culvert. Culverts (including cross-drain) between North Crane Creek and Crane Flat were not inspected due to hazard trees. After large storm events, all culverts and inboard ditch should be inspected to insure proper function and cleared as necessary. This specification provides for pre-storm cleaning and post-storm monitoring and cleaning for 5 large storm events for fiscal year 2014 based on the average amount of large storms for this area. Pre-storm cleaning will require a back-hoe and dump truck and post storm cleaning will require the same. Spoils should be removed from site and stored in an appropriate area well away from drainages. Culverts may be historic.

Tioga Road: There are twenty-four culverts (including cross-drains) below burned slopes along Tioga Road (See Tioga Road Treatment Map). Ten of the culverts need cleaning at the entry and/or exit point prior to fall/winter storms. Culvert C-14 has an abandoned water pipe extending through the length of the culvert and this should be removed if possible. The inboard ditch does not need cleaning prior to fall/winter storms. No culverts are known to be completely plugged. After large storm events, all culverts and inboard ditch should be inspected to insure proper function and cleared as necessary. This specification provides for pre-storm cleaning and post-storm monitoring and cleaning for 5 large storm events for fiscal year 2014 based on the average amount of large storms for this area. Pre-storm cleaning will require a hand crew, and post-storm cleaning will require a hand crew. Spoils should be removed from site and stored in an appropriate area well away from drainages. Culverts may be historic.

Hetch Hetchy Cabins: Clean culvert inlet and inboard ditch above cabins along road to corral prior to fall/winter rains (See Structure Protection Specification Map). Culvert is not fully plugged. After large storm events, the culverts and inboard ditch should be inspected to insure proper function and cleared as necessary. This specification provides for pre-storm cleaning and post-storm monitoring and cleaning for 5 large storm events for fiscal year 2014 based on the average amount of large storms for this area. Ditch cleaning will require a back-hoe and dump truck, and culvert cleaning will require a laborer.

Road crew foreman is responsible for knowing which culverts are historic and for protecting these from inadvertent damage.

D. Purpose of Treatment Specifications (relate to damage/change caused by fire): The purpose of the treatment is to protect lives and property from post-fire watershed conditions. If culverts plug during storms, flooding could damage the road making it impassable to

traffic. Additionally, if road failure occurs, visitors and/or employees could be injured. Additionally, removal of sediments will help protect downstream natural resources.

E. Treatment consistent with Agency Land Management Plan (identify which plan): CE 2007-055

F. Treatment Effectiveness Monitoring Proposed: After storms, culverts and inboard ditches should be monitored for debris deposition and culvert plugging and cleaned as necessary.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	**COST / ITEM**
WG-9 Equipment Operator @ $38/hr. x 352 hr. x 1 FY	$13,376
WG-5 Laborer @ $22/hr. x 640 hr. x 1 FY	$14,080
GS-11 Archeologist @ $45/hr. x 40 hr. x 1FY	$1,800
WG-5 Flagger @ 22/hr. x 352 hr. x 1FY	$7,744
TOTAL PERSONNEL SERVICE COST	**$37,000**
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
Dump Truck rental @ 22 days x $90/day x 1 FY	$1,980
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	**$1,980**
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
Diesel Fuel @ $4.50/gal. x 200 gals.	$900
TOTAL MATERIALS AND SUPPLY COST	**$900**
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
TOTAL TRAVEL COST	**$**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
TOTAL CONTRACT COST	**$**

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLI SHMENTS	PLANNED COST
2014	10/1/13	9/30/14	F	Culverts	$52	422	**$21,772**
2014	10/1/13	9/30/14	F	Miles Ditch	$274	66	**$18,108**
						TOTAL	**$39,880**

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	E
3. Estimate supported by cost guides from independent sources or other federal agencies	M
4. Estimates based upon government wage rates and material cost.	P
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Aspen Valley Road Treatment Map
See Big Oak Flat Road Treatment Map
See Tuolumne Grove Road Treatment Map
See Tioga Road Treatment Map
See Map in Structure Protection Specification WS-4 for Hetch Hetchy Cabins

INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Remove Debris from Roads	**PART D Spec-#**	11
NFPORS TREATMENT CATEGORY*		**FISCAL YEAR(S) (list each year):**	2014
NFPORS TREATMENT TYPE *		**WUI? Y / N**	Y
IMPACTED COMMUNITIES AT RISK	Yosemite National Park	**IMPACTED T&E SPECIES**	None

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

A. General Description: Monitor and remove debris from roads from approximately 21 miles of roads below burned slopes as a result of the post-fire watershed conditions of the Rim Fire.

B. Location/(Suitable) Sites: Aspen Valley Road, Big Oak Flat Road, Tuolumne Grove Road, and Tioga Road.

C. Design/Construction Specifications:

Aspen Valley Road: Monitor after storm events and clear debris as necessary. Approximately 6 miles of road from the park boundary to the 'Y' below Aspen Valley are below burned slopes of the Rim Fire (See Aspen Valley Road Treatment Map). This specification provides for pre-storm cleaning and post-storm monitoring and cleaning for 5 large storm events for fiscal year 2014 based on the average amount of large storms for this area. Materials expected to be removed are woody debris, mud, and rock. Equipment needed include dump truck with blade, front loader, and two laborers. Debris should be removed from site and stored as per standard park procedures.

Big Oak Flat Road: Monitor after storm events and clear debris as necessary. Approximately 4 miles of road from the park boundary to Hazelgreen Creek are below burned slopes of the Rim Fire (See Big Oak Flat Road Treatment Map). This specification provides for pre-storm cleaning and post-storm monitoring and cleaning for 5 large storm events for fiscal year 2014 based on the average amount of large storms for this area. Materials expected to be removed are woody debris, mud, and rock. Equipment needed include dump truck with blade, front loader, and two labors. Debris should be removed from site and stored as per standard park procedures.

Tuolumne Grove Road: Monitor after storm events and clear debris as necessary. Approximately 6 miles of road from Hodgdon Meadow to Crane Flat are below burned slopes of the Rim Fire (See Tuolumne Grove Road Treatment Map). This specification provides for pre-storm cleaning and post-storm monitoring and cleaning for 5 large storm events for fiscal year 2014 based on the average amount of large storms for this area. Materials expected to be removed are woody debris, mud, and rock. Equipment needed include dump truck with blade, front loader, and two labors. Debris should be removed from site and stored as per standard park procedures.

Tioga Road: Monitor after storm events and clear debris as necessary. Approximately 5 miles of the 10 miles of road from the Crane Flat intersection of the Big Oak Flat and Tioga Roads are below burned slopes of the Rim Fire (See Tioga Road Treatment Map). This specification provides for pre-storm cleaning and post-storm monitoring and cleaning for 5 large storm events for fiscal year 2014 based on the average amount of large storms for this area. Materials expected to be removed are woody debris, mud, and rock. Equipment needed include dump truck with blade, front loader, and two labors. Debris should be removed from site and stored as per standard park procedures.

Road crew foreman is responsible for identifying and protecting historic road features during operations. Park cultural resource specialists will provide foreman with documentation on historic features.

D. Purpose of Treatment Specifications (relate to damage/change caused by fire): The purpose of the treatment is to protect lives and property from post-fire watershed conditions. Flooding could transport debris onto road surface making it impassable to traffic and potentially injuring visitors and employees.

E. Treatment consistent with Agency Land Management Plan (identify which plan): CE 2007-055

F. Treatment Effectiveness Monitoring Proposed: Monitor roads after storm events and clear as necessary.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	**COST / ITEM**
WG-9 Equipment Operator @ $38/hr. x 240 hr. x 1 FY	$9,120
WG-5 Laborer @ $22/hr. x 240 x 1 FY	$5,280
WG-5 Flagger @ $22/hr. x 240 x 1 FY	$5,280
TOTAL PERSONNEL SERVICE COST	**$19,680**
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item):	

Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
Dump Truck w/ blade @ $100/day x 15 days x 1 FY	$1,500
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	**$1,500**
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
Fuel @ $4.50/gal x 200 gals. X 1 FY	$900
TOTAL MATERIALS AND SUPPLY COST	**$900**
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
TOTAL TRAVEL COST	**$**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
TOTAL CONTRACT COST	**$**

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLI SHMENTS	PLANNED COST
2014	10/1/13	9/30/14	F	Mile of Road	$1,051	21	**$22,080**
						TOTAL	**$22,080**

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	E
3. Estimate supported by cost guides from independent sources or other federal agencies	M
4. Estimates based upon government wage rates and material cost.	P
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Aspen Valley Road Treatment Map
See Big Oak Flat Road Treatment Map
See Tuolumne Grove Road Treatment Map
See Tioga Road Treatment Map

INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Remove Floatable Woody Debris	**PART D Spec-#**	12
NFPORS TREATMENT CATEGORY*		**FISCAL YEAR(S) (list each year):**	2014
NFPORS TREATMENT TYPE *		**WUI? Y / N**	Y
IMPACTED COMMUNITIES AT RISK	Yosemite National Park	**IMPACTED T&E SPECIES**	None

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

A. General Description: Remove floatable woody debris above and below culverts to allow proper flow through culverts and reduce risk to culvert plugging. Only remove dead or downed woody debris and do not remove woody debris in designated Wilderness. Woody debris should be removed before the fall/winter storms. Equipment used to removed debris will stay on road prism

B. Location/(Suitable) Sites: Tioga and Tuolumne Grove Road.

C. Design/Construction Specifications:

Tioga Road: Most culverts on Tioga Road have been surveyed for road repair and have culvert numbers painted on the road. At culvert C10 and C14 remove woody debris greater than 2 feet in length upstream of the culverts for 200 feet to the Wilderness boundary. Only remove woody debris that is in the channel and 20 feet above the high water mark to each side of the channel. Recommended is a four person hand crew with a sawyer, a small dump truck, and an equipment operator (see Tioga Road Treatment Map).

Tuolumne Grove Road: On Hodgdon Meadow Creek remove woody debris greater than 2 feet in length 100 feet upstream of culvert and 20 feet above high water mark on each side of the creek. On the downstream side remove woody debris greater than 4 feet downstream of culvert in the channel up to 100 feet from the road. On Hazelgreen Creek remove woody debris 2 feet in length 200 feet upstream of culvert and 20 feet above high water mark on each side of the creek. On North Crane Creek remove woody debris 2 feet in length 200 feet upstream of culvert and 20 feet above high water mark on each side of the creek. Recommended is a four person hand crew with a sawyer, a small dump truck, and an equipment operator (see Tuolumne Grove Road Treatment Map).

Both work areas are within potential Traditional Cultural Properties and adjacent to sensitive archeological resources. Work to be preceded by tribal site visit, and to be monitored by cultural specialist during implementation.

D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Floatable woody debris upstream of culverts can mobilize in post-fire watershed conditions and plug culverts potentially causing road failure. Downstream on low gradient streams woody debris can block stream flow backing streams up.

E. Treatment consistent with Agency Land Management Plan (identify which plan): CE 2007-055

F. Treatment Effectiveness Monitoring Proposed: Monitor culverts for plugging from woody debris mobilization and clean as necessary.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	**COST / ITEM**
WG-5 Laborer @ $19/hr x 224 hr. x 1FY	$4,256
WG-9 Equipment Operator @ $32/hr. x 56 hr. x 1 FY	$1,792
GS-9 Archaeologist @ $33 x 160 hr x 1 FY	$5,280
TOTAL PERSONNEL SERVICE COST	**$11,328**
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
Small Dump Truck @ $80/day x 7 days x 1FY	$560
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	**$560**
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
Fuel @ $4.50/gal x 30 gal	$135
TOTAL MATERIALS AND SUPPLY COST	**$135**
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	

TOTAL TRAVEL COST	**$**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
TOTAL CONTRACT COST	**$**

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLI SHMENTS	PLANNED COST
2014	10/1/13	9/30/14	F	Culvert	$2,405	5	**$12,023**
						TOTAL	**$12,023**

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	E
3. Estimate supported by cost guides from independent sources or other federal agencies	M
4. Estimates based upon government wage rates and material cost.	P
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Tuolumne Grove Road Treatment Map
See Tioga Road Treatment Map

INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Structure Protection	**PART D Spec-#**	13
NFPORS TREATMENT CATEGORY*		**FISCAL YEAR(S) (list each year):**	2014
NFPORS TREATMENT TYPE *		**WUI? Y / N**	Y
IMPACTED COMMUNITIES AT RISK	Yosemite National Park	**IMPACTED T&E SPECIES**	None

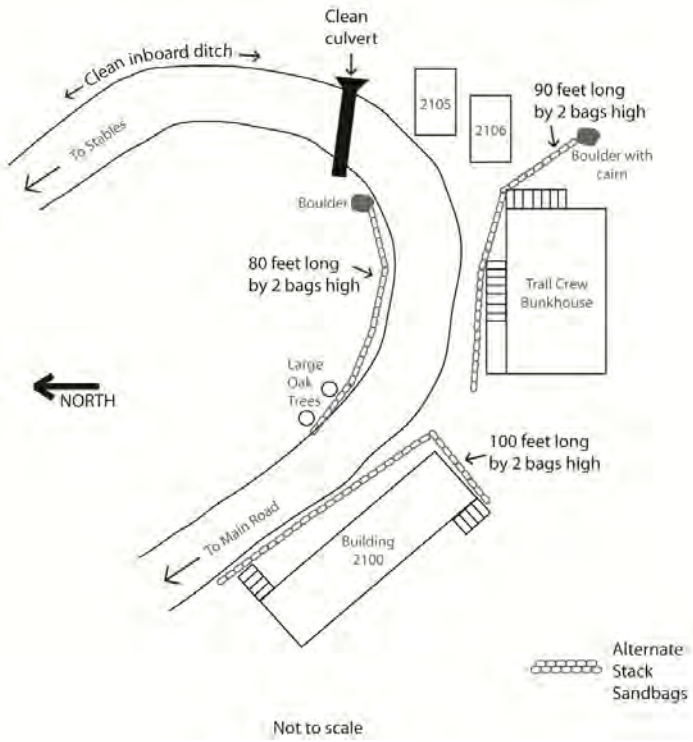
* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

A. General Description: Place sandbags at site to protect structures from post-fire watershed flooding. Use weed free sand to fill sandbags. When filling the sandbags, never overfill; only fill 2/3 of the way and seal. Extra sandbags are provided for maintenance.

B. Location/(Suitable) Sites: Hetch Hetchy cabins.

C. Design/Construction Specifications:
Hetch Hetchy Cabins: Refer to below illustration. Install three rows of sandbags, one 90 feet long stacked two high along the Trail Crew Bunkhouse, one 80 feet long stacked two high along stables road making sure the small ditch is captured by the sandbags, and one 100 feet long row stacked 2 bags high along building 2100. Stack sandbags as if building a brick wall by alternating placement. Approximately 720 sandbags will be needed at this site. Use burlap or other non-solar degradable bags. Consult with the cultural resource staff on sandbag color.



D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Upstream post-fire watershed conditions may cause flooding which may damage buildings; placement of sandbags may reduce the risk.

E. Treatment consistent with Agency Land Management Plan (identify which plan):

F. Treatment Effectiveness Monitoring Proposed: Monitor sandbag condition after storms and replace as needed. Remove sandbags after three years.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	**COST / ITEM**

WG-5 Labor @ $22/hr. x 100 hr. x 1FY	$2,200
TOTAL PERSONNEL SERVICE COST	**$2,200**
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	**$**
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
Filled Sand Bag Delivered @ $3/bag x 1000 bags x 1FY	$3,000
TOTAL MATERIALS AND SUPPLY COST	**$3,000**
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
TOTAL TRAVEL COST	**$**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
TOTAL CONTRACT COST	**$**

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLI SHMENTS	PLANNED COST
2014	10/1/2013	9/30/2014	F	sandbag	$5.20	1000	**$5,200**
						TOTAL	**$5,200**

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	M
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

Refer to above illustration.

United States Department of the Interior

National Park Service
Yosemite National Park
SEP 09 2013

Memorandum

To: Team Leader, Burned Area Emergency Response (BAER) Team

From: Superintendent

Subject: BAER Team Delegation of Authority

Effective on September 9, 2013, Chris Holbeck will hereby be delegated authority and responsibility to administer a Burned Area Emergency Response Team in order to conduct a BAER assessment and if needed develop a BAER Plan outlining emergency treatment measures and standards necessary to mitigate post-fire impacts resulting from the Rim Fire within Yosemite National Park.

Your primary responsibility is to assess potential threats to life and property from postfire conditions. Your second responsibility is to develop a report that identifies specific values at risk. These values at risk include but are not limited to watersheds. If warranted, you are to identify potential treatment recommendations and present those in a plan that presents an assessment of their effectiveness. Lastly, you are to identify impacts to and necessary compliance or protective measures.

You are to work in cooperation with the Incident Management Team assigned to the Rim Fire and coordinate efforts with the USFS BAER effort. You will coordinate your efforts with the Agency Administrator Representative and the Park's Resource Advisor. You are accountable to the Agency Representative assigned to the incident by Yosemite National Park.

At the end of this assignment you are expected to produce a BAER report and if warranted a BAER plan that meets Service and Department standards, and meets the objectives outlined above. You will present this plan to me or my assigned agency representative upon completion of this assignment. You will maintain span of control over all assigned resources. Safety will be a priority for employees under your direction.

Risk Matrix

Likelihood

Rating	Descriptor
Likely	There is a very good chance this event will occur in the near future, 99% chance
Probable	This event has occurred several times or more in corporate experience, 1 in 10 chance
Possible	This event might occur once or twice in corporate experience, 1 in 100 chance
Unlikely	This event does occur somewhere from time to time, but very seldom, 1 in 10,000 chance
Rare	It is theoretically possible for this event to occur, but extremely unlikely that it will, 1 in 1,000,000 chance

Consequence

Rating	Descriptor
Insignificant	May have little or no impact on health and safety, environment (including flora, fauna and ecosystems), Aboriginal and non-indigenous cultural heritage and/or historic heritage;
	will not involve legal non-compliance;
	unlikely to attract any media or political attention;
	will not cost much or require significant other resources to address; and/or
	will not cause noticeable disruption to business operations. Cost <$10,000.
Minor	May have some impact on health and safety, environment (including flora, fauna and ecosystems), Aboriginal and non-indigenous cultural heritage and/or historic heritage, but will be able to recover from or repair the damage within a relatively short term;
	may involve minor breach of regulations, likely to incur no more than a warning or caution from regulatory authority;
	may attract some local media interest or very short term political attention;
	may involve some modest financial costs and/or some short-term commitment of other resources to address; and/or
	may cause some minor disruption to business operations. Cost from $10,000 to $100,000.
Moderate	May have significant detrimental impact on:
	health and safety, such as a moderate permanent disability or long term impairment'
	environment (including flora, fauna and ecosystems), such as damage to flora, fauna or ecosystems which will take medium to long term to recover,
	Aboriginal and non-indigenous cultural heritage and/or historic heritage, which may cause loss of access for an extended period, or permanent loss of less significant objects or of resources available elsewhere;
	may involve legal non-compliance, with possible moderate to significant fines;
	may attract state-level media or political attention over the medium term;
	may involve significant financial costs and/or commitment of other resources to address; and/or
	may cause significant disruption to business operations. Cost from $100,000 to $1M.
Major	Will have substantial detrimental impact on:
	health and safety, such as single fatality or severe permanent disability,
	environment (including flora, fauna and ecosystems), such as damage to habitat and ecosystems that will take an extended period of time to recover or loss of local populations of particular flora or fauna,
	Aboriginal and non-indigenous cultural heritage and/or historic heritage, which may cause long term or permanent partial loss of culturally significant places or species, damage to significant historic or cultural heritage assets, or substantial loss of culturally significant information;
	may involve major legal non-compliance with substantial fines, or major litigation;
	may attract national media or political attention for an extended period of time;
	may involve very substantial financial costs and/or commitment of other resources to address; and/or
	may cause substantial disruption, including short term shutdown, to business operations. Cost from $1M to $10M.
Catastrophic	Will have an unrecoverable detrimental impact on:
	health and safety, such as multiple fatalities or significant irreversible effects on the health of a large number of people,
	environment (including flora, fauna and ecosystems), such as loss of species, endangered community and/or critical habitat,
	Aboriginal and non-indigenous cultural heritage and/or historic heritage, such as loss of human remains or similarly significant cultural material, or permanent loss of access to culturally significant places or species or permanent loss of culturally significant information impacting on the ability of a group to retain and practice culture;
	may involve major prosecutions with substantial fines or other penalties, or very serious litigation, such as class actions;
	may attract national and international media or political attention for a protracted period of time;
	may involve extremely high financial costs and/or commitment of other resources to address; and/or
	may cause long-term or permanent shutdown of significant revenue generating business operations. Cost greater than $10M.

		CONSEQUENCE				
		Insignificant	Minor	Moderate	Major	Catastrophic
PROBABILITY	Likely	Low	Medium	Extreme	Extreme	Extreme
	Probable	Low	Medium	High	Extreme	Extreme
	Possible	Low	Low	Medium	High	Extreme
	Unlikely	Low	Low	Medium	Medium	High
	Rare	Low	Low	Medium	Medium	Medium

		CONSEQUENCE				
		Insignificant	Minor	Moderate	Major	Catastrophic
PROBABILITY	Likely	Low	Medium	Extreme	Extreme	Extreme
	Probable	Low	Medium	High	Extreme	Extreme
	Possible	Low	Low	Medium	High	Extreme
	Unlikely	Low	Low	Medium	Medium	High
	Rare	Low	Low	Medium	Medium	Medium

Rim Fire

Overview

Fire Perimeter

Wilderness

Ownership

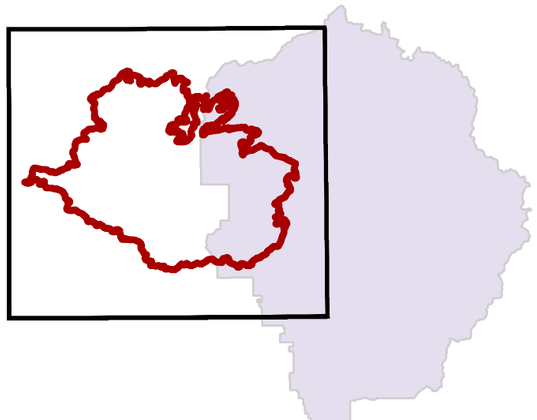
BLM

PRIVATE

STANISLAUS NF

TRIBAL LANDS

YOSEMITE NP



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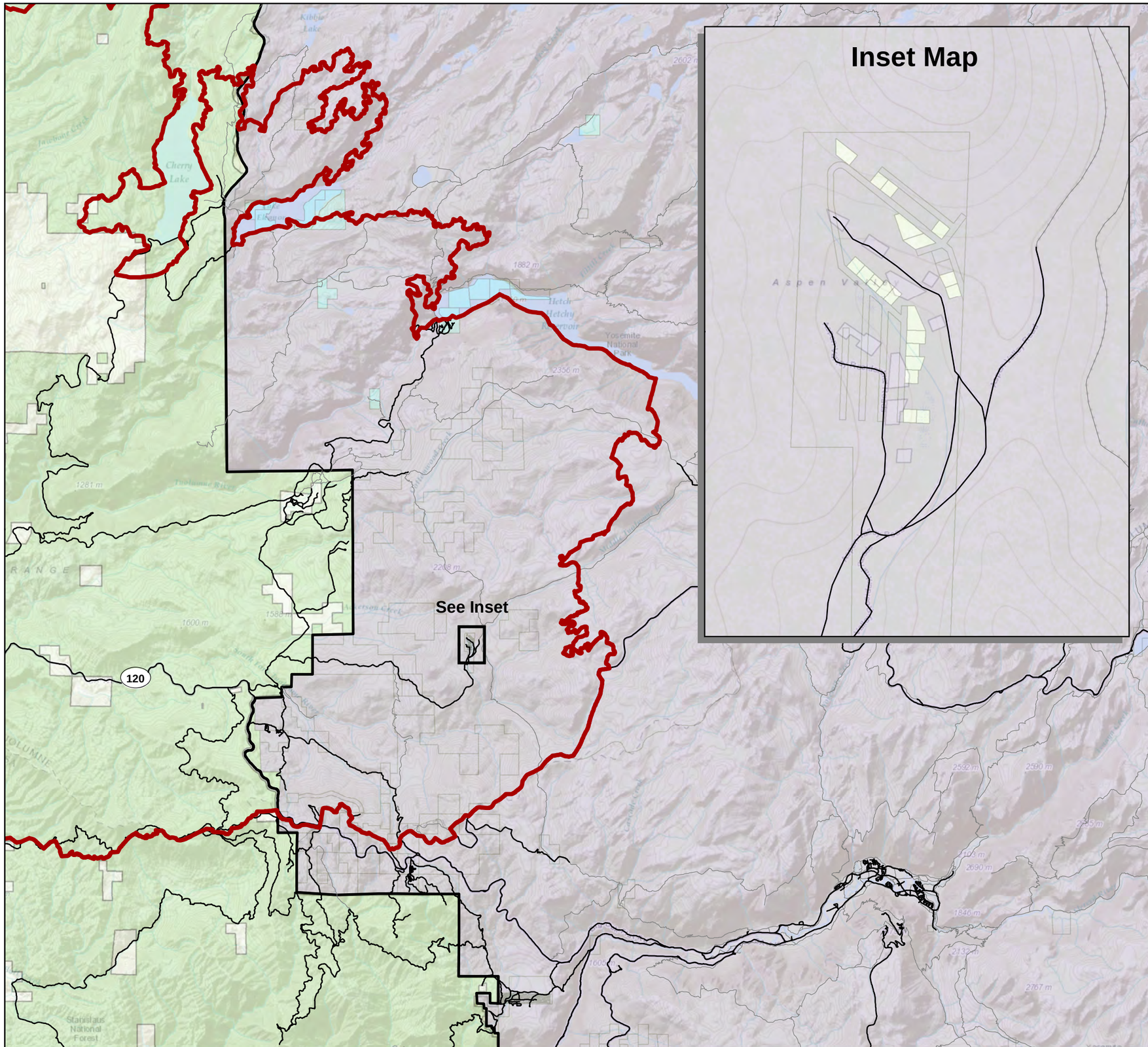
August 2013

0 3 6 12 Miles

The data represented on this map was gathered from multiple sources. They may vary in accuracy, scale and date. This map is for display purposes only.

Rim Fire

Ownership



Roads

Trails

Fire Perimeter

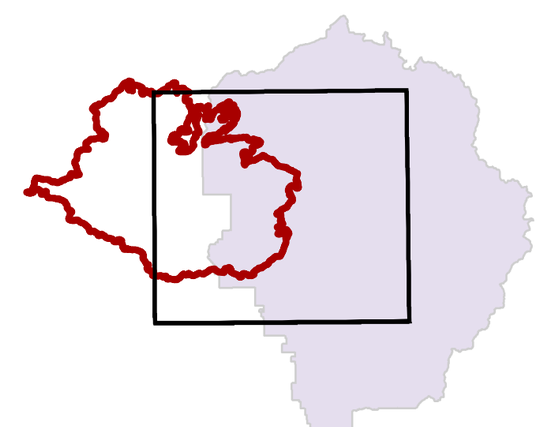
Ownership

NATIONAL PARK SERVICE

DEPARTMENT OF AGRICULTURE

PRIVATE

CITY & COUNTY OF SAN FRANSICO



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August 2013

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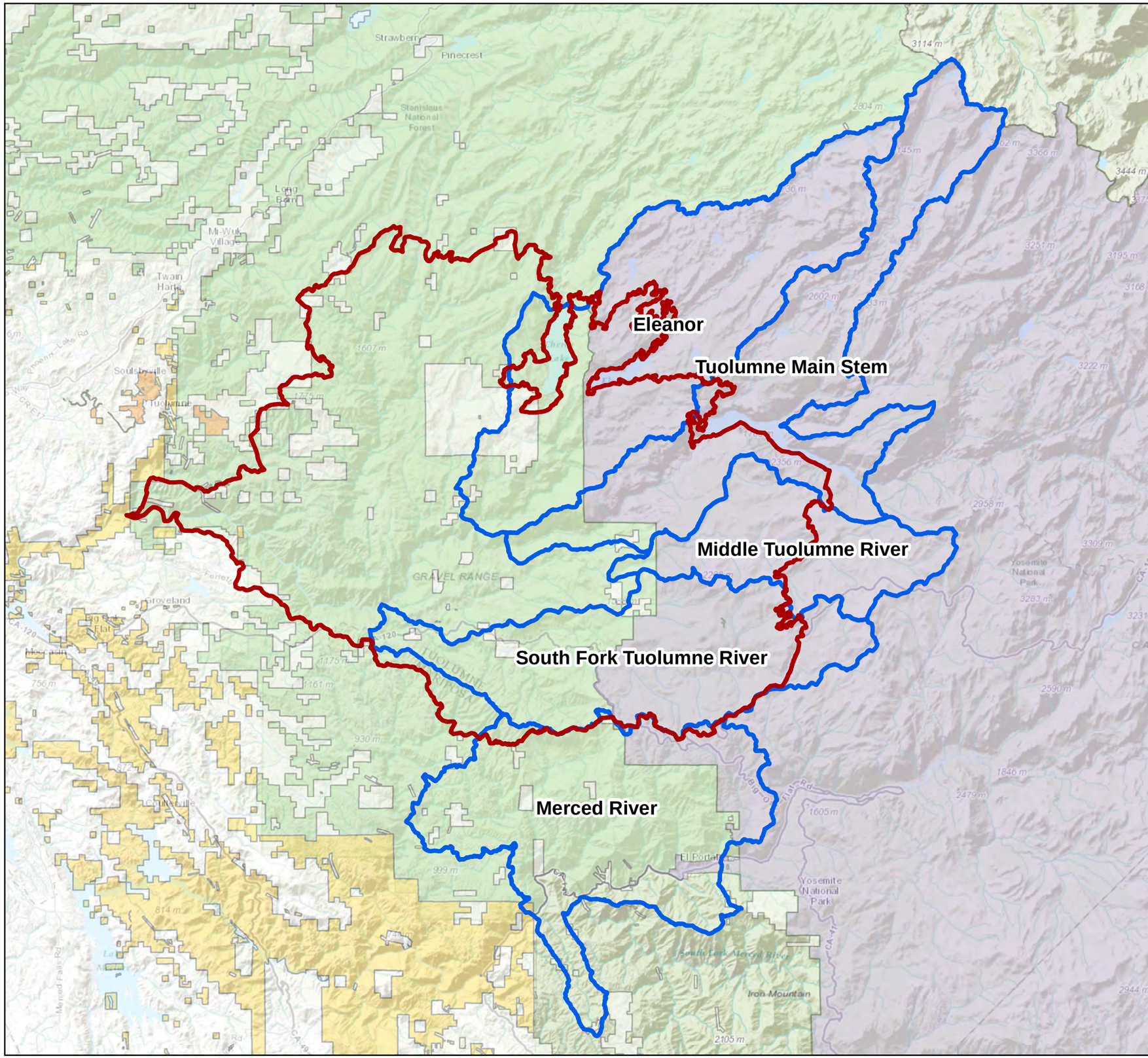
Rim Fire

Major Watersheds

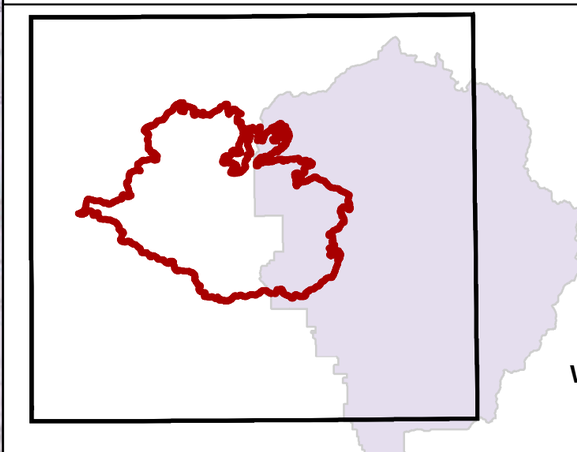


Fire Perimeter

Watershed

Ownership

- BLM
- PRIVATE
- STANISLAUS NF
- TRIBAL LANDS
- YOSEMITE NP



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August 2013

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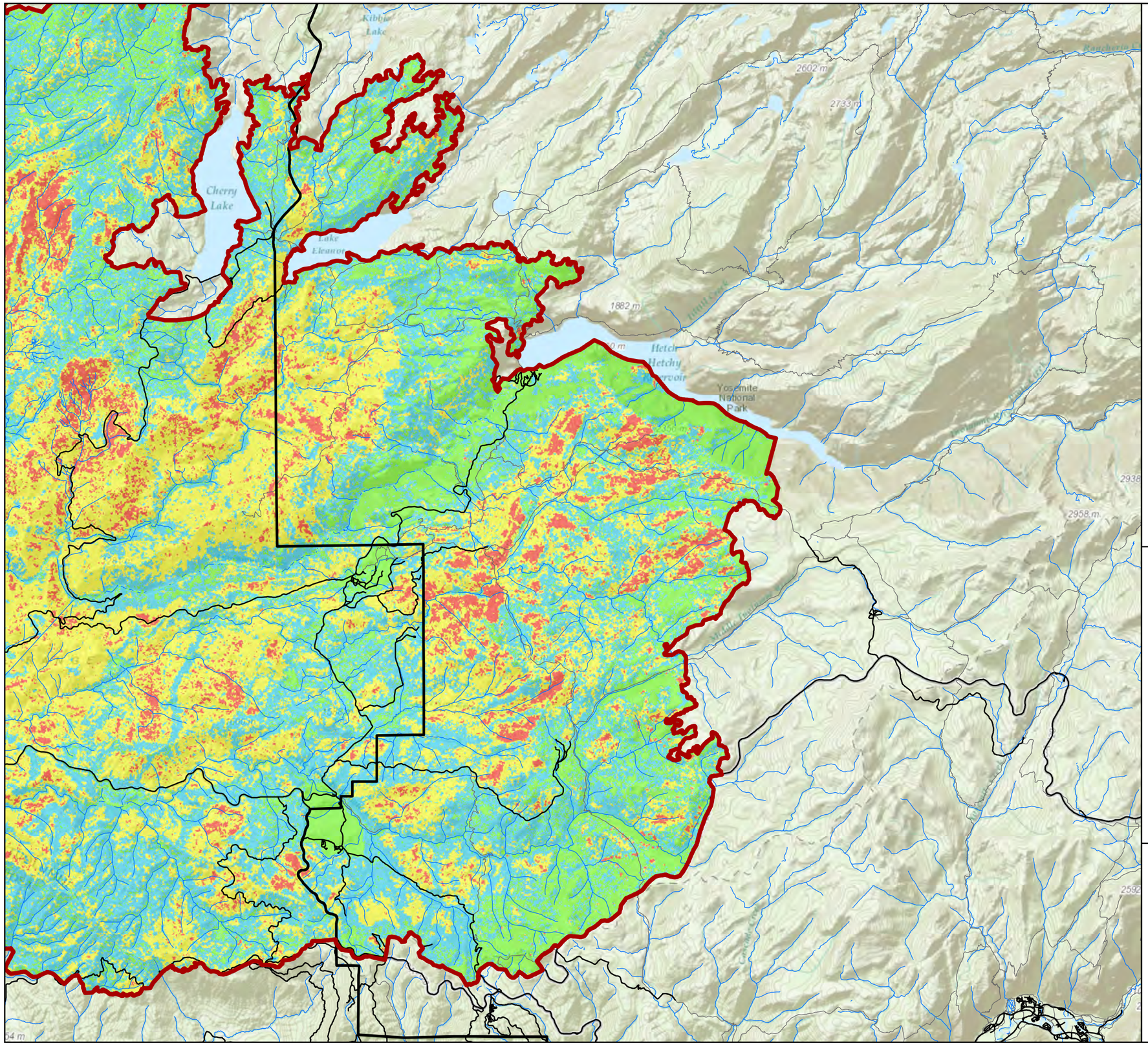


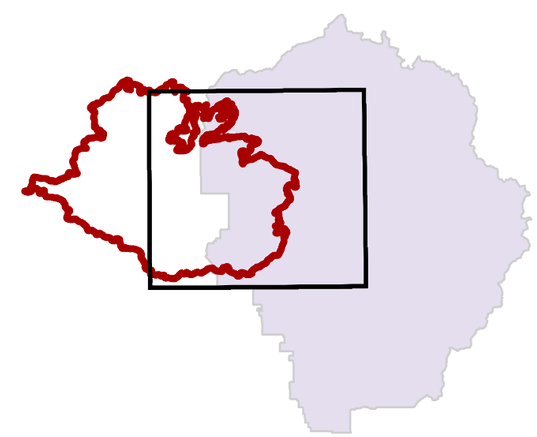
Rim Fire

Soil Burn Severity

- Fire Perimeter
- NPS Boundary
- Roads
- Trails
- Stream

Soil Burn Severity

- Low/Unburned
- Low
- Moderate
- High



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W E
S

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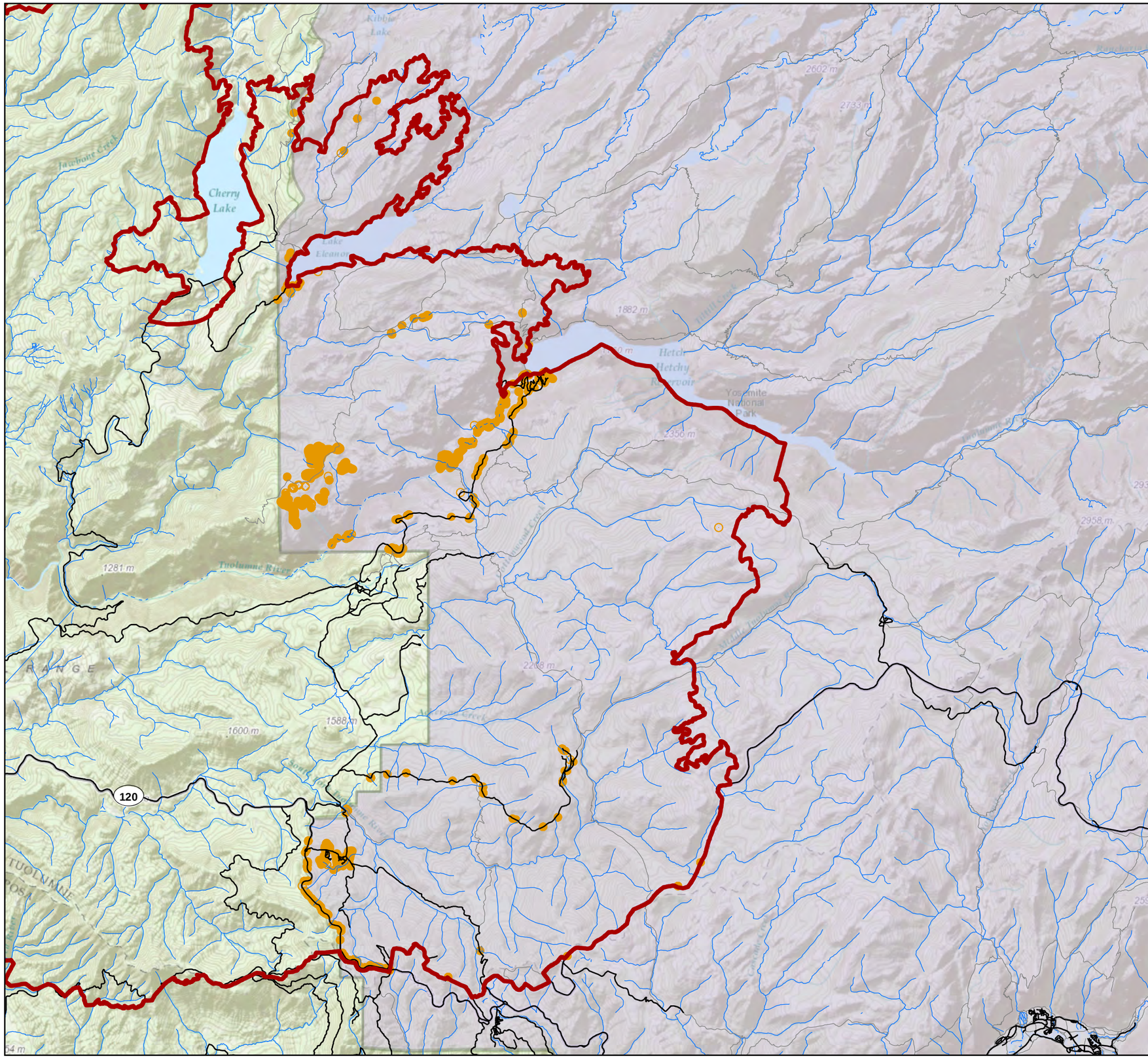
August 2013

0 2 4 8 Miles

The data represented on this map was gathered from multiple sources. They may vary in accuracy, scale and date. This map is for display purposes only.

Rim Fire

Weed Monitoring



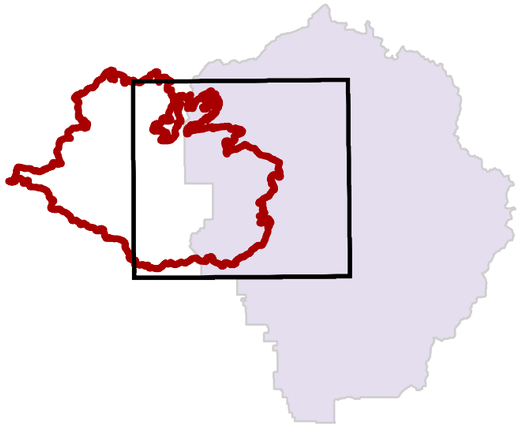
Fire Perimeter

Known Populations of Invasive Plants

Roads

Trails

Stream



N

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1:170,000

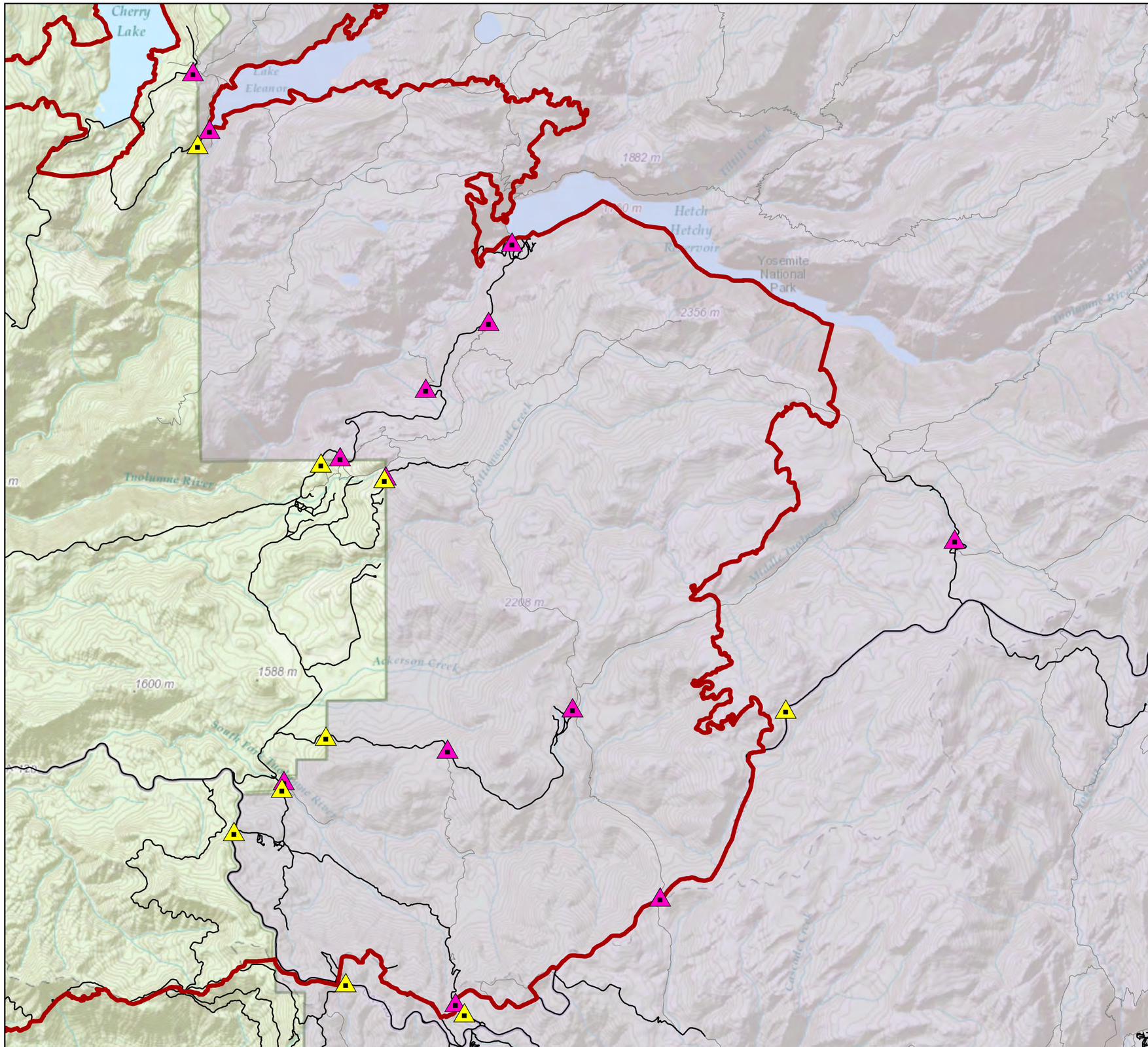
August 2013

0 2 4 8 Miles

The data represented on this map was gathered from multiple sources. They may vary in accuracy, scale and date. This map is for display purposes only.

Rim Fire

Road & Trail Hazard Signage



Road Hazard Signs

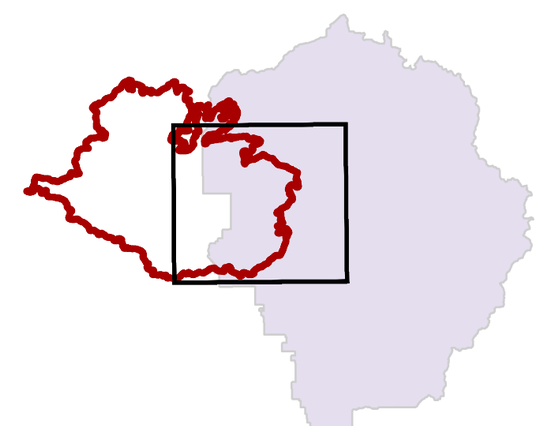
Trailhead Hazard Signs

Trails

Roads

Fire Perimeter

NPS Boundary



N

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1:136,000

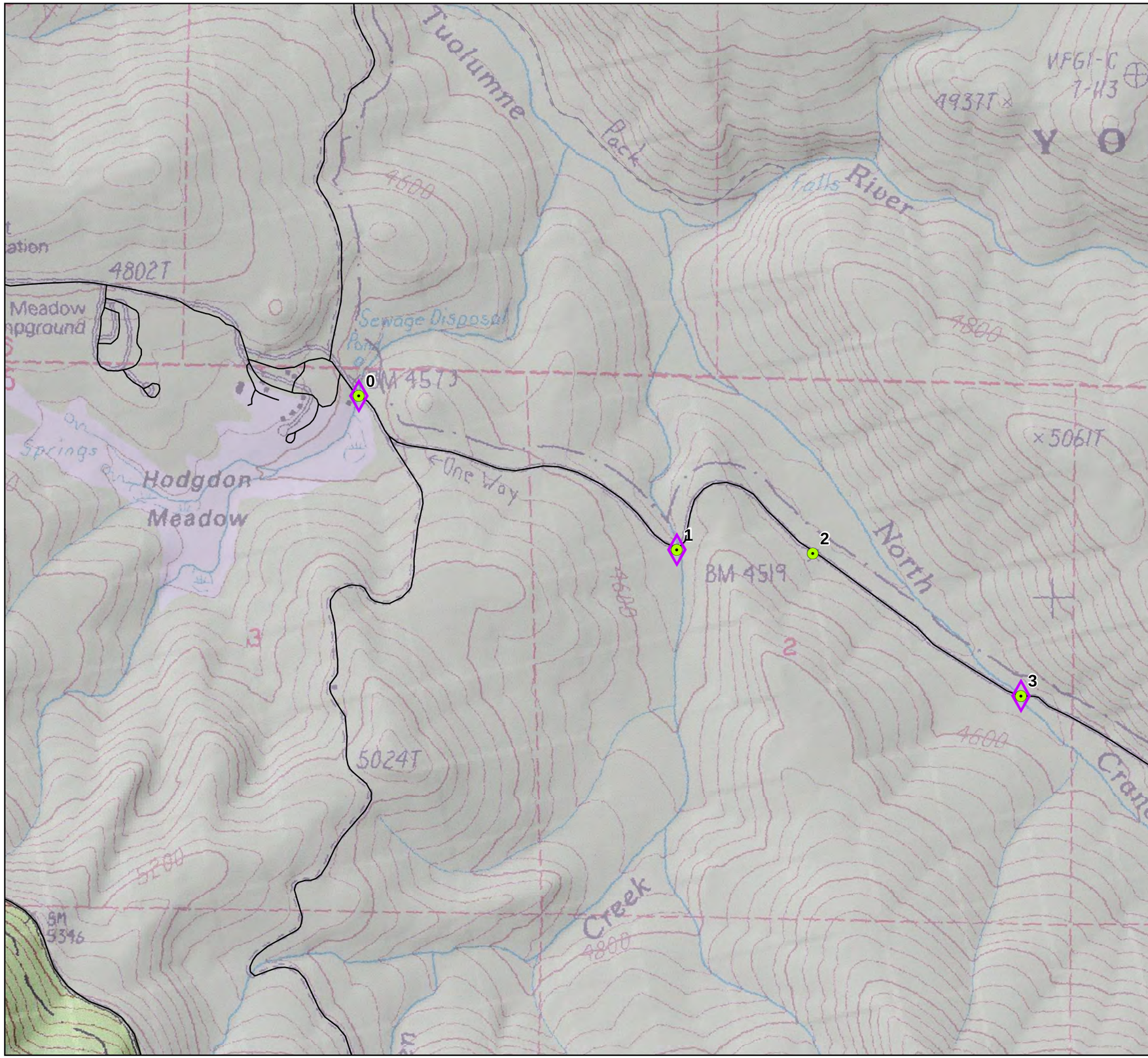
August 2013

0 1.5 3 6 Miles

The data represented on this map was gathered from multiple sources. They may vary in accuracy, scale and date. This map is for display purposes only.

Rim Fire

Tuolumne Grove Road Treatments



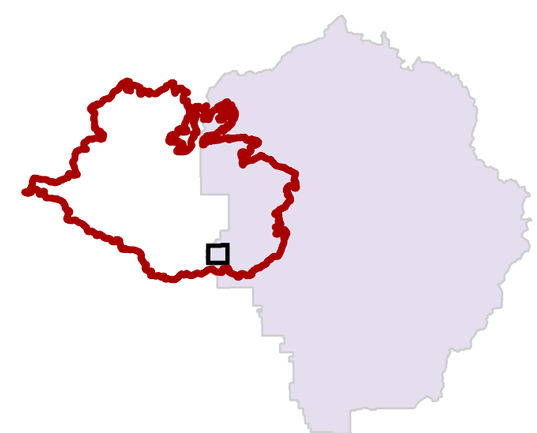
Culverts Requiring Pre-Storm Cleanout

Woody Debris Removal

Roads

Trails

NPS Boundary



N

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1:15,000

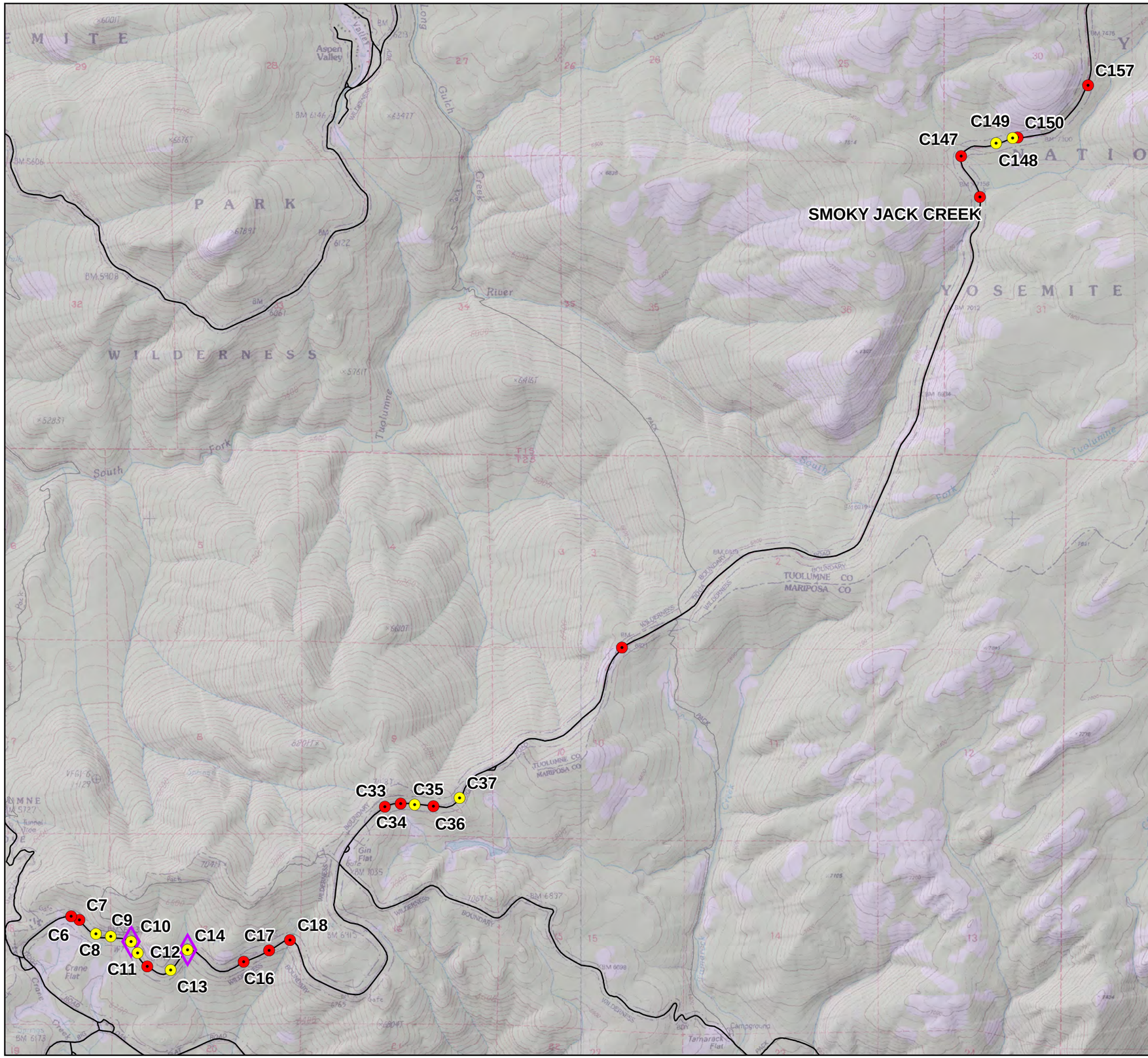
August 2013

0 0.2 0.4 0.8 Miles

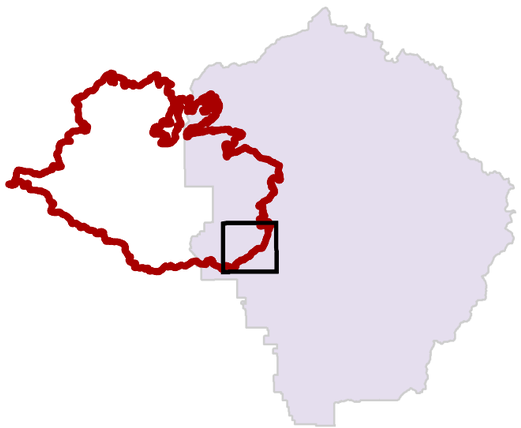
The data represented on this map was gathered from multiple sources. They may vary in accuracy, scale and date. This map is for display purposes only.

Rim Fire

Tioga Road Treatments



- Culverts Requiring Pre-Storm Cleanout
- Culverts
- Woody Debris Removal
- Roads
- Trails
- NPS Boundary



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1:42,000

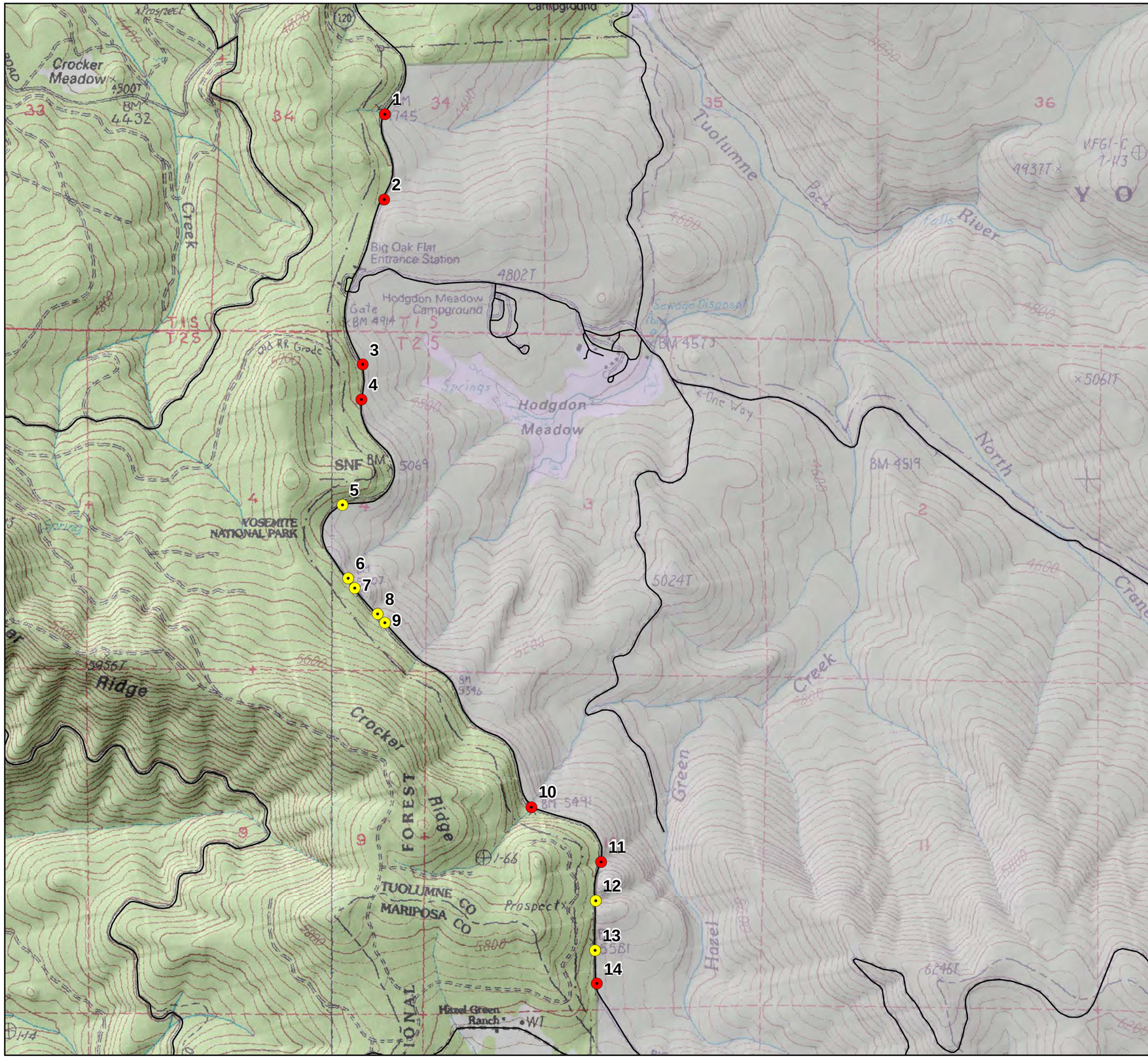
August 2013

0 0.5 1 2 Miles

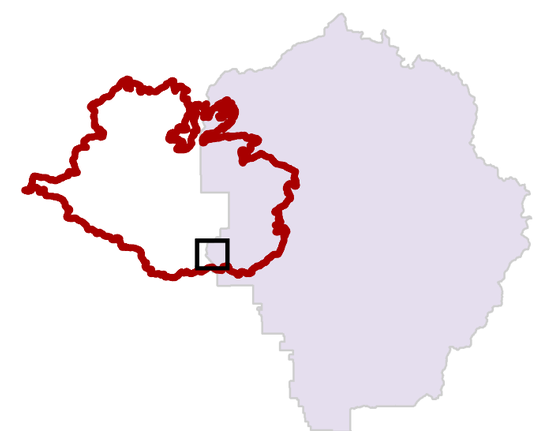
The data represented on this map was gathered from multiple sources. They may vary in accuracy, scale and date. This map is for display purposes only.

Rim Fire

Big Oak Flat Road Treatments



- Culverts Requiring Pre-Storm Cleanout
- Culverts
- NPS Boundary
- Roads
- Trails



N
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1:24,000

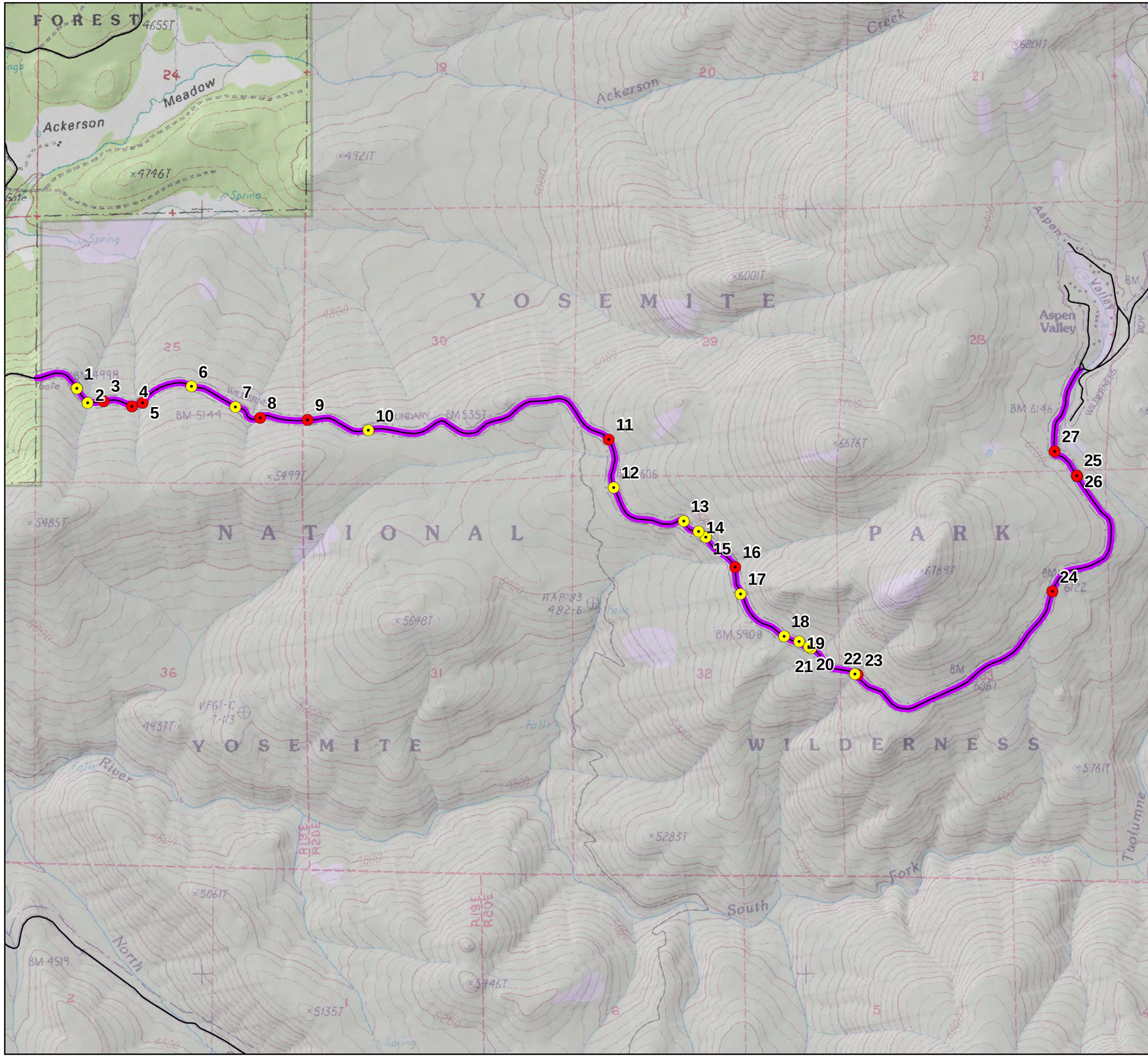
August 2013

0 0.25 0.5 1 Miles

The data represented on this map was gathered from multiple sources. They may vary in accuracy, scale and date. This map is for display purposes only.

Rim Fire

Aspen Valley Road Treatments



Culverts Requiring Pre-Storm Cleanout

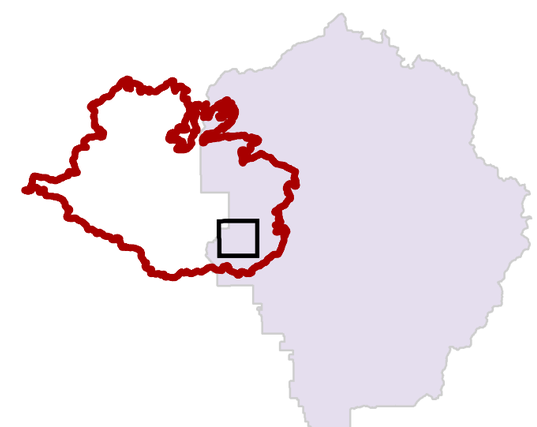
Culverts

Inboard Ditch Cleaning (Pre-Storm)

Roads

Trails

NPS Boundary



1:30,000

August 2013

0 0.375 0.75 1.5 Miles

The data represented on this map was gathered from multiple sources. They may vary in accuracy, scale and date. This map is for display purposes only.

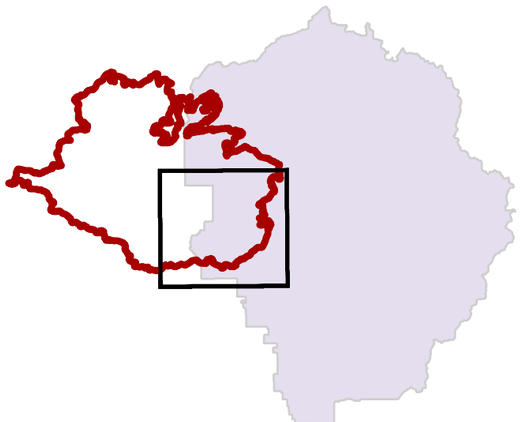
Rim Fire

Fence Treatment

- Fire Perimeter
- Roads
- Trails
- Stream
- Fence Repair

Ownership

- NATIONAL PARK SERVICE
- DEPARTMENT OF AGRICULTURE
- PRIVATE
- CITY & COUNTY OF SAN FRANSICO



1:100,000

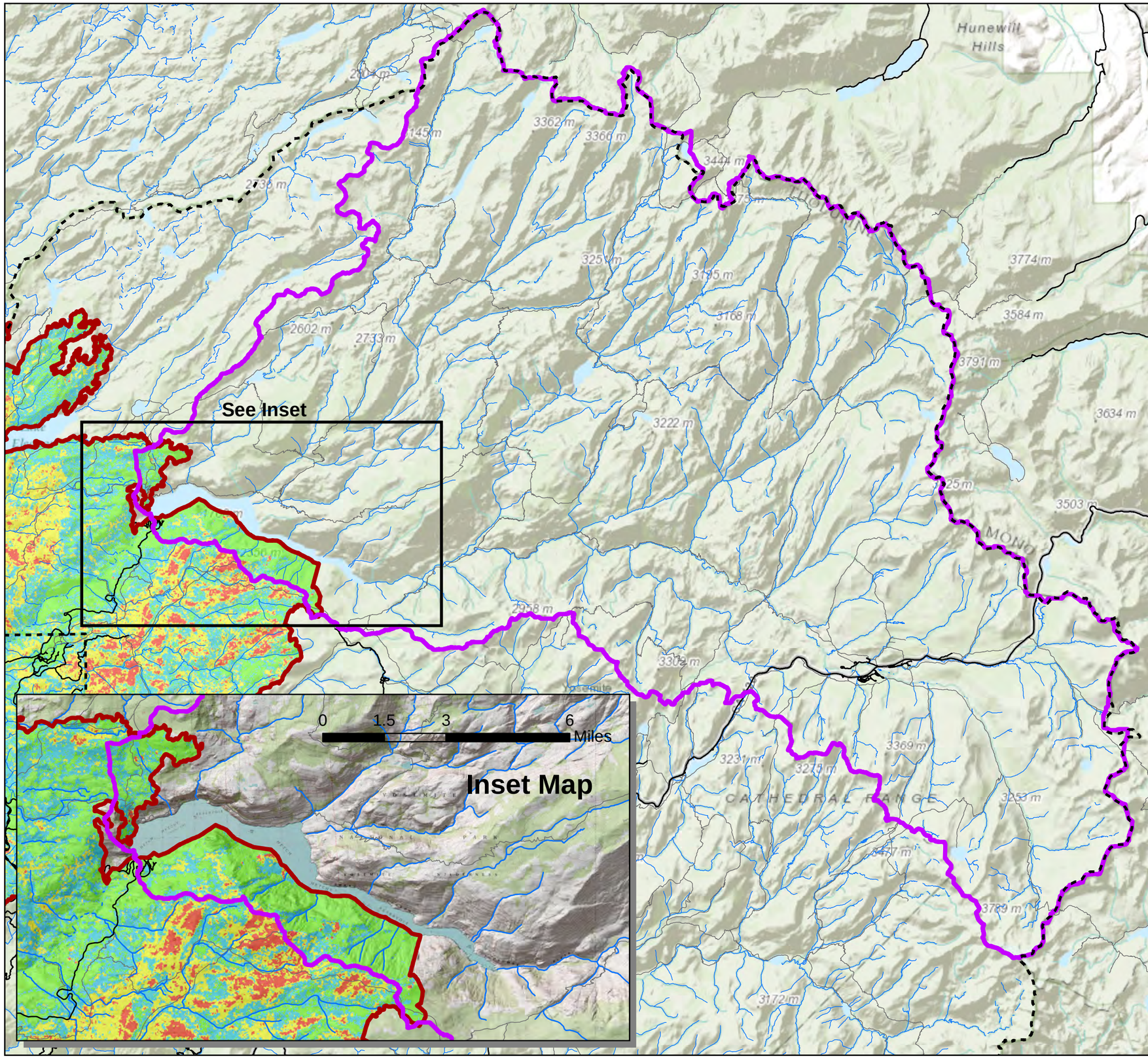
August 2013

0 1.25 2.5 5 Miles

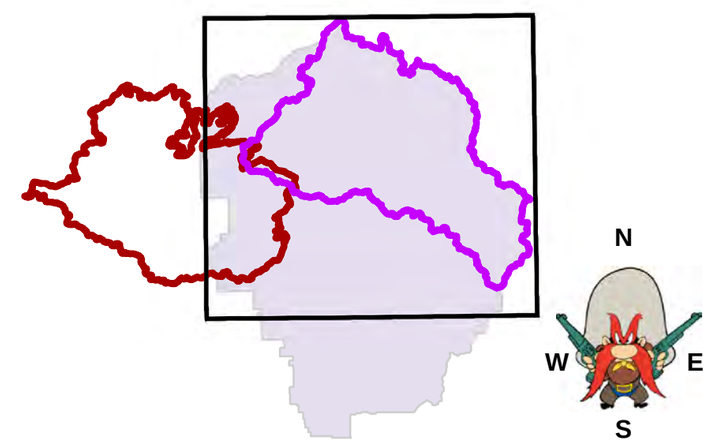
The data represented on this map was gathered from multiple sources. They may vary in accuracy, scale and date. This map is for display purposes only.

Rim Fire

Hetch Hetchy Watershed Soil Burn Severity



NPS Boundary	**Soil Burn Severity**
Watershed	Low/Unburned
Fire Perimeter	Low
Roads	Moderate
Trails	High
Stream	



1:260,000

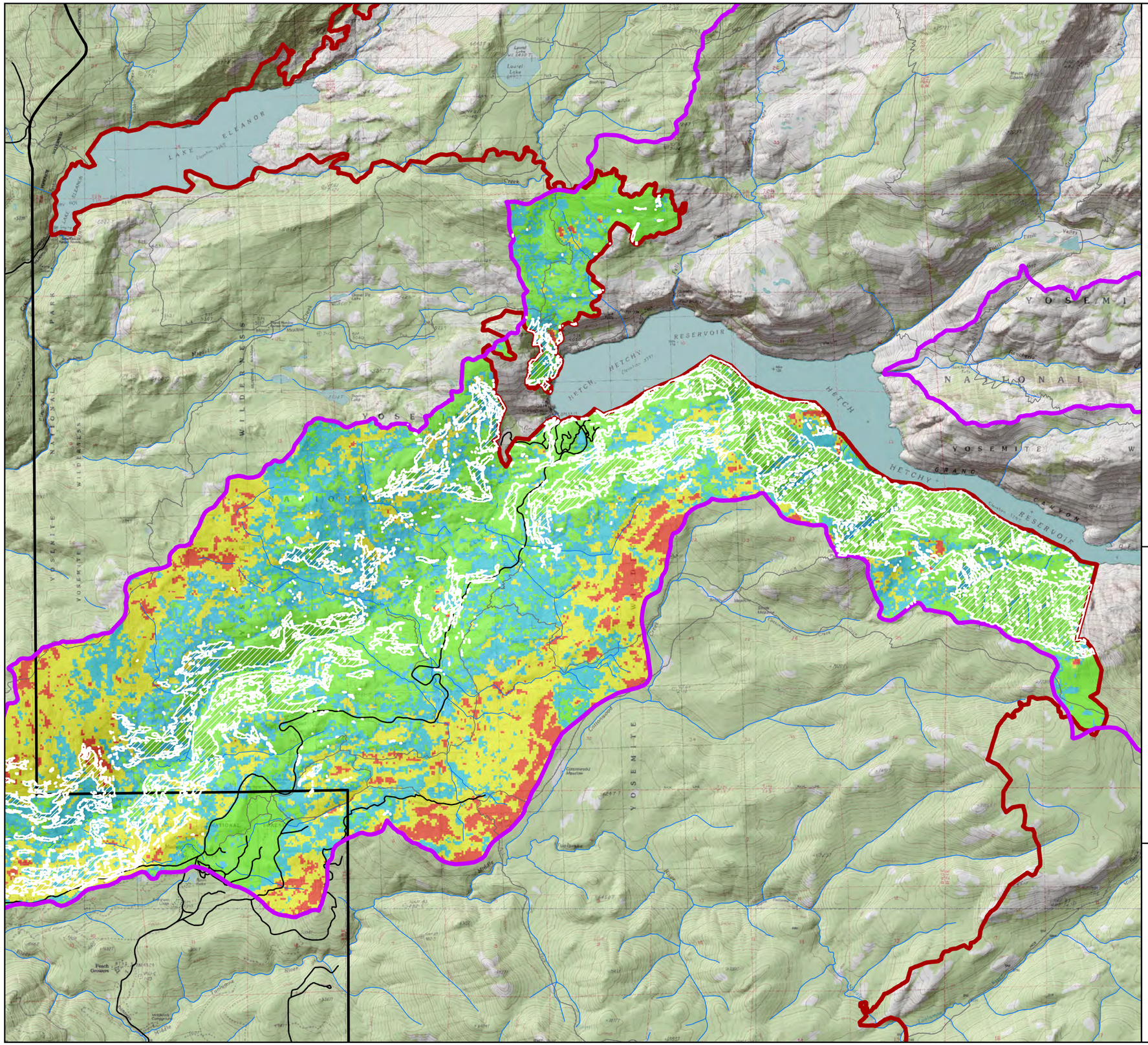
August 2013

0 3.25 6.5 13 Miles

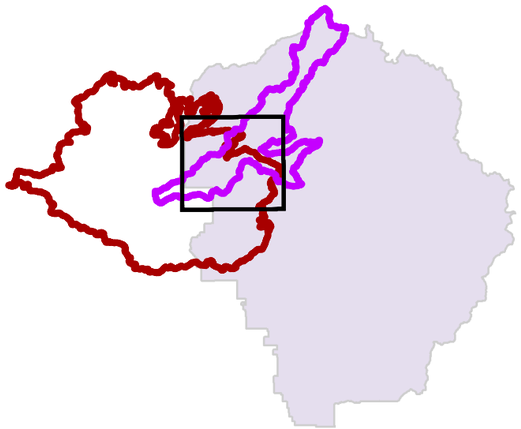
The data represented on this map was gathered from multiple sources. They may vary in accuracy, scale and date. This map is for display purposes only.

Rim Fire

Tuolumne River Watershed Soil Burn Severity



35-70% Slopes	**Soil Burn Severity**
Watershed	Low/Unburned
Fire Perimeter	Low
NPS Boundary	Moderate
Roads	High
Trails	
Stream	



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1:80,000

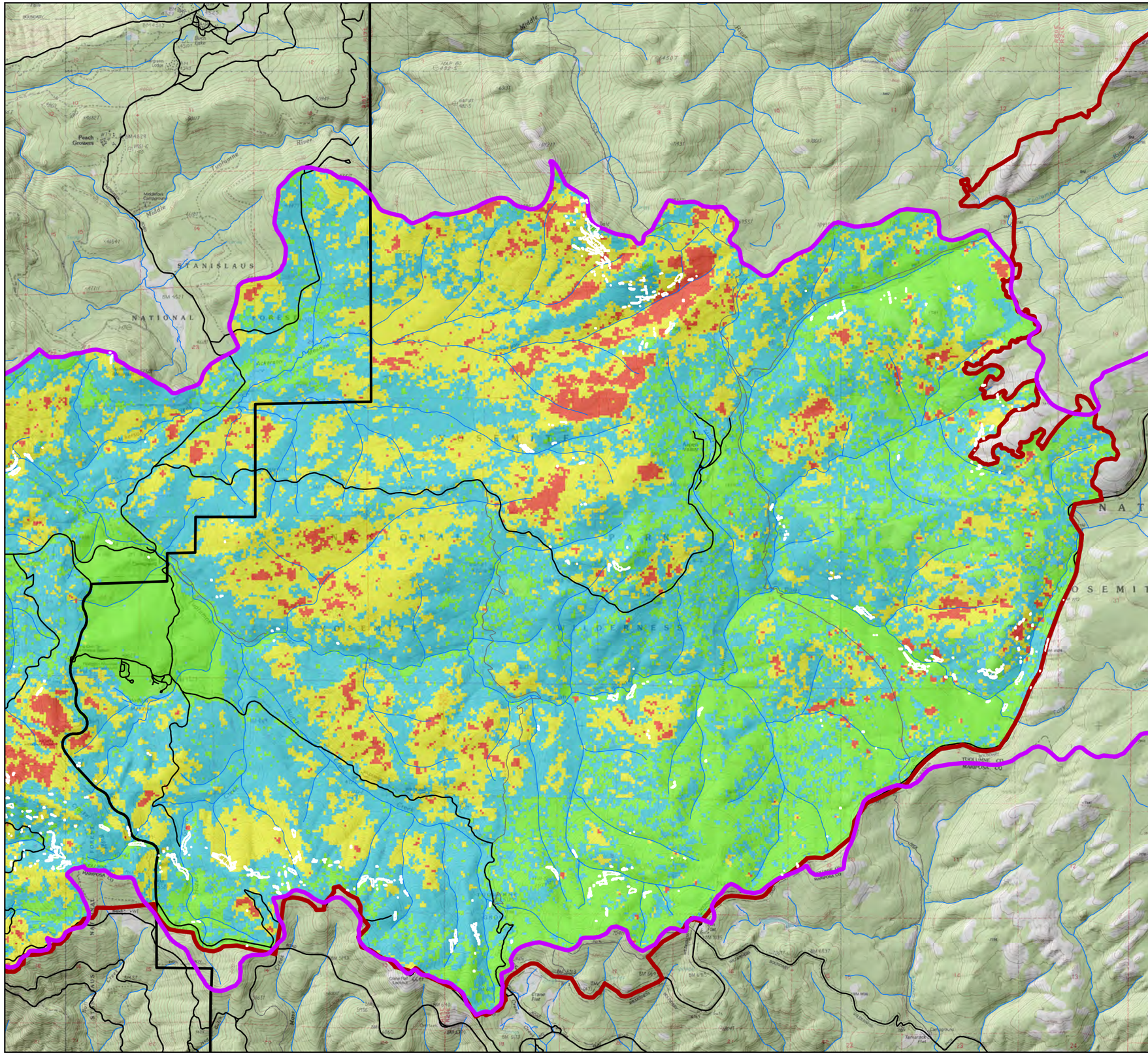
August 2013

0 1 2 4 Miles

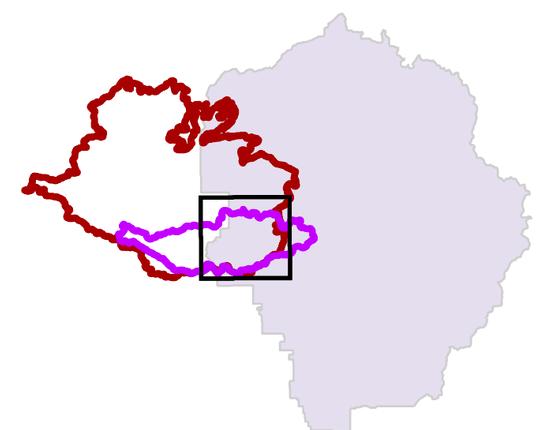
The data represented on this map was gathered from multiple sources. They may vary in accuracy, scale and date. This map is for display purposes only.

Rim Fire

South Fork of the Tuolumne River Watershed Soil Burn Severity



35-70% Slopes	**Soil Burn Severity**
Watershed	Low/Unburned
Fire Perimeter	Low
NPS Boundary	Moderate
Roads	High
Trails	
Stream	



N
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1:70,000

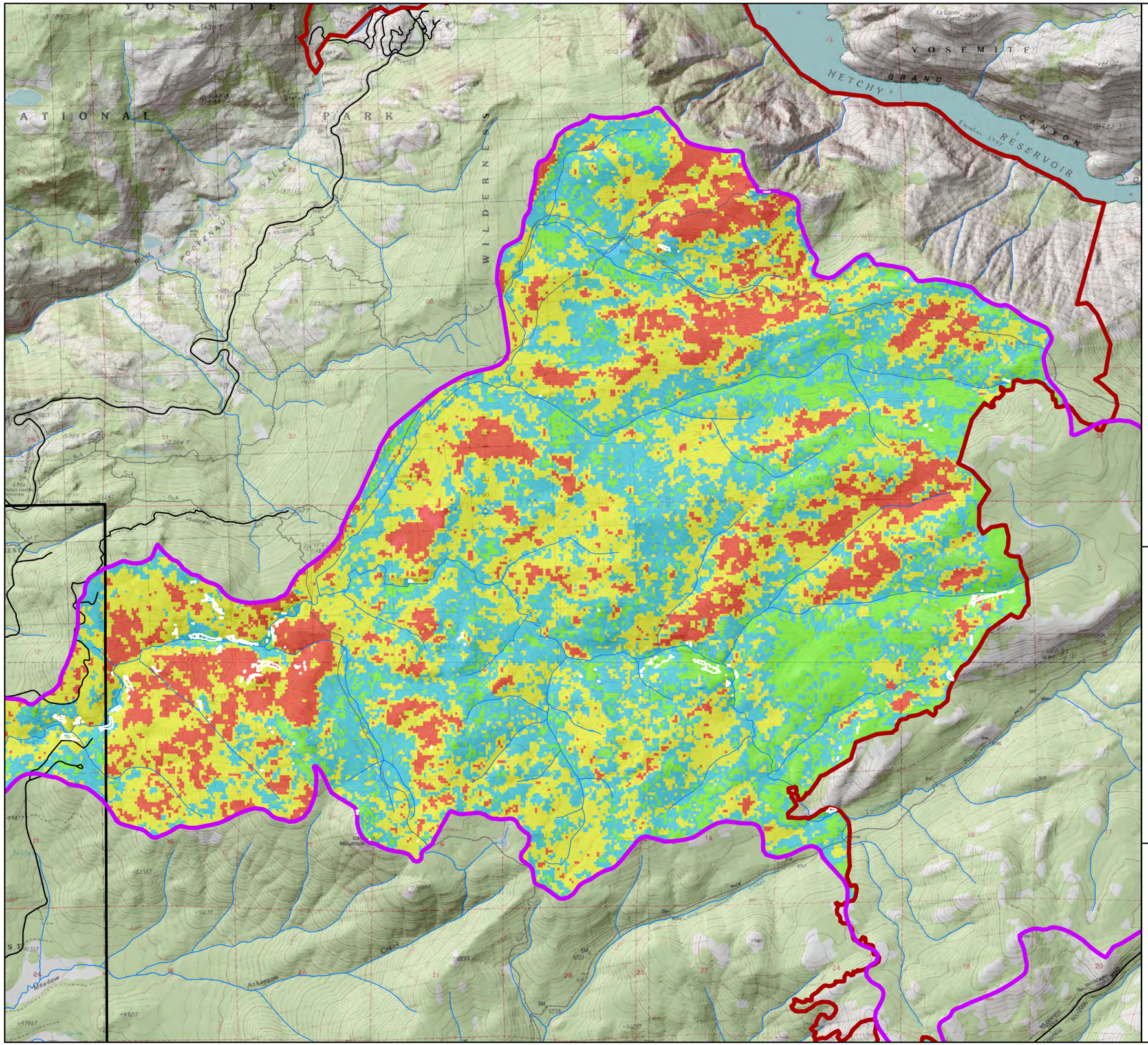
August 2013

0 0.75 1.5 3 Miles

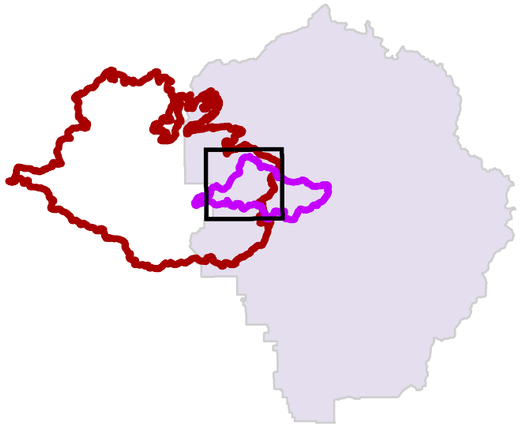
The data represented on this map was gathered from multiple sources. They may vary in accuracy, scale and date. This map is for display purposes only.

Rim Fire

Middle Tuolumne River Watershed Soil Burn Severity



	Soil Burn Severity
35-70% Slopes	
Watershed	Low/Unburned
Fire Perimeter	Low
NPS Boundary	Moderate
Roads	High
Trails	
Stream	



N
W E
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1:60,000

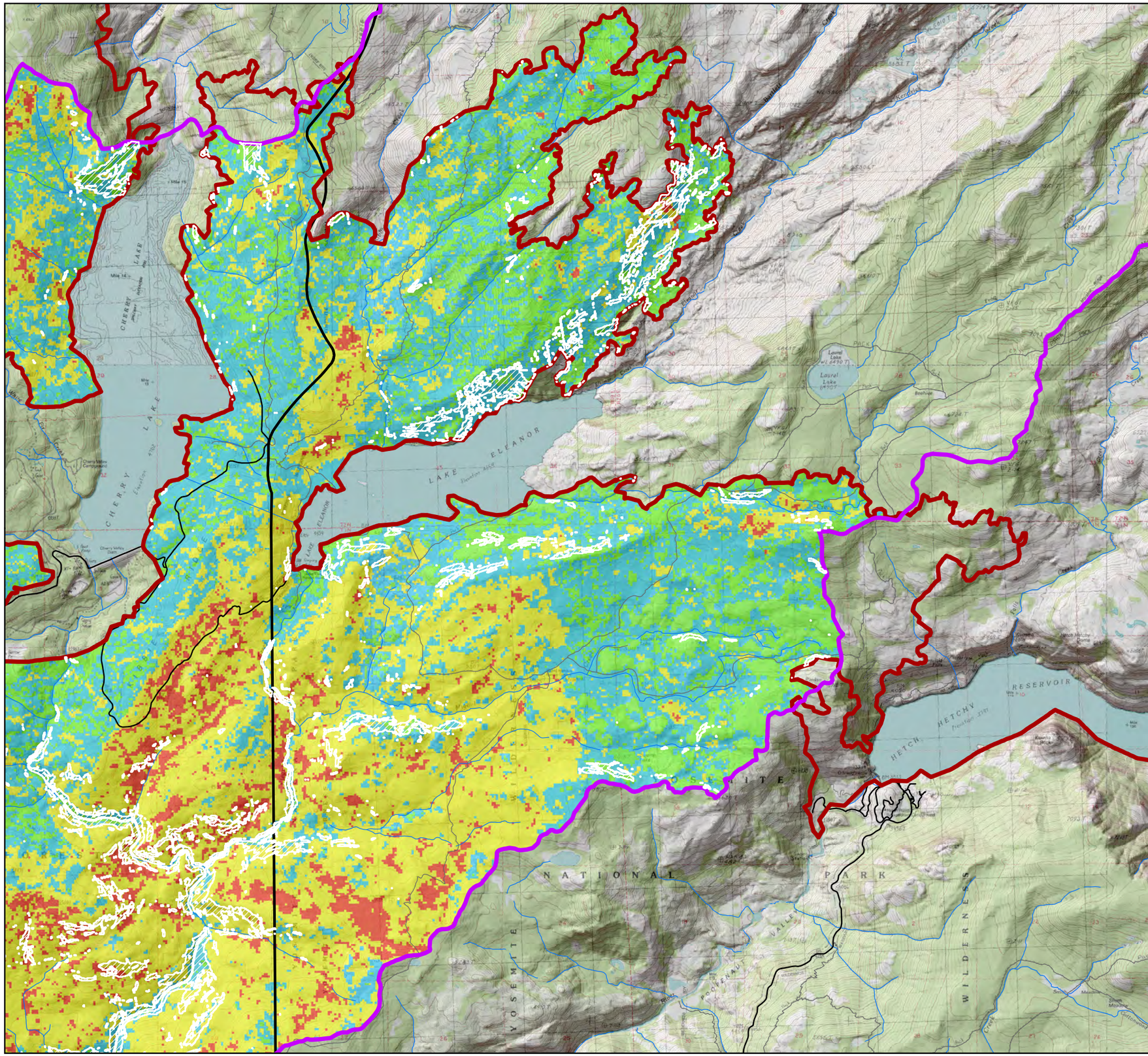
August 2013

0 0.75 1.5 3 Miles

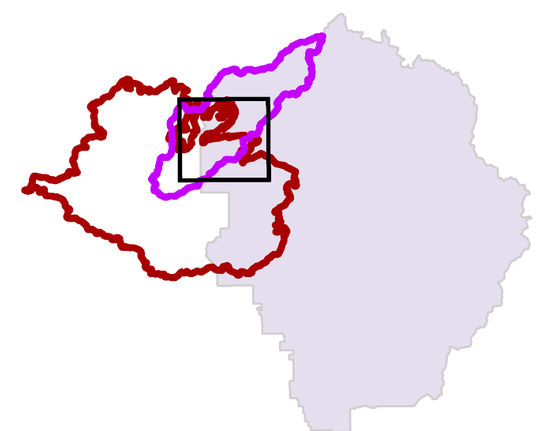
The data represented on this map was gathered from multiple sources. They may vary in accuracy, scale and date. This map is for display purposes only.

Rim Fire

Eleanor Creek Watershed Soil Burn Severity



35-70% Slopes	**Soil Burn Severity**
Watershed	Low/Unburned
Fire Perimeter	Low
NPS Boundary	Moderate
Roads	High
Trails	
Stream	



N
W E
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1:70,000

August 2013

0 0.75 1.5 3 Miles

The data represented on this map was gathered from multiple sources. They may vary in accuracy, scale and date. This map is for display purposes only.

Yosemite, California
SEPTEMBER 2013
NPS BAER TEAM