WILDLIFE TECHNICAL SPECIALIST'S REPORT for
BURNED AREA EMERGENCY RESPONSE for the MOUNTAIN FIRE

Resource Specialty: Wildlife
Fire Name: Mountain Fire/ CA-BDF-010328
Month/Year: August 2013
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1.0 INTRODUCTION

1.1 Objectives

The purpose of this Resource Assessment has two primary purposes.

- Assess the post-fire effects of the Mountain Fire on federally listed wildlife species and their habitats.
- Develop treatments of vital habitat for species at risk to prevent permanent impairment of ecosystem structure and function.

In some instances, direct effects of the fire are documented, but do not necessarily meet the purpose of BAER and so are not a detailed analysis. This specialist report also includes an assessment of several additional locally important wildlife species as well as spring developments for wildlife use.

If necessary, a separate biological assessment will be completed to document determinations of adverse effects to listed species as a result of BAER treatments. Mitigations to reduce impacts to wildlife and funding to pay for biologists time during treatment implementation has been incorporated into treatments proposed by the Mountain Fire BAER Team.

1.2 Background

The Mountain Fire started at 1:43 PM on July 15, 2013 near the junction of Highway 243 and Highway 74 in the community of Mountain Center. It burned east of Mountain Center, through the Apple Canyon and Bonita Vista areas, and then along the Desert Divide and southern portion of the San Jacinto Wilderness. The total acreage within the burn perimeter is approximately 27, 533 acres of which 15, 535 acres were on the San Bernardino National Forest. The remaining acres are composed of BLM land (2,444 acres), BIA land (5, 784 acres), State land (893 acres) and private land (2,877acres). The Mountain fire was declared 100% contained on July 30, 2013.

2.0 POTENTIAL VALUES AT RISK

2.1 Federally-listed and Other Locally Important Wildlife Species

The potential values at risk for wildlife species are stability and viability of suitable habitat which may result in extirpation. Federally threatened and endangered species are those listed under the Endangered Species Act by the US Fish and Wildlife Service. There are three federally endangered species known or likely to occur within the Mountain Fire area (Table 1). Numerous Region 5 sensitive wildlife species are known or are likely to occur in the Mountain Fire area. Bald eagles are included in this report because they are protected by additional federal laws and

are locally important due to the public interest in the potentially affected population. Other R5 sensitive species and wildlife Management Indicator Species (MIS) will not be included in this BAER assessment since R5 sensitive species and MIS are not considered a critical value under FSM 2523.1: *Critical habitat or suitable occupied habitat for federally listed threatened or endangered terrestrial, aquatic animal, or plant species on NFS lands.* A determination under BAER will not be made for R5 sensitive species or MIS in this report.

Table 1. Federal Threatened, Endangered and Forest Service Sensitive Wildlife Species considered in this BAER Assessment

Scientific Name	Common Name	Status	Status and Location within Mountain Fire Area
Rana muscosa	Mountain yellow-legged frog	USFWS Endangered	Within the burn area in Willow Creek the unnamed tributary east of Willow Creek and Tahquitz Creek.
Empidonax traillii extimus	Southwestern willow flycatcher	USFWS Endangered	Within the burn area in Fobes Canyon and outside the burn area in Garner valley and Herkey Creek.
Euphydryas editha quino	Quino checkerspot butterfly	USFWS Endangered	Within the burn area; in Herkey Creek and Fobes Canyon
Haliaeetus leucocephalis	Bald Eagle	Forest Service Sensitive, federally protected under GBEPA	Outside the burn area, this species is found around Lake Hemet.

2.2 Spring Developments

There is one spring development within the fire perimeter where the primary purpose is to provide water for wildlife. All other troughs and drinkers within the fire area are part of the range infrastructure and will be covered in the range specialist report. Cartridge Spring, east of the Bonita Vista Ranch, has a developed spring box and water drinker for wildlife. The concerns are that fire directly damaged Cartridge Spring and that the burned area around and upstream of the development has increased the potential of sediment from the surrounding burned slopes filling the water drinker thereby reducing the amount of water available to wildlife.

3.0 RESOURCE CONDITION ASSESSMENT

A Soil Burn Severity Map was created in order to assess the potential watershed response for the watersheds affected by the Mountain Fire. The data used to create the map was collected by both satellite imagery and flights over the burn area in addition to on-the-ground data collection. The northern portion of the burn area was created using on-the-ground data, flight data and heads up digitizing because the satellite imagery was obscured by cloud cover. A break-down of the fire area by burn severity is found in Table 2.

Table 2. Total Soil Burn Severity in Acres and Percentages for the Mountain Fire		
	Acres	**Percentage of Total**
High severity	365	1%
Moderate severity	13,568	49%
Low severity	9,872	36%
Unburned/Very Low Severity	3,715	14%
Totals	27,520	

Table 3. Soil Burn Severity in Acres for the Affected HUC 6 Watersheds for the Mountain Fire			
HUC6	**Total HUC6 Acreage**	**% Watershed Burned**	**% High and Moderate Soil Burn Severity**
Lower Palm Canyon Wash	11,946	22%	10%
Middle Palm Canyon Wash	18,297	52%	31%
Strawberry Creek-San Jacinto River	16,286	4%	3%
Tahquitz Creek-Contains Willow Creek	22,550	12%	3%
Upper Palm Canyon Wash	26,768	2%	<1%
Upper South Fork San Jacinto River	40,811	19%	13%

As a result of the Mountain Fire, species and their habitat are at risk of injury, mortality, disturbances, and degradation from post-fire impacts including invasive plants, habitat type conversions, increased sediment delivery, loss of water quality, scouring of riparian vegetation, and changes to stream channel configuration. These areas are also at risk from potential long-term disturbance and habitat impacts from increased access by people, vehicles, cattle, illegal OHV use, mountain bikes, horseback riders, and garbage dumping. Wildlife species that survived the fire are likely to experience difficulty in finding adequate food and shelter. As a result, an additional loss of individuals is likely.

Several locations were selected for hydrological and soil erosion analysis based on identified BAER values at risk. Several of these points (pour points, See Pour Points Map) were selected based on their potential to contribute sediment into occupied habitats, Designated Critical Habitats, and historic territories of federally-listed wildlife species. These points and the associated watersheds that may contribute sediment are found in table 4. This table also shows the burn severity classes and acreage for each of these delineated watersheds.

Table 4. Soil Burn Severity in the Watersheds Delineated by Pour Points for the Mountain Fire					
Watershed by Pour Point	**High Burn Severity (acres)**	**Moderate Burn Severity (acres)**	**Low Burn Severity (acres)**	**Unburned (acres)**	**Total (acres)**
Andreas Canyon	3.7	879.0	403.3	170.6	1456.6
Fobes Canyon	22.3	1852.0	255.6	459.4	2589.3
Herkey Creek	0	689.5	363.9	5889.1	6942.5
Willow Creek	45.4	98.0	549.5	682.1	1375.0
Unamed Tributary of Tahquitz	36	179	358	35	608
Upper Tahquitz Creek	153	632	1664	1600	4050

Since the fire started several rain events have occurred. The first rain event dropped 0.02 inches and occurred on July 20. The second rain event was measured at the Mt. San Jacinto Remote Automatic Weather Stations (RAWS) station near the north end of the fire. This rain event occurred on July 21 and dropped approximately 2.36 inches, of which over 1.5 inches fell between 3 and 4 am. The same rain event dropped 1.03 inches near the southeastern edge of the fire as was measured at the Keenwild RAWS station. Most of the 1.03 inches fell between 12pm and 2 pm. This seems to indicate that the northern portion of the fire may have seen more rainfall and of higher intensity. Then on July 22 0.2 inches fell on the fire. On July 25 0.04 inches of rain fell on the fire. Finally, on July 26 0.03 inches of rain fell on the fire.

3.1 Mountain yellow-legged Frog (*Rana muscosa*)

3.1.1 Existing Environment

The mountain yellow-legged frog is listed as endangered by the US Fish and Wildlife Service. In southern California, mountain yellow-legged frogs inhabit perennial mountain streams (i.e. streams that contain plunge pools or backwaters year-round, although not necessarily flowing year-round) with steep gradients. Mountain yellow-legged frogs are seldom found more than two or three jumps from water (Stebbins 1985). Highly aquatic, they occupy rocky shaded streams with cool waters originating from springs and snowmelt. Breeding habitat is in plunge pools and backwaters of perennial streams. Occupied and designated critical habitat exists in the northern portion of the Mountain Fire, in the Tahquitz Creek watershed and Andreas Creek.

Occupied and Designated Critical Habitat Units (Unit 3C and 3D) are found within the burn area. Occupied habitat is found within the Tahquitz Creek watershed (see MYLF map) and Designated Critical Habitat is found within Tahquitz Creek and Andreas Creek. No focused surveys for

MYLF (Rana muscosa) were conducted as part of the BAER assessment. However, focused surveys have been completed by the U.S. Geological Survey in 2009 2010, and 2011(Backlin et al. 2010, Backlin et al., 2011and USGS 2011). Only six individual MYLFs have been observed in Tahquitz creek, Willow Creek and an unnamed tributary of Tahquitz Creek during surveys completed in 2009-2011. Rainbow trout (*Oncorhynchus mykiss*), a known predator of MYLF have also been observed in Tahquitz Creek.

3.1.2 Initial Post-fire Concerns

These populations may experience significant sedimentation and debris flows which could result in a temporary loss of suitable breeding habitat. Loss of pool and slack water habitat in these areas could make them less suitable for breeding and may result in frogs being subjected to injury or mortality. Significant sedimentation, or debris flows, could result in extirpation of affected habitats.

3.1.3 Post-fire Affects Assessment

No specific surveys for the MYLF were conducted as part of this BAER assessment.

The following table identifies the amount of MYLF habitat that burned during the Mountain Fire. ArcGIS and data provided by the local district were used to run the analysis.

Table 5. MYLF Habitat Burned in Mountain Fire

Species	Soil Burn Severity (acres)				Grand Total
	High	Moderate	Low	Unburned*	
MYLF Occupied Habitat	2.67	35.88	72.31	5.08	115.95
MYLF Critical Habitat	2.11	99.97	132.81	232.52	467.42

* Includes habitat within the Mountain Fire vicinity that was unburned. Does not include mapped habitat for the species outside of the vicinity of the Mountain Fire.

Approximately 63% of the Upper Tahquitz Creek drainage was burned and approximately 19% of the Upper Tahquitz Creek watershed was a moderate to severe soil burn severity (see Table 5). A limited rapid on-the-ground assessment of Willow Creek and its watershed and a portion of Tahquitz creek and its watershed was performed on July 20, 2013 and on July 27, 2013. The assessment began as biologists and botanists hiked along the Willow creek trail (3E02) from Hidden Lake Divide. The first drainage that was assessed that is considered occupied by MYLFs was the unnamed drainage to the east of Willow Creek. There was a significant amount of sedimentation that had already occurred due to the precipitation event on July 21, 2013. Any pool habitat that may have been present before the fire was no longer present and there was no evidence of any running or standing water near the trail crossing. There was no suitable habitat for mountain yellow legged frog near the trail crossing.

The next portion of the Tahquitz Creek watershed that was assessed was the Willow Creek drainage. This burn severity in the Willow creek watershed appeared to be moderate to severe with scattered pockets of low. During this site assessment there was evidence of significant

sediment contribution from the watershed above the 3E02 trail crossing. There was also evidence of retardant application in the vicinity of the 3E02 trail crossing at Willow Creek. Flowing water was present and was estimated to be less than 1 cfs. No pools were present at the time of the assessment and were filled with sediment. Upon comparison with photos of the Willow Creek watershed taken on July 20, 2013 prior to the rain event it was evident that the pool habitat had been filled by the sedimentation caused by the rain event on July 21, 2013. In some locations the stream had been diverted onto adjacent benches/floodplain due to the high deposition of sediment. In addition the only macroinvertebrates observed in the creek near the 3E02 crossing were water striders (Family: Gerridae). As the team walked downstream along Willow Creek the creek went dry in several locations and the entire stream length from the 3E02 crossing down to the confluence of Willow Creek and Tahquitz Creek was no longer suitable habitat for the MYLF due to sedimentation. Near the confluence of Willow Creek and Tahquitz there was evidence of additional macroinvertebrates including water striders (Family: Gerridae), water boatsmen (Family: Corixidae) and potentially aquatic snails.

The team then traveled downstream in Tahquitz Creek below the confluence of Willow Creek and Tahquitz Creek. The habitat downstream of the confluence transitions into steeper adjacent hillslopes and a higher stream gradient. As a result the habitat transitions into more of a plunge pool system. Pool habitat was still present with evidence of fine siltation present in the pools. Several pools over 2 feet deep remain in Tahquitz Creek that still provide suitable breeding habitat for the mountain yellow legged frog.

As a result of comparing the field assessment conducted by a Resource Advisor on July 20, 2013 and observations of the subsequent field assessment conducted on July 26, 2013 after the intense rain event on July 21, it is likely that any tadpoles or egg masses that may have been present within the Willow Creek watershed or the unnamed watershed to the east were buried with sediment or washed downstream. In addition, it is likely that all of the habitat in Willow Creek and the unnamed drainage to the east will remain unsuitable for frogs until the sediment is flushed out of the system. Vegetative recovery on the slopes is anticipated to occur in 3-5 years. Based on this it is anticipated that sediment could be contributed to the Tahquitz watershed until the vegetation recovers or there is no more sediment left on the hillslope or in the streambed. However, sediment contribution to the streams is expected to decrease considerably in years two and three. Based on the sediment modeling it is anticipated that the Tahquitz watershed will experience a 2.3 fold increase in sediment over background and will result in 7.0 acre feet of sediment delivered to the pour point (See the Mountain Fire Soil Resource Assessment). In addition, the Willow Creek watershed will likely experience a 1.7 fold increase in sediment over baseline resulting in 1.7 acre-feet per year delivered to the pour point. It is possible that mature frogs present in the Tahquitz Creek watershed may have survived the fire and avoided direct mortality by retreating upslope to avoid debris flows. However, the habitat in this drainage may no longer have a suitable forage base to sustain these individuals. It is also likely that the plunge pools in Tahquitz will also fill with sediment as the watershed is likely to experience 2.3 times the amount of sediment over baseline and the flows are not predicted to increase much over baseline (See the Mountain Fire Soil Resource Assessment and the Mountain Fire Hydro Resource Assessment). Therefore it is likely that the system will not flush the sediment as rapidly as it would if peak flows were increased significantly over baseline. Therefore, this watershed may take several years before suitable breeding habitat is present for this species. In addition, during this time individuals that have escaped direct mortality will be subjected to

increased predation and mortality from the lack of refugia until scouring flows restore pool habitat in the stream channel.

The Designated Critical Habitat in Tahquitz and Andreas Canyon is expected to see the same sort of impacts from the fire and to a similar degree (see Mountain Fire Soil Resource Assessment). Sedimentation is predicted to be similar to the discussion above for the frog population. Sedimentation is expected to fill in the pool habitat. Currently these areas are not known to be occupied so no anticipated impacts to individuals are expected. The stream habitat is expected to recover over time once the slopes in the burned area recover sediment contribution to the stream will decrease and stabilize. Once that occurs peak flows will likely flush any sediments that have accumulated due to the fire. No long term loss or degradation of designated critical habitat is expected.

Emergency treatments to alleviate the risk to MYLF and its habitat are very limited. In-channel treatments to increase the movement of sediment through the channel in order to reestablish pool habitat are logistically infeasible, cost-prohibitive, or impractical due to the low likelihood of success. Slope treatments to reduce sedimentation were also considered. If only high burn severity acres (153 acres) were treated, it would likely result in a reduction of 0.88 acre-feet (12%) of sediment being contributed to the Tahquitz pour point. In addition, treating high severity burn acres would result in a reduction of 0.26 acre-feet (15%) of sediment delivered to the Willow Creek pour point.

A more site specific analysis was completed for the high severity burn areas in the Willow Creek and unnamed tributary to Tahquitz Creek to better gauge the reduction of sediment at a more site specific location. The first location was just down slope of the high burn severity polygon in Willow Creek. The model shows that the sub-watershed containing the high burn severity polygon left untreated will result in 8.86 tons/acre of sediment in year one and then 2.29 tons/acre in year two and 0.03 tons/acre in year three. If the high burn severity acres are treated with 0.5 tons/acre of wood straw then the sediment delivery to the stream would be 0.02 tons/acre in year one, 0.44 tons/acre in year two and 0.03 tons/acre in year three. This seems to indicate that treatment of high burn severity areas will significantly reduce the amount of sediment contributed to these watersheds. However, when we consider that the habitat in Willow Creek and the adjacent unnamed drainage are already unsuitable for MYLF due to the sedimentation event on July 21, these treatments will not likely benefit any individuals that may be present in these two drainages. If the treatment had occurred prior to the rain event they may have benefited individuals in Willow Creek and the unnamed drainage. Thus this treatment will likely have limited benefits other than to decrease additional sediment being contributed to the stream. When we take into account the whole Tahquitz watershed, treating the high soil burn severity areas will only reduce sediment delivery by 12% for the entire Tahquitz watershed (see the Mountain Fire Soil Resource Assessment). The cost to treat the 153 acres of high severity burn area would cost approximately $612,000. This equates to approximately $51,000 to reduce the amount of sediment delivered to the stream by 1%.

In addition to the modeling that the USFS BAER team completed, the University of Arizona completed hydrologic/sedimentation modeling using the Automated Geospatial Watershed Assessment (AGWA) model. This modeling used the same pour points that the USFS modeling completed and modeled a 5 year 6 hour storm that deposited 2.11 inches and a 10 year 1 hour storm that deposited 1.26 inches (see the Mountain Fire Hydro Resource Assessment). In the

Willow Creek drainage peak flows are modeled to increase by 13% and total sediment is modeled to increase by 14%. For the 10 year storm and peak flows are anticipated to increase by 62% and total sediment contribution is expected to increase by 33% for the 6 hour storm. The Tahquitz Creek watershed response is predicted to result in a peak flow increase of 28% and a total sediment contribution of 59% for the 10 year storm and the peak flow response is modeled to increase by 87% and total sediment contribution is expected to increase by 146%.

Numerous modeling was conducted for the anticipated watershed response following the Mountain Fire. In general, all of the results were similar. The only exception is that total sediment yield for the 2.11" 5 year 6 hour storm AGWA modeling resulted in much less tons of sediment than the Mountain Fire Soil Resource Assessment. Overall the greatest increase in watershed response is expected to occur in the unnamed tributary east of Willow Creek. The peak flow is expected to increase 10 times over pre-fire conditions and total sediment delivery is expected to increase 23 times over pre-fire conditions. Based on the modeling, the site visit, the known location of the frogs and topography and stream morphology it is very likely that all the pool habitat will fill in and will no longer be suitable for refuge or breeding. In addition, it is very likely that this population is at risk of extirpation due to the potential for being washed downstream due to peak flows, injury and mortality due to the increased risk of predation because of lost refugia and the potential for altered prey base due to the increase in sedimentation lowered water quality and the direct impacts of the fire.

Another possible emergency action would be a salvage operation in which individuals would be captured and removed from the wild and placed in captivity or moved to suitable habitat upstream of the burn area in the Tahquitz watershed. The Tahquitz Creek population is thought to be genetically similar to the populations located in Dark Canyon and Fuller Mill Creek (Backlin, personal communication) although this is based on only a few genetic samples and is not statistically significant. There is a captive population representative of the Fuller Mill Creek and North Fork San Jacinto River (Dark Canyon) populations that is currently being used to produce individuals for release into the wild. The habitat affected by the Mountain Fire will be unsuitable for at least a couple of years and there were only 6 known individuals in the population and interpretation of the modeling results suggest that they will not likely survive. Frogs would be held until such time that they can be re-released into the Tahquitz watershed from where they were captured.

It is helpful to compare other situations where fire has impacted this species. In 2009 the Station Fire burned the Devils Canyon watershed on the Angeles National Forest which also contained a relatively small population (~20 individuals) of MYLFs prior to the fire. The soil burn severity was moderate to high in that watershed (Station BAER Soils report) and post fire debris flows resulted in a loss of suitable breeding habitat after the fire. Surveys in 2010 found 12 individuals in Devils Canyon. Once the slopes stabilized and scouring flows moved the sediment downstream, breeding habitat was re-established and the frog numbers have increased higher than have ever been found in this population. There are some differences in the two watersheds that may explain the anticipated extirpation of the Tahquitz population and the rebound of the Devils Canyon population. Assuming that the reduction in individuals found in Devils Canyon in 2010 was a direct result of the Station Fire, this is a 40% reduction of the population size. Since theWillow and Tahquitz Creek populations are much smaller to begin with, the peak flows that are likely to occur could result in extirpation (see AGWA modeled results). In addition, the stream morphology is different in Devils Canyon. In Devils Canyon the stream slope is generally

steeper and the contributing watershed above occupied habitat is considerably smaller and therefore would likely have contributed less total sediment to the occupied stream stretch than is likely to occur in Tahquitz Creek. We anticipate that scouring flows in Devils Canyon due to the stream slope occurred more rapidly than is anticipated in the Tahquitz watershed.

3.2 Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

3.2.1 Existing Environment

Southwestern willow flycatcher (SWWF) is federally-listed as Endangered. The southwestern willow flycatcher is a neotropical migrant that breeds in low-elevation riparian habitats. Habitat characteristics include the presence of perennial or near-perennial water, high vegetative volume in the lower strata and high canopy density.

There is one territory for SWWF within the burn perimeter in Fobes canyon and one territory located outside the burn perimeter in Herkey Creek (see SWWF map) that may be impacted by post fire debris flows or sedimentation. The Fobes canyon territory has not been surveyed since 2005 and surveys in 2005, 2002 and 2001 did not find any individuals occupying this territory. Nesting has never been documented in the Fobes canyon territory. The only individuals observed in this territory were migrants in 2001 and in 2002. The Herkey Creek territory has not been surveyed since 2005 and surveys in 2005 and 2004 did not find any individuals occupying this territory. Nesting has never been documented in the Herkey Creek territory. The only individual observed in this territory was a migrant sometime between 1994-1998. Based on the survey data it does not appear that these territories are used for breeding, however surveys have not been conducted in recent years.

3.2.2 Initial Post-fire Concerns

Direct effects of a fire in riparian habitat include temporary loss of riparian vegetation. Willows will generally lateral and root-sprout relatively quickly following a fire. Post-fire effects to riparian habitat may include debris flows and/or increased peak flows which could further retard that natural regrowth of riparian vegetation. If debris flows deposit substantial sediment willows may not be able to re-sprout through several feet of sediment. If this were to occur, these historic territories may not be suitable until such time as willows are able to become reestablished by aerially broadcast seed from adjacent willows. This could greatly increase the amount of time that the habitat takes to become suitable for breeding.

3.2.3 Post-fire Effects Assessment

No specific surveys for the SWWF were conducted as part of this BAER assessment.

The following table identifies the amount of SWWF habitat that burned during the Mountain Fire. ArcGIS and data provided by the local district were used to run the analysis.

Table 6. SWWF Habitat Burned in Mountain Fire					
Species	Soil Burn Severity (acres)				Grand Total
	High	Moderate	Low	Unburned*	
SWWF Historically Occupied Habitat	0.87	23.84	4.49	0.37	29.59

* Includes habitat within the Mountain Fire perimeter that was unburned. Does not include mapped habitat for the species outside of the perimeter of the Mountain Fire.

A direct result of the fire was that the riparian obligate vegetation, including willows, was burned. The fire has caused a temporary loss of approximately 29.2 acres of suitable habitat for SWWF. Direct mortality/injury to SWWF, if present at the time of the fire, may have occurred when the fire burned through the habitat. However, no injury/mortality to SWWF is anticipated as a result of post-fire effects.

Rowe, Countryman & Storey modeling was conducted for both Fobes Canyon and Herkey Creek. The erosion at the outlet at the fire perimeter of Fobes canyon is modeled at 18.2 times above background as a result of post-fire hydrologic impacts. The modeled amount of sediment delivery is 29.0 acre feet. This result is in alignment with the results of the AGWA modeling that was conducted for the Mountain Fire. The Mountain Fire BAER team has concerns about hyper-concentrated flows occurring in Fobes Canyon. However, the topography within the historically occupied SWWF habitat is a relatively wide channel, with a lot of alluvium storage. Therefore, sediment that flushes into this habitat is expected to spread out across the channel. Because of the channel characteristics within the SWWF historically occupied habitat, sediment deposition as a result of the Mountain Fire is not expected to substantially retard the natural regrowth of riparian vegetation.

3.3 Quino checkerspot butterfly (*Euphydryas editha quino*)

3.3.1 Existing Environment

The U.S. Fish and Wildlife Service has designated the QCB as endangered. The most commonly used primary host plant (plants upon which adults deposit eggs) is *Plantago erecta*, but other documented primary host plants include *P. patagonica*, *Antirrhinum coulterianum*, and *Cordylanthus rigidus*. Other species of *Plantago* may be used as primary host plants. Secondary host plants (adults don't deposit eggs on it, but larvae eat it) include *Castilleja exserta* and perhaps other species belonging or related to the figwort family (Scrophulariaceae). Primary host plant species may serve only as secondary hosts at some occupied sites (Anderson pers. comm.). The primary food plant is not strongly associated with a single vegetation community; rather, it is found in sparsely vegetated openings embedded in a variety of vegetation types, most commonly in coastal sage scrub, chaparral, grasslands, and juniper woodlands (Stephenson and Calcarone 1999).

The life cycle of QCB includes one generation of adults per year, with a 4 to 6 week flight period beginning from late January and to early March and continuing as late as early May. Diapuase occurs during the larval stage, primarily during the summer and fall.

The QCB has been observed within and adjacent to the burn area. This species has been observed within the burn area near Bonita Vista/Herkey Creek and adjacent to the burn area in the Fobes Canyon area immediately south of the fire perimeter. Adult butterflies are not currently present. Larvae are likely currently in diapause just under the leaf litter.

3.3.2 Initial Post-fire Concerns

Larvae in diapause were likely killed when the fire moved through diapause sites. Direct impacts that could occur from post-fire conditions are that post-fire flows and sedimentation could cause diapausal larvae to be washed away and/or buried in debris. Both of these post-fire effects would likely cause mortality of larvae.

Indirect adverse effects to the QCB habitat could occur as a result of post-fire effects. The host and food plants used by the QCB are annual plants which grow in open, somewhat disturbed areas. These plants are likely fire adapted and would be expected to recolonize soon after the fire under natural conditions. However, existing conditions at the site could substantially increase the amount of time for recolonization or even cause long-term loss of host and food plants. Of particular concern is grazing and increased weed encroachment following the fire. In addition, substantial debris flows within suitable habitat could wash away the existing seed bank of annual host plants.

3.3.3 Post-fire Effects Assessment

No specific surveys for the QCB were conducted as part of this BAER assessment.

The following table identifies the amount of QCB habitat that burned during the Mountain Fire. ArcGIS and data provided by the local district were used to run the analysis. "QCB Occupied Habitat" refers to locations of observed QCBs buffered by 1 km which is standardly used on the San Jacinto Ranger District. The "QCB Mapped Suitable Habitat" identifies surveyed locations that contain necessary host plants. Not all of the ground within the fire perimeter has been surveyed for suitability.

Table 7. QCB Habitat Burned in Mountain Fire

Species	Soil Burn Severity (acres)				Grand Total
	High	Moderate	Low	Unburned*	
QCB Occupied Habitat (buffer)	0.02	290.50	71.81	603.97	966.30
QCB Mapped Suitable Habitat	0	84.64	49.76	1,255.16	1,389.55

*Includes habitat within the occupied habitat buffers that was unburned. Does not include mapped habitat for the species outside of the vicinity of the Mountain Fire.

As displayed in Table 7 above, a total of 362 acres of mapped occupied QCB habitat burned in the Mountain Fire. Of those, only 0.02 acres burned at high soil burn severity. QCB mapped occupied habitat is based on an adult quino observation. The observation is then buffered by 1 km. It is important to note that not all of the mapped occupied habitat is in fact occupied, and it is very likely that not all of the mapped habitat is even suitable for the species.

Larvae in diapause were likely killed when the fire burned through occupied habitat. The initial concern was that diapausal larvae not killed by the flames could be washed away and/or buried in debris resulting from post-fire effects. Up to 18.2 times sediment delivery above background (or 29.0 acre feet) is modeled for Fobes Canyon (Mountain Fire Soil Resource Assessment). Up to 3.4 times sediment delivery above background (or 14.4 acre feet) is modeled for Herkey Creek (Mountain Fire Soil Resource Assessment). Some mapped occupied and suitable habitat for QCB occurs in the floodplains of Fobes Canyon and Herkey Creek. Sedimentation in the floodplains will likely suffocate and kill any diapausal larvae that survived the fire. However, field assessments indicate that most of the habitats within the floodplains were burned. It is likely that larvae present in the floodplains were killed during the fire and that post-fire debris will have little direct impact on diapausal larvae in the floodplain of Fobes Canyon and Herkey Creek.

Diapausal larvae that survived the fire in suitable upland habitats may be affected by post-fire debris flows. Localized rilling and erosion was observed during field assessments in both the Fobes Canyon and Bonta Vista areas. These impacts occurred in some swells in the topography. Remaining larvae in these areas may be suffocated by minor movement of sediment as they are generally close to the surface of the ground. As these effects are very localized, it is not possible to quantify the amount of mortality expected. However, it is probable that mortality occurred during the fire and further mortality from post-fire effects will be limited in upland habitats of Fobes Canyon and Bonita Vista areas.

A total of 496.73 acres of mapped QCB occupied and suitable habitat (134.4 acres of mapped suitable and 362 acres of mapped occupied) was burned in the Mountain Fire. No mapped suitable habitat burned at high soil burn severity. QCB mapped suitable habitat is based upon the results of habitat surveys. Ground surveys were conducted during the spring and polygons were generated based on presence of QCB host plants. Not all areas have been surveyed. QCB host plants are annuals. Habitat that was mapped in one year may not be there the next due to natural fluctuation in the plant's range and annual precipitation.

Anecdotal evidence suggest that quino host and food plants thrive in disturbed habitats. Furthermore, these annuals are well adapted to fire. Although the viability of host and food plant seeds close to or on the surface of the ground was likely diminished as a direct result of the flames, any seeds deeper in the soil are still probably viable. In addition, seed from nearby unburned plants would spread into the burn area over time. Fire would be expected to result in only a short-term reduction in host and food plants for the QCB unless acted upon by other forces.

Without treatment, spread of non-native invasive plants and cattle grazing within the burn area may result in long-term loss of QCB host and food plants. Non-native cheatgrass currently exists within the burn area. In addition, cattle grazing has been ongoing here for close to a century. Refer to the Mountain Fire General Botany Report for additional information on how non-native invasive plants and cattle grazing can adversely affect native plant regeneration, specifically the host plants for the quino checkerspot butterfly, following a wildfire.

3.4 Bald Eagle (*Haliaeetus leucocephalis*)

3.4.1 Existing Environment

Bald eagles are a Forest Service Region 5 sensitive species. They are also protected under the Bald and Golden Eagle Protection Act and are a species of local public interest in the San Jacinto

Mountains. Bald eagles occur in a variety of habitats. Key habitat components are large bodies of water or rivers with abundant fish, and large trees or snags with heavy limbs or broken tops. Bald eagles feed on fish, carrion, and occasionally small mammals

A population of bald eagles overwinters in the San Bernardino Mountains. Lake Hemet, south of the Mountain Fire, is home to a resident pair of breeding bald eagles. For approximately 8 years, a pair of bald eagles has resided at Lake Hemet year-round.

3.4.2 Initial Post-Fire Concerns

Although not federally-listed, the bald eagle is a locally important species in the San Jacinto Mountains. During the Mountain Fire Lake Hemet was heavily used by water drafting helicopters. The bald eagles were likely adversely disturbed during these activities. However, since the suppression activities at the lake have ceased, the eagles have returned (Poopatanapong pers. comm.).

Indirect adverse effects to Lake Hemet could occur as a result of post-fire effects. Herkey Creek and numerous other unnamed tributaries that burned in the Mountain Fire drain into Lake Hemet. It is possible that the introduction of large amounts of sediment and ash to Lake Hemet could cause a die-off of fish in the lake. As fish are a primary food source for the resident bald eagles, a loss of fish could render Lake Hemet unsuitable to support bald eagles.

3.4.3 Post-fire Effects Analysis

Lake Hemet is almost two miles downstream in Herkey Creek from the Mountain Fire perimeter. Given the attenuation capacity of water, watershed topography, channel and floodplain capacity, and the distance of the Mountain Fire from Lake Hemet, there is no expectation that runoff from the fire area will detrimentally affect the water quality of Lake Hemet (Mountain Fire Hydrological Resource Assessment). Therefore, we do not anticipate that sedimentation or debris flows will result in negative impacts to prey species so no impacts to bald eagles are anticipated.

4.0 EMERGENCY DETERMINATIONS

Table 8 below illustrates the risk assessment process defined under BAER.

Table 8. BAER Risk Assessment*

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

*FSM 2523.1 Exhibit 02

4.1 Mountain Yellow-legged Frog:

MYLF Risk Assessment: It is our determination that an emergency *does* exist for mountain yellow-legged frog as a result of post-fire effects of the Mountain Fire. This determination is

based on the high likelihood that this species habitat will fill with sediment and no longer be suitable habitat. In addition, this population is likely to be extirpated from this watershed.

Probability of Damage or Loss: **Very Likely**. This determination is due to the likelihood that the stream habitat will be filled with sediment and there will be no remaining suitable habitat for several years. In addition, the high likelihood that the post storm peak flows and sedimentation modeled will result in extirpation.

Magnitude of Consequence: **Moderate**. This determination is due to the fact that if this population is extirpated this will likely result in a damage

Risk Level: **Very High**

4.2 Southwestern Willow Flycatcher

SWWF Risk Assessment: It is our determination that an emergency does *not* exist for the southwestern willow flycatcher as a result of post-fire effects of the Mountain Fire. This is based on the low likelihood that debris flows at these habitats would result in long-term damage to potential nesting habitat.

Probability of Damage or Loss: **Unlikely**. This determination is due to low likelihood of significant debris flows at the historic habitat that would result in a long-term loss or alteration of habitat for this species.

Magnitude of Consequence: **Moderate**. This determination is due to the fact that if debris flows did occur and this resulted in the removal of suitable nesting habitat this would result in damage to potential nesting resources for this species.

Risk Level: **Low**

4.3 Quino Checkerspot Butterfly

QCB Risk Assessment: It is our determination that an emergency *does* exist for quino checkerspot butterfly as a result post-fire effects of the Mountain Fire. This determination is based on the likelihood that invasive plants will displace host and food plants and this would be further exacerbated by cattle grazing. These effects would be considered a long-term reduction in available suitable habitat.

Probability of Damage or Loss: **Very Likely**. This determination is based on the expectation that without treatment, non-native invasive plants will out-compete native QCB host and food plants. In addition, cattle grazing following a wildfire will further retard the regrowth of host and food plants.

Magnitude of Consequence: **Moderate**. This determination is a result of expected damage to QCB habitat resulting in considerable and long-term effects.

Risk Level: **Very High**

4.4 Spring Developments

Spring Development Risk Assessment: It is our determination that an emergency *does* exist for Cartridge Spring wildlife drinker as a result of post-fire effects of the Mountain Fire. This is due to the likelihood that the drinker will fill with sediment and the drinker will no longer function as a water source for wildlife.

Probability of Damage or Loss: **Likely**. This determination is due to the high potential for sedimentation to fill in the drinker and resulting in the drinker box no longer being effective for wildlife.

Magnitude of Consequence: **Moderate**. This determination is a result of the fact that if the drinker fills with sediment and is buried it would result in a long term loss of water available to wildlife.

Risk Level: **High**

4.5 Bald Eagle

No risk assessment or determination of emergency will be done for bald eagle as it is not a critical value under BAER.

5.0 TREATMENTS TO MITIGATE THE EMERGENCY

The emergency situation as discussed in the above sections can be mitigated, in part, by the following treatments:

5.1 Mountain Yellow-legged Frog Treatments

The recommended emergency action to benefit MYLF is a salvage effort in which individuals may be captured and removed from the wild and placed into captivity, or if habitat conditions outside the burn area within Tahquitz Creek are suitable for MYLF they could be translocated into those suitable habitats. On August 2, Jesse Bennett with the USFWS suggested that it might be preferable to move any frogs that are found into suitable habitats upstream of the burn area in Tahquitz Creek rather than put the frogs into captivity (J. Bennett, personal communication). The district office staff should coordinate with the regulatory agencies and USGS to determine whether it is preferable to move frogs into captivity or move them upstream of the burn area.

The Tahquitz Creek population is thought to be genetically similar to the populations located in Dark Canyon and Fuller Mill Creek (Backlin, personal communication) although this is based on only a few genetic samples and is not statistically significant. There is a captive population representative of the Fuller Mill Creek and Dark canyon populations that is currently being used to produce individuals for release into the wild. Since it is likely that the habitat will be unsuitable for at least a couple of years and there were only 6 known individuals in the population and the peak flow potential indicates that there is a real possibility of washing any individuals that survived the recent storm events downstream and they would not likely survive. Frogs would be held until such time that they can be re-released into the Tahquitz watershed from where they were captured. Biologists that have all the necessary permits from the CA Fish and Wildlife and the U.S. FWS will visit the known locations where frogs have been found. They will be collected and transported to a facility that is equipped to care for them. The agreements for this kind of work are already in place and would not require any new agreements to be established. We are recommending that District staff coordinate with the CA Fish and

Wildlife, USGS and USFWS to determine how many visits will need to be made to collect individuals of any life stage for captive husbandry and breeding. These individuals will be held until the habitat is suitable for re-introduction. We anticipate that this will take 2-4 years but will depend on precipitation and will vary by site. Each year biologists from the Forest Service in coordination with the USFWS, USGS, CDFW will coordinate on whether there is consensus on whether the habitat is suitable for release.

Item	Unit	Unit Cost	# of Units	Cost
USGS Recovery Surveys	Day	$3250	4	$13,000
Captive breeding	Year	$10,000	1	$10,000
GS-11 Wildlife Biologist	Day	$400	10	$4,000
GS-7 Wildlife Technician	Day	$200	10	$2,000
Supplies	Each	$500	1	$500
Vehicles Mileage	Miles	$0.50	1500	$550
			Total Cost	**$30,050**

5.2 Southwestern Willow Flycatcher Treatments

No treatments are proposed for SWWF however treatments to reduce establishment of non-native invasive plants and temporary closure of portions of cattle allotments will benefit the SWWF. Refer to the Mountain Fire General Botany Report for details on these treatments.

5.3 Quino Checkerspot Butterfly Treatments

Two treatments were proposed to reduce the post-fire impacts to QCB habitat. The intention of these treatments is to reduce the establishment of non-native invasive plants and implement temporary closure of portions of cattle allotments. These treatments are expected to benefit multiple natural resources and will partly alleviate the emergency condition for QCB. The Mountain Fire General Botany Report contains details on these treatments.

5.4 Water Development Treatments

The loss of vegetation above the Cartridge Spring spring box and wildlife drinker has left these structure vulnerable to destruction by debris flow. This treatment will reduce erosion from reaching these structures. In addition, burnt plastic piping persists at the wildlife drinker. This treatment will also remove the hazardous materials.

a) Treatment Type: Land and hazardous removal treatments
b) Treatment Objectives: Reduce the potential for the Cartridge Spring spring box and wildlife drinker to be damaged by erosion. Remove hazardous materials.
c) Treatment Description and Location: The proposed treatment will occur upslope of the Cartridge Spring spring box and wildlife drinker. Treatment will consist of installation of coconut core wattles and effectiveness monitoring. During installation of land treatment, hazardous materials will also be removed. Force account or volunteer labor will be used for installation.
d) Estimated Treatment Cost:

Item	Unit	Unit Cost	# of Units	Cost
GS-11 Wildlife Biologist	Day	$400	5	$2,000

CCC Crew	Day	$1200	1	$1,200
Coir Wattles	Foot	$6.50	100	$650
Supplies	Each	$200	1	$200
Vehicles Mileage	Miles	$1.00	300	$300
			Total Cost	**$4,350**

Note: Cost may be reduced if the local unit is able to recruit volunteers to help implement the land treatment.

6.0 ADDITIONAL RECOMMENDATIONS

- Ensure that the USFWS and the local District Wildlife Biologist are available to provide recommendations during installation of all proposed BAER treatments to minimize impacts to wildlife species that have already been impacted by the fire.

7.0 REFERENCES

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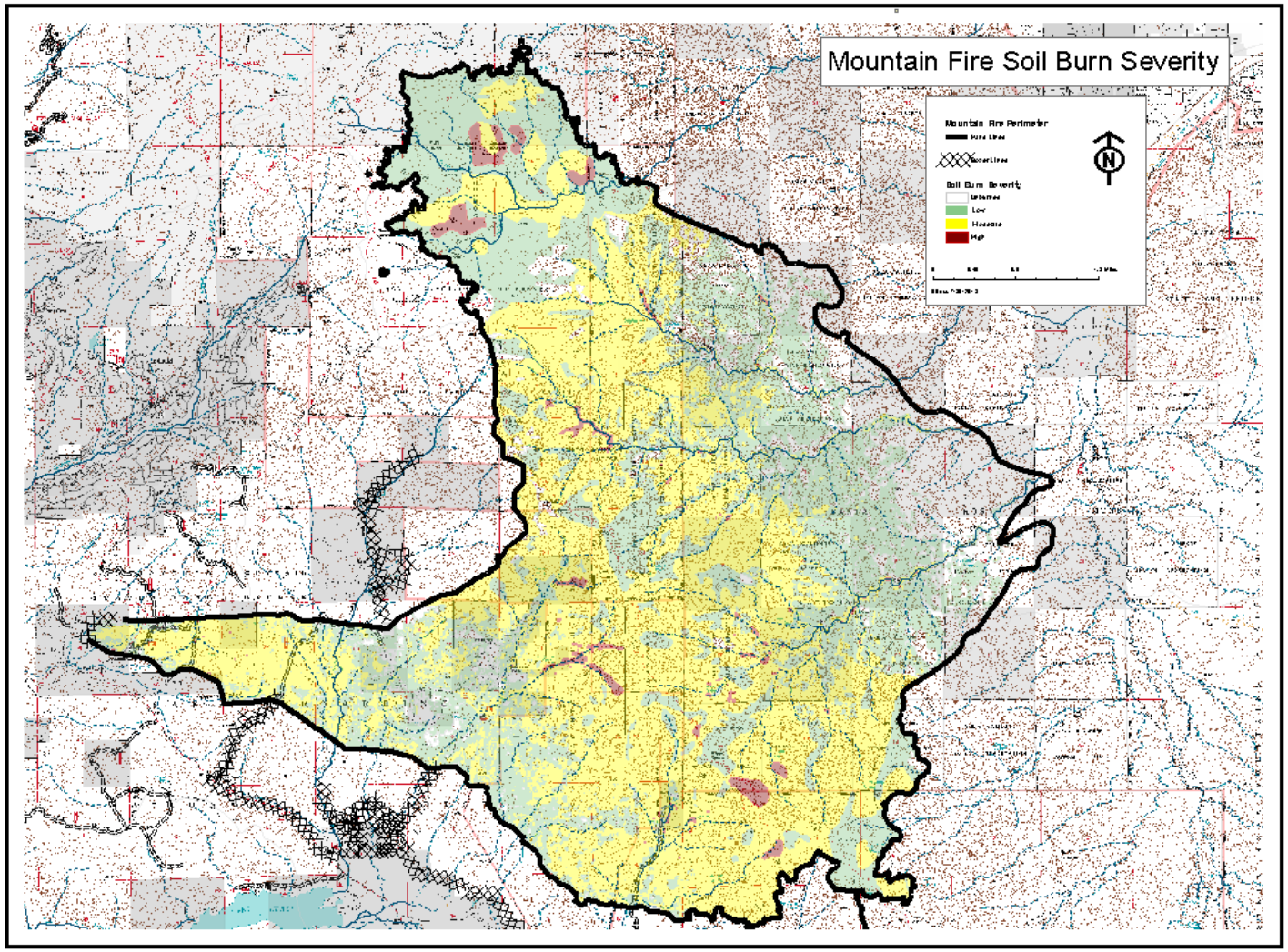
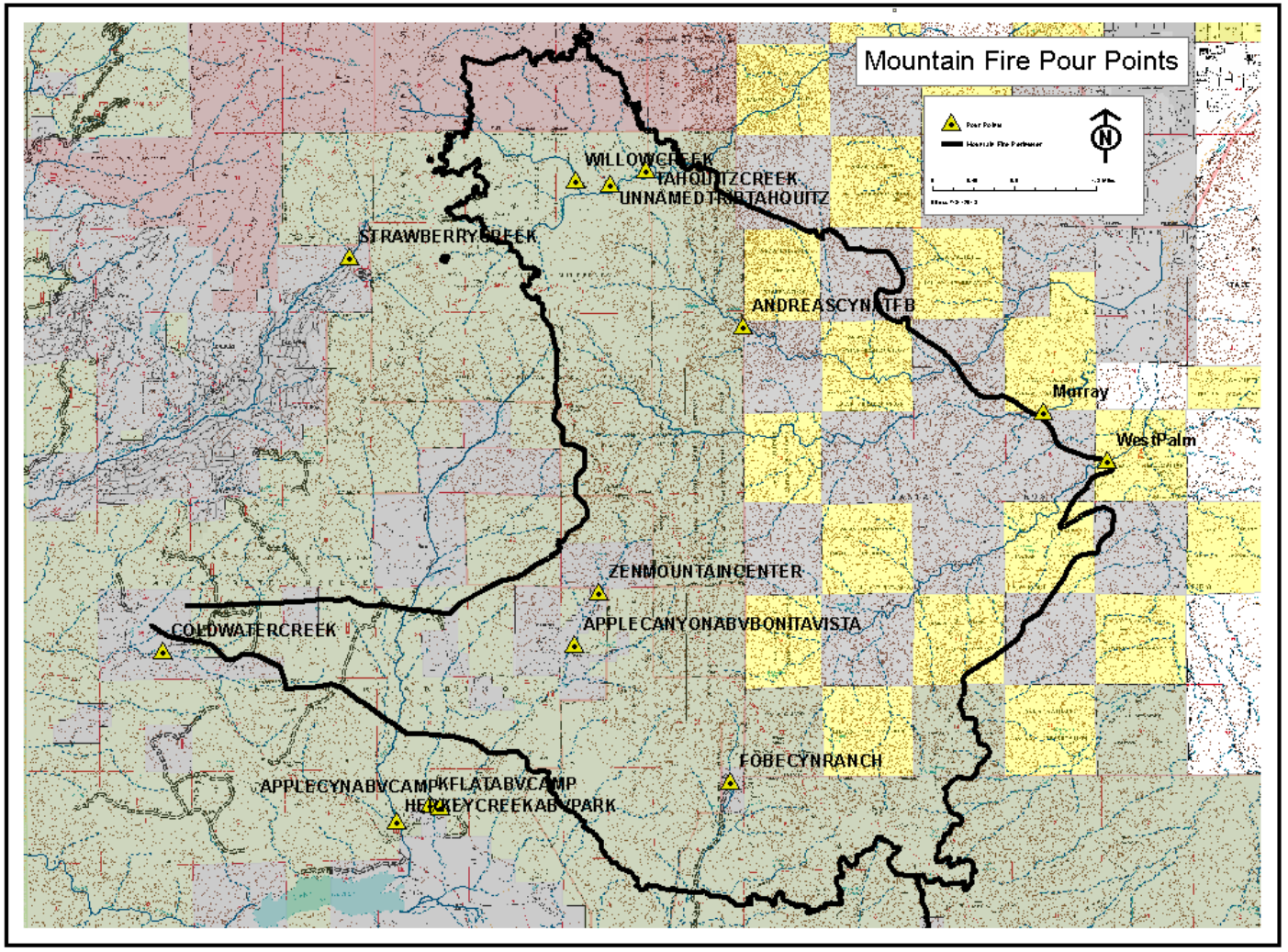
APPENDIX 1: MAPS

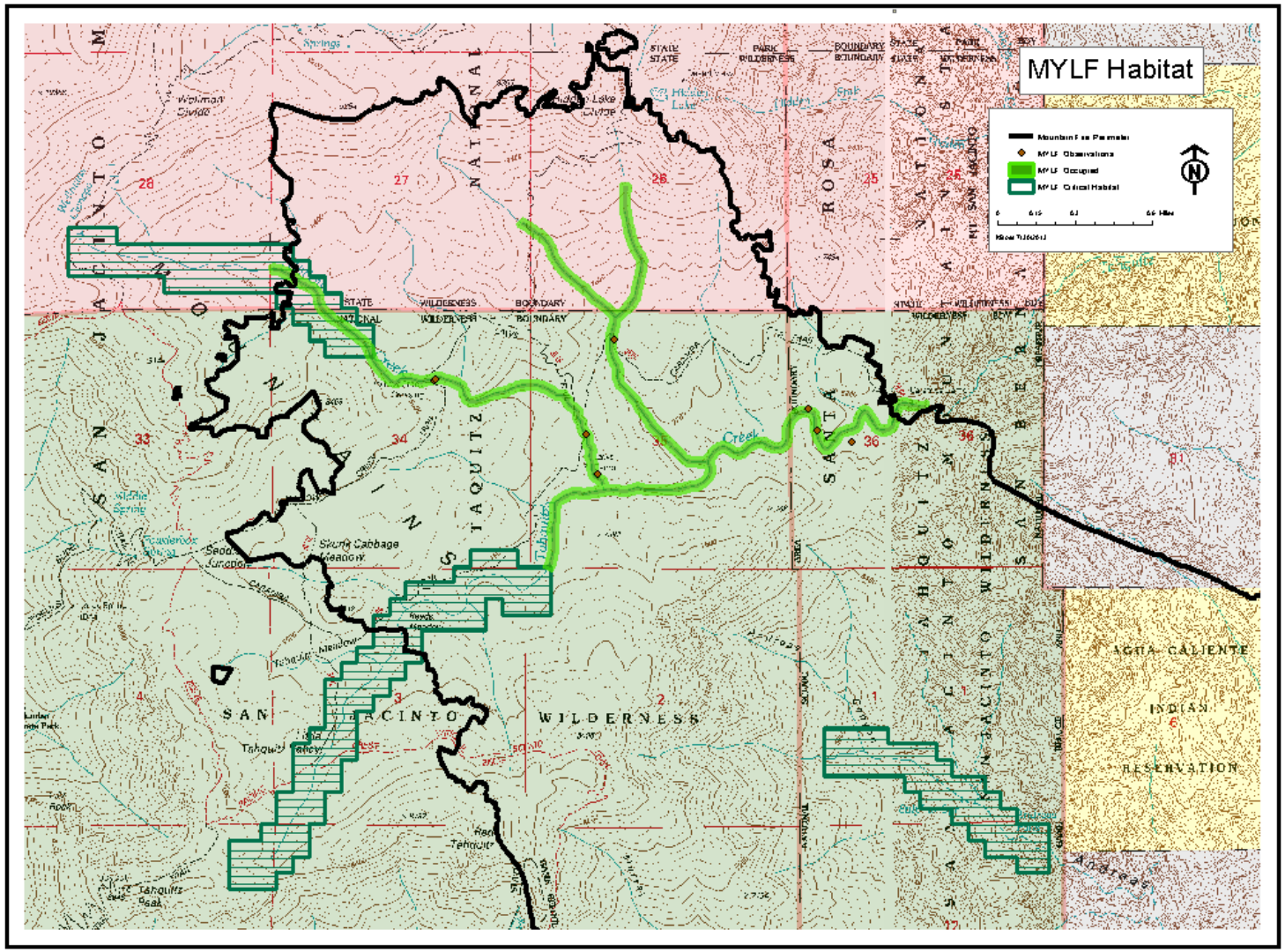
Map 1. Mountain Fire Soil Burn Severity



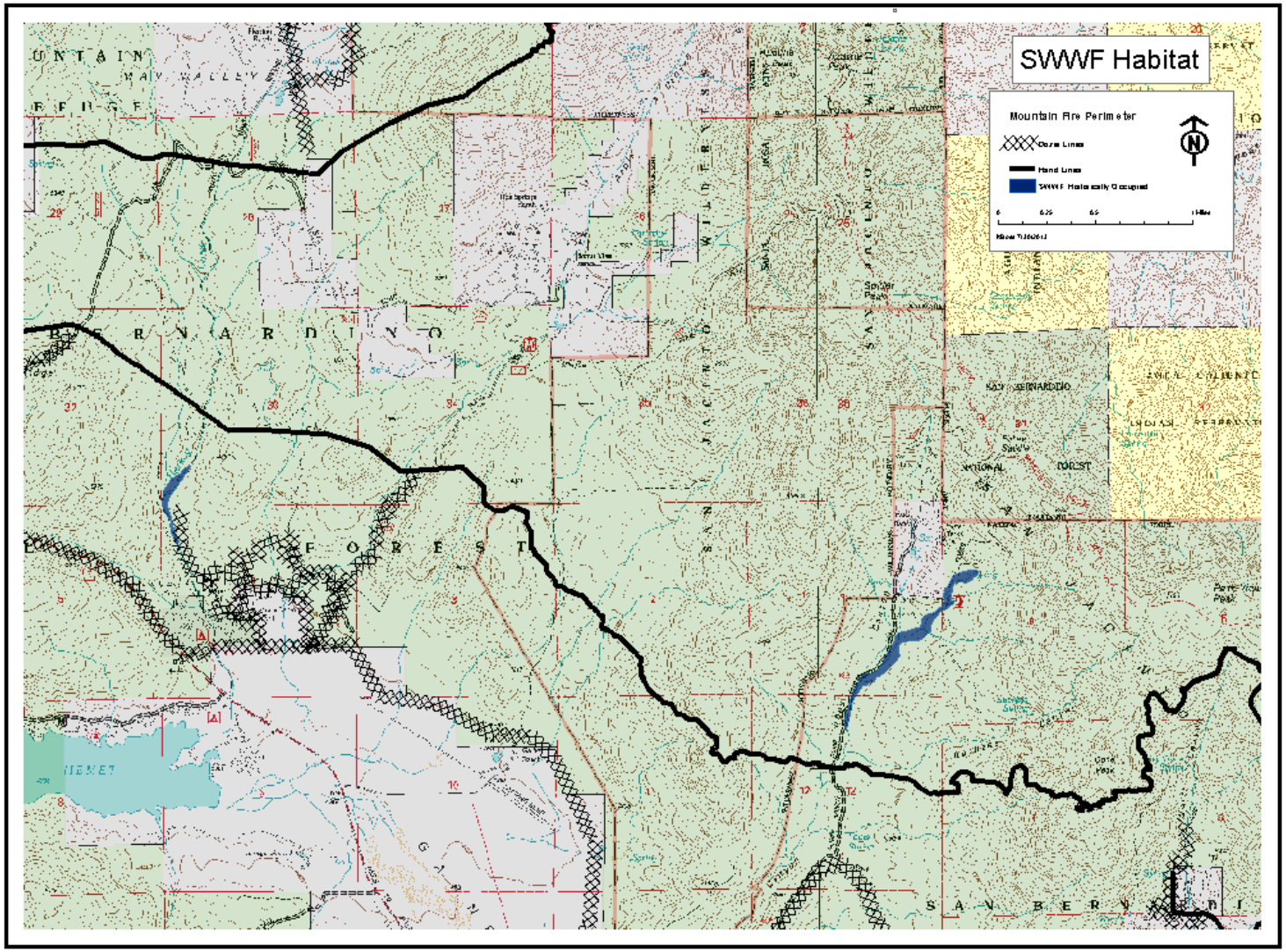
Map 2. Mountain Fire Soils and Hydro Modeling Pour Points



Map 3.Mountain Yellow-legged Frog Habitat in the Mountain Fire Area



Map 4. Southwestern Willow Flycatcher Habitat in the Mountain Fire Area



Map 5. Quino Checkerspot Butterfly Habitat in the Mountain Fire Area