Telegraph Fire

State Emergency Assessment Team (SEAT)
Report

DRAFT

Affecting Watersheds in Mariposa County
California

September 30, 2008

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DISCLAIMER

The scope of the assessment and the information contained in this report should not be construed to be either comprehensive or conclusive, or to address all possible impacts that might be ascribed to the fire effect. Post fire effects in each area are unique and subject to a variety of physical and climatic factors which cannot be accurately predicted. The information in this report was developed from cursory field examination by licensed resource professionals and should be viewed in conjunction with other relevant sources of information. Neither the State of California nor any Agency or Department participating as a member of the State Emergency Assessment Team (SEAT) makes any warranty, express or implied, nor assume any legal liability for the information disclosed herein.

EXECUTIVE SUMMARY

The Telegraph fire began on July 25 in the Merced River Canyon north of the town of Mariposa and burned approximately 34,100 acres by the time it was declared controlled on August 18, 2008. Land ownership in the fire boundary included 21,200 acres controlled by the U.S. Bureau of Land Management (BLM), 8,900 acres of private land, 3,900 acres of U.S. Forest Service (USFS), and 100 acres owned by the State of California.

Topography in the burned area ranges from gentle slopes, primarily in the south portion of the fire, to extremely steep slopes in the Merced River canyon and in nearby watersheds draining into the Merced River just above Lake McClure. Elevations in the burned area range from 850 to 4,000 feet, and precipitation occurs mostly as rain with occasional snowfall in the upper watersheds. Geology consists of basic igneous and metasedimentary rocks with moderately deep soils on gently sloping areas and shallow to very shallow, rocky soils on steeper slopes. Primary plant communities are chaparral, oak woodlands or savannah, pines, and herbaceous plants.

Land uses in areas affected by the fire are residential, mining, livestock grazing, recreation, and watershed. Roads in and adjacent to the fire included Highway 140, local access roads, and unpaved roads used for recreation and management on BLM and USFS lands. Major infrastructure includes 800 KV transmission lines that cross the fire, and water from the Merced River and Lake McClure is used for agriculture and domestic purposes.

Runoff and sediment from the fire area is expected to be greatly increased, with a potential for debris flows or torrents from upstream channels and rockfalls or landslides on steeper slopes. Improved access to the burned area could lead to additional disturbance from off-highway vehicles and grazing. Values at risk include life, safety, property, transportation systems and access, water supply and water quality, wildlife habitat, and threatened, endangered and sensitive plants.

Proposed mitigation measures include:

- Clearing channel debris, installing debris barriers, and establishing evacuation criteria for residences at risk of flooding or debris flows.
- Establishing monitoring and closure criteria for Highway 140 adjacent to the fire, for Burma Grade, and for the Briceburg bridge during large storms.
- Developing plans for treating or replacing turbid water supplies from Lake McClure and other water sources following large storms.
- Surveying stream crossing and road drainage on local roads located in and below burned areas to identify potential washout sites.
- Develop a monitoring program to identify maintenance needs and for notifying residents of access problems and restrictions during and following large storms.
- Blocking access to spur roads and firelines and deferring grazing to prevent disturbance by off-highway vehicles and livestock that could threaten regrowth of wildlife habitat or recovery of threatened, endangered, and sensitive plants.
- Pre-project surveys to protect threatened, endangered, and sensitive plants in the fire area.
- Use of native plants and weed-free materials for erosion control and equipment washing to prevent the introduction or spread of invasive weeds.
- Blocking and clearly marking adits and shafts that have become visible and accessible as a result of the fire.

ACKNOWLEDGEMENTS

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SETTING AND CONDITIONS

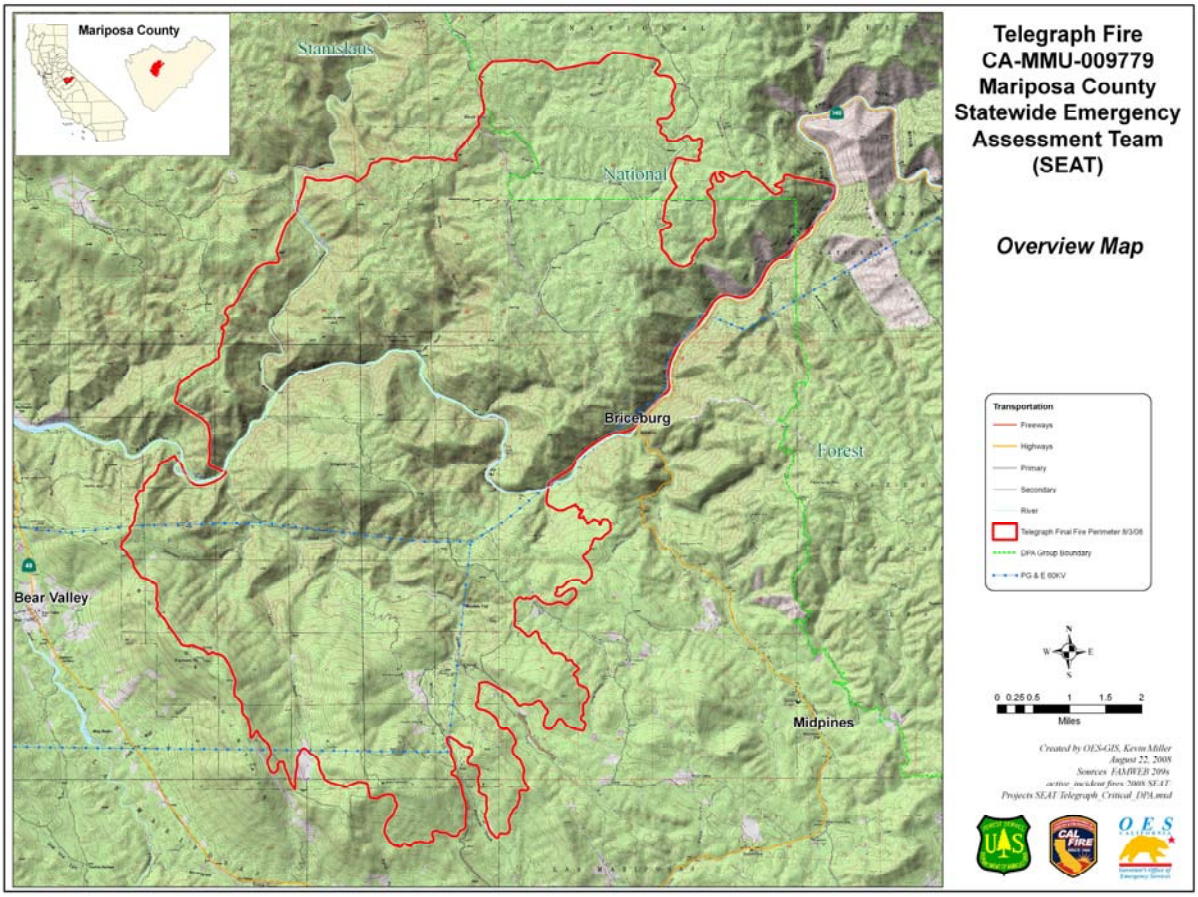
The Telegraph Fire began on July 25, 2008, was contained on August 7, 2008, and declared controlled on August 8, 2008. As shown in Figure 1, below, the burned area is centered on the Merced River canyon between Lake MClure to the west and Highway 140 at Briceburg on the east. The town of Mariposa lies about two miles south of the fire boundary, and the fire burned into the Stanislaus National Forest on its northern edge. The fire ultimately burned approximately 34,100 acres along the western margin of the Sierra Nevada Mountains, all within Mariposa County. Ownerships within the fire are shown in Figure 2, including Bureau of Land Management (21,200 acres), private (8,900 acres), U.S. Forest Service (3,900 acres), and state (100 acres).

Elevations in the burned area range from about 850 feet to 4,000 above mean sea level. Slopes range from gentle, primarily in the south portion of the fire, to extremely steep in the Merced River canyon and in the watersheds draining to the Merced River in the center and northern parts of the fire. Underlying geology consists of basic igneous and metabasic igneous rocks (e.g. greenstone) in the south and northwest portions of the fire and metasedimentary schist (e.g. amphibolite) in the balance of the burned area. Soils on the basic and meta-basic igneous rocks are red in color and are often 20 to 40 inches deep with loam surface and clay loam subsoil textures. Soils less than 20 inches

deep with less well developed subsoils are also found in these areas, primarily on steeper slopes. The metasedimentary rock materials are generally found in steep to extremely steeply sloping landscapes with shallow, yellowish brown colored soils that have loam surface and subsoil textures. More detailed information about physical site conditions can be found in the attached Geology and Soils specialist reports.

Nearly all of the burned area drains into the Merced River upstream from the Lake McClure reservoir. The Merced River runs through the center of the fire and is federally designated as a free-flowing, wild and scenic river in this area. CAL WATER planning watersheds with substantial burned area include Lyons gulch, Halls Gulch, and Saxon Creek. Watersheds with smaller proportions of burned area are Feliciana Creek, Indian Gulch, Solomon Gulch, Gentry Gulch, Miller Gulch, Stockton Creek, and Agua Fria Creek.

Figure 1: Fire Boundary and Topography Map

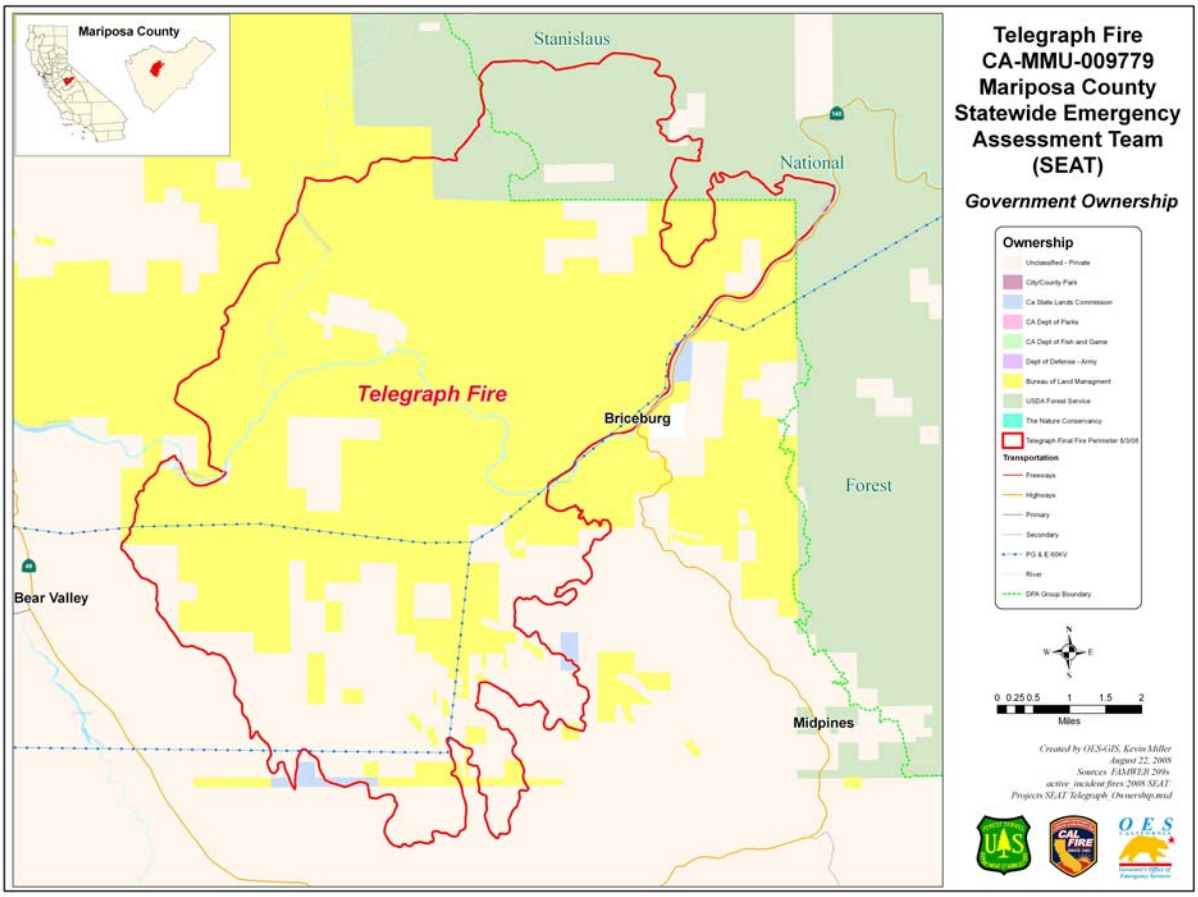


Precipitation in the burned area mostly occurs as rain, with occasional snowfall in the upper portions. Annual rainfall for the Mariposa area ranges from 59 inches (1982) to 15 inches (1961), with an average annual precipitation of about 30 inches. Peak rainfall intensity in Mariposa has been as high as 5.47 inches (1995) in a single twenty four

hour period. Average annual snowfall is 6 inches, and the maximum snowfall of 24 inches occurred in 1967. Rain-on-snow can occur in higher elevations of the fire area, and more precipitation falls at higher elevations than the lower portions of the included watersheds due to the orographic effect of rapidly increasing elevations from canyon bottoms to ridgetops. Additional information about runoff and streamflow is contained in the attached Hydrology and Water Quality specialist report.

The primary plant communities within Telegraph Fire include chaparral, oak woodlands or savannah, pines, and herbaceous vegetation. Because the Forest Service lands within the fire boundary have more forest and woodlands, the vegetation distribution of the Bureau of Land Management public lands are even more heavily weighted to chaparral, while private lands in the south part of the fire included much of the oak woodlands and savannah vegetation, with some pines on north facing slopes and in stream corridors. More specific information about vegetation types can be found in the attached Botany specialist report.

Figure 2: Fire Area Ownership Map



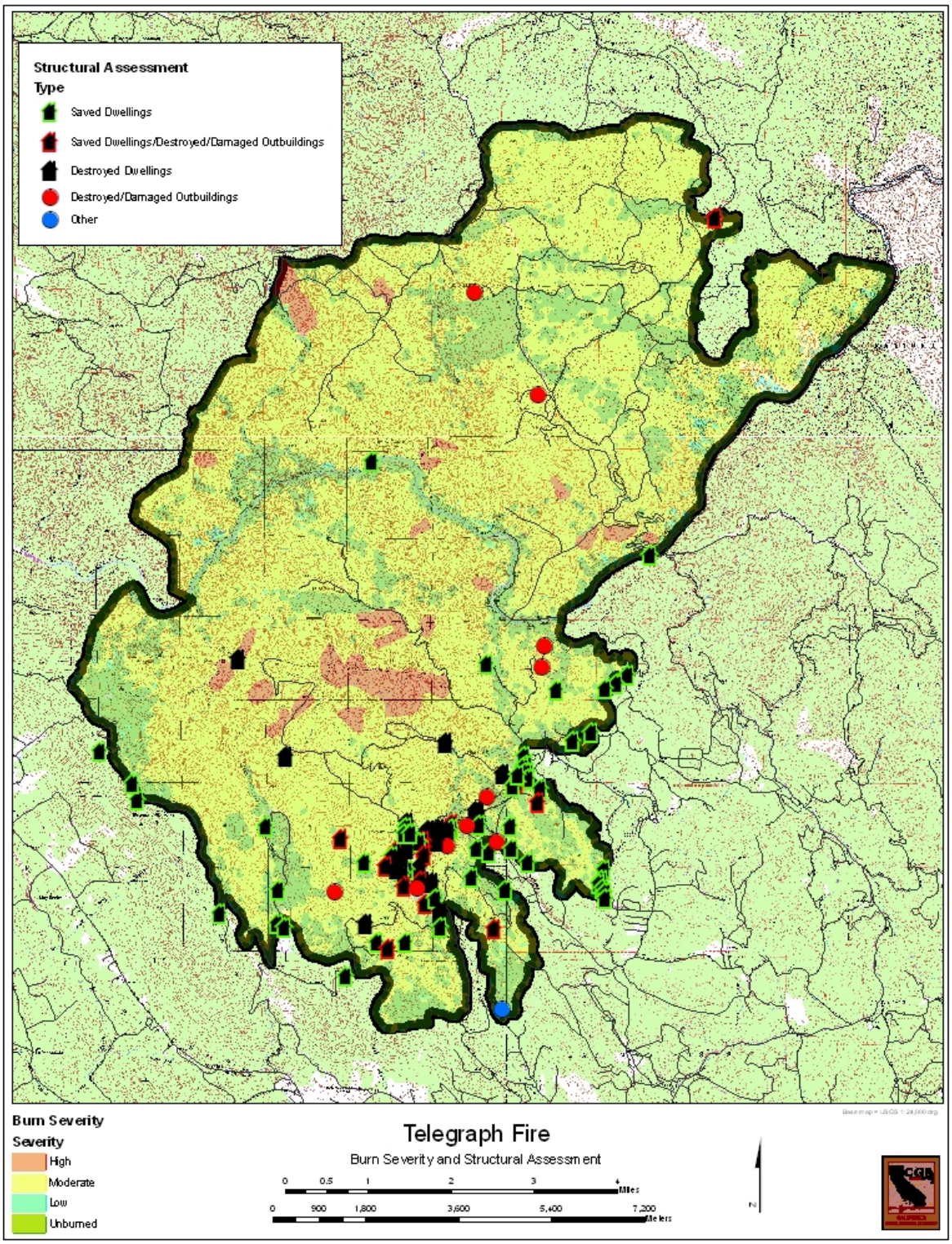
Land uses in the fire area are residential, mining, livestock grazing, recreation, and watershed. Major infrastructure facilities include 800 KV transmission lines. Streams in the burned area drain into Lake McClure, which supplies water for both domestic and agricultural uses. Roads affected by the fire include Highway 140 in the Merced River canyon along the east side of the fire, local roads providing access to private homes and property in the south portion of the fire, and roads through Bureau of Land Management (BLM) lands providing access for land management, recreation, fire control, mining claims, and other private property. Highway 140 is a major access road to Yosemite National Park and is of critical economic importance to the town of Mariposa and to Mariposa County. In addition, the Burma Grade section of the Briceburg BLM road provides a critical link to areas north of the Merced River for fire control and land management.

SEAT field review found that water repellent soils were present in most burned areas. Hydrophobic conditions were generally seen as very thin layers at the contact between the soil surface and ash or litter layers. However, thicker layers located a half inch or deeper in the soil were found in areas where more severe burning conditions were indicated by nearly complete consumption of brushfields or the presence of charcoal from heavier fuel loadings. These results are generally consistent with findings described in the BLM BAER report.

A burned area reflectance characterization (BARC) map covering the fire area was provided by the US Forest Service (USFS) to rate differences in soil burn severity. This map was modified by the BLM BAER Team based on observed post-fire vegetation and water repellency conditions (Figure 3). The SEAT field review generally confirmed the BLM findings, and no modifications to the revised BARC map are proposed in this report. The resulting, overall, burn severity estimates for the fire area are 9 percent low, 70 percent moderate, and 3 percent high. In addition, 9 percent of the area within the fire boundary was found to be unburned.

Erosion hazard ratings (EHRs) for soils in the burned area were calculated using the California Soil Survey Committee method (CSSC 1989). In general, soils on more gently sloping areas that were rated as having a low pre-fire EHR remained in the low EHR category or moved into moderate, while areas with moderate pre-fire EHR generally moved into either high or very high EHR categories as a result of the fire. Soils that were rated as having a high EHR before the fire invariably moved into the very high category. No soils were rated as having a very high EHR prior to the fire. Additional information about EHR determinations is included in the Soils Specialist report.

Figure 3: Soil Burn Severity Map



SPECIALIST REPORTS FINDINGS SUMMARY

Geology

Principal concerns with the Telegraph fire related to geology and land stability are:

- Potential loss of life, property, and infrastructure due to debris flow initiation, in-channel flooding, and debris torrents affecting homes and nearby outbuildings. Infrastructure includes drainage ditches, culverts, county and private bridges, power lines, subsurface cable, water and sewer lines, domestic wells, domestic leach fields, road cuts, road and embankment fill, and other infrastructure.
- Potential loss of life, property, and the closure of State Route 140 in the Merced River canyon due to an increase in sudden, rain-initiated, downslope debris torrents, rock avalanches, rock falls, and other catastrophic failures. Partial or complete closure of this vital corridor would greatly restrict travel and commerce in the County of Mariposa. Highway closure would also impact travel and commerce into and out of Yosemite National Park.
- Potential loss of life, property, and the closure of the Burma Grade Road, which climbs out of the Merced canyon at Briceburg up and into National Forest and Bureau of Reclamation lands. This road has been used for more than 75 years by multiple government agencies for fire control and land management work and for access to public lands for recreational purposes.

Sudden debris flows or torrents, or in-channel flooding can affect homes and nearby outbuildings adjacent to existing channel pathways. This is most significant to homes and buildings that were directly affected by the Telegraph Fire and to homes and buildings that are located adjacent to and immediately downstream of the burned areas. These areas include residences in the Whitlock Road drainage area, Mosher Road drainage area, Sherlock Creek Road drainage area, Saxon Road drainage area, and the Mariposa Creek drainage area.

State Route 140 in the Merced River canyon could be closed by sudden, rain-initiated debris torrents, rock avalanches, rock falls, and other catastrophic failures. Soil materials along the crest of Merced canyon and inner gorge may ravel and slough down slope. Where soils have become hydrophobic due to moderate and high burn intensity, debris flows may occur even during low rainfall events. Rock fall may be initiated by this sloughing soil material, leading to rock bouncing down a steep slope and into the Wild and Scenic Merced River corridor and onto State Route 140, this could make driving the corridor during a rain event treacherous. This vital corridor is strategic for continued commerce and well being of the County of Mariposa. Highway closure would also impact travel and commerce in and out of Yosemite National Park, which has a direct and immediate effect on the economy of Mariposa as the County seat as well as other smaller communities such as Midpines, El Portal, Cathays Valley and others.

Burma Grade on the Briceburg Road has been used by government agencies and the public for at least 75 years. This road provides the only access to extensive public lands on the north side of Merced Canyon. Government agency staff represent the U.S. Forest Service, the Bureau of Land Management, Cal Fire, County law enforcement, and others. The Burma Grade was built and exists on a metastable landslide. In spite of continued high maintenance and dangerous passage during certain times of the year, it remains a vital access to the back country. High and moderate severity burns occurred on the crest and flank of the Burma Grade hillside. Materials at the top of the road are metastable landslide debris and cut-bank sliver-fill embankments. Water drainage problems and spring activity exist on this road. Maintaining the Burma Road may require a plan of exigency to address the situation.

Soils

Post-fire runoff and erosion on hillslopes and sediment in stream channels will be greatly increased for several years following the fire, especially in response to the first large storms. The expected increase in post-fire runoff can also cause erosion on roads and failure of stream crossings, which would block access to and from parcels in and downstream from the fire.

Landscape level treatments for erosion control are either extremely expensive (e.g. aerial application of mulch) or not likely to be successful during the first storms that generally lead to the majority of erosion (e.g. grass seeding). Therefore, residents and water users located in or downstream from the burn should be prepared to avoid or treat sediment laden floodwaters that are likely to occur during large rainstorms. However, mulching may be used to prevent erosion at high value sites or to prevent runoff damage to specific road or site improvements.

To maintain access and prevent excessive road erosion, permanent drainage control treatments and crossing removal should be applied to roads that are to be closed, and self-maintaining drainage features and crossings should be provided on roads that are to remain open.

Hydrology and Water Quality

Water quality in Merced River watershed and Lake McClure may be impacted by fire, particularly during the first rainstorms of 2008-09. Depending on the intensity of these first storms on the burned area, there may be noticeable increases in stormwater turbidity and bedload loads, particularly in Sherlock Creek and tributaries. The hydrologic effect of the burned area is expected to diminish rapidly over the first three years following the fire, and to be near full recovery after five years. The Merced Irrigation District (MID) does not expect these transient hydrologic changes to

significantly affect Lake McClure. Neither the MID assistant general manager nor the general manager of Mariposa PUD anticipate that burned area will significantly impact their operations, barring very unusual conditions, like the rain-on-snow storm of January 1997. We recommend that the water quality monitoring by Upper Merced River Watershed Council continue and that pre-fire data be compared to the post fire data.

The Briceburg Bridge is at low risk of being affected by the temporary hydrologic changes caused by the Telegraph Fire. Only eight-tenths percent of the watershed above the bridge was burned in the fire. There is, however, always a risk that an upstream landslide could temporarily dam the river and then release a surge of flood water and debris that might impact the bridge. See the geologist specialist report for a discussion of this risk.

The “Burma Grade” switchback section of the Briceburg Road is a difficult three and a half miles of road to drive and to maintain under normal conditions. The approximately 178-acre area that drains to and from this section of road immediately adjacent to the Merced River has been burned, with about a fifth of the area rated as high soil burn severity. We recommend the drainage on this section of road be upgraded to accommodate the hydrologic changes resulting from fire.

Debris flow risk is covered in the geologist specialist report, which lists many potential sites at risk. One residence and crossing on Mosher Road is of particular concern for risk to life and property. We recommend an engineer or engineering geologist evaluate this site for possible mitigation of the risk.

Calls for emergency help from the populated areas affected by the fire may increase this winter, depending on the types of storms that occur. House numbering of residences is generally good. In many cases, however, road access to residences for emergency vehicles is not. This could be a particular problem during wet weather and severe storms. This situation existed prior to the fire, but has been made worse by the potential, post-fire increases in runoff and sediment production.

Wildlife

The area burned by the Telegraph fire contains occupied habitat for several federal and state species of special concern, and one species listed as Threatened by the State, as well as many common wildlife species. Many wildlife species, including threatened and sensitive species, have been significantly impacted by the fire itself. However, all of the native wildlife in the area have evolved to live in a fire-adapted ecosystem, and over time are likely to recover. Impacts to fisheries and aquatic life should be temporary.

Emergency actions are not recommended for wildlife habitat and species recovery at this time. However, recommendations have been made for treatments and monitoring that can reduce impacts to their habitat and to document the effects of the fires on wildlife.

Treatments to Mitigate the Emergency could include:

- Minimize erosion
- Temporarily limit disturbance of vegetation and wildlife
- Monitor vegetation and wildlife populations
- Coordinate with local wildlife experts/agencies on treatments

Objectives of these treatments include:

- Minimize sedimentation of streams and rivers by making road improvements, such as larger culverts, suggested elsewhere in this document. Limit OHV access to the burn area.
- Allow native vegetation to recover adequately by deferring grazing for at least the first year after the fire, especially in riparian areas.
- Allow native wildlife to recover adequately by limiting disturbance in the burn area for at least the first year. Block off all new access ways, such as fire lines, dozer lines and spur roads. Block off and decommission roads/trails that were improved to allow access for fire suppression and are no longer needed.
- Monitor recovery of wildlife and vegetation affected by the fire to identify potential declines in populations and encourage adaptive management.
- Seek cooperation between agencies and local experts when performing and evaluating treatments

Botany

The Telegraph Fire covered approximately 34,091 acres, including valuable upland and lowland habitat types that support or have the potential to support 12 special-status plant species. Most of the vegetation communities affected by the Telegraph Fire and associated wildlife have evolved with periodic fires and will naturally regenerate within a few years. Rare plants that may require special attention include Yosemite onion (*Allium yosemitense),* Big-scale balsamroot (*Balsamorhiza macrolepis var. macrolepis),* Small's southern clarkia *(Clarkia australis),* Mariposa clarkia *(Clarkia biloba ssp. australis),* Beaked clarkia *(Clarkia rostrata),* Koch's cord moss (*Entosthodon kochii)***,** Congdon's wooly sunflower ***(****Eriophyllum congdonii***),** Parry's horkelia *(Horkelia parryi),* Congdon's lewisia (*Lewisia congdonii*), Elongate copper moss *(Mielichhoferia elongate)***,** Slender-stemmed monkeyflower *(Mimulus filicaulis),* and Shevock's copper moss *(Schizymenium shevockii)*. If ground-disturbing activities or weed control are planned in areas supporting these plants, surveys should be conducted at the appropriate time of year (generally the spring blooming period) to pinpoint rare plant occurrences, and a qualified botanist should be present to guide workers as they implement post-fire treatments.

Use of seeding and mulching for erosion control is discouraged because they may inhibit natural re-colonization of native species and introduce weeds. Invasive weeds

may invade burned areas and fire control lines throughout the fire as well as contingency lines outside the fire perimeter. Particular areas of concern can be identified by contacting botanists from the Department of Fish and Game – Central Region, the Bureau of Land Management – Folsom Field Office and the USDA Forest Service – Stanislaus National Forest.

Recommendations to prevent invasive weed encroachment include; 1) surveys for invasive weeds in the specified areas during the next two growing seasons; 2) immediate control of invasive plants upon discovery with at least two additional years of follow-up inspections and control, 3) avoidance of seeding; and 4) using weed-free mulch if this treatment cannot be avoided entirely.

Homeowners who desire to replant their properties are encouraged to use alternatives to invasive plants. Lists of invasive species to avoid planting are available from the California Invasive Plant Council (http://www.cal-ipc.org/ip/management/plant profiles/index.php). Except where necessary to protect life and property, avoid seeding and tilling in wildlands as much as possible. If seeding is needed, weed-free seed should be used.

Special-status plant protection and prevention of noxious weed invasions will be improved by closing fire control lines with shrubs, logs, or other means to minimize trespass.

Avoid disturbing islands of unburned vegetation, which provide wildlife habitat as well as seed sources for natural revegetation.

Grazing should be restricted on burned landscapes to allow natural vegetation communities to recover and thrive.

Elderberry is protected by law. Removal of these plants or degredation of their habitats is prohibited.

There are some limited opportunities to assist in improving restoring forest health in ponderosa stands severely affected by the fire. Funding through CAL FIRE's California Forest Improvement Program is recommended.

Pacific Gas and Electric Company should be made aware that trees in drainage corridors are of concern to foresters and hydrologists. Trees that block storm drainage pathways may be removed.

VALUES AT RISK SUMMARY

Hazards resulting from the Telegraph Fire, resulting values at risk, and proposed mitigations are summarized in Table 1. Agencies implementing mitigations or responsible for resources for which mitigation is recommended are listed in Table 2, along with whether the recommended mitigation is unique to the SEAT assessment or has also been recommended for implementation as part of the previously completed BLM BAER Report. Following is a more detailed discussion of the information contained in Tables 1 and 2 to address hazards created by the fire.

The house at 5888 Mosher Road was found to be at risk of damage by both flooding and debris flows from the adjacent stream channel if a large storm occurs during the first year or two following the fire. The SEAT recommendation for this site is to clear the upstream channel of debris that could affect the culvert above the house and to install flow deflectors to protect the house from a potential debris flow or torrent. In addition, criteria for evacuation of this site should be established. This is a high priority recommendation for the protection of life, safety, and property.

State Highway 140 provides a critical transportation corridor linking Mariposa County and the town of Mariposa to Yosemite National Park. The SEAT geologic assessment found that the stretch of Highway 140 adjacent to the east side of the fire is at risk for debris flows or torrents, landslides, and rockfalls that threaten life and safety and/or require highway closure, which would cut off access between the town of Mariposa and Yosemite National Park. To protect travelers using Highway 140, the SEAT recommends that Caltrans institute a highway monitoring program with criteria for closing the highway during large storms.

The very steep Burma Grade on Briceburg Road uses a series of switchbacks to climb out of the Merced River Canyon and provide access to the area north of the river. SEAT geologic and hydrologic assessments found hazards to Burma Grade from debris flows or torrents, landslides, and washouts of the numerous culverts that drain runoff from the road surface and pass water collected from slopes above the road. To protect life and property, SEAT recommends that BLM establish criteria inspecting the roadway for safety hazards and closing the roadway during larger storms. This is consistent with BLM's BAER Report proposal to inspect the roadway daily. BLM is also planning to replace a number of culverts on the Burma Grade. SEAT members recognized that many of these culverts are undersized; but also observed that much effort had gone into installing the current culverts, as indicated by the hand placed rockwork where culverts exited the road fill. Similar care in bedding, compacting, and construction will be needed to ensure the long term stability of new culverts and associated road fill.

The Briceburg Bridge links Burma Grade with the south side of the Merced River and Highway 140, with similar concerns for life, safety, property and access to areas north of the river. This bridge was overtopped and damaged by large flows generated by the rain-on-snow storm of January, 1997. The SEAT hydrologic assessment found that

only a small part of the fire occurred upstream of the bridge, so there will be little additional runoff passing under the bridge from the burned area. However, a landslide from the burned area in the upstream Merced Canyon could block the river and then release a surge of water and debris that might damage or destroy the bridge. The SEAT assessment did not identify a means of predicting or preventing landslides in the Merced Canyon, but does recommend that BLM establish criteria for closing the Briceburg bridge during large storm events and following upstream landslides. This is consistent with, and could be done in conjunction with, the daily Burma Grade inspections proposed in the BLM BAER Report.

Lake McClure is a source of irrigation and domestic water that will be receiving sediment and debris from the upstream fire area. This will affect water quality and storage capacity in the reservoir, and floating debris will pose a threat to life, safety, and property to people using the lake for recreation. SEAT recommends that the Merced Irrigation District (MID) establish a plan for dealing with higher than usual turbidity in the lake water and a plan for clearing floating debris. MID has experience in dealing with both of these problems, which were also created by the very high flows from the January, 1997, rain-on-snow event. Preventing loss of reservoir capacity would require extensive erosion control activities across the burned area, such as helimulching, that would be extremely expensive and of little overall benefit considering the generally low sedimentation rate reported by MID officials.

Local public roads are at risk for stream crossing washouts and for erosion of road cuts, fills, and surface materials from higher than normal flows, plugging of crossing structures by debris from the fire, and debris flows or torrents from the burned area. These potential post-fire conditions can lead to threats to life, safety, property, and access. Populated areas in the upper watersheds of Whitlock, Sherlock, and Saxon Creeks are most affected by these conditions. SEAT recommendations include stream crossing and road drainage surveys by the County to identify needed improvement work, a storm watch program for timely maintenance and repair during and after large storms, and a program for notifying residents of access problems and restrictions.

Post-fire wildlife terrestrial habitat is threatened by disturbance from grazing and increased off-highway vehicle (OHV) access to spur roads and fire-lines that were opened as part of the fire control effort. This problem has been recognized in both the SEAT assessment and the BLM BAER Report. In response, BLM is proposing to defer grazing on BLM lands in the fire area and to block access to spur roads, along with ripping of specified sections of spur roads to promote vegetation recovery. Most fire lines were blocked and erosion control measures were applied as part of earlier fire suppression rehabilitation work.

SEAT assessment of post-fire aquatic and riparian habitat indicates that the primary effect will be from sediment moving from burned hillsides and upstream channels in response to loss of cover and increased runoff. Previously described erosion control work on fire lines, roads, and crossings will provide some mitigation for this concern. It is also recognized that extensive erosion control measures on burned hillslopes and

upstream channels is not practical or necessary in this fire adapted ecosystem, and that impacts to fish and amphibians are expected to be temporary. However, to preserve riparian cover, trees should be left standing in riparian zones where they do not otherwise present a threat to life, safety, or property.

The SEAT assessment of threatened, endangered, and sensitive (TES) plants on the fire area identified grazing, OHV use, disturbance from road projects, and invasive weeds as primary risk factors. In addition to grazing deferment and the blocking of spur road and fire line access, as described above for terrestrial wildlife habitat, additional SEAT recommended protection measures include pre-project surveys to prevent destruction of TES plants and the use of weed-free erosion control materials and equipment washing to prevent the introduction or spreading of invasive weeds. These recommendations should be built into the design and cost of erosion control, road work, and other projects conducted on both public and private land.

Finally, it was observed that clearing of vegetation by the fire has exposed numerous mine adits and shafts, which now present an increased hazard to life and safety to recreationists and others as a result of increased visibility and improved access. The openings of these old mining remnants should be blocked by current owners whenever possible and clearly marked as a hazard to prevent accidents.

REFERENCES: See individual Specialist Reports

TABLE 1: Risks, Hazards, and Mitigations Summary

Rank	Risk To	Location Type	Hazard Site	Hazard Cause	Values at Risk	Mitigation
A	Structures	Channel zone	Residence	Debris flow or torrent	Life, safety, property	Deflector, evacuate
A	Structures	Channel zone	Residence	Flooding	Life, safety, property	Clearance, evacuate
A	Transportation	Roads, crossings	Highway 140	Debris flow or torrent	Life, safety, property, access	Watch with closure criteria
A	Transportation	Roads, crossings	Highway 140	Landslide	Life, safety, property, access	Watch with closure criteria
A	Transportation	Roads, crossings	Highway 140	Rockfall	Life, safety, property, access	Watch with closure criteria
A	Transportation	Roads, crossings	Burma Grade	Debris flow or torrent	Life, safety, property, access	Establish closure criteria
A	Transportation	Roads, crossings	Burma Grade	Landslide	Life, safety, property, access	Establish closure criteria
A	Transportation	Roads, crossings	Burma Grade	Crossing washout	Life, safety, property, access	Crossing improvement
A	Transportation	Bridge	Briceburg	Flooding	Life, safety, property, access	Watch with closure criteria
C	Water Supply	Reservoir	Lake McClure	Turbidity	Water Quality	Watch with treatment or supply contingency plan
C	Water Supply	Reservoir	Lake McClure	Sediment	Storage Capacity	Prevent upstream erosion
A	Recreation	Reservoir	Lake McClure	Floating Debris	Life, safety, property	Debris removal
B	Transportation	Stream crossings	Local public roads	flooding	Property, access	Crossing improvement survey, watch
B	Transportation	Roads	Local public roads	Surface, fill, and cut erosion	Property, access	Drainage improvement survey, watch
D	Wildlife	Wildlands	Terrestrial habitat	Habitat conversion	Native habitat	Defer grazing for one year

TABLE 1: Risks, Hazards, and Mitigations Summary

Rank	Risk To	Location Type	Hazard Site	Hazard Cause	Values at Risk	Mitigation
D	Wildlife	Wildlands	Spur roads	Site disturbance	Native habitat	Block spur roads
D	Wildlife	Wildlands	Fire lines	Site disturbance	Native habitat	Block fire roads and lines
C	Wildlife	Channel zone	Aquatic habitat	Site disturbance	Native habitat	Crossing removal and improvement
C	Wildlife	Channel zone	Aquatic habitat	Sediment	In-stream habitat	Erosion control
D	Riparian ecosystem	Channel zone	Riparian habitat	Tree removal	Native habitat	Leave trees standing in riparian zones
D	Elderberry plants	Wildlands	All habitats	Plant and habitat destruction	Plant loss	Survey, avoid
D	TES plants	Wildlands	All habitats	Plant and habitat destruction	TES plant loss	Survey, protect, avoid
D	TES plants	Wildlands	Terrestrial habitat	Habitat conversion	Native habitat	Defer grazing
D	TES plants	Wildlands	Spur roads, fire lines	Mulching, seeding, site disturbance	Native habitat	Project review, block access
D	TES plants	Private lands	Terrestrial habitat	Mulching, seeding, site Disturbance, weeds	Native habitat and plants	Use native plant and weed free materials
D	TES plants	Wildlands and private lands	Terrestrial habitat	Invasive weeds	Native habitat	Surveys, post-fire treatment, weed free materials, equipment washing
D	TES plants	Wildlands and private lands	Spur roads, fire lines	Invasive weeds	Native habitat	Surveys, post-fire treatment, weed free materials, equipment washing
A	Cultural	Wildlands and private lands	Terrestrial habitat	Adits and shafts	Life, safety, property	Block, mark

TABLE 2: Hazards, Values, and Mitigations Implementation Summary

Rank	Hazard Site	Hazard Cause	Values at Risk	Mitigation	Implementing Agency	Status
A	Residence	Debris flow or torrent	Life, safety, property	Deflector, evacuate	County	SEAT recommendation
A	Residence	Flooding	Life, safety, property	Clearance, evacuate	County	SEAT recommendation
A	Highway 140	Debris flow or torrent	Life, safety, property, access	Watch with closure criteria	Caltrans	SEAT recommendation
A	Highway 140	Landslide	Life, safety, property, access	Watch with closure criteria	Caltrans	SEAT recommendation
A	Highway 140	Rockfall	Life, safety, property, access	Watch with closure criteria	Caltrans	SEAT recommendation
A	Burma Grade	Debris flow or torrent	Life, safety, property, access	Establish closure criteria	BLM	SEAT recommendation
A	Burma Grade	Landslide	Life, safety, property, access	Establish closure criteria	BLM	SEAT recommendation
A	Burma Grade	Crossing washout	Life, safety, property, access	Crossing improvement	BLM	BLM BAER Report recommendation
A	Briceburg	Flooding	Life, safety, property, access	Watch with closure criteria	BLM	SEAT recommendation
C	Lake McClure	Turbidity	Water Quality	Watch with treatment or supply contingency plan	MID	SEAT recommendation
C	Lake McClure	Sediment	Storage Capacity	Prevent upstream erosion	State	No Treatment recommended
A	Lake McClure	Floating Debris	Life, safety, property	Debris removal	MID, State	SEAT recommendation
B	Local public roads	flooding	Property, access	Crossing improvement survey, watch	County	SEAT recommendation
B	Local public roads	Surface, fill, and cut erosion	Property, access	Drainage improvement survey, watch	County	SEAT recommendation
D	Terrestrial habitat	Habitat conversion	Native habitat	Defer grazing for one year	BLM	BLM BAER Report recommendation

TABLE 2: Hazards, Values, and Mitigations Implementation Summary

Rank	Hazard Site	Hazard Cause	Values at Risk	Mitigation	Implementing Agency	Status
D	Spur roads	Site disturbance	Native habitat	Block spur roads	BLM	BLM BAER Report recommendation
D	Fire lines	Site disturbance	Native habitat	Block fire roads and lines	BLM	BLM BAER Report recommendation
C	Aquatic habitat	Site disturbance	Native habitat	Crossing removal and improvement	BLM	SEAT recommendation
C	Aquatic habitat	Sediment	In-stream habitat	Erosion control	BLM	No Treatment recommended
D	Riparian habitat	Tree removal	Native habitat	Leave trees standing in riparian zones	County, PG&E	SEAT recommendation
D	All habitats	Plant and habitat destruction	Plant loss	Project survey, avoid	BLM	SEAT recommendation
D	All habitats	Plant and habitat destruction	TES plant loss	Project survey, protect, avoid	BLM	SEAT recommendation
D	Terrestrial habitat	Habitat conversion	Native habitat	Defer grazing	BLM	BLM BAER Report recommendation
D	Spur roads, fire lines	Mulching, seeding, site disturbance	Native habitat	Project review, block access	BLM	SEAT recommendation
D	Terrestrial habitat	Mulching, seeding, site disturbance, weeds	Native habitat and plants	Native plant materials, weed free materials	County, BLM. private owners	SEAT recommendation
D	Terrestrial habitat	Invasive weeds	Native habitat	Surveys, treatment, weed free materials, equipment washing	County, BLM	BLM BAER Report Recommendation
D	Spur roads, fire lines	Invasive weeds	Native habitat	Surveys, treatment, weed free materials, equipment washing	County, BLM	BLM BAER Report Recommendation
A	Terrestrial habitat	Adits, shafts	Life, safety, property	Block, mark	BLM, private owners	SEAT Recommendation

APPENDIX A: Botany Technical Specialist Report

Botanical Resources
Telegraph Fire
September 2008
Lorna Dobrovolny, Department of Fish and Game, Environmental Scientist, North Central Region

I. Resource Condition Assessment

A. Resource Setting

The primary plant communities within the perimeter of the Telegraph Fire as mapped by the USDA Forest Service Remote Sensing Lab (November 2006) are chamise chaparral (39.0%), lower montane mixed chaparral (12.2%), interior live oak woodland (14.4%), blue oak savannah (5.8%), canyon live oak woodland (3.6%), black oak woodland (0.9%), mixed hardwood (0.8%), non-native annual grassland (5.1%), gray pine (9.0%), west side ponderosa pine forest (7.9%), and valley-foothill riparian forest (0.1%). Lumping these figures into broader classes, 51% of the lands within the fire were chaparral, 25% oak woodlands or savannah, 17 % was dominated by pines and 5% supported mostly herbaceous vegetation. Because the Forest Service lands within the fire boundary have more forest and woodlands, the vegetation distribution of the Bureau of Land Management (BLM) public lands were even more heavily weighted to chaparral than the above figures would suggest.[1]

Private lands comprise 26 percent (8,941 acres) of the burn.[2] Vegetation types there are similar in nature to the BLM lands, except that a greater percentage of private land is oak woodland, ponderosa pine or gray pine. Ephemeral, as opposed to perennial drainages, exist throughout the private lands. Riparian hardwood areas are a small percentage of private lands. See Figure 1 for a map of the vegetation within the fire.

Chamise dominates on south facing slopes. Forest and hardwood communities dominate on north facing slopes and at higher elevations. Few of the drainages are truly perennial, but many have substantial reaches with riparian vegetation. Apparently some riparian areas are spring-fed, forming static pools or providing subsurface water for vegetation after flow has ceased in the spring or summer.

[1] BLM BAER Report - Vegetation
[2] Per John Carota, Telegraph Fire SEAT Team GIS Analyst

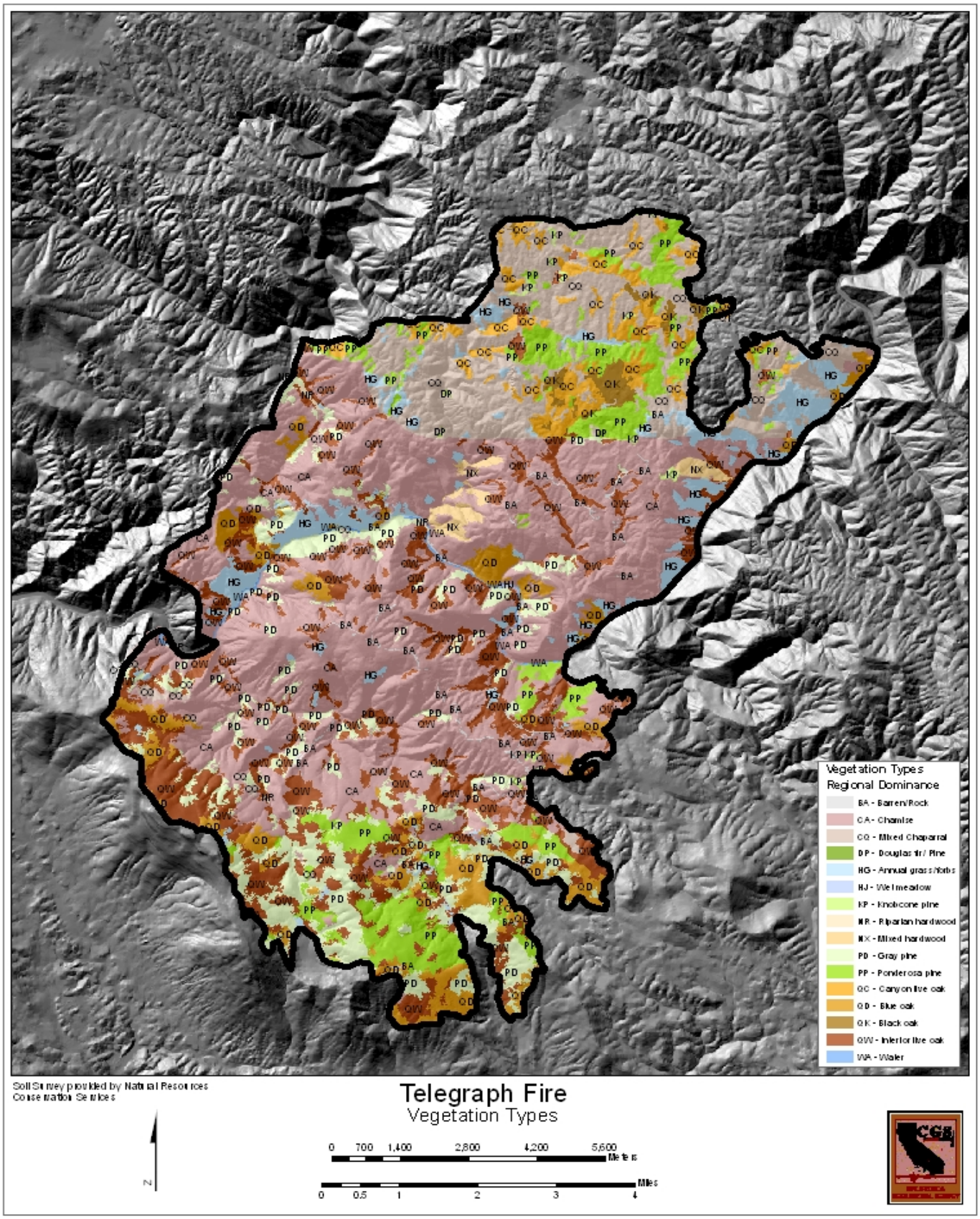


Figure 1: Telegraph Fire Vegetation Types

Chaparral species in the fire area include chamise, white leaf manzanita, mewukka manzanita, buckbrush, toyon, western mountain mahogany, flowering ash, golden fleece, blue elderberry, keckiella, holly-leaf redberry, and poison oak. Associated tree species include knobcone pine, gray pine, sugar pine, California juniper, interior live oak.

Many of the same species are found in the oak woodland and forest sites with additions like ponderosa pine, incense cedar, canyon live oak, black oak, blue oak, woollyleaf ceanothus. Elderberry can be found within the fire perimeter as well.

The topography is generally sloped. The fire started within the steep Merced River canyon and spread to associated drainages. Few meadows or meadow complexes exist within the fire perimeter, generally on ridge tops. Ridge tops were the focus of mechanically-constructed fire lines built extensively throughout the burn. A large percentage of the fire area is used by grazing animals. The Bureau of Land Management maintains grazing allotments on their lands. Private lands generally consist of small ranches or ranchettes. Elevation ranges from 849 to 3825 feet.

Soils are generally Auburn, Blasingame, Boomer, Josephine, Mariposa, Maymen, Trabuco and Whiterock Series (see Soils Specialist Report).

B. Findings of the On-The-Ground Survey

Concerns for botanical resources fall into three major categories: damage to native vegetation and expected recovery time after fire (especially in the areas burned at high severity), the risk for invasive non-native weeds to spread across the freshly burned landscape, and the potential for damage to rare plants either directly from the burn or as a result of rehabilitation efforts, or indirectly from post-fire spread of noxious weeds.

The issues around rare plants and native vegetation are discussed below. In preface, it should be noted that the risk of invasive weed spread is extreme based on the following factors:

Infestations of the following species are known to occur in and near the burned area: yellow starthistle, Italian thistle, klamathweed (also known as St. Johnswort), and tocalote. A population of white top (*Cardaria pubescens)* occurs at the entrance to the fairgrounds where fire camp was located for this fire. Medusahead and various species of broom occur in the county, as does the A-rated spotted knapweed. Burned areas provide exceptional opportunities for the exponential spread of noxious weeds, and this would be expected especially for yellow starthistle and tocalote, possibly the most abundant species of those listed above. The potential for additional weed species to have been imported by firefighting equipment is very high, given the number of dozers that were present

and the number of miles of fireline constructed. The condition of special-status plant species post-fire is difficult to determine. Much of the area is inaccessible due to its remoteness, the lack of pre-fire botanical survey data within the fire zone and lack of information on lands under private ownership. Annuals have either died naturally or were extinguished in the fire. According to records available through the Department of Fish and Game's California Natural Diversity Database, three rare mosses were identified in the Merced River Canyon along Highway 140 in Briceburg and areas north. This area was either not affected by the fire or burned at low severity. However, this habitat type can be found along the Merced River through the burn. Very little fire reached down into this riparian corridor or it burned at low intensity. Recorded occurrences of Parry's horkelia are located within the northwest section of the burn area. Appendix 1 summarizes the location information derived from existing sources and local botanical experts.

Lands under the management of the BLM suffered the majority of the direct impacts to botanical resources resulting from the fire. The BLM BAER report characterizes the resource condition of these lands. Figure 2 compares the vegetation with the level of burn severity. The fire burned private lands at low to moderate intensity, resulting in an overall mosaic pattern. Plant communities with a variety of age classes arranged this way throughout the landscape provide for high plant and animal diversity. The native plant communities within the burn area have evolved under a fire regime and will regenerate naturally within two to three years to a moderately functioning condition if they were not disturbed by firefighting activities and are subsequently left undisturbed. The Hunter fire, which burned in 2000, is located adjacent to the Telegraph Fire with a similar vegetation structure. After eight years, most of the chaparral species have returned. The trees are recovering, although in many areas chaparral is out-competing them for light and nutrients.

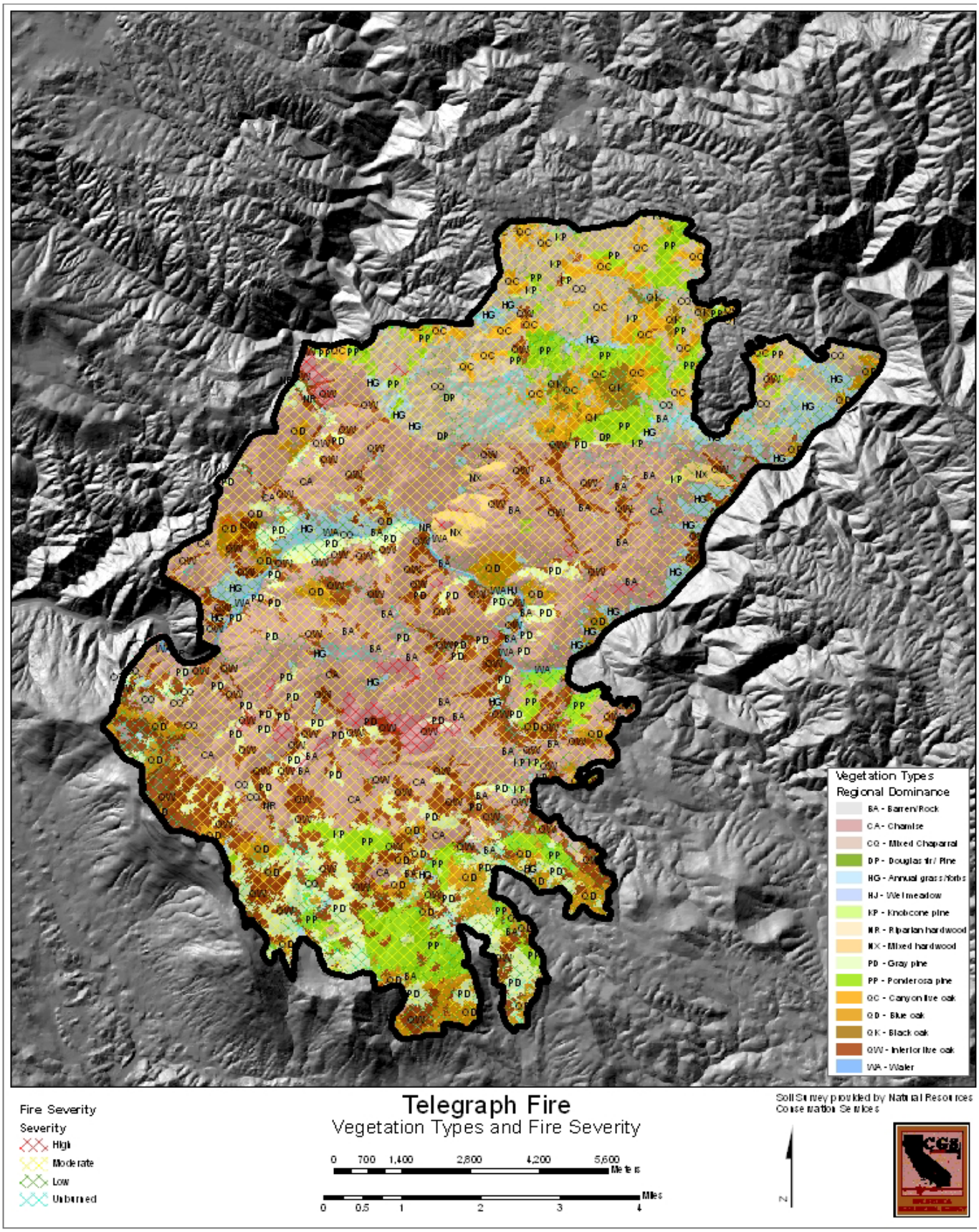


Figure 2: Telegraph Fire Vegetation Types and Fire Severity

1. Values At Risk

There are **twelve** special-status plants[3] that were or are potentially impacted by the fire, fire-fighting activities and post-fire repair efforts; three mosses, five annuals, three perennial herbs and one perennial bulb.

Scientific Name **Common Name** **Conservation Status***	**Life Form/ Blooming Period**	**Habitat**
Clarkia australis **Small's southern clarkia** **CNPS List 1B.2**	Annual herb May-Aug	Cismontane woodland, lower montane coniferous forest. Open, rocky sites in conifer forest or oak woodland
Clarkia biloba ssp. australis **Mariposa clarkia** **CNPS List 1B.2**	Annual herb May-Jul	Grows on East facing slopes in metamorphics, including but not limited to serpentine. In the Merced River, it occurs on phyllite; fireline cut through the slope above the Merced by the Los Angeles crew
Clarkia rostrata **Beaked clarkia** **CNPS List 1B.3**	Annual herb Apr-May	Lower elevations, cismontane woodland, valley and foothill grassland, north-facing slopes, sometimes on sandstone
Entosthodon kochii **Koch's cord moss** **CNPS List 1B.3**	Moss	Cismontane woodland; moss growing on soil
Eriophyllum congdonii **Congdon's woolly sunflower** **CNPS List 1B.2**	Annual herb Apr-Jun	Chaparral, cismontane woodland, lower montane coniferous forest, in cracks in rock outcroppings and on talus
Horkelia parryi **Parry's horkelia** **CNPS List 1B.2**	Perennial herb Apr-Sep	Chaparral, cismontane woodland

[3] The Department of Fish and Game (DFG) recognizes California Native Plant Society (CNPS) list 1A, 1B, and 2 plants as meeting the criteria for listing under CEQA 15380. All CNPS category 1A, 1B, and 2 plants must meet the criteria of Fish and Game Code sections 1901, 2602 or 2607 to be included on one of these lists. The DFG concurs with the criteria used and the data supporting these list decisions. The DFG believes, as the trustee agency for fish and wildlife, that based on the best currently available scientific information the plants occurring on this list in categories 1B or 2 should be considered rare, threatened, or endangered species for purposes of CEQA 15380 (d).

Scientific Name **Common Name** **Conservation Status***	**Life Form/ Blooming Period**	**Habitat**
Mielichhoferia elongata **Elongate copper moss** **CNPS List 2.2**	Moss	Cismontane woodland. Commonly called "copper mosses", moss growing on metamorphic rock, usually vernally mesic.
Lewisia congdonii **Congdon's lewisia** **CNPS List 1B.3**	Perennial herb Apr-Jun	Chaparral, lower montane coniferous forest, cismontane woodland, upper montane coniferous forest. North exposures, in crevices on slopes among rocks and granite substrates.
Allium yosemitense **Yosemite onion** **CA Rare** **CNPS 1B.3**	Bulb Apr-Jul	Chaparral, cismontane woodland, lower montane coniferous forest, in pockets of wet soil or in wet cracks of metamorphic rock, also on slopes and walls
Balsamorhiza macrolepis var. macrolepis **Big-scale balsamroot** **CNPS List 1B.2**	Perennial herb Mar-Jun	Valley and foothill grassland, cismontane woodland
Schizymenium shevockii **Shevock's copper moss** **CNPS List 1B.2**	Moss	Moss on metamorphic rocks, mesic sites. On rocks along roads
Mimulus filicaulis **Slender-stemmed monkeyflower** **CNPS List 1B.2**	Annual herb Apr-Aug	Cismontane woodland, lower montane coniferous forest, meadows and weeps, upper montane coniferous forest within transition zone of the Sierra Nevada, moist granitic sand and meadow edges, vernally mesic sites

The derivation of this list is provided in Appendix 1. Since these locations are not public knowledge, Appendix 1 has been provided to the CA Department of Fish and Game botanist and can be made available to local agencies and their contractors on an "as needed" basis.

Vegetative communities, in particular, chaparral species were denuded in areas of high fire severity. The topography of the area is characterized by steep slopes of varying stability. Soils have high erosion potential. Decadent, dense vegetative cover previously providing wildlife escape from predators, songbird nest opportunities and soil stability have been completely removed from large sections in the Wild and Scenic Merced River canyon. This river section is

classified as “Wild”, generally a remote river classification with little human disturbance. The remaining fire landscape was impacted to a lesser degree, generally classified as a low to moderate intensity burn.

2. Condition of Values At Risk

The fire burned from July 27 to August 6, 2008[4]. The majority of the rare annuals would have bloomed and dispersed seed prior to the fire. All of these plants are expected to respond favorably to undisturbed, post-fire conditions in areas burned at low to moderate intensities. The most severe fire impacts are in the mixed chaparral/chamise vegetation type. Recovery in these high severity areas will be slower. However, this vegetation type is fire-adapted and offers an opportunity for early successional plants to propagate without the competition for light, water and nutrients by decadent chaparral. New growth offers forage more favorable and nutritious to herbivores in subsequent seasons.

The fire caused a loss of above-ground plant structures resulting in short-term direct impacts. Depending on the life stage of the plant and the intensity of the fire, impacts will be variable. Plants past their blooming period, exposed to low intensity fire and left undisturbed by soil disturbance are expected to recover well. In some cases, such as the *Mimulus* and *Clarkia* species, the fire is expected to have a positive impact if left undisturbed. On the other hand, rare plants in the path of mechanically-developed fire lines or those which experienced high fire intensities may not recover at all. Exotic plant invasions have the potential to increase competition and exclude native plant populations. Equipment used to fight the fire arrived from all over the state. No wash down procedures were in place during the initial fire suppression efforts. This equipment also disturbed existing noxious weed occurrences and is likely to have carried seed sources to previously uninvaded areas.

Lands within the fire perimeter have traditionally been used for grazing, though the range has been limited by extensive stands of chaparral. The fire should result in expanded range containing a higher quality of forage. However, certain areas may need to be allowed to recover from the fire prior to reintroducing grazing animals in the short term.

Few private timber resources were adversely impacted by the fire, though some salvage harvesting on private lands is planned. In general, the harvest of forest products is limited by distance to lumber mills and marginal site quality. Certain ponderosa pine stands on Bullion Mountain were severely impacted by the fire. However, this was a fairly isolated occurrence. Most of the tree-dominated lands experienced a low to moderate severity fire.[5] It was reported that Pacific Gas and Electric Company cut trees under their lines and left them within drainage

[4] Cal Fire Telegraph Fire incident information
[5] Robert Little, personal communication

corridors on-site at Mosher and Whitlock Roads, perhaps impacting storm water drainage.

Potential for exotic species invasions in the years following the fire due to rehabilitation efforts (erosion control, reseeding, tree planting, etc) by private property owners exists. Private lands tend to have the greatest number of roads and on-going human disturbance leading to an increased risk of noxious weed invasions.

The moss species are found in rocky, mesic habitats. According to a comparison of fire severity and vegetation type, it appears unlikely that the fire affected these species directly. However, fire fighting and post-fire rehabilitation activities have the potential to adversely affect them.

Blue elderberry (*Sambucus caerulea*) is likely to occur below 3000 feet elevation, commonly near creeks in oak woodland habitats. Two known sites for elderberry occurrence are along Forest Road 2S05 within the burned area and a spur road off of Forest Road 3S02 outside of the burned area per USFS BAER report. The BLM noted several occurrences within the fire perimeter in their report. The U.S. Fish and Wildlife Service (FWS) prohibits destruction or removal of these plants as they are a critical habitat component for the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus)*, a Federally threatened species. On October 2, 2006, the FWS announced their recommendation to remove the beetle from the threatened species list. However, the agency continues to recommend their protection. Elderberry is well adapted to fire and will resprout. Fire also scarifies the seed coat and stimulates seed germination.[6] Adverse impacts to elderberry plants are to be avoided.

Most of the riparian habitat within and along streams burned at a lower intensity during the Telegraph Fire and many of these habitats will recover within a two to three year timeframe if they were impacted at all. As upland vegetation regenerates within the watersheds, the native plant associations will again act to filter and hold sediments and water quality will improve. Areas that were identified as severely burned should be monitored and adaptively managed to ensure native plant regeneration. If areas are identified during the post fire monitoring program that are not naturally regenerating due to a lack of seed source or damaged top soils, erosion control measures such as hydro mulching are recommended.

Additionally should mass wasting (landslides and significant erosion events) occur, the potential to overwhelm sensitive plant species that are known to occur on steep slopes and within the river corridor exists.

[6] FEIS

II. Emergency Determination

Emergencies to botanical resources related to the Telegraph Fire fall into three major categories: 1) threats to rare plants from the fire and fire-fighting activities, 2) from post-fire treatments implemented to protect other values, and 3) loss of natural community integrity due to invasive weeds. The State concurs with BLM and USFS BAER reports that identify no immediate emergency with respect to the direct impacts of the fire on special-status plants.[7],[8] These plants are either fire-adapted or located in areas minimally impacted by the fire. Riparian corridors were lightly or not affected by direct impacts from the fire. They could be affected, however, should mass wasting and landslide events occur.

The State further concludes that an emergency condition does exist with respect to potential invasion of exotic species. Noxious weeds present threats to ecosystem structure and function, plant communities and biodiversity, water quality, and post-fire vegetation recovery. An emergency exists with respect to the spread of noxious weeds from existing populations throughout the fire lines and burned area. Areas previously inaccessible due to heavy brush accumulations are now widely accessible, particularly on the public lands. Previously undisturbed rare plant occurrences, both known and unknown, are now accessible by fire lines and susceptible to both human disturbance and spread of invasive plants.

The urban intermix is especially at risk due to the generally higher levels of disturbance and expected increased disturbance levels associated with reconstruction of infrastructure and private property. Washing stations were not available for vehicles and equipment arriving at this fire, although they were made available to resources leaving this fire in the days following initial attack.

While the focus of this report is directed to private lands, the State concurs with emergency actions planned by federal agencies and coordination throughout implementation of the treatment recommendations is emphasized.

III. Treatments to Mitigate the Emergency

A. Treatment Objectives

The objectives of mitigations propose are; 1) educate private property owners of the risk of noxious weed species invasions and help them identify and monitor special-status plant populations, 2) establish a strategy coordinated with federal agencies to effectively abate noxious weed invasions and 3) provide local agency funding to support a coordinated and comprehensive effort.

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[7] BLM BAER Report - Vegetation
[8] USFS BAER Report - Botany

Future fire mitigation activities need to consider the potential to introduce invasive plant species and survey for special-status plant occurrences prior to installation of projects, particularly for projects where an emergency no longer exists.

B. Treatments to Mitigate the Emergency

Treatments recommended include:

1. Focused public education to landowners impacted by the fire encouraging them to let the vegetation recover on its own rather than large-scale sowing of "wildflower" seed mixes (the potential for inadvertent introduction of invasive species from these mixes is quite high).
2. Identification and mapping, through physical survey of potential routes, of weed invasions and rare plant occurrences. Fire control line maps are available from CAL FIRE.
3. Local agencies, in concert with private property owners, develop an integrated weed treatment strategy: manual or herbicide treatment (or both)
4. Local agencies hold formal coordination meetings early in 2009 to oversee and implement the strategy
5. Follow-up monitoring and treatment through two to three growing seasons

Actions should be coordinated with existing survey and removal efforts planned by the BLM and USFS. To effectively address this emergency, it is critical a coordinated effort between federal and local agencies be developed to ensure private lands are included in integrated weed abatement efforts.

Actions taken or planned by local agencies: The Natural Resources Conservation District (NRCS) has distributed wildflower seed to landowners and plans to distribute young ponderosa pine trees in the fall. The USFS has would prefer that no further distributions of wildflower seed packets occur, as the risk of introduction of invasive species is high and these species would not generally help with soil stabilization. In addition, botanists from local agencies (Forest Service, Park Service, U.S. Geological Survey, BLM) is concerned that the wildflower seeds are not of local origin and could interfere with recovery of the native flora. The Mariposa County Resource Conservation District is conducting a workshop on landscape restoration within the fire zone on September 20, 2008.[9]

Local agency actions recommended: The local agricultural commissioner and Mariposa County Resource Conservation District should be made aware the concerns and mitigations suggested in this report. Public education forums

[9] Mariposa Gazette article

should be supported and emphasized during the first several growing seasons following the fire, with an emphasis on supporting natural vegetative recovery. Noxious weed control and rare plant species identification should be topics of these and other workshops and education programs directed to private property owners. Integrated weed management education and financial support to the local agricultural commissioner and Mariposa County Resource Conservation District is also recommended to allow a comprehensive approach to weed control.

The Mariposa NRCS should assist the two ranchers affected by the fire with grazing recommendations to ensure forage species are allowed to recover and thrive.

C. Treatment Description

Financial assistance and technical support should be provided to local agencies to develop and implement a land owner assistance program to address noxious weed control and identify rare plants on properties within the fire perimeter. This program should include the following elements:

<u>Coordination Meetings</u>

1. Initial and follow-up meetings between local agencies and landowners
2. On-going coordination with federal agencies

<u>Survey</u>

1. High intensity burn areas, mechanical fire lines, drop points and safety zones will require post-fire surveying to evaluate native plant regeneration, rare plant occurrences, soil erosion rates, and weed species invasion. Two survey periods per year in the first two growing seasons are recommended. The first survey should occur in late April for special-status plants and the second in late-June to ensure detection of weed species with different life cycles and blooming periods. Surveyors should look for all California State Noxious Weeds (www.cdfa.ca.gov/weedhome), specifically the early-blooming Italian thistle (*Carduus pycnocephalus)* the second in late-May to early June for klamathweed, knapweeds, and starthistles species. Timing of treatment for yellow star thistle (*Centaurea solstitialis)* is especially important to be effective. Priority should be given to conduct on-the-ground surveys of fire control lines, drop points and safety zones (including those developed outside of the fire perimeter) to determine potential spread of noxious weeds.

2. Map existing weed occurrences.

Weed Treatment

1. Determine appropriate treatment methods, manual thinning or herbicide treatment
2. Develop a treatment plan that includes pest control advisor recommendations as required by law
3. Purchase recommended herbicide and appropriate application equipment if this option is chosen
4. Oversee herbicide treatment operation and/or weed abatement crews.

Monitor

Follow-up weed treatment should be planned following the results of the first year's treatment. Ongoing monitoring should occur for up to three years.

Non-treatment mitigations

Ground disturbing activities subsequent to the fire have the potential to both introduce invasive species and destroy existing occurrences of rare plants. The State has learned that the area known as Burma Grade will have emergency stabilization work and culvert replacement to minimize the potential for catastrophic failure of this critical roadway. Ground-disturbing activities could negatively impact Mariposa clarkia (*Clarkia biloba ssp. australis).* This work is scheduled to take place within the next 30 days under an emergency funding allocation from the Bureau of Land Management. This area, and others like it, should be monitored for rare plant occurrences and exotic species invasions.

Contractors for Pacific Gas and Electric Company (PG&E) have left downed hazard trees within stream corridors. These trees have the potential to block and redirect storm water flows or cause other drainage problems. PG&E needs to remove these trees from storm water pathways.

D. Treatment Costs

Costs for treatment will be highly dependent on the extent of weed invasion, treatments planned and timing. Costs will be lowest if treatments are implemented in the first year following the fire. If weeds are allowed to grow and populations are allowed to expand, treatment costs will be significantly higher. Rough estimates are given as a guide.

Survey - Year 1

Areas to be surveyed	Area or mileage of surveys	Person-days to accomplish	Cost of surveys/year
Mailer to property owners within fire perimeter explaining program; physical surveys (2) of private lands during growing season	894 acres (8,941 acres of private land; 10% of area assumed to be impacted; limited by level of participation)	18 person-days (9 person-days * 2 surveys)	$2,304 (@ $16/hour)
In and adjacent to fire control lines	35 miles*	20 person-days (10 days, 2 survey periods)	$2,560
Total		**38 person-days**	**$4,864**

* Mileage is a rough estimate of mechanical fire line based on local knowledge from CAL FIRE representatives

Survey - Year 2

Follow-up monitoring of same areas will need to be conducted to ensure effectiveness in Year 2 = $4,864

Total Year 1 & 2 weed survey costs = $9,728

Weed Treatment Costs

Manual control

Field crews for conducting thinning operation

Cost component	Unit cost	Number of units	Total cost/yr
Crew boss	$25/hr	80 hrs	$2,000
3-person crew	$12/hr * 3	80 hrs	$2,280
Total			**$4,280**

Total Manual Control Cost = $4280

Herbicide Treatment

If contracting with the county for road-side spraying, the costs will be in this range (estimated from costs charged by Calaveras County):

Year 1

Cost component	Unit cost	Number of units	Total cost/yr
Pest Control Advisor - development of recommendations - oversight of treatment	$25/hr	10 hrs	$250
Labor (Qualified Applicator)	$16/hr	40 hrs	$640
Spray rig	$100/day	3 days	$300
Herbicide	$25/mi	35 mi	$875
Adjuvant	$3/mi	35 mi	$105
Mileage	$0.50/mi	50 mi	$25
Subtotal			$2,195
Administrative	15% of above		$329
Total			**$2,524**

Year 2

If follow-up spraying is necessary, include the same costs = **$2,524**

Total herbicide treatment cost = $5,048

Total OVERALL COST = $19,056

IV. Discussion/Summary/Recommendations

The Telegraph Fire covered approximately 34,091 acres including valuable upland and lowland habitat types that support or have the potential to support 12 special-status plant species. Most of the vegetation communities affected by the Telegraph Fire and associated wildlife have evolved with periodic fires and will naturally regenerate within a few years. Rare plants that may require special attention include Yosemite onion (*Allium yosemitense),* Big-scale balsamroot (*Balsamorhiza macrolepis var. macrolepis),* Small's southern clarkia *(Clarkia australis),* Mariposa clarkia *(Clarkia biloba ssp. australis),* Beaked clarkia *(Clarkia rostrata),* Koch's cord moss (*Entosthodon kochii)***,** Congdon's wooly sunflower ***(****Eriophyllum congdonii***),** Parry's horkelia *(Horkelia parryi),* Congdon's lewisia (*Lewisia congdonii*), Elongate copper moss *(Mielichhoferia elongate)***,** Slender-stemmed monkeyflower *(Mimulus filicaulis),* and Shevock's copper moss *(Schizymenium shevockii)*. If ground-disturbing activities or weed control are planned in these areas, surveys should be conducted at the appropriate time of year to pinpoint rare plant occurrences, and a qualified botanist should be present to guide workers as they implement post-fire treatments.

Seeding and mulching are discouraged because they may inhibit natural recolonization of native species and introduce weeds. Invasive weeds may

invade burned areas and fire control lines throughout the fire as well as contingency lines outside the fire perimeter. Particular areas of concern can be identified by contacting botanists from the Department of Fish and Game – Central Region, the Bureau of Land Management – Folsom Field Office and the USDA Forest Service – Stanislaus National Forest.

Recommendations to prevent invasive weed encroachment include; 1) surveys for invasive weeds in the specified areas during the next two growing seasons; 2) immediate control of invasive plants upon discovery with at least two additional years of follow-up inspections and control, 3) avoidance of seeding; and 4) using weed-free mulch if this treatment cannot be avoided entirely.

Homeowners who desire to replant their properties are encouraged to use alternatives to invasive plants. Lists of invasive species to avoid planting are available from the California Invasive Plant Council (http://www.cal-ipc.org/ip/management/plant_profiles/index.php). Other than necessary to protect life and property, avoid seeding and tilling in wildlands as much as possible. If seeding is needed, weed-free seed should be used.

Special-status plant protection and noxious weed invasions will be improved by closing fire control lines with shrubs, logs, or other means to minimize trespass.

Avoid disturbing islands of unburned vegetation, which provide wildlife habitat as well as seed sources for natural revegetation.

Grazing should be restricted on burned landscapes to allow natural vegetation communities to recover and thrive.

Elderberry is protected by law. Removal of these plants or degredation of their habitats is prohibited.

There are some limited opportunities to assist in improving restoring forest health in ponderosa stands severely affected by the fire. Funding through CAL FIRE's California Forest Improvement Program is recommended.

Pacific Gas and Electric Company should be made aware that trees in drainage corridors are of concern to foresters and hydrologists. Trees that block storm drainage pathways should be removed.

V. References

Telegraph Fire Burned Area Emergency Response (BAER) Report - Bureau of Land Management – Folsom Field Office, August 2008

Telegraph Fire Burned Area Emergency Response (BAER) Report – USDA Forest Service – Stanislaus National Forest, August 2008

Basin Complex / Indians Fire -State Emergency Assessment Team (SEAT) Draft Final Report, August 2008

BIOS, Biological Information Observation System, California Department of Fish and Game, Sacramento, California accessed on September 7, 2008.

California Invasive Plant Council, website: http://www.cal-ipc.org/ip/index.php

California Natural Diversity Database, California Department of Fish and Game, Sacramento, California accessed on September 7, 2008.

California Natural Diversity Database. 2008. RareFind 3, Version 3.1.0 (June 29, 2008 update). Sacramento, CA: California Department of Fish and Game.

California Native Plant Society. 2008. On-line inventory of rare and endangered plants, seventh edition. Accessed at http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi on September 8, 2008.

Persons contacted during report development:

Afman, Dawn, Soil Conservationist, Mariposa County Natural Resources Conservation Service

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Boze, Cathi, Agricultural Commissioner, Mariposa County

Clines, Joanna, Forest Botanist, Sierra National Forest

Colwell, Alison, Botanist, Yosemite National Park

Cranston, Peggy, Wildlife Biologist, Bureau of Land Management – Folsom Field Office

Daly, Clark, Fire Captain, CAL FIRE – Rancheria Forest Fire Station

Franklin, Al, Botanist, Bureau of Land Management – Folsom Field Office

Greenwood, Dave , Merced River Ranger, Bureau of Land Management

Haas, Jennie, Botanist, Stanislaus National Forest

Little, Robert, Forester, CAL FIRE – Amador-El Dorado Unit

Moore, Peggy, Plant Ecologist, U.S. Geological Survey, Yosemite

Rowney Roscoe, Division Chief, CAL FIRE –Madera-Mariposa-Merced Unit

VII. Maps

Figure 1 - Telegraph Fire – Vegetation Types
Figure 2 – Telegraph Fire – Vegetation with Fire Severity overlay

Appendix 1 – Sensitive Species Plant Scoping and Location Information

This report summarizes, in general, the likelihood that rare plants were impacted by the fire. Records of plant occurrences, if available, are generally identified from survey records on public lands and local knowledge. Rare plant occurrences on private lands must generally be inferred as few survey records are available.

Appendix 1 summarizes the special-status species scoping for the Telegraph Fire. Due to the size of the fire and where it falls in the center of four quads, scoping within the covered by the fire was considered adequate to determine the known or potential rare plant occurrences within the fire zone. This analysis is based on vegetative communities found within the fire perimeter, local specialist knowledge and plant associates. Species that may occur are further analyzed for impacts and recommendations to avoid or minimize the impacts. Table 1 describes special-status plants and their likelihood of occurrence.

- SPECIAL-STATUS SPECIES INFORMATION IS NOT AVAILABLE FOR PUBLIC DISTRIBUTION. LOCAL AGENCIES OR THEIR CONTRACTORS CAN CONTACT CA DEPARTMENT OF FISH AND GAME – CENTRAL REGION BOTANIST AT (559) 243-4005 FOR SPECIFIC PROJECT ASSISTANCE.

APPENDIX B: Geology Technical Specialist Report

TECHNICAL SPECIALIST'S REPORT
STATE EMERGENCY ASSESSMENT TEAM (SEAT) Emergency Report
Resource: Geology

Fire Name: Telegraph Fire **Month/Year:** July 2008

Author Name: Darby K. Vickery PG, Engineering Geologist
California Department of Water Resources
Division of Flood Management
1416 9th Street, Room 1601
Sacramento, CA 95814
Office (916) 651-0881
Vickery@water.ca.gov

Purpose and Background

This SEAT effort is meant to compliment and extend existing assessment efforts already undertaken. The Burn Area Emergency Response (BAER) team produced documents 1) Emergency Stabilization Plan, and 2) Burned Area Rehabilitation Plan for review and use. Post-fire watershed and assessment and recovery operations are conducted to:

- Identify on-site and downstream threats to public health or safety from various landslide events such as floods, debris flows and torrents, rock fall, rock avalanche, road hazards, or other fire-related problems.
- Identify threats to watershed resources including: Excessive erosion, impaired water quality, threats to wildlife, fisheries, and botanical values, and cultural resources.
- Determine measures needed to prevent or mitigate identified threats.

This Draft Technical Specialist's Report is a rapid assessment of the fire area and downstream values at risk which may be impacted by post-fire effects which may pose a threat to life or property or will cause unacceptable degradation to natural resources.

This report nor the overall SEAT report is not meant to imply that all risks and all hazards have been identified and that this analysis and suggested mitigations will eliminate all risk from identified hazards.

Resource Condition Assessment

Resource Setting

The Telegraph Fire began on July 28, 2008 and ultimately burned 34,091 acres within Mariposa County. The fire area is located in the Mother lode region of the Sierra Nevada geomorphic province west of Yosemite National Park. The fire perimeter can be

located on portions of the following U.S. Geological Survey 7.5-Minute Series Topographic Maps:

- Bear Valley Quadrangle 1947 (Photorevised 1973)
- Feliciana Mtn. Quadrangle 1992
- Kinsley Quadrangle 1992
- Buckhorn Peak Quadrangle 1947 (Photorevised 1987)

Geological information for the burn area is derived from two maps:

- Geologic Map of California, Mariposa Sheet, 1:250,000 scale, 1967 (Fourth printing 1991), and
- Geologic Map of the San Francisco-San Jose Quadrangle, 1:250,000 scale, 1990

When placed side by side for burned area consideration, a noticeable difference in color types and rock identification becomes apparent (Figure 1). This is due to an increased understanding between 1967 and 1990 and change in nomenclature. Table 1 provides a general comparison chart of formation types between the two maps. Actual formation correlation may differ with further investigation.

The San Francisco-San Jose quadrangle contains a legend symbol for Quaternary landslide deposits (Qls). Although Qls features are commonly mapped in the Coast Range area of the sheet, they are conspicuously missing in the mapped portions of the Sierra Nevada. Qls symbology is missing entirely on the Mariposa Quadrangle. The difference reflects change over time in the geologic community concerning recognition of landslide hazards as related to public health and safety as well as State infrastructure and watershed resources.

An additional map, Fault Activity Map of California and Adjacent Areas, 1:750,000 scale, 1994, was consulted for information. The above geologic maps can be obtained through the California Geological Survey.

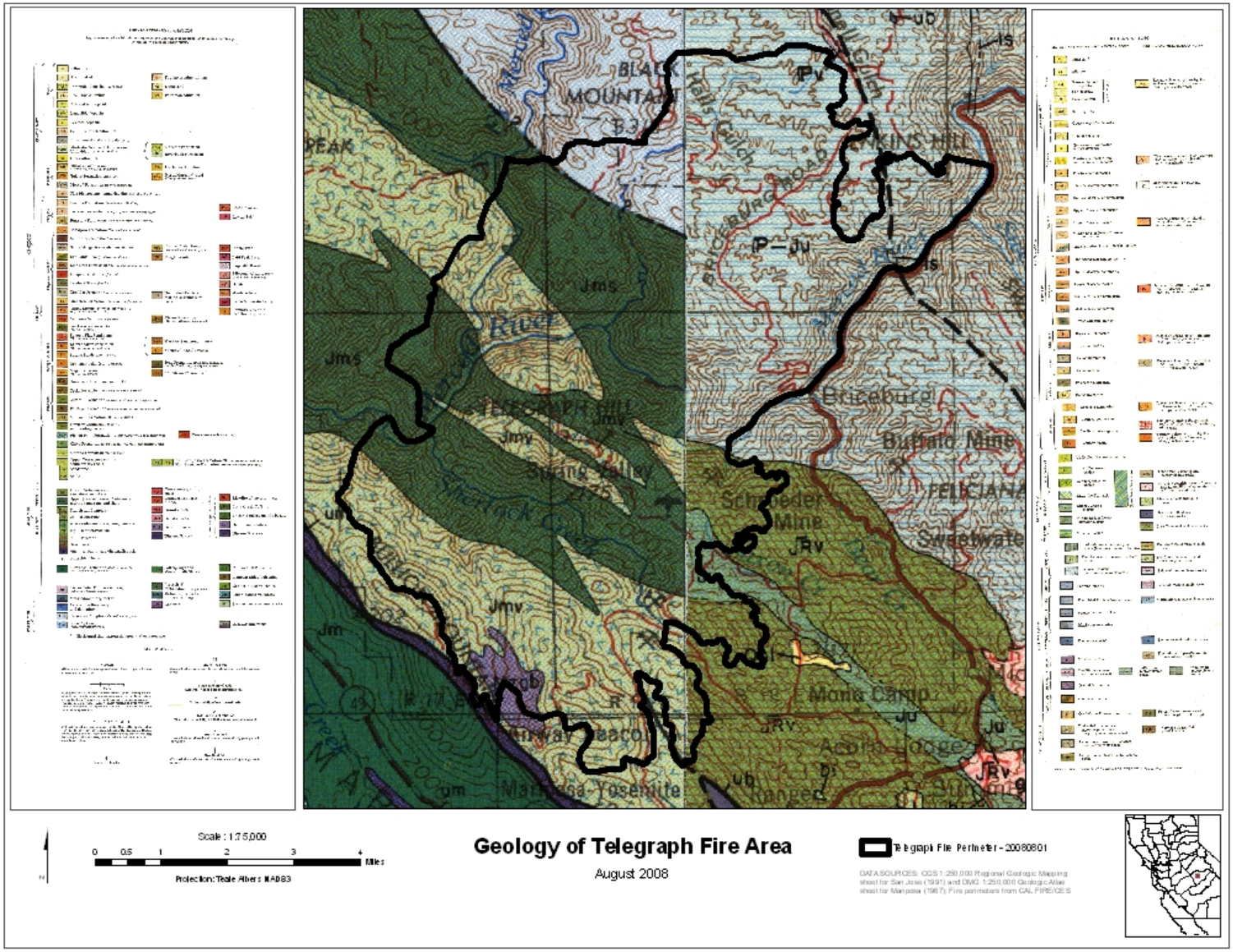

Scale : 1:75,000
0 0.5 1 2 3 4 Miles
Projection: Teale Albers NAD83
Geology of Telegraph Fire Area
August 2008
Telegraph Fire Perimeter - 20080801
DATA SOURCES: CGS 1:250,000 Regional Geologic Mapping sheet for San Jose (1991) and DMG 1:250,000 Geologic Atlas sheet for Mariposa (1967); Fire perimeters from CAL FIRE/CES
BLACK MOUNTAIN
PEAK
KING HILL
Briceburg
Buffalo Mine
PELICIANA
Schneider Mine
Sweetwater
Mariposa-Yosemite
Jms
Jmv
Jm
Jv
Ju
JRv
P-Ju
Pv
ub
um
is

Table 1. Comparison of geologic legend symbols

Comparison of Geologic Legend Symbols			
San Francisco-San Jose Quadrangle		Mariposa Quadrangle	
Mzg	Granitic rocks	Gr	Mesozoic granitic rocks
Mzd	Dioritic rocks	Gr	Mesozoic granitic rocks
Mzgb	Gabbroic rocks	Bi	Mesozoic basic intrusive rocks
Um	Ultramafic rocks	Ub	Mesozoic ultrabasic intrusive rocks
Jm	Mariposa Fm. (slate, graywacke, conglomerate marine)	Ju	Upper Jurassic marine
Jms	Jurassic (?) metasedimentary rocks	Ju	Upper Jurassic marine
Jmv	Jurassic (?) metavolcanic rocks	Jtrv	Jura-Triassic metavolcanic rocks
Pzcc	Calaveras Fm.	IP-Ju	Paleozoic marine

Regional Overview

The Sierra Nevada mountain range is a geomorphic province that is approximately 400 miles long and extends from the Cascade Range to the Mojave Desert. The Sierra Nevada is a tectonic block of the earth's crust which has been tilted westward as a result of seismic uplift along faults on the eastern flank. Asymmetric uplift of this block during the last four to five million years (Pliocene Epoch) caused the west-flowing rivers to cut deep valleys and steep-walled canyons.

The Sierra Nevada forms a barrier to the Pacific storm belt and as a result, orographic rainfall (rising of water-laden clouds over the mountains) is common. During wet years, weak rocks and unconsolidated surfacial deposits become saturated and may fail as rock falls, debris slides, and landslides. Debris flows generated during rain storms on recently burned areas have destroyed lives and property throughout the Western U.S. (Cannon, et al, 2007).

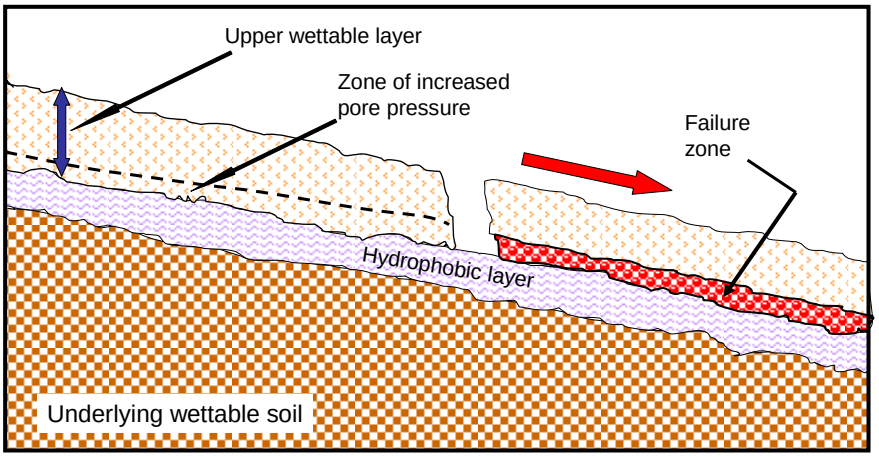
Rock types underlying the southern portion of the burn area are predominately hard Mesozoic age metasedimentary and metavolcanic rocks (Wagner, et al 1990). The northern portion of the burn area is underlain by hard Paleozoic metasedimentary rocks (Strand, 1967). Intact rock outcrops commonly exhibit fairly strong structural foliation and well developed joint planes. Depending on orientation with respect to the open mountain face, structural features such as joints and foliation may become adverse and produces rockfall downslope. This appears to be the case in the Merced River canyon and other inner gorges within the burn area.

Soil has developed over the bedrock. In some areas, the soil is weathered regolith and in other areas, soil and sediments have been deposited as sedimentary features. Often, the soils contain a fair amount of rock fragments and clasts. For more information on soils, please refer to the Soil Specialist's report.

Existing and previous landslides, debris chutes and other mass wasting features are found within the burn area. A Landslide Inventory map of the Kinsley 7.5 Minute Quadrangle in Sierra National Forest (provided for use by USDA Forest Service Province Geologist Alan J. Gallegos) indicates that debris slides and other landslide features are common in Merced canyon just outside of the burn area. The large Ferguson Rock Slide, a rock block slide-rock fall complex approximately nine acres in size, is located about six miles from the town of El Portal (Gallegos and DeGraff, 2006). In response to the severity of this landslide, a multi-agency response plan has been formulated (South Central Sierra Inter-agency Incident Management Team, 2006).

Many soils exhibit water-repellent properties after burning. On a typical burned slope, the surficial soil is loosely compacted and easily wettable (Turner and Schuster, 1996). During moderate to high burn intensities, waxy organic molecules generated by the burning of vegetative matter on and in the soil, are driven down into the soil where a hydrophobic barrier forms resisting penetration by water. During a rain event, increased pore pressure above the hydrophobic zone can cause the surface soils to slip. A steep slope is not necessary to start the process of slide movement. As momentum increases with the inclusion of pebbles, cobbles, dead vegetation, and boulders, a rapid pulse of debris flow is formed. The results can be devastating.

Schematic diagram of post-fire colluvial soil slope, showing effects of hydrophobic soil layer (after Turner and Schuster, 1996)



B. Survey Methods

The State Emergency Assessment Team (SEAT) assembled in Mariposa on September 2, 2008. After an introductory informational session and safety tailgate meeting, the SEAT was provided a tour of the burn area out to Telegraph Hill for which the fire was named. Field surveys were performed with 4WD vehicles throughout most of the burn area. Depending on need, some specialists walked distances to assess botany, biology, or water quality.

A slope stability map showing locations of **existing** landslides, debris chutes and landforms susceptible to mass movement of the burn area was not available at the outset of study. Locating existing features is profitable for use when determining the likelihood of debris slide reoccurrence or reactivation of other slope failure mechanisms.

For slope stability assessment, the geologist primarily made use of the 4WD vehicle to cover large distance and to drive to high over looks. Two sets of binoculars (10X50 and 16X100) were used to view geomorphic features across canyons, to look downslope along canyon crests and upslope from State Route 140. A 7.5 Minute topographic map placed on a field board was used to record and draw information directly to the sheet. In some instances, walking over the crest was necessary to examine the interior of steep scarp features.

A series of aerial photographs were supplied by Alan Gallegos (U.S. Forest Service) which covered the northeastern portion of Merced Canyon. A Leitz Sokkisha MS-27 mirror stereoscope was used to assess existing landslide features in the photos. High quality mapping of geomorphic forms can be obtained with this type of aerial surveying. This type of mapping technique is more applicable when time is available.

Field information was reassessed in the office. After review, the hard copy maps were then scanned at Kinkos to form a .tif file image which was imported into a GIS system. SEAT GIS specialist John Carotta then constructed the map titled: **Geomorphic Features of Potential Landsliding Related to Burn Intensity, Telegraph Fire, Mariposa County, California** (Figure 2). This map is preliminary in nature. Any site-specific work that requires geological assessment should by performed and addressed individually on a site-specific basis.

General Observations

The principle geologic concern with the Telegraph fire area is an increase in the potential for in-channel floods, hyperconcentrated floods, debris flows or torrents, debris avalanches, and rock falls or topples resulting from slope movement. The primary mechanisms for these landslide features are:

- Increase in runoff which results from the loss of live vegetation and evapotranspiration,

- Reductions in infiltration due to the removal of duff and the dehydration of the soil,
- Development of hydrophobic soils,
- The simplification of surficial runoff patterns, and
- The loss of mechanical support of hill slope materials that was provided by vegetation and vegetative litter along stream channels.

The fire severity map indicated large areas of moderate to high fire severity throughout much of the burn. This was consequently observed during the field mapping for existing landslide features and evaluating slopes for potential future instability.

Three areas of urgency for landslide stability consideration are:

- Lost residences, damaged and undamaged residences, homes and dwellings located within or downstream from burned areas which could cause loss of life and suffer direct impacts from debris flows or debris torrents
- Impacts to State Route 140 passing through Merced canyon. Heightened risk of debris flows and debris torrents, associated rock fall and rock avalanche into the canyon which may cause loss of life, road closure, and impairment to the Wild and Scenic River, and
- Impacts to Burma grade.

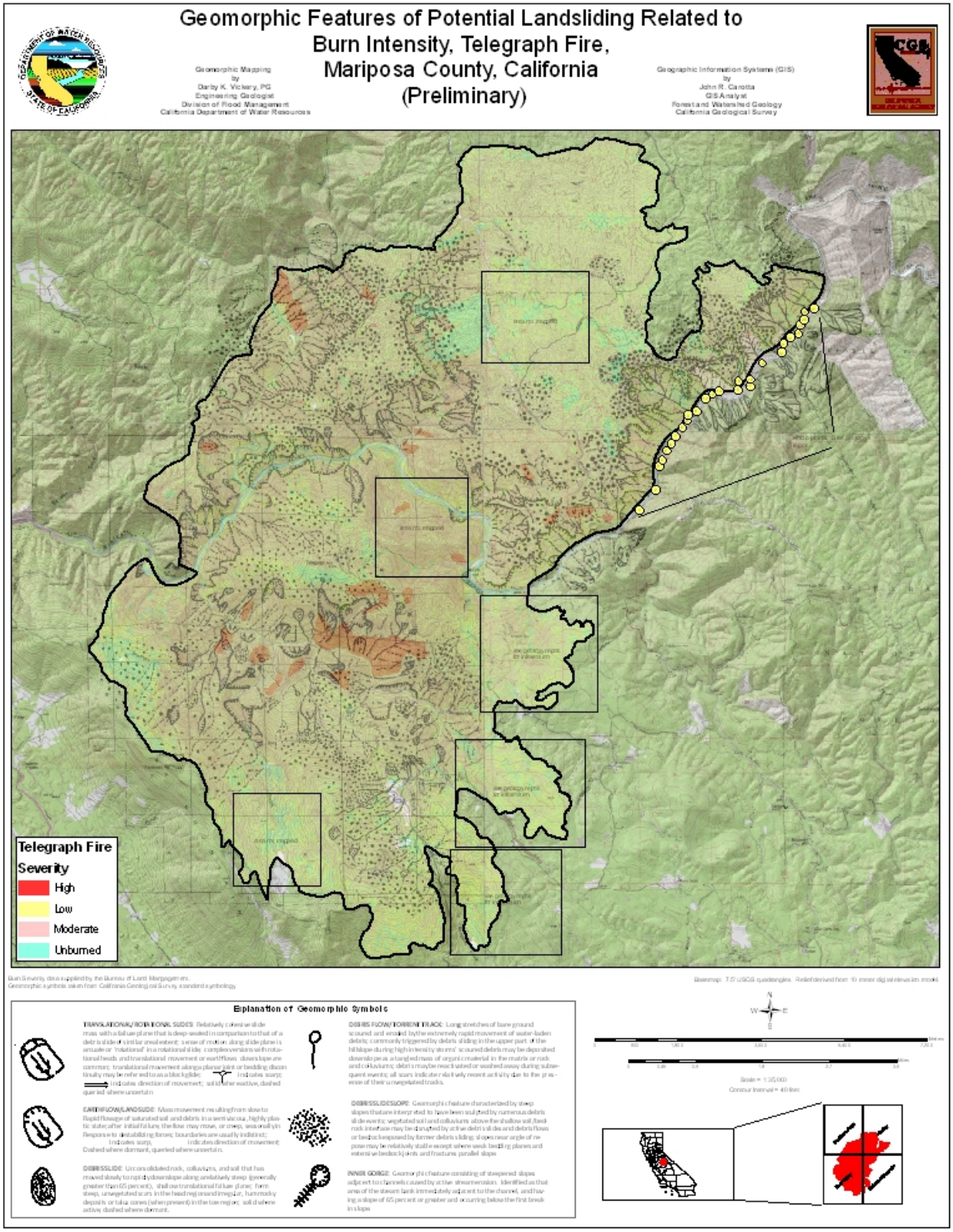
Other impacts such as slope stability and water quality in the drainages of
Sherwood creek, North Fork Merced River, Halls Gulch, Good Gulch, and ultimately Lake McClure are also of concern and will be addressed.

Geomorphic Features of Potential Landsliding Related to Burn Intensity, Telegraph Fire, Mariposa County, California

This map was generated in the field and is intended to provide interested agencies with information to assist in recovery and rehabilitation efforts. The map is preliminary in nature. The layers of this map are as follows:

- Basemap: 7.5 Minute USGS Quadrangles. Relief derived from 10 meter digital elevation model.
- Burn severity data supplied by the Bureau of Land Management.
- Geomorphic symbols taken from California Geological Survey standard symbology.
- Areas that were not mapped are designated as such.
- Areas that were later reviewed which are not on the map are referred to in this report.
- Yellow-numbered dots refer to a photo base log created along the State Route 140 corridor in Merced canyon. These photos can serve as a post-fire catalogue from which future studies. The Rockfall Hazard Rating System (Pierson and Van Vickle, 1993) can be utilized to make specific assessments of debris chutes and/or rockfall sites and a base photo log can serve as a beginning.

Figure 2:


Geomorphic Features of Potential Landsliding Related to
Burn Intensity, Telegraph Fire,
Mariposa County, California
(Preliminary)
Geomorphic Mapping
by
Darby K. Vickery, PG
Engineering Geologist
Division of Flood Management
California Department of Water Resources
Geographic Information Systems (GIS)
by
John R. Carotta
GIS Analyst
Forest and Watershed Geology
California Geological Survey
Telegraph Fire
Severity
High
Low
Moderate
Unburned
Explanation of Geomorphic Symbols

Interpreting the geomorphic features of potential landsliding related to burn intensity map

The common symbol for debris slide slope (scattered dots) also includes burn areas where potential movement of soils may occur as a result of possible generation of hydrophobic zones or layers based on the field-visual estimation of burn severity.

The symbol for debris flow or torrent track is used often on this map and is generally restricted to topographic drainage. The symbol is solid where field observation suggests that debris flooding of flows have occurred within a recent past. The symbol is dashed in areas where the potential for debris flows or torrents may occur.

The symbols used for translational slide/rotational slides, and earthflow landslides refer to fairly large-scale features that were recognized in the field as large-scale mass wasting features.

It must be stressed that not all the areas where these features are mapped are absolutely going to occur. Debris flows, debris torrents, rock falls or other mass wasting features may occur in areas not mapped. This map serves only as a guide to potential sites.

Discussion

Burn severity appears to have occurred mostly in the Sherlock Creek watershed drainage area (including Lyons Gulch and Drunken Gulch. This drainage is steep-walled and contains a number of inner gorges and large-scaled Landsliding features. This suggests that the potential for multiple mass wasting events are likely to occur. These events may occur early as the first winter rains cover the region. Downstream stakeholders may be impacted by multiple pulses or cumulative pulses of debris flow and/or torrent events. Significant peril for loss of life or property may occur for persons or property located along the lower reaches of Sherlock Creek during times of inclement weather.

Three high-burn severity sites within the North Fork Merced River drainage also contain geomorphic features related to prior landslide events. These sites have an increased potential for additional or renewed sliding.

The crest and flanks of the Burma Road also indicate areas of moderate to high burn severity. As stated elsewhere in this report, the Burma Road is built into a complex metastable landslide. The potential for renewed partial or increased movement on portions of the hillside are elevated.

Along the crest of the Merced Canyon above State Route 140, the burn areas are considered moderate. The map depicts much of the canyon as an inner gorge consisting of inner slopes which reach down to the river channel. A fairly abundant

supply of debris-slide generating material exists along the crest of the canyon. Debris slides and rock fall events generated by debris slides at multiple sites may potentially occur (even simultaneously) depending on the severity, length of time, and location of a rain storm event.

Specific Observations of Values at Risk for Loss of Life, Property, or Infrastructure

1) Local Residences directly or indirectly impacted by the Telegraph fire:

a) Mariposa Creek watershed area (southern portion of the fire)
The fire primarily burned the hill tops in this area. Nontheless, there are at least eight drainages which proceed from the burn areas east and earth movement could initiate in the upper reaches of the burn and travel down hill. Depending on the strength and duration of a rain event, cumulative downslope flows may subject homes, outbuildings, and other structures located near the creek to sudden and potentially catastrophic flooding, debris flows and torrents. Impacts to surface water storage or conveyances such as ponds, canals, small dams and/or reservoirs within the drainage catchment area may be affected. Any burned soil area upstream from a value of risk may mobilize and present a danger. Prudent steps should be taken to minimize values at risk for loss of life, property, or resources.

b) Whitlock Creek watershed area
Nearly all of the Whitlock Creek watershed area was burned to one severity or another. As such, potential for increased runoff, flooding, debris floods, channel and bank erosion, or debris torrents is substantially increased. The Whitlock creek watershed is fairly large. Geomorphic features such as steepened slopes, increased soil availability, long runout, and cumulative effects suggest that homes and outbuildings such as well houses, water storage tanks, or other outbuildings located within a flood channel or overbank deposits may be severely impacted. Depending on the strength and duration of a rain event, cumulative downslope flows may subject homes, outbuildings, and other structures located near the creek to sudden and potentially catastrophic flooding, debris flows and torrents. Impacts to surface water storage or conveyances such as ponds, canals, small dams and/or reservoirs within the drainage catchment area may be affected. Groundwater recharge for this watershed may be affected. Leach fields within this watershed may become impacted. Any burned soil area upstream from a value of risk may mobilize and present a danger. Prudent steps should be taken to minimize values at risk for loss of life, property, or resources. Any planned or ongoing rebuilding operations in a burned watershed should consider the safety of such operations and proximity to potential debris flow sites.

c) Sherlock Creek Road watershed area

Sherlock Creek Road is located in the upper portion of the Sherlock Creek watershed. Low and moderate burn areas occurred on both ridge tops and upper hills surrounding the upper drainage. At least 14 drainages proceed off of the hill tops and down into Upper Sherlock Creek. A number of homes, residences, out buildings, equipment and other values of risk are situated adjacent to drainages. Depending on the strength and duration of a rain event, cumulative downslope flows may subject homes, outbuildings, and other structures located near the creek to sudden and potentially catastrophic flooding, debris flows and torrents. Impacts to surface water storage or conveyances such as ponds, canals, small dams and/or reservoirs within the drainage catchment area may be affected. Groundwater recharge for this watershed may be affected. Leach fields within this watershed may become impacted. Any burned soil area upstream from a value of risk may mobilize and present a danger. Prudent steps should be taken to minimize values at risk for loss of life, property, or resources. Any planned or ongoing rebuilding operations in a burned watershed should consider the safety of such operations and proximity to potential debris flow sites.

d) Saxon Creek watershed area

Saxon Road joins together with Sherlock Creek Road and the road out to Telegraph Hill. Saxon Road continues easterly around a tall hill which suffered low to moderate burn intensities. Saxon road also connects with Colorado School road located out of the burn area towards the east. The tall hill which was burned drains into Sherlock creek on the western side of the hill and into Long Canyon Creek on the eastern side. At least four long drainages flow out of the burn area toward a northerly direction. A number of homes are built on or adjacent to two of these northerly-draining burn-area drainages. . Depending on the strength and duration of a rain event, cumulative downslope flows may subject homes, outbuildings, and other structures located near the creek to sudden and potentially catastrophic flooding, debris flows and torrents. Impacts to surface water storage or conveyances such as ponds, canals, small dams and/or reservoirs within the drainage catchment area may be affected. Groundwater recharge for this watershed may be affected. Leach fields within this watershed may become impacted. Any burned soil area upstream from a value of risk may mobilize and present a danger. Prudent steps should be taken to minimize values at risk for loss of life, property, or resources.

2) State Route 140 Corridor Within the Merced River Canyon

Threat of loss of life, property, and the closure of State Route 140 which passes through the Merced canyon is recognized due to an increase in the likelihood of sudden rain-initiated downslope debris. Any planned or ongoing rebuilding operations in a burned watershed should consider the safety of such operations and proximity to potential debris flow sites. Soil materials which exist along the crest of Merced canyon and inner gorge may ravel and sough down slope. If some of the soils have become hydrophobic due to

moderate and high burn intensity, debris flows may initiate even during low rainfall events. Rock fall, initiated by this sloughing soil material will proceed downward. Rock bouncing down a steep slope can and may enter the Wild and Scenic Merced River corridor and may bounce up and onto State Route 140. Driving the corridor during a rain event may become treacherous. The partial or complete closure of this vital corridor is strategic for continued commerce and well being of the County of Mariposa. Highway closure impacts travel and commerce in and out of Yosemite National Park and this has a direct and immediate effect on the economy of Mariposa as the County seat as well as other smaller communities such as Midpines, El Portal, Cathays Valley and others.

3) Burma Road, beginning at Briceburg Bridge and ascending from Briceburg north and up to the Merced River canyon ridge top.
The Burma Road has been used extensively by various government agencies and private individual for at least 75 years. The road provides the only access to an extensive acreage of public lands. Governmental users include the U.S. Forest Service, the Bureau of Reclamation, Cal Fire, County law enforcement, and others. The Burma Road was built and exists on a metastable landslide. Geologic inspection of the grade, including measurement of changing rock foliation direction and dip, disappearance and reappearance of joint sets in and out of slide masses, recognition of chaotic deposits at slide toes, changes in material color, and assessment of geomorphologic forms concludes that the slope in which the Burma Road has been constructed has failed in multiple areas in the past. In spite of continued high maintenance and oft time's dangerous passage during certain times of the year, it remains a vital asset to those needing to access the back country. High and moderate burn severity occurred on the crest and flank portions of the Burma Road hillside. Materials at the top of the road consist of metastable landslide debris and cut-bank sliver-fill embankments. Water drainage problems and spring activity exist on this road. When assessing the SEAT geology report and accompanying map titled "Geomorphic Features of Potential Landsliding Related to Burn Intensity", maintaining the Burma Road may require a plan of exigency to address the situation.

Emergency Determination and General Recommendations

An emergency determination is made based on geologic assessment of burned areas and areas adjacent for potential mass movements in the form of debris slides and flows, debris torrents, rock falls, rock avalanches, and other destructive mass wasting events which may endanger the lives of people and property. Depending on weather related events, slope failures may be more substantial and may occur at an accelerated rate than what the general population has experienced in memory for this region and area. Values at risk include but are not limited to life, property, access, travel, and commerce. Homes, outbuildings, domestic wells, leach fields, sewage systems, storage tanks and other properties may be at risk. Infrastructure including but not limited to culverts,

berms, bridges, retaining walls, highways and roads, impacts to buried infrastructure such as buried cable, power and water may be at risk.

General Recommendations:

a). Personal Residences Directly or Indirectly affected by the Telegraph fire
Recognize and respond to the increased potential for sudden flooding events in your area including but not limited to debris flows or debris torrents from upstream sources or areas burned by the Telegraph Fire. Effectively take action to stabilize and/or limit, or deflect potential mass movement on slopes that may impact lives and property.

b). State Route 140 in Merced Canyon
Recognize the potential severity of multiple mass movements within the canyon up to and including the closing of State Route 140. It is recommended that this report be sent to Caltrans rock fall mitigation specialists as soon as possible so that a rockfall hazard rating of burned slopes may be accomplished prior to winter. Additional monitoring may become necessary including 24-hour monitoring from a safe distance. Similar methods, technologies, and protocols that are used to monitor the Ferguson slide may be implemented and installed.

c). Burma Road north of Briceburg
The Burma Road is recognized as a value resource. The hillside supporting the road is a complex landslide which has moved in the past. Slope stability has been and will continue to be an issue. Dewatering of the slopes and hillside masses may become necessary. This may take the form of culvert replacement, culvert enlargement, culvert addition, lining water drainages off of the road, protecting drainage slopes off of and adjacent to the road, horizontal drilling and placement of horizontal drainage systems, and other dewatering methods. A monitoring program should be instituted for this important value. The monitoring system may include but is not limited to installation of slope inclinometers, strain wires, groundwater level monitoring and remote sensing.

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Appendix C: Hydrology and Water Quality Technical Specialist Report

TECHNICAL SPECIALTIST'S REPORT
STATE EMERGENCY ASSESSMENT TEAM (SEAT) Emergency Report
Resource: Hydrology
Fire Name: Telegraph CA-MMU-009779 **Month/Year**: September/2008

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Resource Condition Assessment

I. Resource Setting

A. Setting

The Telegraph Fire burned approximately 34,000 acres, all in Mariposa County and almost all in the Merced River Watershed upstream from Lake McClure Reservoir, operated by Merced Irrigation District (MID). In fact, 98% of the burned area is in the Merced River Watershed and 2% was in the adjoining Mariposa Creek Watershed. The primary focus of this report is on the burned area in Merced River Watershed.

Affected Watersheds

The fire burned 33,000 acres in the Upper Merced River Hydrologic Unit (over 660,000 acres, (listed as CALWATER 6537.000000 and USGS HUC 1804008). and approximately 1,000 acres in the Mariposa Hydrologic Unit (listed as CALWATER 6538.000000 and USGS HUC 1804007). Watershed references in report will be made using CALWATER 2.2.

The Upper Merced River Hydrologic Unit is comprised of 80 planning watersheds, of which three are below Lake McClure. The Telegraph fire was limited to 10 planning watersheds eight within the Upper Merced and two within the Upper Chowchilla-Upper Fresno watershed (see Figure Hydrology-2).

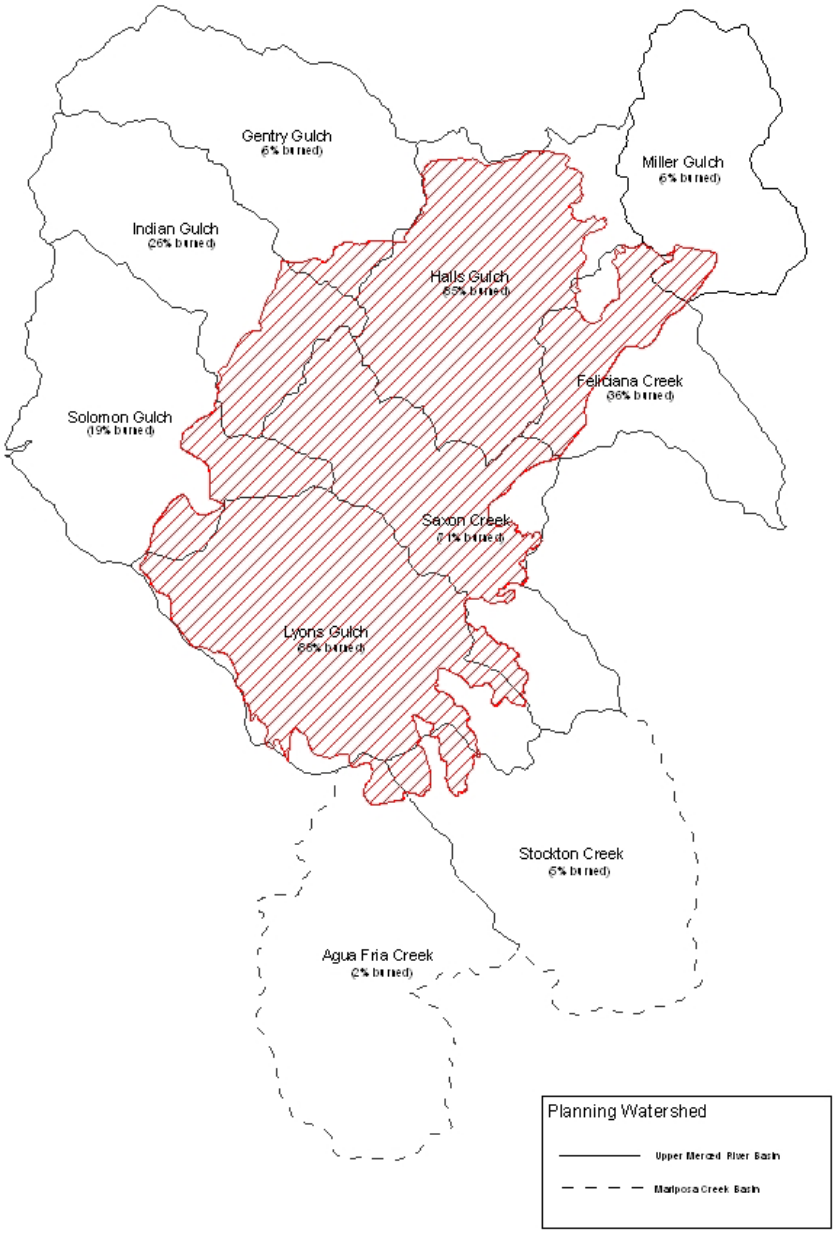

Figure Hydrology-2. The Telegraph Fire was almost entirely within the Merced River basin. The fire burned all or portions on 8 planning watershed in the Merced River basin and very small portions of 2 planning watershed in the Mariposa Creek basin. This figure shows the planning watershed and in relation to the fire perimeter. Not all areas within the fire perimeter burned. See fire intensity map.

The eight planning watersheds within the Telegraph Fire are tributary to the Merced River. The beneficial uses designated for the Merced River from its source to McClure Lake are as follows: potential municipal and domestic supply (MUN); agricultural supply (AGR), hydropower generation (POW); water contact recreation, including canoeing and rafting (REC-1); non-contact water recreation, including aesthetic enjoyment (REC-2); warm freshwater habitat (WARM); cold freshwater habitat (COLD); and wildlife habitat (WILD). The Water Quality Control Plan for the Sacramento and San Joaquin River Basins, Fourth Edition, Revised October 2007 designates MUN as a potential use; however, it is an existing use as the Mariposa Public Utility District has a municipal water supply intake on the river downstream of the discharge.

The Aqua Fria Creek and Stockton Creek planning watersheds are within Mariposa Hydrologic Unit (No. 538.00). Both planning watersheds flow to Mariposa Creek, which is tributary to Duck Slough, which flows into the Eastside Canal. Water from the Eastside Canal is distributed to a system of natural and manmade channels that drain to the San Joaquin River downstream of Mendota Pool. The beneficial uses of Mariposa Creek are as follows: agricultural supply (AGR), water contact recreation (REC-1) and non-contact water recreation (REC-2), warm freshwater habitat (WARM), and wildlife habitat (WILD).

Runoff from 98% of the burned area flows into Lake McClure Reservoir, which has a catchment area of 1037 square miles or about 663,680 acres (MID). The downstream edge of the burned area is about 2 river miles upstream from the reservoir. Most of the water that flows to Lake McClure originates upstream of the fire in Yosemite National Park. About 5% of the watershed that flows in Lake McClure Reservoir burned in the fire (see Figure Hydology-1). The focus of this report is the Merced River watershed.

In contrast, runoff from 2% of the burned area flows into Mariposa Creek, which eventually flow through the town of Mariposa. The area burned is relatively small and on a ridge top. Burn severity is a mix of moderate, low and unburned. This small portion of the burned area is likely to have no significant downstream hydrologic effects. Mariposa P.U.D. has a small domestic water supply reservoir on Stockton Creek. The watershed above the reservoir was not affected by the fire, water from the Merced watershed is pumped into this reservoir, when available, to supplement Mariposa's water supply.

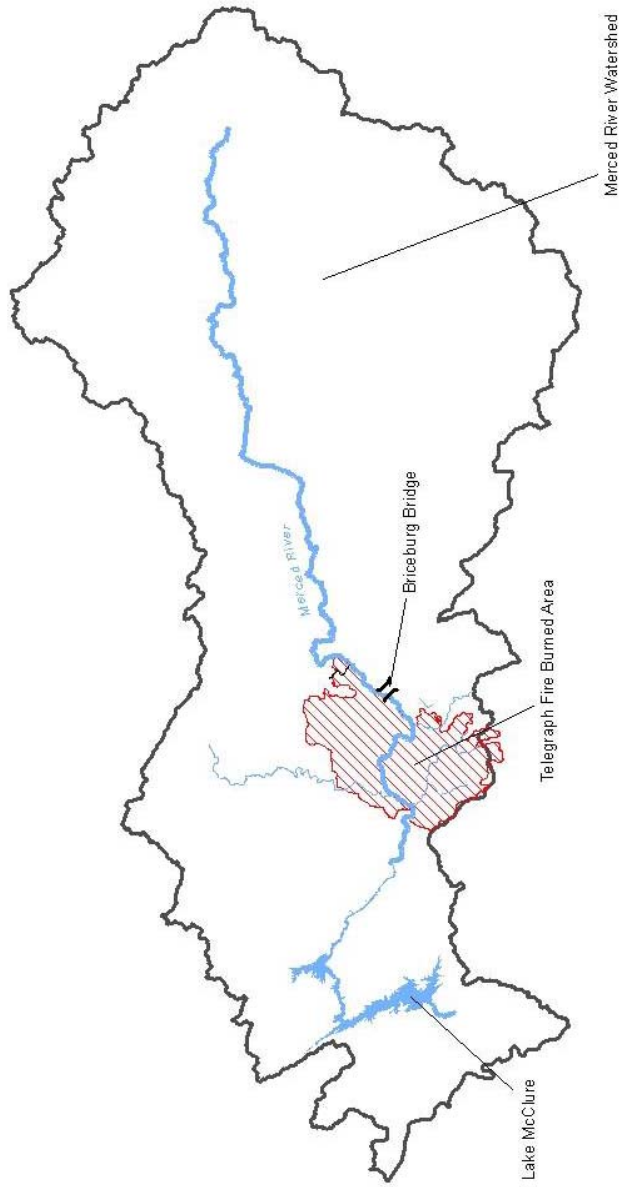

Figure Hydrology-1. The Telegraph Fire burned approximately 5% of the Merced River Watershed above Lake McClure. This figure shows the perimeter of the Telegraph Fire in relation to Merced River watershed above Lake McClure, a major reservoir operated by the Merced Irrigation District (MID) for water and power supply.

Upper Merced HU Planning Watersheds	CALWATER 2.2	Burned (acres)	Watershed (acres)	% Burned
Feliciana Creek	6537.300403	2,335	6,456	36%
Gentry Gulch	6537.300302	542	9,179	6%
Halls Gulch (Good Gulch and Halls Gulch)	6537.300502	8,765	10,314	85%
Indian Gulch	6537.300301	2,184	8,472	26%
Lyons Gulch (includes Drunken Gulch, Lyons Gulch, Sherlock Creek, Whitlock Creek)	6537.300602	10,720	12,212	88%
Miller Gulch	6537.300401	397	6,812	6%
Saxon Creek	6537.300503	6,325	8,941	71%
Solomon Gulch	6537.300601	1,919	10,187	19%
Upper Chowchilla-Upper Fresno HUPlanning Watersheds	CALWATER 2.2	Burned (acres)	Watershed (acres)	% Burned
Agua Fria Creek	6538.000201	249	11,565	2%
Stockton Creek (includes Mariposa Creek and Stockton Creek)	6538.000206	578	10,939	5%

Precipitation and floods

Elevations in the burned area run from about 850 feet to 4,000 above mean sea level. The watersheds in the burned area are rain dominated with occasional snowfall mostly in the upper portions. Due to the orographic effect more precipitation falls on the upper portions then the lower portions.

Annual rainfall for the Mariposa can range from 59 inches (1982) to 15 inches (1961), with an average annual precipitation of 30 inches. Average annual snowfall is 6 inches, the maximum snowfall of 24 inches occurred in 1967. Peak rainfall intensities in Mariposa can be as high as 5.47 inches (1995) in a single twenty four hour period (DWR).

Significant floods have affected the Upper Merced River during the historical period. Flow records on the Merced are discontinuous and incomplete. One of the largest flood flows occurred on or about January 2, 1997, resulting from a rain-on-snow event in the Merced. Inflow into Lake McClure was reported by MID to be 85,000 cubic feet per second (cfs), but the actual peakflow flow may have been larger, because the Bagby gage record had been discontinued. Another large flow occurred on December 23, 1955, when the flow peaked at 101,000 cfs at Bagby gage, The record for the Bagby gauge ended 1966 with the construction of New Exchequer Dam and the filling of Lake McClure Reservoir, which inundates the site when the reservoir is near full.

Peak Flow Analyses

Research in Southern California indicates that post-fire peak flows can produce as much as 10 to 30 fold increases for low magnitude storms and 2 to 3 fold increases for larger magnitude storms (Rowe, et al. 1949, 1954). Post-fire flows were estimated based on the following assumptions recently used by USFS hydrologists for the Angora Fire in the Lake Tahoe Basin last year (USFS 2007):

Burned areas that have a high runoff response rating as a result of the fire (i.e. forested environments with high burn severity) will experience 5-fold increase in the Q2 (or a flood with a recurrence interval of 2 years), a 3-fold increase in the Q5, and a 2-fold increase on the Q10.

Burned areas that have a moderate runoff response rating as a result of the fire (i.e. forested environments with moderate burn severity) will experience 2.5-fold increase in the Q2, a 1.75-fold increase in the Q5, and a no increase on the Q10.

Areas of low burn severity, rock, and unburned have a low runoff response and it is assumed for these calculations that they will not experience increases in post-fire runoff.

It is assumed that runoff response classes are evenly distributed throughout the watershed. Also, there is no channel routing or sediment bulking factor used in this analysis.

Table Hydrology- 1 shows the acreage burned, acres on the whole watershed, unburned acres, acres of low severity burn, acres of moderate severity burn, and acres of high severity burn. These numbers were used to calculate the values in Table Hydrology- 2.

Table Hydrology- 2 calculates the percent of pre-fire peak flow we are likely to see for each watershed during the first winter for the following sizes of storms: a two-year return-interval storm (Q2), a five-year return interval storm (Q5), and a ten-year interval storm (Q10). For example, a Q2 flow in the Lyons Gulch planning watershed is expected to be twice as large in the post-fire condition (210%) as in the pre-fire condition (100%).
Table Hydrology- 2 shows how the longer the return interval (or in other words the larger the size of the storm), the smaller the effect of the fire on increasing the peak flow resulting from that storm. It also shows that for the Upper Merced River watershed as a whole, the effect of fire on peak flow is expected to be small to negligible for larger storms with longer return intervals. Q2, Q5 and Q10 peak flows are expected to increase 6%, 3% and 0%, respectively, in the first year following the fire.

Table Hydrology-1. Acres of watershed burned and acres of severity.

Watershed	Burned	Watershed	Unburned	Low	Moderate	High
Agua Fria Creek	249	11565	58	114	77	0
Feliciana Creek	2335	6456	262	775	1296	2
Gentry Gulch	542	9179	29	40	453	20
Halls Gulch	8765	10314	838	992	6904	31
Indian Gulch	2184	8472	99	271	1680	134
Lyons Gulch	10720	12212	924	1789	7450	557
Miller Gulch	397	6812	32	126	239	0
Saxon Creek	6325	8941	571	1521	4136	97
Solomon Gulch	1919	10187	126	406	1387	0
Stockton Creek	578	10939	105	290	183	0
Total Burned Area	34014	95077	3044	6324	23805	841
Upper Merced	33187	639612	3044	6324	23805	841

Table Hydrology-2. Predicted 1st year post-fire peak flow percent changes for 2, 5, and 10 year events.

Watershed	Peak flow Q2	Peak flow Q5	Peak flow Q10
Agua Fria Creek	101%	100%	100%
Feliciana Creek	130%	115%	100%
Gentry Gulch	108%	104%	100%
Halls Gulch	202%	151%	100%
Indian Gulch	136%	118%	102%
Lyons Gulch	210%	155%	105%
Miller Gulch	105%	103%	100%
Saxon Creek	174%	137%	101%
Solomon Gulch	120%	110%	100%
Stockton Creek	103%	101%	100%
Total Burned Area	141%	121%	101%
Upper Merced	106%	103%	100%

B. Survey Methods

To evaluate the risk to life and property reconnaissance was conducted from September, 3 through September 6 2008. Our field investigations focused on areas of particular concern identified by experience with past fires in similar settings, knowledge of people familiar with this portion of Mariposa County, and information and specialized maps developed during and in the weeks following the fire. Areas of particular concern included inhabited areas (particularly within the potential path of burned area runoff), the Briceburg Bridge and the burned area with potential to produce runoff which will flow under the bridge, the "Burma Grade" section of the Briceburg Road (with particular attention to the culverts and other road drainage features), and the burned watershed and stream network that discharge in McClure Lake Reservoir.

Access was by four-wheel drive vehicle, 4x4 ATV, and foot. Visual observation where recorded in field notebooks. Slopes were measured with a clinometer. Distances were measured with vehicle odometer or by pacing. Culvert sizes were measured with a tape measure Simple soil hydrophobicity tests were made with a eyedropper and watch. GPS was used to take waypoints and digital camera for pictures. Two way radios were utilized to communicate in the field.

We used historical information from the Mariposa County Library and various websites. We also conducted phone interviews affected organizations, including MID, Mariposa PUD, Upper Merced Watershed Council, BLM, and NRCS.

II. Findings of the On-the Resource Condition Assessment (Observations)

A. Indentify Values at Risk

Post-fire hydrologic concerns were developed from the information available at the time the SEAT started their work. Sources of this information included the draft information and maps developed by the Telegraph ICP, the draft USFS BAER Team Report, the draft BLM BAER Team Report, and discussions with individuals with local knowledge and concerns. These post-fire concerns were used to focus our field observations for finding potential values at risk.

As SEAT began its fieldwork, the principal post-Telegraph Fire hydrologic concerns were:

- Potential effects of burned-area runoff on downstream water quality, including the Merced River, local water supplies, and Lake McClure reservoir.
- Potential effects of burned-area runoff on the Briceburg Bridge during flood events.
- Potential effects of burned-area runoff keeping the 3.4-mile "Burma Grade" section of the Briceburg Road open and serviceable.

- Potential effects of flash flooding, in-channel flooding, hyper-concentration of slope runoff, debris torrents, and debris flows, which have the potential to put either life or property at risk.

These concerns were evaluated to indentify values-at-risk resulting from wildfire-caused hydrologic changes. The potential changes may include increased storm runoff, increased erosion, increased streamflows and peakflows during storms, and increased turbidity and sediment transport. Areas with the high soil burn severity produce the greatest changes. High soil burn severity maps as mapped by the BLM within the Telegraph Fire Area exhibit hydrophobicity, a condition of water repellency created by the extreme heat of the fire essentially cooks the soil and volatizes the organic matter. Areas with moderate soil burn severity produce much less change. Areas with low soil burn severity moderate soil burn severity produce very little change and unburned areas produce no change. The effects are most severe during the first storms during first wet season. Hydrologic recovery typically takes place readily during the first three years and is typically nearly complete in five years.

Fortunately, of the 34,106 acres Telegraph Fire produced very little acreage with high soil burn severity. Only 840 acres (<3%) has high soil burn severity, while 23,840 acres (70%) rated was rate as moderate, 6,350 acres (19%) was rated was low, and 3,076 acres (9%) was rated as very low or unburned (BLM, 2008). This is consistent with what the SEAT observed in the field.

With the exception of the southeast corner of the fire, the burned area is uninhabited or very sparsely populated. The areas mapped with high soil burn intensity are in and above uninhabited and very sparsely areas.

B. Describe Conditions of Values at Risk

Water Quality

MERCED RIVER and LAKE McCLURE

There was concern expressed about the potential effects of sediment-ladened burned-area runoff on the Merced River and downstream in Lake McClure Reservoir operated by Merced Irrigation District . There is likely to be some impact on water quality in this system, particularly during the first rainstorms of 2008-09. Depending on the intensity of these first storms over the burned area there may be noticeable increase in stormwater turbidity and bedload loads particulary in Sherlock Creek and its tributaries (Lyons Gulch planning watershed), which are tributary the Merced River. The hydrologic effect of the burned area expected to diminish rapidly over the first three years following fire and with nearly full recovery in about five years, based past experience and some analysis done using the Erosion Risk Management Tool (ERMiT), a simple

to use but effective web-based computer model for calculating recovery with and without mitigating treatments.

Several factors will mitigate the magnitude of the effect on the Merced River. First, while the fire did burn 33,000 acres in the Merced River watershed, the watershed contributing flow to Merced River where it enters Lake McClure is about 660,000 acres. That means only about 5% of the upper Merced River watershed burned in the Telegraph Fire (see Figure Hydrology-1.). Due to the orographic effect and the fact that the burned area is at a relatively low elevation (850' to 4,000' above mean sea level) in the Merced River watershed, runoff from will account for less then 5% of the inflow into Lake McClure (see Figure Hydrology-1). Second, only about 840 acres of these 33,000 acres (less than 3%) are rated as high soil bun intensity. The 97% of the burned area with moderate, low and very low/unburned soil burn intensity ratings will have much less impact on water quality. Third, there are areas of low stream gradient on lower Sherlock Creek and in the main channel of the Merced River where all but the finest sediment is likely to settle out and become part of bedload channel storage, until little by little it is re-moblized over time and moved downstream. This may have a buffering affecting on areas downstream during the watershed recovery period. The fill line of reservoir is about 2-miles downstream of the lower edge of the burned area. And, fifth the McClure Lake is large at 1,024,600 acre-feet. Compare this to the average annual flow of the upper Merced River at 987,000 acre feet. Of course, annual flows vary greatly year to year.

Agricultural Water supplies are not likely to be impacted. Lake McClure should impound and settle any increased sediment load.

Contact and non-contact recreation may need to be curtailed due to safety concerns on streams experiencing high winter or spring flows, debris flows, flooding, or mud flows.

Mr. Hicham El Tal, assistant general Manager of the Merced Irrigation District was contacted on September 8, 2008. Mr. El Tal's main concern is the water quality effects of the first flush of sediment from the burned area resulting for the first few storms. However, he is not overly concerned about this depending on the size and intensity of the first rainstorms of the 2008-2009 wet season. Generally the water quality is good. The major exception being the aftermath of the January 1997 flood, which created turbidity problems in the reservoir and filled the reservoir surface with floating woody debris that had washed down from upstream. The woody debris was very time consuming and expensive to remove. No such effect is expected as result of the Telegraph Fire, but of course another flood the size of the January 1997 is always a possibility.

Mr. El Tal mention that Lake McClure has a low sedimentation rate for due the fact that most of its water comes from Yosemite. He also mentioned that at about one million acre feet the reservoir is large, but to achieve optimal water

yield from the upper Merced River watershed another 300,000- to 400,000 acre feet of storage would be needed. Another reservoir was once proposed upstream at Bagby but was never built.

Discussion with Liana Lopez of Mariposa Resource Conservation District, Upper Merced River Watershed Council, revealed watershed monitoring for several years prior to the Telegraph Fire. Volunteer monitoring is conducted along four sampling points between Briceburg Bridge and Bagby Recreational Area. Parameters monitored include: turbidity, dissolved oxygen, pH, and conductivity. Measurements are collected quarterly. The watershed group is interested in collecting data post fire. In addition, the Merced River Alliance Project completed an Interim Biological Monitoring and Assessment Report. The project was developed as a component of the Merced River Alliance Project and represents the first planned comprehensive assessment of fish, bird, and BMI (benthic macro invertebrate) species composition and distribution in the Merced River. Data was collected prior to the Telegraph fire and represents a baseline whereupon effects from the Telegraph fire can be compared.

Mariposa domestic water supply

The potential for the burned area to affect Mairposa's water supply was briefly investigated. Mr. Mark Rowney, general manager of the Mariposa Public Utility District (PUD) was contacted. Mariposa PUD supply surface water to the town of Mariposa from a small reservoir on Stockton Creek. The Stockton Creek watershed was not involved in Telegraph Fire. However, Mariposa PUD pumps supplemental water to refill Stockton Creek from the Merced River watershed near Saxon Creek inside the burned area during certain times of the year when instream flows are high enough to meet requirements of the diversion permit. Mr. Rowney, said runoff from the burned area was unlikely to effect their operations. The PUD stopped pumping in advance of the fire. Sufficient water is stored in the reservoir on Stockton Creek to meet the PUD needs until it is safe to pump from the Merced River watershed again.

Briceburg Bridge

There was concern expressed about the potential effects of burned-area runoff on the Briceburg Bridge during flood events. The concern is that an extreme flood event combined with runoff, sediment and debris coming from the burned area would rise to or above the level of the bridge span and either damage or destroy the bridge.

The Briceburg Bridge, built in 1937, is a one-lane suspension bridge across Merced River, connecting Highway 140 to the lower end of the "Burma Grade" section of the Briceburg Road, several residents on the river and a section of old Yosemite Valley Railroad grade that runs on the north side of river. The bridge span is approximately 157 feet and the span is more than 25-30 feet above

normal river level. The bridge is maintained by the BLM and provides access to the Merced River Recreational Area. There are three BLM campgrounds along the Merced River between Briceburg and Bagby. They are the McCabe Flat Campground, Willow Placer Campground and the Railroad Flat Campground.

The bridge has been severally tested by flood flows. "During the flood of Yosemite Valley in a January 1997 storm, the river reportedly rose to a level of approximately 4 ft above the bridge deck and was flowing at an estimated volume of over 90,000 cu ft per second (cfs). The deck, guardrails and suspender rods trapped debris and vegetation in the flow and witnesses reported a substantial waterfall formed over the deck. Heavy damage to the timber wheel guards, guard rails suspender rods and the extreme lateral overloading inflicted sway bracing beneath the deck (April 1999, *Roads & Bridges.*)" Local residents who witnessed this event provide similar information. According to BLM staff the bridge was bent 17 inches off center and repairs cost over $600,000. A more complete list of 1997 damage to bridge can be found in the April 1999 issue of *Roads & Bridges.*

Although, the bridge sustained significant damage, it is important to note the bridge did survive what was very likely the highest flow for this un-gaged site during the period of historical record. Flood- events of this size or larger have a very low probability happening in any one year period, perhaps a 1% chance of occurrence.

The Merced River watershed above the Briceburg Bridge is approximately 442,000 acres. Of the 34,000 acre Telegraph Fire about 3,650 acres is along and tributary Merced River above the Briceberg Bridge. This 3,650 acre represents about 0.8% of the watershed that contributes to flood flows that pass under the bridge (see Figure Hydrology-3). Soil Burn intensities in this area are mostly low to moderate (98%), with about 80 acres (2%) high soil burn intensity just inside the Wild and Scenic area and located and adjacent to one of the upper switchbacks of the "Burma Grade." Because the burned area is only about 0.8% of the contributing watershed above the Briceburg Bridge and because 98% of the contributing burned area has moderate to low soil burn intensity, increased runoff and sediment transport from this area is very unlikely to measurably increase the stage of peck flows under the Briceburg Bridge. In addition, the probability of a flood flow occurring that would test the limits of bridge occurring during the expected 3 to 5 year recovery period is very low. In summary the bridge is at low risk of being affected at by the temporary hydrologic changes caused by the Telegraph Fire.

There is however always a risk that a landslide will occur upstream, temporarily dam the river, and then causing a surge of flood water and debris moving downstream that might impact the bridge. For an assessment of the landslide see the TECHNICAL SPECIALTIST'S REPORT on geology.

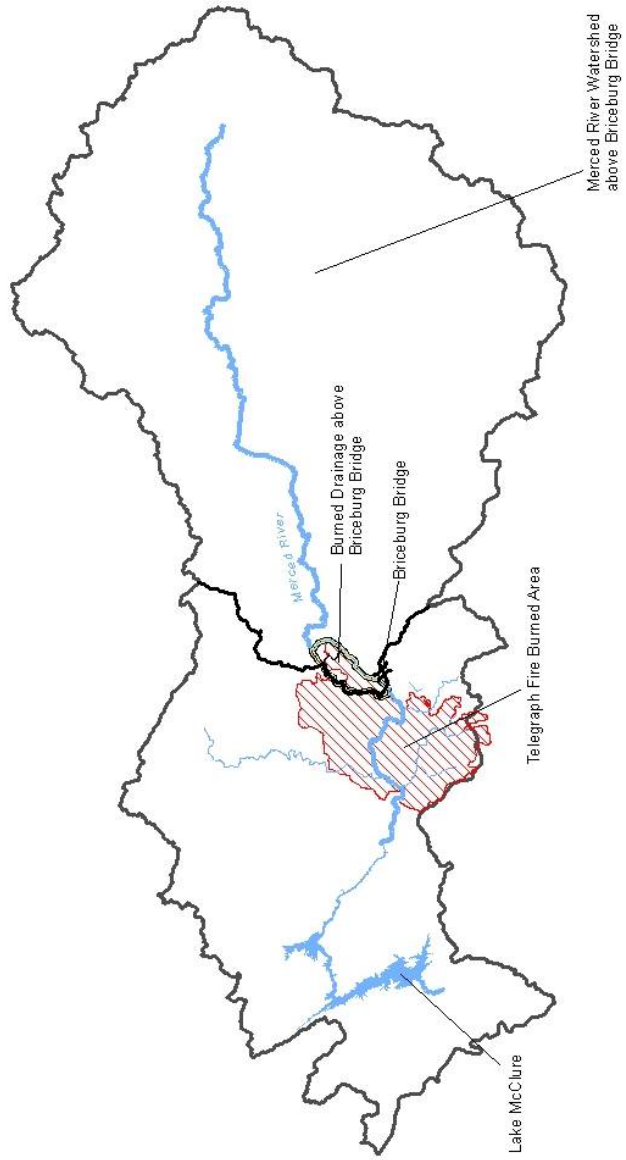

Figure Hydrology-3. The Telegraph Fire burned about 3,650 acres which are tributary to the Merced River above the Briceburg Bridge. This figure shows the area above the Briceburg Bridge in relation to the Merced River watershed above Briceburg Bridge. The area burned in relationship to area contributing to the flow under bridge is relatively very small and sediment generated surface erosion from this area is unlikely to affect bridge.

"Burma Grade" section of the Briceburg Road

The slopes above the Burma grade switchbacks experienced a moderate to high severity burn. This section of road was constructed approximately 75 years ago and has forty culverts ranging from 12 to 36 inches in diameter. The elevation change from Briceburg Bridge (elevation 1,150 ft) to the last switchback of Burma grade (elevation 1,900 ft) is over 750 ft with about a 40% slope.

The planning watersheds above the Burma grade include the Saxon Creek Watershed, Feliciana Creek Watershed, and Halls Gulch Watershed. The watershed area contributing to flows over the Burma Grade is about 178 acres. This area burned and contains significant area with high soil burn intensity, about 35 acres in size.

SEAT members surveyed the Burma grade and found six blocked inlets, five squashed inlets, nine shotgunned culverts, one shallow seated culvert, and one misaligned culvert. Culvert maintenance is a significant issue for the Burma grade. The design of culverts along the Burma Grade road is a complex task. The culverts cascade between the seven switchbacks. The seating of the culverts and maintenance to clear blocked culverts will be critical to maintaining the road.

Bureau of Land Management is recommending replacing or upgrading 25 culverts as follows:

Upgrade from 12-inch to 18-inch	14
New 12-inch	1
New 18-inch	1
Replace with same size (8 12-inch & 1 18-inch)	9

The upgrade and replacement of culverts should aid in keeping Burma grade road open. In addition, treatments such as properly
spaced rolling dips, water bars, and culvert reliefs can help move water off the road prism to reduce road failures.

Potential risks to life or property

The concern is for the potential effects of flash flooding, in-channel flooding, hyper-concentration of slope runoff, debris torrents, and debris flows, which have the potential to put either life or property at risk. Both the geologist and the hydrology team made field observations looking for potential threat to life and property. See the geologist's TECHNICAL SPECIALTIST'S REPORT for a detailed of list of addresses with debris torrent and debris flow potential.

Approximately 30 dwellings were destroyed directly as result of the Telegraph Fire. Most of the area burned in the Telegraph Fire is sparsely populated or uninhabited, with a few wildly scattered dwellings which are likely occupied only intermittently. Year-around dwellings in or potentially affected by the burned are concentrated southeast in the upper reaches of Whitlock, Sherlock and Saxon Creeks. Whitlock and Sherlock Creeks are in the Lyons Gulch planning watershed (CALWATER 6537.300602). Saxon Creek is in the Saxon Creek planning watershed (CALWATER 6537.300503). Primary access is from the town of Mariposa (southeast) side.

The SEAT looked for homes with potential to be affected by the burned area on East Whitlock Road, West Whitlock Road, Mosher Road, and Rancheria Creek Road. One site, which is also listed in geology report, particularly stood out as having potential to be impacted, a small subwatershed of about 230 acres inside the burned area immediately above the residence at 5888 Mosher Road. A small, dry, unnamed creek drains this area and crosses Mosher Road in under-sized culvert. Immediately, down stream is the residence. The crossing is and the residence may be in jeopardy in the event of debris flow.

The SEAT also looked at Mt. Bullion Road and CYA Road as far as the CYA Conservation Camp. Mt. Bullion Ridge Road provides access between West Whitlock Road and CYA Road. The road has a locked gate. At waypoint 28 (N 37° 32’ 28.22” W 120° 1’ 17.77”) a shallow seated culvert (<6 inches) is in need of repair. The outlet is scoured and partially blocked. The California Youth Authority (CYA) operates a Conservation Camp in Lyons Gulch on CYA Road. The watershed above the Camp is a mosaic of unburned and burned areas of moderate to low soil burn intensity. Much of the burned area above the Camp is the result of backfiring operation during the firefight. A brief field visit confirmed that there appears to be little or no hydrologic threat to life or property life and property at this location resulting from the Telegraph Fire.

Discussion and Summary

Water quality in Merced River watershed and Lake McClure, particularly during the first rainstorms of 2008-09, may be impacted by fire. Depending on the intensity of these first storms over the burned area there may be noticeable increase in stormwater turbidity and bedload loads particularly in Sherlock Creek and tributaries. The hydrologic effect of the burned area expected to diminish rapidly over the first three years and be near full recovery after five years. These transient hydrologic changes are not expected to significantly affect Lake McClure (MID). Neither the MID assistant general manager of MID or the general manager Mariposa PUD anticipate that burned area will significantly impact their operations, barring very unusual conditions like January 1997. Recommend that the water quality monitoring by Upper Merced River Watershed Council continue and that pre-fire data be compared to the post fire data.
The Briceburg Bridge is at low risk of being affected at by the temporary hydrologic changes caused by the Telegraph Fire. Only about 0.8% of the watershed that collects

water and discharges under the bridge was burned in the fire. There is however always a risk that a landslide will occur upstream, temporarily dam the river, and then causing a surge of flood water and debris moving downstream that might impact the bridge. See geologist report for a discussion of this risk.

The "Burma Grade" switchback section of the Briceburg Road is difficult there and half miles of road to drive and to maintain under normal conditions. There approximate 178-acre area which drains to and from this section of road immediately adjacent to the Merced River. This area burned. About a fifth of the area is rated as high soil burn severity. Recommend the drainage on this section of road be upgraded to accommodate the hydrologic changes resulting from fire.

Debris flow risk is covered in the geologist report, which list many potential sites at risk. One residence and crossing on Mosher road is of particular concern for risk to life and property. Recommend an engineer or engineering geologist evaluate this site for possible mitigation of the risk.

Calls for emergency help may increase this winter in the populated areas affected by the fire, depending on the types of storms that occur. House numbering of residences is generally good. Road access to residences for emergency vehicles is not, in many cases. This is a particular problem during wet weather and severe storms. This situation pre-existed the fire.

VI. References

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USGS National Water Information System
http://nwis.waterdata.usgs.gov/ca/nwis/

Appendix C: Soils Technical Specialist Report

TECHNICAL SPECIALTIST'S REPORT
STATE EMERGENCY ASSESSMENT TEAM (SEAT) Emergency Report
Resource: Soils
Fire Name: Telegraph CA-MMU-009779 **Month/Year**: September/2008

Author Name: John Munn, Watershed Specialist
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Resource Setting:

The Telegraph Fire area includes soils and parent materials shown in Table 1. These map units and soil characteristics have been taken from the Soil Survey of Mariposa County Area, California (Soil Conservation Service, 1974), as shown in Figure 1, which covers approximately 89 percent of the burned area and includes all but about 700 acres of the nearly 9,000 acres of the private land within the fire boundary. The U.S. Forest Service (USFS) has prepared a soil survey covering the more remote, northern part of the fire that has been previously addressed in the USFS Burned Area Emergency Response (BAER) report.

Soils in the southern portion of the fire in the headwaters of Lyons Gulch, Whitlock Creek, Sherlock Creek, and Saxon Creek have developed from basic igneous and metamorphosed basic igneous rocks. These soils include the Boomer, Trabuco, and Blasingame series that are generally moderately deep with heavier textured, clay loam subsoils and reddish color. Also found in this area are Auburn soils that are generally less than 20 inches deep with loam subsoil and reddish color.

The remainder of the burned area, beginning with the steep slopes of the Sherlock Creek canyon and extending to the north, is dominated by Maymen soils that are generally 8 to 20 inches deep with little subsoil developement over metamorphosed sedimentary rock parent material. Included in this area are isolated map units of the shallow Auburn soils and an extensive area of Auburn soils in the northwest corner of the fire.

Erosion Hazard Ratings:

Erosion hazard ratings (EHRs) for soils in the burned area were calculated using the California Soil Survey Committee method (CSSC 1989) and are shown in Table 2. These ratings are given for cover conditions existing before and after the fire and for the range of slopes described for each soil map unit. The resulting ratings show both the importance of slope steepness in determining EHRs and the increase in erosion potential following loss of cover from the fire. In general, soils on more gently sloping

areas that were rated as having a low pre-fire EHR remained in the low EHR category or moved into moderate, while areas with moderate pre-fire EHR generally moved into either high or very high EHR categories as a result of the fire. Soils that were rated as having a high EHR before the fire invariably moved into the very high category. No soils were rated as having a very high EHR prior to the fire.

Watershed Conditions:

The acreage of individual soil map units in different watersheds within the fire are given in Table 3a. This clearly shows the large extent of the shallow and steeply sloping Mayman soils, which cover about 43 percent of the burned area. Summary information about burned areas in each watershed are listed in Table 3b, which shows that the Lyons Gulch (containing Sherlock Creek), Halls Gulch, and Saxon Creek planning watersheds have, by far, the largest proportions of burned area, with approximately 88, 85, and 71 percent burned, respectively. These watersheds also have large areas of shallow and steeply sloping Mayman, Mariposa, and Auburn soils.

Much of the burned area is affected by soil water repellency following the fire. This occurs as a result of waxy substances that are vaporized by burning and then penetrate the soil, where they condense on soil particles and create a hydrophobic layer that prevents water infiltration. The degree of water repellency depends on the type and amount of burned materials, soil moisture content, and the heat of the fire. As described in the Bureau of Land Management (BLM) BAER report (2008), there is some degree of water repellency on about 72 percent of the area within the fire perimeter. The SEAT field review found a weak water repellent layer at the contact between the soil surface and the overlying ash and/or litter layer of most burned areas, and a deeper, more persistent water repellent layer in severely burned areas. This is generally consistent with the BLM findings. The shallow water repellent layers are expected to break down during the first winter following the storm, while deeper layers may be more persistent.

A burned area reflectance characterization (BARC) map covering the fire area was provided by the USFS to rate differences in soil burn severity. This map was modified by the BLM BAER Team based on observed post-fire vegetation and water repellency conditions. The SEAT field review generally confirmed the BLM findings, and no modifications to the revised BARC map are proposed in this report.

Runoff and Sediment Production:

In addition to fire induced water repellency, post-fire runoff is increased by raindrop impact on exposed ash and soil, which dislodges fine particles that plug soil surface pores and channels. Peak runoff rates are also increased by the loss of surface litter and vegetation that previously delayed runoff by blocking flow paths and holding back water in small pools or puddles. The loss of surface cover along with loose ash and soil following a fire greatly increases the potential for erosion, as indicated by the increased EHR values described above. Combined with increased runoff, this leads to much

greater rates of sediment production in streams within and downstream of burned watersheds.

The BLM BAER Team used the Erosion Risk Management Tool (ERMiT) model to estimate the amount of sediment based on expected changes in site characteristics in areas with low, moderate, and high burn severity ratings, as summarized in Table 4. These estimates indicate that the burned areas may experience a thousand-fold increase in sediment production. The BLM BAER report also includes estimates of erosion prevented by recommended mitigation measures.

Road Erosion:

In addition to sediment from hillslopes, erosion from the roads and firelines that were used, opened, or constructed to contain the fire can also be sources of sediment. Post-fire erosion control measures have been applied to areas disturbed by fire disturbed by suppression activities, such as firelines, to prevent sediment production, and the BLM BAER report recommends that some roads be closed. Closure alone, however, does not prevent erosion from roads that are poorly drained or have inadequate crossing design. And roads that are to remain open require sufficient drainage design to remove water before it creates significant surface erosion, stream crossings that can pass high flows without failing, and maintenance to fix problems before failures occur. On remote roads or roads that do not receive annual maintenance, it is generally best to use low maintenance design that relies on rolling dips and fords to prevent failure and preserve road condition.

Emergency Determination:

- Post-fire erosion on hillslopes and sediment in stream channels will be greatly increased for several years following the fire, especially in response to the first large storms.

- Increased post-fire runoff can cause erosion on roads and failure of stream crossings.

- Increased runoff from burned areas can block access to and from parcels in and downstream from the fire.

Treatments to Mitigate the Emergency:

Landscape level treatments for erosion control are either extremely expensive (e.g. aerial application of mulch) or not likely to be successful during the first storms that generally lead to the majority of erosion (e.g. grass seeding). Therefore, residents and water users located in or downstream from the burn should be prepared to avoid or treat sediment laden floodwaters that are likely to occur during large rainstorms.

To maintain access and prevent excessive road erosion, permanent drainage control treatments and crossing removal should be applied to roads that are to be closed, and self-maintaining drainage features and crossings should be provided on roads that are to remain open.

Recommendations:

Landscape level erosion control treatments are impractical for treating the entire fire area, but mulching may be used to prevent erosion at high value sites or to prevent runoff damage to specific road or site improvements.

Road drainage and crossing improvements can be applied to keep roads open.

References:

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California Soil Survey Committee, 1989, Computation of Erosion Hazard Rating (EHR) for Sheet and Rill Erosion, 2 pages.

Bureau of Land Management, 2008, Telegraph Fire Burned Area Emergency Response Report, United States Department of Interior.

Figure 1: Soils Map for Telegraph Fire Area

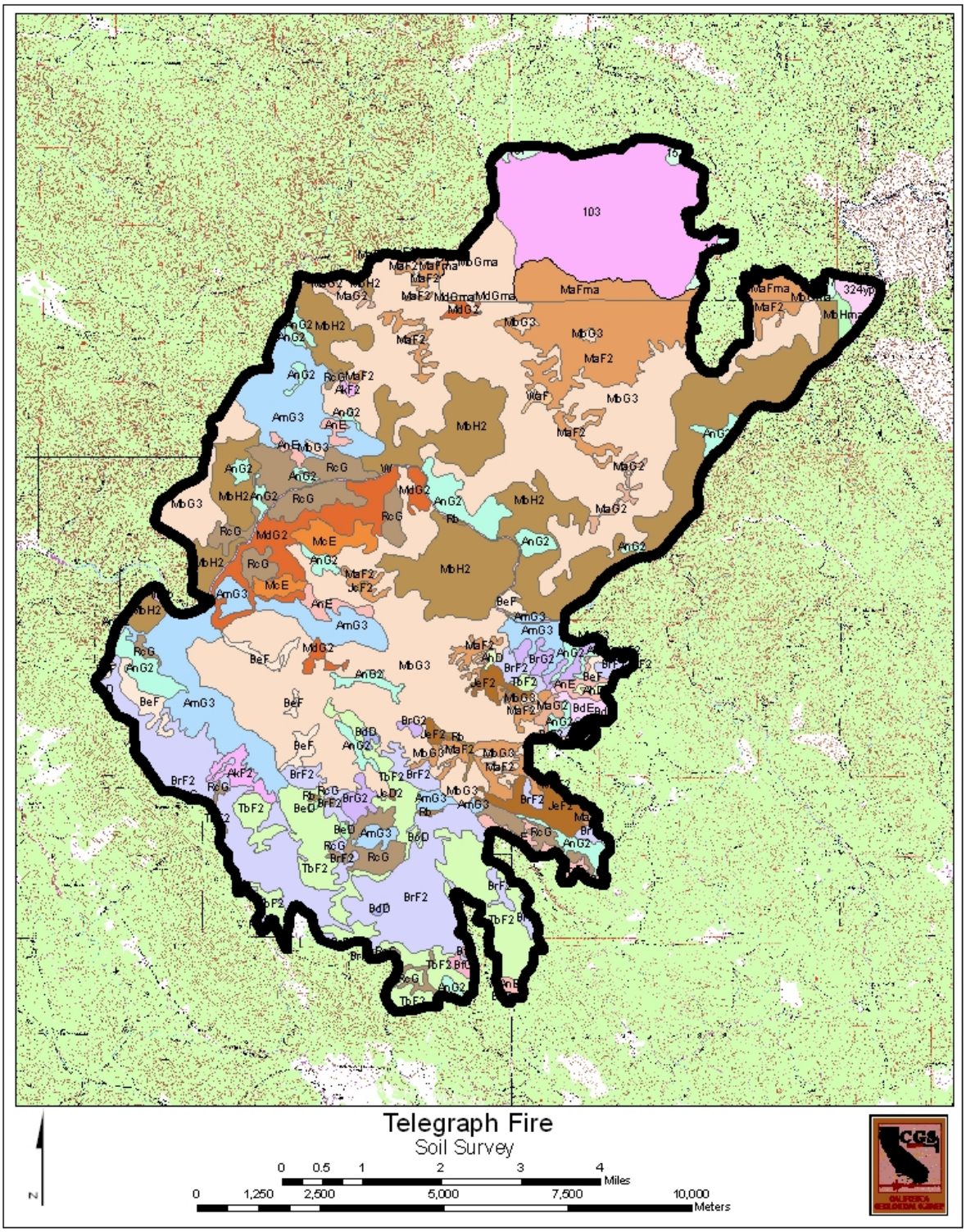

Table 1: Telegraph Fire Area Soil Map Units Summary (1)

Mapping Units	Soil Series Name	Surface Texture	Subsoil Texture	Effective Depth (in)	AWC (in)	Parent Material (rock)	Slope Range (%)	Rock Outcrop (%)
AhD	Auburn	loam	loam	10 – 16	1.5 – 2.5	basic igneous	2 – 15	<2
AkF2	Auburn	stony loam	loam	10 – 16	1.5 – 2.5	basic igneous	30 – 50	None?
AmG3	Auburn	rocky loam	loam	8 – 14	1.0 – 2.0	basic igneous	30 – 75	2 – 10
AnE	Auburn	very rocky loam	loam	10 – 20	1.5 – 3.0	basic igneous	15 – 30	10 – 25
AnG2	Auburn	very rocky loam	loam	10 – 16	1.5 – 2.5	basic igneous	30 – 75	10 – 25
BdD	Blasingame	loam	clay loam	24 – 40	4.0 – 7.5	basic and metabasic igneous	2 – 15	<2
BdE	Blasingame	loam	clay loam	24 – 40	4.0 – 7.5	basic and metabasic igneous	15 – 30	<2
BeD	Blasingame	rocky loam	clay loam	24 – 40	4.0 – 7.5	basic and metabasic igneous	2 – 15	2 – 10
BeF	Blasingame	rocky loam	clay loam	24 – 40	4.0 – 7.5	basic and metabasic igneous	15 – 50	2 – 10
BfG	Blasingame	ex. Rocky loam	clay loam	24 – 40	4.0 – 7.5	basic and metabasic igneous	50 – 75	10 – 50
BoD	Boomer	loam	cobbly clay loam	40 – 60+	5.5 – 10	basic and metabasic igneous	2 – 15	None
BrF2	Boomer	cobbly loam	cobbly clay loam	40 – 60+	4 – 9	basic and metabasic igneous	15 – 50	None
BrG2	Boomer	cobbly loam	cobbly clay loam	40 – 60+	4 – 9	basic and metabasic igneous	50 – 75	None
JcD2	Josephine	gravelly loam	clay loam	24 – 40	4 – 7	metasedimentary	2 – 15	None
JcF2	Josephine	gravelly loam	clay loam	24 – 40	4 – 7	metasedimentary	30 – 50	None
JeF2	Josephine	very rocky loam	clay loam	24 – 40	4 – 7	metasedimentary	15 – 50	10 – 25
MaF2	Mariposa	gravelly silt loam	gr. Silty clay loam	12 – 20	1.5 – 3	metasedimentary	15 -50	None?
MaG2	Mariposa	gravelly silt loam	gr. Silty clay loam	12 – 20	1.5 – 3	metasedimentary	50 – 75	None?
MbG3	Maymen	gravelly loam	gr. Heavy loam	8 – 20	.8 – 2.4	metasedimentary	30 – 75	None?
MbH2	Maymen	gravelly loam	gr. Heavy loam	8 – 20	.8 – 2.4	metasedimentary	>75	None?
McE	Maymen	rocky loam	gr. Heavy loam	8 – 20	.8 – 2.4	metasedimentary	15 – 30	2 – 10
MdG2	Maymen	very rocky loam	gr. Heavy loam	8 – 20	.8 – 2.4	metasedimentary	30 – 75	10 – 25
Rb	Riverwash & Tailings						gentle	NA
RcG	Rock land						2 – 75	NA
TbF2	Trabuco	very rocky loam	clay	24 – 40	4 – 7	basic igneous	15 – 30	2 – 25
WaF	Whiterock	rocky loam	gravelly loam	5 – 12	,6 – 1,7	metasedimentary	5 – 50	2 – 10

(1) Soil mapping units from Soil Survey of Mariposa County Area, California by USDA, Soil Conservation Service, 1974.

Table 2: Telegraph Fire Soil Erosion Hazard Ratings Summary (part 1)*

Mapping Unit	Erodibility Rating		Runoff Production							Runoff Energy	
	Before Fire	**After Fire**	Climate	Water Movement	Adjacent Runoff	Length Before	Length After	**Rating Before**	**Rating After**	**Rating Least**	**Rating Most**
AhD	**3**	**3**	3	6	0	1	6	**3.33**	**5.00**	**0.02**	**0.15**
AkF2	**3**	**3**	3	6	0	1	6	**3.33**	**5.00**	**0.30**	**0.50**
AmG3	**3**	**3**	3	6	0	1	6	**3.33**	**5.00**	**0.30**	**0.75**
AnE	**3**	**3**	3	6	2	1	6	**4.00**	**5.67**	**0.15**	**0.30**
AnG2	**3**	**3**	3	6	2	1	6	**4.00**	**5.67**	**0.30**	**0.75**
BdD	**3**	**3**	3	4	0	1	6	**2.67**	**4.33**	**0.02**	**0.15**
BdE	**3**	**3**	3	4	0	1	6	**2.67**	**4.33**	**0.15**	**0.30**
BeD	**3**	**3**	3	4	0	1	6	**2.67**	**4.33**	**0.02**	**0.15**
BeF	**3**	**3**	3	4	0	1	6	**2.67**	**4.33**	**0.15**	**0.50**
BfG	**3**	**3**	3	4	2	1	6	**3.33**	**5.00**	**0.50**	**0.75**
BoD	**3**	**3**	3	6	0	1	6	**3.33**	**5.00**	**0.02**	**0.15**
BrF2	**3**	**3**	3	6	0	1	6	**3.33**	**5.00**	**0.15**	**0.50**
BrG2	**3**	**3**	3	6	0	1	6	**3.33**	**5.00**	**0.50**	**0.75**
JcD2	**3**	**3**	3	6	0	1	6	**3.33**	**5.00**	**0.02**	**0.15**
JcF2	**3**	**3**	3	6	0	1	6	**3.33**	**5.00**	**0.30**	**0.50**
JeF2	**3**	**3**	3	6	2	1	6	**4.00**	**5.67**	**0.15**	**0.50**
MaF2	**4**	**4**	3	6	0	1	6	**3.33**	**5.00**	**0.15**	**0.50**
MaG2	**4**	**4**	3	6	0	1	6	**3.33**	**5.00**	**0.50**	**0.75**
MbG3	**3**	**3**	3	6	0	1	6	**3.33**	**5.00**	**0.30**	**0.75**
MbH2	**3**	**3**	3	6	0	1	6	**3.33**	**5.00**	**0.75**	**0.90**
McE	**3**	**3**	3	6	0	1	6	**3.33**	**5.00**	**0.15**	**0.30**
MdG2	**3**	**3**	3	6	2	1	6	**4.00**	**5.67**	**0.30**	**0.75**
Rb											
RcG											
TbF2	**3**	**3**	3	6	2	1	6	**4.00**	**5.67**	**0.15**	**0.30**
WaF	**3**	**3**	3	6	0	1	6	**3.33**	**5.00**	**0.05**	**0.50**

***** Erosion hazard factors and ratings based on California Soil Survey Committee method for sheet and rill erosion

Table 2: Telegraph Fire Soil Erosion Hazard Ratings Summary (part 2)*

Mapping Unit	Cover					Ratings Products				Adjective Ratings			
	Quantity Before	Quantity After	Distri-bution	**Rating After**	**Rating After**	**Least Before**	**Least After**	**Most Before**	**Most After**	**Least Before**	**Least After**	**Most Before**	**Most After**
AhD	2	5	0	**2**	**5**	0.40	1.50	3.00	11.25	**L**	**L**	**L**	**M+**
AkF2	2	5	0	**2**	**5**	6.00	22.50	10.00	37.50	**M**	**H**	**M**	**VH**
AmG3	2	5	0	**2**	**5**	6.00	22.50	15.00	56.25	**M**	**H**	**H**	**VH**
AnE	2	5	0	**2**	**5**	3.60	12.75	7.20	25.50	**L+**	**H-**	**M**	**H**
AnG2	2	5	0	**2**	**5**	7.20	25.50	18.00	63.75	**M**	**H**	**H**	**VH**
BdD	2	5	0	**2**	**5**	0.32	1.30	2.40	9.75	**L**	**L**	**L**	**M**
BdE	2	5	0	**2**	**5**	2.40	9.75	4.80	19.50	**L**	**M**	**M-**	**H**
BeD	2	5	0	**2**	**5**	0.32	1.30	2.40	9.75	**L**	**L**	**L**	**M**
BeF	2	5	0	**2**	**5**	2.40	9.75	8.00	32.50	**L**	**M**	**M**	**VH**
BfG	2	5	0	**2**	**5**	10.00	37.50	15.00	56.25	**M**	**VH**	**H**	**VH**
BoD	2	5	0	**2**	**5**	0.40	1.50	3.00	11.25	**L**	**L**	**L**	**M+**
BrF2	2	5	0	**2**	**5**	3.00	11.25	10.00	37.50	**L**	**M+**	**M**	**VH**
BrG2	2	5	0	**2**	**5**	10.00	37.50	15.00	56.25	**M**	**VH**	**H**	**VH**
JcD2	2	5	0	**2**	**5**	0.40	1.50	3.00	11.25	**L**	**L**	**L**	**M+**
JcF2	2	5	0	**2**	**5**	6.00	22.50	10.00	37.50	**M**	**H**	**M**	**VH**
JeF2	2	5	0	**2**	**5**	3.60	12.75	12.00	42.50	**L+**	**M+**	**M+**	**VH**
MaF2	2	5	0	**2**	**5**	4.00	15.00	13.33	50.00	**L+**	**H**	**H-**	**VH**
MaG2	2	5	0	**2**	**5**	13.33	50.00	20.00	75.00	**H-**	**VH**	**H**	**VH**
MbG3	2	5	0	**2**	**5**	6.00	22.50	15.00	56.25	**M**	**H**	**H**	**VH**
MbH2	2	5	0	**2**	**5**	15.00	56.25	18.00	67.50	**H**	**VH**	**H**	**VH**
McE	2	5	0	**2**	**5**	3.00	11.25	6.00	22.50	**L**	**M+**	**M**	**H**
MdG2	2	5	0	**2**	**5**	7.20	25.50	18.00	63.75	**M**	**H**	**H**	**VH**
Rb													
RcG													
TbF2	2	5	0	**2**	**5**	3.60	12.75	7.20	25.50	**L+**	**H-**	**M**	**H**
WaF	2	5	0	**2**	**5**	1.00	3.75	10.00	37.50	**L**	**L+**	**M**	**VH**

***** Erosion hazard factors and ratings based on California Soil Survey Committee method for sheet and rill erosion

Table 3a: Soil Map Unit and Watershed Areas

Mapping Unit	Soil Series Name	Aqua Fria Creek	Feliciana Creek	Gentry Gulch	Halls Gulch	Indian Gulch	Lyons Gulch	Miller Gulch	Saxon Creek	Solomon Gulch	Stockton Creek	**Row Totals**	**Percent of Area**	**Soil Series (%)**
AhD	Auburn								43			**43**	**0.1**	**--**
AkF2	Auburn					3	133		15			**151**	**0.4**	**--**
AmG3	Auburn					706	1125		326	284		**2442**	**7.2**	**--**
AnE	Auburn					32	226		163	7	36	**464**	**1.4**	**--**
AnG2	Auburn		96		35	160	266		524	144	34	**1258**	**3.7**	**12.8**
BdD	Blasingame						32		13		8	**53**	**0.2**	**--**
BdE	Blasingame								99			**99**	**0.3**	**--**
BeD	Blasingame						23					**23**	**0.1**	**--**
BeF	Blasingame						294		73	11		**377**	**1.1**	**--**
BfG	Blasingame										50	**50**	**0.1**	**1.8**
BoD	Boomer						5					**5**	**0.0**	**--**
BrF2	Boomer						2727		238	23	46	**3034**	**8.9**	**--**
BrG2	Boomer						118		157			**275**	**0.8**	**9.7**
JcD2	Josephine						6					**6**	**0.0**	**--**
JcF2	Josephine								6	0		**7**	**0.0**	**--**
JeF2	Josephine						122		279			**401**	**1.2**	**1.2**
MaF2	Mariposa		103	98	1376	13	246	6	251	18		**2111**	**6.2**	**--**
MaG2	Mariposa		1	43	73	1			57			**175**	**0.5**	**6.7**
MbG3	Maymen		838	355	2799	524	3280	64	1331	461		**9652**	**28.4**	**--**
MbH2	Maymen		1129	23	876	588		75	1658	323		**4671**	**13.7**	**--**
McE	Maymen						12		123	143		**278**	**0.8**	**--**
MdG2	Maymen				39		140		356	264		**798**	**2.3**	**45.2**
Rb	Riverwash						45		7	5		**57**	**0.2**	**0.2**
RcG	Rock land	79				159	422		517	208	10	**1395**	**4.1**	**4.1**
TbF2	Trabuco	170					1509		28		395	**2101**	**6.2**	**6.2**
WaF	Whiterock				25							**25**	**0.1**	**0.1**
103					2521							**2521**	**7.4**	**7.4**
157			28		131			26				**185**	**0.5**	**0.5**
324yp								145				**145**	**0.4**	**0.4**
MaFma			140	13	405			0				**558**	**1.6**	**1.6**
MbGma			0	10	483			3				**497**	**1.5**	**--**
MbHma			0					77				**78**	**0.2**	**--**
MdGma					10							**10**	**0.0**	**1.7**
W			3		0				65	29		**96**	**0.3**	**0.3**

Table 3b: Soil Map Unit and Watershed Areas Summary

Mapping Unit	Aqua Fria Creek	Feliciana Creek	Gentry Gulch	Halls Gulch	Indian Gulch	Lyons Gulch	Miller Gulch	Saxon Creek	Solomon Gulch	Stockton Creek	**Row Totals**
MU Sum (ac)	**249**	**2338**	**542**	**8774**	**2186**	**10729**	**396**	**6331**	**1921**	**579**	**34044**
MU In Fire (ac)	**249**	**2335**	**542**	**8765**	**2184**	**10720**	**397**	**6325**	**1919**	**578**	**34014**
MU In Fire (%)	**0.7**	**6.9**	**1.6**	**25.8**	**6.4**	**31.5**	**1.2**	**18.6**	**5.6**	**1.7**	**100.0**
Total WS (ac)	**11565**	**6456**	**9179**	**10314**	**8472**	**12212**	**6812**	**8941**	**10187**	**10939**	**95077**
WS in Burn (%)	**2.2**	**36.2**	**5.9**	**85.0**	**25.8**	**87.8**	**5.8**	**70.7**	**18.8**	**5.3**	**35.8**

MU = Soil mapping unit
WS = Watershed

Table 4: Modeled Erosion Production*

Burn Severity Rating	Probabability of Exceeding (%)	Year 1 Erosion Rate (tons/ac)	Post-Fire Increase (%)
Pre-Fire	50	3.9	0
Low	50	18.7	379
Moderate	50	27.0	592
High	50	33.5	759
Low	20	39.1	903
Moderate	20	50.5	1,195
High	20	65.5	1,579

* From BLM BAER Report (2008)

Appendix E: Wildlife Technical Specialist Report

DRAFT TECHNICAL SPECIALIST'S REPORT
STATE EMERGENCY ASSESSMENT TEAM (SEAT) REPORT

Resource: Wildlife

Fire Name: TELEGRAPH CA-MMU-009779 September 2008

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Resource Condition Assessment

I. Resource Setting

A. Setting

The 34,091 acre Telegraph fire started as the result of a human cause (target shooting) on the Merced River near Lake McClure in Mariposa County on July 25, 2008, and was declared 100% contained on August 6, 2008. Approximately 63% of the Telegraph fire occurred on Bureau of Land Management (BLM) land, 12% on U.S. Forest Service (USFS) land, 24% on private land and 1% on State of California (State) land.

The Telegraph fire area is located in southern Mariposa county in the foothills on the western slope of the Sierra Nevada Mountains. Elevation changes from, approximately 850 to 4000 feet above sea level (asl). The fire area is bounded generally by highway 49 to the west, highway 140 to the east, and the Stanislaus National Forest to the north. The burn perimeter is almost evenly bisected east to west by the Merced River from Briceburg on Hwy 140 to Lake McClure. The habitat (vegetation) is comprised primarily of chaparral, with significant oak woodland components and some areas of Ponderosa pine at the higher elevations. There is a significant amount of riparian vegetation along the Merced River and the various tributaries draining into it. The fire burned many different wildlife habitats (vegetation types) at various levels of intensity (Telegraph Vegetation/Burn Severity map). This report will focus primarily on the direct and indirect impacts to wildlife within the fire perimeter, with particular emphasis on the sensitive species found there.

B. Survey methods

The initial review of wildlife resources potentially impacted by this fire included a search of the California Natural Diversity Data Base (CNDDB) for occurrences of sensitive species (rare, threatened or endangered) within and adjacent to the burned area. Species occurrences adjacent to the burned area were searched to get a list of species that may occur, or occurred; in the burn area even though they had not been previously detected. The BLM's Burned Area Rehabilitation (BAR) report for the burn area was also reviewed, particularly the wildlife and vegetation specialists reports. Much of the background information for his report came from the BAR. A wealth of informative maps provided by the California Department of Forestry, BLM, OES and the SEAT's GIS specialist were also reviewed. Multiple field surveys were made to selected areas of the burn to assess impacts, gauge the potential for future impacts and potential remedies for impacts.

I. Findings of On-The-Ground Surveys

A. Values at Risk

1. Habitat (Vegetation) Types

The primary plant communities within the perimeter of the Telegraph Fire as mapped by the USDA Forest Service Remote Sensing Lab (November 2006) are chamise chaparral (39.0%), lower montane mixed chaparral (12.2%), interior live oak woodland (14.4%), blue oak savannah (5.8%), canyon live oak woodland (3.6%), black oak woodland (0.9%), mixed hardwood (0.8%), non-native annual grassland (5.1%), gray pine (9.0%), west side ponderosa pine forest (7.9%), and valley-foothill riparian forest (0.1%) (Telegraph Vegetation/Burn Severity map). Lumping these figures into broad classifications, the vegetation types within the perimeter of the fire break out to 51% chaparral, 25% oak woodlands or savannah, 17 % was dominated by pines and 5% supported mostly herbaceous vegetation (BLM BAR report).

2. Wildlife Resources at Risk

The Telegraph fire impacted all of the species of wildlife and their habitat within the burned area to varying degrees. It is certain that significant amounts of mammals, birds, reptiles, amphibians and insects either perished or lost important habitat in the fire. There are large areas, primarily comprised of dense stands of chaparral, where nearly all of the above-ground vegetation has been removed and the hillsides appear bare. However, most of the area burned at moderate to low intensity, as viewed by the affects on the soil (Telegraph

Vegetation/Burn Severity map). Further, all of the vegetation in this area has evolved to become fire-adapted through various strategies. Many of the underground portions of shrubs survive from which re-sprouting will occur in most cases and seeds of many plants only germinate after a fire. Also, a significant amount of habitat was left unburned, or minimally burned, in a mosaic-like distribution. This interspersion of burned and unburned vegetation is often the goal of wildlife habitat enhancement burns.

Many wildlife species, such as mule deer, are also adapted to post-fire (early succession) conditions and will ultimately benefit from this burn as new vegetation growth provides highly nutritious forbs and shrubs for them to eat. Fire also opens up habitat for deer and other wildlife that has become too thick or tall for use as cover, food or travel corridors. California quail and mountain quail also typically increase in number after fire alters their habitat. Additionally, after the prey base increases, so will the predator population (mountain lions, black bear, bobcats, coyotes, gray fox, etc.). Indeed, the wildlife community that resides in the habitat types affected by the fire is so large that this assessment will only specifically address impacts to state and/or federally listed endangered or threatened species and State Species of Concern that occur within the burn area. Beyond that only select species, or suites of species, will be addressed.

B. Condition of Values at Risk

Many of the native plant communities within the burn area have evolved under a fire regimen and will regenerate quickly (1-3 yrs). As the habitat recovers, wildlife species will reoccupy the burned areas. The resulting vegetation types, with a variety of age classes, distributed in a mosaic throughout the landscape will typically provide for high wildlife use and productivity.

1. Sensitive Species Assessments

<u>Limestone salamander</u>

The limestone salamander (Hydromantes brunus) is listed as Threatened, Fully Protected, under the California Endangered Species Act (CESA) and as a BLM Sensitive Species. This salamander prefers moist conditions, and is found on north- and east-facing moss-covered talus slopes. The salamander spends much of the year deep in the talus, and only emerges to the surface during the wet season. The range of the limestone salamander is restricted to 31 occurrences along a 20-mile stretch of the Merced River between the headwaters of Lake McClure, near the community of Bagby, and the mouth of Sweetwater Creek, near Briceburg. There is also 1 isolated sighting on the South Fork Merced on Sierra National Forest near Hite Cove. Twenty-one of 31 confirmed population sites, and 29 of 38 sites containing suitable habitat are on BLM lands (BLM BAER report). The largest known population occurs at Hell Hollow (Tordoff 1981).

The limestone salamander is one of California's rarest native amphibians and occurs no where else in the world. Limestone salamander potential habitat is characterized by 1) northwest to east facing slopes 34 degrees and steeper; 2) numerous rock outcrops and moss covered talus, and; 3) oak/buckeye woodland with a thick shrub understory. BLM has designated approximately 2000 acres as a Limestone Salamander ACEC (Area of Critical Environmental Concern) that includes confirmed sites and potential habitat of the limestone salamander. A significant portion (approximately 500 acres) of the ACEC is within the burn perimeter, primarily along the Merced River, the north fork of the Merced and Sherlock creek. In addition, a small portion (less than 10 acres) of the Department of Fish and Games 120 acre Limestone Salamander Ecological Reserve lies within the burn boundary.

Most of the Limestone Salamander habitat with in the fire perimeter was burned at low or moderate severity, with some high severity burning in the Sherlock Creek drainage. Since the salamander is deep under rocks this time of year and most of its habitat was not severely burned it is believed that the salamander was not seriously impacted by the fire (Walter Tordoff, pers. comm.) Perhaps of greater concern is down slope movement of material on the steep slopes the salamander prefers during the rainy season. It is not advised that any attempt at stabilizing these slopes be made, however, as it may do more harm than good. The greatest benefit to this species would probably come from the otherwise proposed erosion control methods.

Foothill yellow-legged frog

The foothill yellow-legged frog (Rana boylii) is designated as a Species of Special Concern by the State and by BLM as a sensitive species. The situation for foothill yellow-legged frogs in the Sierra Nevada is bleak; there are no populations in the southern Sierra Nevada foothills that are likely to remain viable for more than a decade (BLM BAER Report). Populations in the northern Sierra are more numerous and generally larger, but they may be in decline as well. Foothill yellow-legged frogs are susceptible to a wide range of environmental impacts including loss of habitat, pesticides, competition/predation from nonnative species.

This species inhabits partially shaded, rocky streams at low to moderate altitudes, in areas of chaparral, open woodland, and forest. It seeks cover at the bottom of a pool when startled. Its breeding and non-breeding habitats are the following, in order of decreasing favorability: (1) partially shaded, small perennial streams , 30-1,000 m asl (above sea level), with at least some cobble-sized rocks, riffle areas and a stream depth rarely greater than 1 m; (2) intermittent , small, partly shaded, rocky streams displaying seasonal riffle habitat; (3) large (consistently greater than 1 m in stream depth), partly shaded, perennial streams

with rocky or bedrock habitat; and (4) open perennial streams with little or no rocky habitat. Breeding takes place in pools of streams, and eggs are usually attached to gravel or rocks at the edge of pools or streams (BLM BAER report).

Extant populations of foothill yellow-legged frogs are not evenly distributed in California. In the Pacific northwest, 40% of the streams support populations of foothill yellow-legged frogs, while that number drops to 30% in the Cascade Mountains (north of the Sierra Nevada), 30% in the south coast range (south of San Francisco), and 12% in the Sierra Nevada foothills. There is one known population of foothill yellow-legged frog within the burn perimeter in Sherlock Creek, a tributary of the Merced River. This population appears to be robust, with tadpoles, morphs, and adults all seen within the stream. The portion of the stream with the largest numbers of frogs extends from Drunken Gulch downstream to the Merced River. However, there are frogs using the stream upstream of Drunken Gulch as well.

Depending on the amount of post-fire erosion, short-term impacts to the frog are expected to be significant. Sediment laden water has a much higher capacity to move material, cobbles and frogs, downstream compared to clear water. Further, deposited sediment will obscure the rocks and gravels that the frog uses for egg attachment in the near term. Eventually, as the hillsides stabilize and erosion diminishes, the channels should be scoured out to resemble their pre-fire condition. How long this will take is unknown. Ultimately, it is believed that former frog habitat will be repopulated from the extant population.

Valley elderberry longhorn beetle (VELB)

VELB *(Desmocerus californicus dimorphus)* is listed as threatened under the Federal Endangered Species Act (FESA) and has no State special status. Because VELB is an obligate specialist on elderberry, reduction in the amount or quality of suitable riparian woodland habitat has had a significant impact to the VELB. .

The VELB is completely dependent on its host plant, elderberry (*Sambucus* species), which is a common component of the remaining riparian forests and adjacent upland habitats of California's Central Valley and associated foothills up to 3000 feet. *Sambucus* serving as hosts for the VELB occurred in several plant communities: riparian forest, savanna or grassland, oak woodland, and mixed chaparral-foothill woodland. The VELB is more frequently encountered in riparian forest margin and elderberry savanna than other situations. Host plants grow in the open, without overstory, and also as understory plants. Elderberry shrubs/trees with many exit holes were most often large, mature plants; young stands were seldom infested. The VELB seems to prefer stems for larval development and pupation which are larger than an inch or two in diameter. The beetle was most likely to occur in situations where plants were not isolated from one another (BLM BAER report).

There are several known occurrences of elderberry shrubs within the fire perimeter. These include an occurrence on Black Mountain Road near the North Fork Merced and two sites on FS road 2S05. There are also known occurrences within areas impacted by fire suppression activities. These are Buckhorn Road, Schilling Road, and Rancheria Road (USFS BAER report).

Direct impacts to the VELB are unknown. Elderberry shrubs which provide potential habitat for the VELB were impacted directly by the fire and through fire suppression activities. As elderberry shrubs sprout after disturbance and are fire adapted, those shrubs are expected to recover providing future potential habitat.

Southwestern Pond Turtle

The southwestern pond turtle (Actinemys marmorata) is found in ponds, lakes, rivers, streams and creeks with either rocky or muddy bottoms, in woodland, forest and grassland habitat. Logs, rocks, cattail mats and exposed banks are required for basking. They may be active all year, but also may hibernate underwater, often in the muddy bottom of a pool. Pond turtles aestivate during summer droughts by burying themselves in soft bottom mud. In some areas, they inhabit streams that dry out and move onto land to hibernate under dense brush or wood rat nests (BLM BAER report).

Southwestern pond turtles may have been directly impacted by the Telegraph fire. Per the CNDDB there are two locations within the fire perimeter, one in the Merced River canyon and one along the North Fork of the Merced. The level of immediate impact would depend on whether or not they were aestivating at the time out of the river channels and weather or not there was escape habitat, such as open water, nearby that they could reach in time. As the vegetation along the riparian areas was less impacted these sites are expected to recover quickly and therefore provide habitat for the pond turtle in short order.

Townsend’s big-eared bat

Townsend’s big-eared bat (Corynorhinus townsendii) is a State of California Species of Special Concern. Townsend’s bats roost in natural caves and artificial openings such as mines. Adult bats would have had the ability to escape the flames and smoke and the fire occurred near the end of the breeding season. The main concern would be overcoming juveniles in maternal roost colonies with smoke. However, whether adverse impacts would occur would be based on the residence time of smoke within the caves or mines. While two occurrences of Townsend’s big-eared bat are known on the Bear Valley quad adjacent to the burn there are no known locations within the burn perimeter. Still, suitable habitat exists in the form of caves and mines. These bats are extremely sensitive to human disturbance.

2. General Wildlife Assessments

Mule Deer

In the short term deer have been displaced and there may have been direct mortality. In the near to long term however, mule deer will largely benefit from the burn. The deer in the burn area come from both the resident Mariposa herd (year round) and the migratory Yosemite deer herd (during the winter) (Mariposa Deer Herd Boundary map). The Yosemite Deer Herd Plan and the Mariposa Deer Herd Progress Report, in particular, site habitat decadence as significant factors contributing to the decline of both herds. Deer prefer early successional habitat, which is naturally produced by fire. The resulting re-sprouting vegetation is highly nutritious for deer. Further, much of what was burned was extremely dense and was not accessible by deer or many other species of wildlife.

Of concern is the loss of oaks from the burn. Deer, among many other species (bear and several species of birds) utilize the high energy acorn mast from oak trees during the winter. If not severely burned, oaks will re-sprout after a fire. However, it can take up to 25 years before a re-sprouting black oak tree will produce an acorn (Jim Maddox, pers. comm.). Blue oaks and live oaks may respond more quickly, but it will still be a considerable number of years before acorn production resumes. Further, it can take over 80 years for a Black oak that has sprouted from an acorn to in turn produce acorns. For these reasons, it is extremely important that remaining oaks be retained as much as possible. Timber salvage operations should retain oaks during their operations. During re-forestation planting oaks should be included if possible.

Birds

Wood eating insect populations are expected to increase post-fire. This will in turn be a boon to insectivorous birds such as Lewis' Woodpeckers, Western Kingbird, and Western Bluebird (Jim Maddox, pers. comm.). Further the woodpeckers will create cavities during their foraging which will in turn be used by the bluebirds for nesting. This makes retaining some snags important, both softwood and hardwood. Gallinaceous birds, such as California quail and Wild Turkey, will suffer somewhat from the lack of cover in the short-term but will also benefit from the flush of fire following plants and the seeds they produce.

Fisheries

The main impacts to fisheries from the fire will be short-term. There is a small native fishery in the Merced River in the stretch from Briceburg to the mouth of Lake McClure (Brian Beal, pers. comm.). It is likely that there will be some impacts to this fishery from the anticipated increased sediment load. However, as the sediments move down the river over the next few years, this fishery is expected to recover. Also, both the river and the lake are stocked with fish by the California Department of Fish and Game (DFG) upstream of Briceburg and in the lake. Therefore, the river is not dependant on

natural reproduction for recovery. There are no special status fish species in this stretch of the Merced or its tributaries (CNDDB).

Emergency Determination

There has been a significant short-term loss of native habitat and, most likely, native wildlife by the Telegraph fire. However, these vegetation and wildlife communities are adapted to recovering from fire, and this fire should be no different. Emergency actions are not recommended for wildlife habitat and species protection at this time, but recommendations are given in the following section for treatments and monitoring that may be conducted to minimize the short-term loss of habitat and document the possible effects of the fires on wildlife resources.

I. Treatment Objectives

- Drainages that are identified as habitat for the foothill yellow-legged frog and southwestern pond turtle are at risk from excessive sedimentation during high rainfall events and should be monitored for impacts to these species. Special consideration should be given to these drainages when determinations are being made on sedimentation control operations.
- Take measures to limit impacts to newly accessible areas, particularly by OHVs, to limit what can be a significant source of erosion and sedimentation.
- It is anticipated that the vegetation will recover on its own, and therefore no revegetation activities are recommended at this time.

II. Treatment Descriptions

- Monitor slopes using ocular plant cover estimates and plant species composition on a site specific basis to identify areas of poor plant regeneration and areas showing signs of excessive soil erosion. Implement appropriate best management practices (BMPs) upstream of sensitive riparian habitats to minimize sediment load. Monitoring should be down persons with knowledge of the species and habitats in question.
- Re-visit known locations of the limestone salamander and foothill yellow-legged frog (that were identified in the CNDDB) that were either directly burned or immediately impacted by above normal sedimentation to determine what impacts the fire actually had on these species. Surveys should be done at the appropriate time of year by a biologist familiar with the species.

Discussion/summary/recommendations

The Telegraph fire burned over 34,000 acres of chaparral, oak woodland and ponderosa pine forest that supported a variety of wildlife species, including the threatened limestone salamander. Of that 3,875 acres were FS, 21,215 acres were BLM, 8,925 acres were private and 76 acres were State (BLM BAER report). Without a doubt, mammals, birds, reptiles, amphibians and insects perished, or lost important

habitat in the fire. However, many species were likely able to move out of the way of the approaching fire to areas that were not burned, or they found shelter in moist areas such as streams or creeks, underground or in rock outcrops or talus slopes, or even in abandoned mines. Still, most of the vegetation that burned, and therefore the habitat that wildlife depends on, has evolved with periodic fires and will naturally regenerate within a few years. Very little of the fire area burned at a high intensity and therefore the soils that support the overlying vegetation are expected to retain their productivity. Also, not all of the habitat within the fire perimeter was burned, and a significant amount burned in a highly desirable mosaic pattern.

The species of greatest concern, the limestone salamander most likely passed through the fire unscathed since it is deep within the talus slopes during the summer. While little of the salamander's ecology is known, significant post-fire threats are not anticipated, short of a catastrophic landslide in its habitat areas which seems unlikely. The foothill yellow-legged frog will likely suffer from habitat degradation due to siltation in the short-term, particularly in the Sherlock creek drainage. Yet the silt is expected to move through the system, revealing the habitat characteristics which presently exist. The same holds for the southwestern pond turtle, although to a lesser extent since it has more flexible habitat requirements and is more mobile.

General recommendations

- **No revegetation activities are recommended at this time**. **The native vegetation is expected to recover on its own and could actually be hindered by any supplemental planting/seeding.** The only exception being reforestation activities involving the post-salvage planting of trees in ponderosa pine forest. If private landowners wish to re-vegetate their property, they should be encouraged to use native plants appropriate to their site.
- Monitor known occupied sensitive species habitat to assess impacts and rate of recovery. Monitor common wildlife species populations, particularly deer, and patterns of use.
- Take steps as recommended in the BAER (BAR) and SEAT reports to limit erosion during the first season after the fire which is almost certain to be significant. Specifically, BLM has advised small scale straw mulching in the upper Sherlock Creek watershed. This is an area of high burn severity that is expected to erode heavily into the most sensitive stream in the burn area. Implementing mulching as proposed by BLM is strongly recommended.
- Defer grazing in burned areas until at least the 2009-2010 grazing season (longer if rainfall is below the long-term average in the year after the fire), particularly on the Merced and Cavagnaro allotments, the first year to allow the natural vegetation to recover and set seed. Avoid feeding hay in burn areas since soils are very receptive to contamination from weed seeds.
- Avoid disturbing islands of unburned vegetation, which provide wildlife habitat as well as seed sources for natural re-vegetation.
- Take steps to restrict access to newly opened areas, or areas where access has been improved, particularly by OHVs.

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Figures

Figure 1: Telegraph Vegetation/Burn Severity map

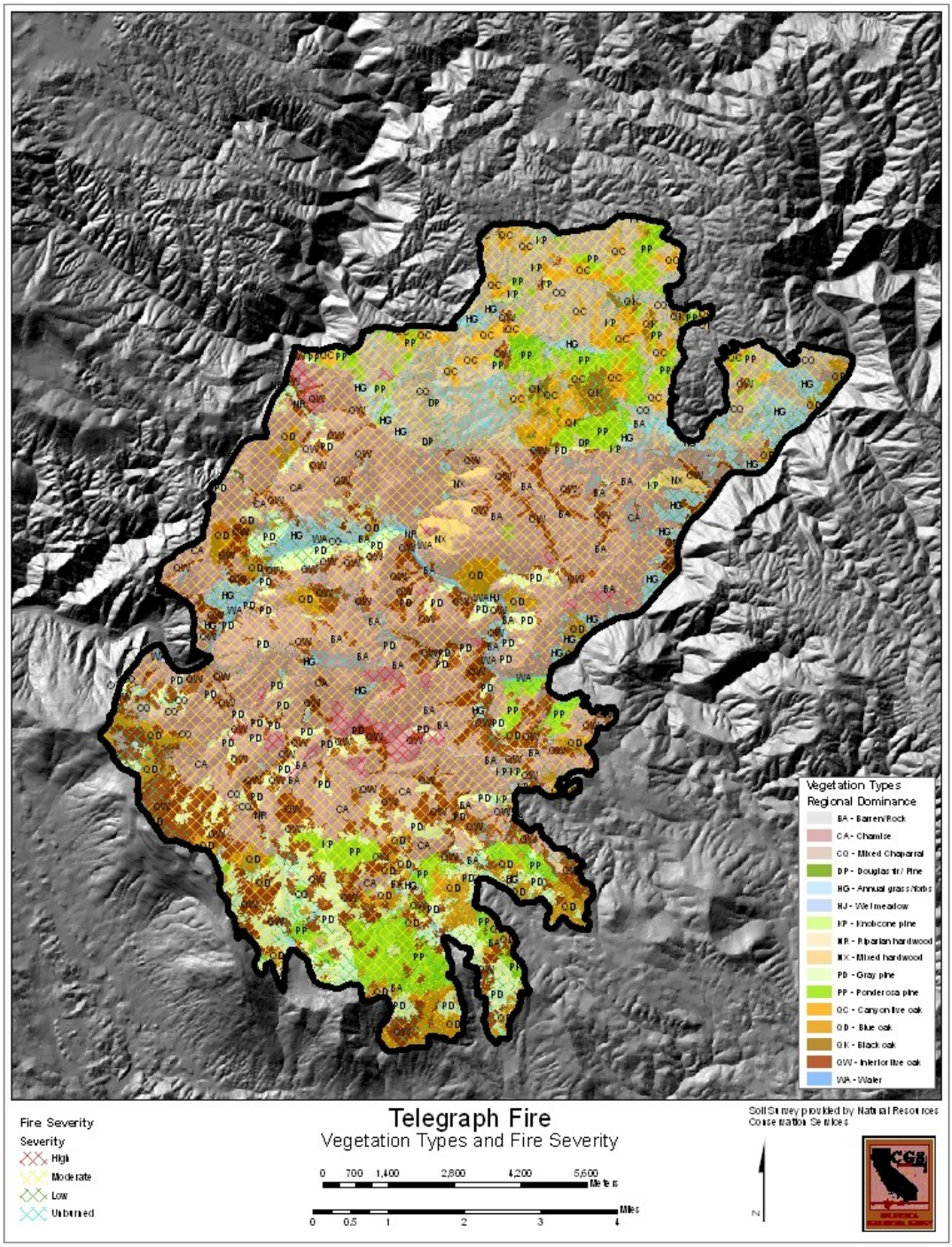
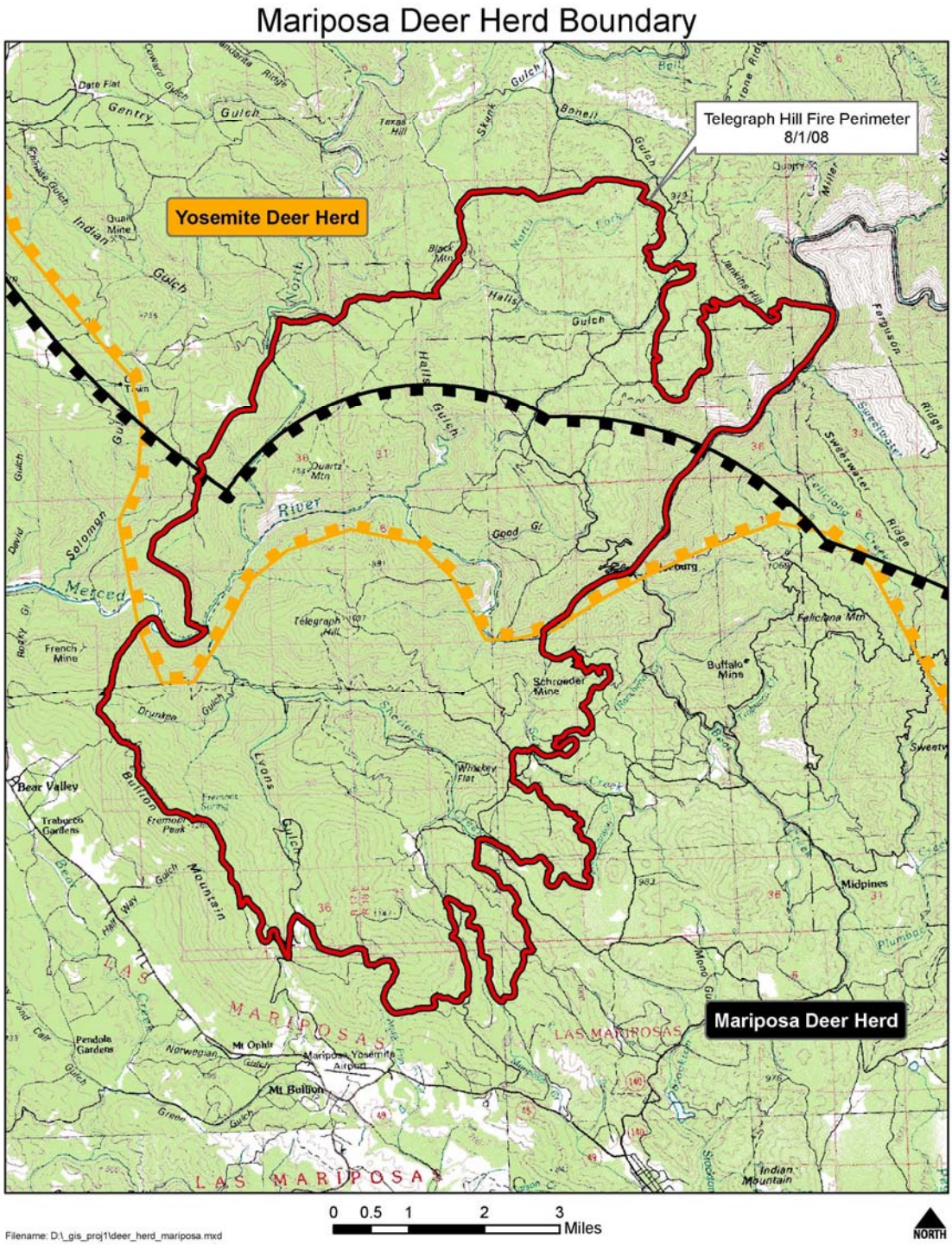
Figure 2: Mariposa Deer Herd map