TECHNICAL SPECIALIST REPORT-BAER

Resource: Botany
Fire Name: Mountain Fire Month/Year: July 2013
Author: Kerry Johnston
Authors Duty Station: Angeles National Forest

I. Resource Condition Assessment

A. Resource Setting

The Mountain Fire started on July 15, 2013 near the junction of Highway 243 and Highway 74. 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 Fire burned a total of 27,531 acres (ac.) on National Forest System (NFS), state, and private lands. A total of 15,535 ac. burned on the San Bernardino National Forest (SBNF), 2,877 ac. on private land, 893 ac. on state land and 2442 ac. on BLM land. Within the fire perimeter, 36% was unburned, 36% was low intensity, 49% was moderate intensity and less than 1% was high intensity. The dominant vegetation communities within the fire perimeter include lower montane mixed chaparral, mixed conifer-fir, mixed conifer-pine, red shank chaparral, semi-desert chaparral, semi-desert chaparral, desert mixed chaparral, desert mixed shrub, encelia shrub, upper montane mixed chaparral and canyon live oak woodland. Associated vegetation communities within the fire perimeter include scrub oak woodland and black oak (CNPS, 1997) (refer to the table below for additional associated communities). A table of vegetation types within the burn area is displayed in the table below, and a general vegetation map is displayed in Appendix A.

Vegetation Community	Acres
Lower Montane Mixed Chaparral	7226
Red Shank Chaparral	4387
Mixed Conifer-Fir	4031
Semi-Desert Chaparral	3191
Desert Mixed Shrub	2275
Mixed Conifer-Pine	1297
Encelia Shrub	1111
Upper Montane Mixed Chaparral	1080
Canyon Live Oak	836
Black Oak	667
White Fir	297
Riparian Mixed Hardwood	208
Birchleaf Mountain Mahogany	199
Coulter Pine	120
Basin Sagebrush	116
Barren	113
Chamise	100
Annual Grasses and Forbs	79
Jeffrey Pine	59
Scrub Oak	45
Subalpine Conifers	36
Urban/Developed (General)	23
Rabbitbrush	9
Montane Meadows	7
Bare Soil	7
Fan Palm	7

Perennial Lake or Pond	4
Water	1
Total	27,531

All of these habitat types have some level of resilience post-fire, and no treatments are recommended to facilitate natural vegetation recovery. Resilience of the Great Basin sagebrush vegetation community can be threatened by a post-fire expansion of non-native annual grasses (mostly *Bromus* spp. and *Schismus* spp.). These grasses provide a flashy and continuous fuel bed that increases the probability of pre-mature reburn, shortened fire interval, and in the worst case, type conversion. Excessive grazing and frequent fires can damage biological soil crusts and many perennial plants, thus encouraging cheatgrass establishment, survival persistence, and dominance. Approximately 118 acres of Great Basin sagebrush is present within the burn perimeter therefore, these areas could potentially be impacted over time if cheatgrass infestations become established.

Mixed chaparral exists on northern slopes and drainages at elevations above 3,000 feet within the burn area. This vegetation community is dominated by chamise (*Adenostoma fasciculatum*), bigberry manzanita (*Arctostaphylos glauca),* hoaryleaf ceanothus (*Ceanothus crassifolius*), birchleaf mountain-mahogany (*Cercocarpus betuloides*), scrub oak (*Quercus berberidifolia*), chaparral ash (*Fraxinus velutina*), yerba santa (*Eriodictyon trichocalyx*), and laurel sumac (*Malosma laurina*). Most of the chaparral vegetation burned at a low to moderate burn soil severity. These shrubs are adapted to *normal* fire regimes and will rapidly regenerate in the burn by either re-sprouting from underground burls or establishing from seed in the more pristine areas in the uppermost 2/3 portion of the fire. Vegetation is expected to recover more slowly (approximately 5 to 7 years) in other areas especially those areas that have experienced repeated short fire return intervals. The typical fire return interval for chaparral vegetation ranges from 20-60 years. Short fire return intervals tend to hinder many native vegetation communities from re-establishing to healthy pre-fire conditions due to lack of time to build up an adequate seed bank which would increase potential to out-compete non-native species.

The lower 1/3 of the fire is expected to recover more slowly than the more pristine areas to the north due to repeated disturbance. Threats to vegetation recovery include unauthorized user created trails, grazing allotments, dozerlines, handlines and access roads. Fire typically kills seeds stored on the soil surface; however buried seed tends to remain insulated from extreme heat. Some chaparral species including Ceanothus, manzanita, and fire-following herbs are obligate seeders (will not re-sprout) after fire and repeated disturbance may hinder their proliferation. Approximately 21 miles of dozerline, 51 miles of handline, 5.9 miles of roads, 109 miles of riparian areas and 30 miles of trails exist within the burn area.

Red shank chaparral is the dominant shrub community above 1,000 feet within the burn area. Red shank chaparral occurs on any aspect and typically grows on dry, well-drained slopes and mesas, Red shank or ribbon wood (*Adenostoma sparsifolium*) is a dominant species in the red shank chaparral vegetation community and primarily occurs in the San Jacinto and Santa Monica mountains, where it often forms open, nearly pure stands (FEIS, 2013). It grows up to 18 feet (5.5 m) tall and typically dominates chaparral overstories. Red shank chaparral merges with desert vegetation on its eastern edges and with coastal sage scrub and annual grassland on other margins. Red shank reproduces vegetatively (sprouts from underground tuber) and re-sprouts vigorously following fire from underground roots and lignotuber (FEIS, 2013).

Vegetation communities in the northern portion of the Mountain Fire are expected to recover along their respective post-fire successional trajectories without risk of type conversion.
The dominant vegetation community north of Andreas Canyon within the Tahquitz watershed is mixed conifer forest. This area burned at a low to moderate intensity with less than 1% burn soil severity being high. This area is expected to recover within the next 3 to 5 years especially with the proposed temporary closure to prevent further disturbance which would allow the slopes to stabilize more readily.

Approximately 10 acres of Meadow Habitat exists within the burn area. Meadows provide habitat for many Forest Service Sensitive plant and animal species. As emphasized in Part 2 of the LMP

(LMP, 2005) enhancement of wildlife habitat for threatened, endangered, proposed, candidate, and sensitive species, such as bald eagles, Quino checkerspot butterfly and unique plant species will be emphasized in all management activities. The meadows in the northern portion of the burn area are expected to recover rapidly. Resprouting native bunch grasses were observed after week 2 of ignition and the meadows burned at a low burn soil severity. A temporary closure of the trails in this northern portion would allow the vegetation to recover more readily and reduce the probability of invasive weed introduction into these sensitive habitat areas.

In contrast, the meadows in the lower 1/3 of the burn area experience more disturbance due to the threat of grazing and invasive weed introduction. These lower meadows within the burn area will benefit from temporary grazing closures in order to allow the vegetation to recover for the next approximately 3 years.

Coast live oak/cottonwood-sycamore riparian forests occur in the major drainages throughout the fire area. The overstory is dominated by coast live oak (*Quercus agrifolia)* and sycamore *(Platanus racemosa)* with the occasional red willow *(Salix laevigata)* and cottonwood (*Populus fremontii*). The understory consists of scattered weedy annual grasses such as ripgut brome and wild oats, heartleaf keckiella *(Keckiella cordifolia)*, chaparral ash, rush (*Juncus sp.)* and hoaryleaf Ceanothus. Most of the riparian vegetation in the fire area burned at low to moderate intensity. This lower intensity burn left much of the vegetation intact and those individuals that did burn should re-sprout readily.

Invasive weed species: wild oats (*Avena* sp.), ripgut brome (*Bromus diandrus*), cheatgrass (*Bromus tectorum*), redstem filaree (*Erodium cicutarium*), shortpod mustard (*Hirschfeldia incana*), tumble mustard (*Sisymbrium altissimum*), bull thistle (*Cirsium culgare*), (blessed thistle) *Cnicus benedictus*, teasel (*Dipsacus fullonum*) tree of heaven (*Ailanthus altissimum*) and salt cedar (*Tamarix ramosissima*) occur within a five mile radius of the burn and along direct access routes to the burn (refer to the Noxious Weed Report).

B. Findings of on-the ground survey

Values at risk: During fire suppression activities, 6 drop points, 21miles of dozerline and 51 miles of hand line were constructed. These may all serve as weed seed dispersal corridors. Dispersal of weeds from fire equipment movement poses a significant risk to native plant post-fire regeneration. Even though a weed washing station was brought in, seed may have been transported into the burn on suppression vehicles and equipment that arrived on the fire before the washing station was established. This increases the possibility of suppression equipment acting as weed seed vectors. Roadsides, dozerlines and handlines will be most impacted by this threat.

The potential values at risk for rare plants are the stability and viability of sensitive plant populations. These Forest Service Sensitive plants exist within the Mountain Fire area (see Table 1 below).

Table 1. FS Sensitive Plants in the Mountain Fire Area

Scientific Name	**Common Name**	**Location in the Fire Area**
Hemizonia mohavensis	Mojave tarweed	6805 Fobes Canyon Rd.
Sidotheca emarginata	white margined Oxytheca	South end of Apple Canyon
Heuchera hirsutissima	shaggy haired alumroot	Willow Creek N portion of the burn area
Galium angustifolium ssp. *jacinticum*	San Jacinto Mountain bedstraw	W of May Valley
Linanthus jaegeri	San Jacinto Linanthus	N end of Herkey Creek

Caulanthus simulans	Payson's Caulanthus	Apple Canyon
Lilium parryi	lemon lily	Willow Creek, Tahquitz Creek, Skunk Cabbage Meadow, Reed Meadow, Tahquitz Meadow
Malaxis monophyllos var. brachypoda	white bog adder's mouth	N. Tahquitz Meadow
Hulsea vestita ssp. *callida*	pumice alpine gold	slopes along Tahquitz Valley
Potentilla rimicola	cliff Cinquefolia	E of Reeds Meadow, Little Tahquitz Valley
Castilleja lasiorhyncha	San Bernardino Mountains owl's clover	Strawberry Valley
Calochortus palmeri var. *munzii*	Munz's Mariposa lily	Herkey Creek
Ivesia callida	Tahquitz Ivesia	E of Tahquitz Creek
Monardella nana ssp. *leptosiphon*	San Felipe Monardella	E of Tahquitz Creek
Chorizanthe polygonoides var. *polygonoides*	knotweed spineflower	Garner Valley, Fobes Canyon, Morris Creek
Arabis johstonii	Johnston's rockcress	Morris Ranch
Allium munzii	Munz's onion	May Valley
Layia platyglossa	coastal tidytips	Johnson Meadow, Morris Ranch Rd., Fleming Ranch
Scutellaria bolanderi ssp. *austromontana*	Sierra skullcap	May Valley, Bonita Vista, Johnson Meadow
Symphyotrichum defoliatum	San Bernardino aster	Johnson Meadow, Herkey Creek

Condition of values at risk:

Rare Species:
The burn conditions of rare plants within the Mountain Fire area are listed below in Table 2.

Table 2. FS Sensitive Plant Burn Conditions

Common Name	**Burn Intensity**
Lemon lily	Observed post-fire in Moderate burn area. Expected to survive in locations where sedimentation potential is low
Mojave tarweed	Low-Moderate burn .Observed in the burn area. Expected to survive.
white margined Oxytheca	Low-Moderate burn area. Expected to survive.
shaggy haired alumroot	Low-Moderate burn .Observed in the burn area. Expected to survive.
San Jacinto Mountain bedstraw	Moderate burn area no plants observed.
San Jacinto Linanthus	Low-Moderate burn area. Expected to survive.
Payson's Caulanthus	Low-Moderate burn area. Expected to survive.
southern jewelflower	Low-Moderate burn area. Expected to survive.
white bog adder's mouth	Low-Moderate burn area. Expected to survive.
pumice alpine gold	Low-Moderate burn area. Expected to survive.
cliff Cinquefolia	Low-Moderate burn area. Expected to survive.

San Bernardino Mountains owl's clover	Low-Moderate burn area. Expected to survive.
Munz's Mariposa lily	Low-Moderate burn area. Expected to survive.
Tahquitz Ivesia	Low-Moderate burn area. Expected to survive.
San Felipe Monardella	Low-Moderate burn area. Expected to survive.
knotweed spineflower	Low-Moderate burn area. Expected to survive.
Johnston's rockcress	Low-Moderate burn area. Expected to survive.
Munz's onion	Low-Moderate burn area. Expected to survive.
coastal tidytips	Low-Moderate burn area. Expected to survive.
Sierra skullcap	Low-Moderate burn .Observed in the burn area. Expected to survive.
San Bernardino aster	Low-Moderate burn area. Expected to survive.

Weed Species:
Many portions outside the burn area are dense with non-native annuals including various species of brome (*Bromus* spp.), wild oats (*Avena barbata*), tumble mustard (*Sisymbrium altissimum*), shortpod mustard, redstem filaree (*Erodium cicutarium*), shortpod mustard (*Hirschfeldia incana*), tumble mustard (*Sisymbrium altissimum*), bull thistle (*Cirsium culgare*), (blessed thistle) *Cnicus benedictus,* teasel (*Dipsacus fullonum*) tree of heaven (*Ailanthus altissimum*) are known to occur within the vicinity of the burn area with the highest concentrations occurring along roads and trails. Many of the individuals were burned, however significant patches of infestations persisted and many of the seeds in the soil bank probably survived due to their high heat tolerance and low/moderate burn intensity. There is a high potential for these infestations to hinder the regeneration of native vegetation, especially in the early seral stages, through increased fire intervals and competition for nutrients.

II. Emergency Determination

Threats to vegetation recovery due to an Increase in Noxious Weed Populations: An emergency exists with respect to vegetative recovery as a result of the threat of post-fire weed introduction and spread. Much of the Mountain Fire occurred in Wilderness and did not have many previously documented weed infestations. The unknowing introduction and dispersal of invasive weeds into areas disturbed by fire suppression and rehabilitation has the potential to establish large and persistent weed infestations. In addition, it is highly likely that existent weed infestations along roadsides will increase in the burn area, due to their accelerated growth and reproduction and a release from competition with natives. These weed populations may affect the structure and habitat function of native plant communities within the burn area. It is expected that most native vegetation would recover if weed invasions are minimized.

Approximately 21 miles of dozerline were constructed during fire suppression activities. In addition to causing an increase in weed invasion, the disturbances caused by dozerlines are expected to inhibit the recovery of native plant populations.

Approximately 18, 396 acres of the Mountain Fire have burned previously within the past 32 years; 1, 444 acres of which have been burned by multiple fires since 1994. If weed infestations are not controlled there is potential for these short fire return intervals to lead to vegetation type conversion over time.

Probability of Damage or Loss: Very Likely. This determination is due to the change in watershed response causing sheet and rill erosion of topsoil. There is also a significant amount of unauthorized off-highway vehicle use within the burn area and dozerlines that may be detrimental to vegetation recovery and encourage noxious weed invasion.

Magnitude of Consequence: Major. This determination is due to the high potential for vegetation type conversion to non-native annual grasslands in substantial portions of the burn area, most especially dozerlines, roadsides, and areas that have experienced frequent fire intervals.

Risk Level: Very High.

It is determined there is no emergency situation for the continued existence of Forest Service sensitive plant species. Based on conditions found during field assessments and literature reviews regarding fire ecology for each species, some populations may be adversely affected by the wildfire. Some species may have bloomed this season and released their seed into the seedbank pre-fire however, the conditions pre-fire are unknown. Seeds are more tolerant of heat on the soil surface than on the stem, leading to enhanced germination success and species recovery. These species are not threatened by eminent extirpation throughout their ranges.

III. Treatments to Mitigate the Botanical Emergency

A. Treatment Type:
   1. Weed detection surveys
   2. Weed infestation treatment
   3. Seeding at Johnson Meadow
   4. Treatment effectiveness monitoring

B. Treatment Objective:
   1. Accelerated vegetation re-growth/restoration
   2. Decreased disturbance and weed establishment/dispersal
   3. Outcompete invasives
   4. Early detection of weed invasions and consequent manageable eradication

C. Treatment Description:
   1. Conduct weed detection surveys (described in the weed detection survey report).
   2. Manually remove weed infestations within the priority areas within the burn
   3. Locally collect seed and broadcast seed into proposed treatment area
   4. Conduct rare plant surveys to determine post-fire population status

D. Treatment Costs: [redacted] **(**See Noxious Weed Survey Report)

IV. Discussion/Summary/Recommendations

Weed detection surveys and treatments are recommended for at least one year post fire due to the high potential for weed invasions (see Noxious Weed Detection Plan). All vegetation communities should be included in the list of high priority areas to survey and eradicate weed infestations. Any new or expanding invasive species will be removed.

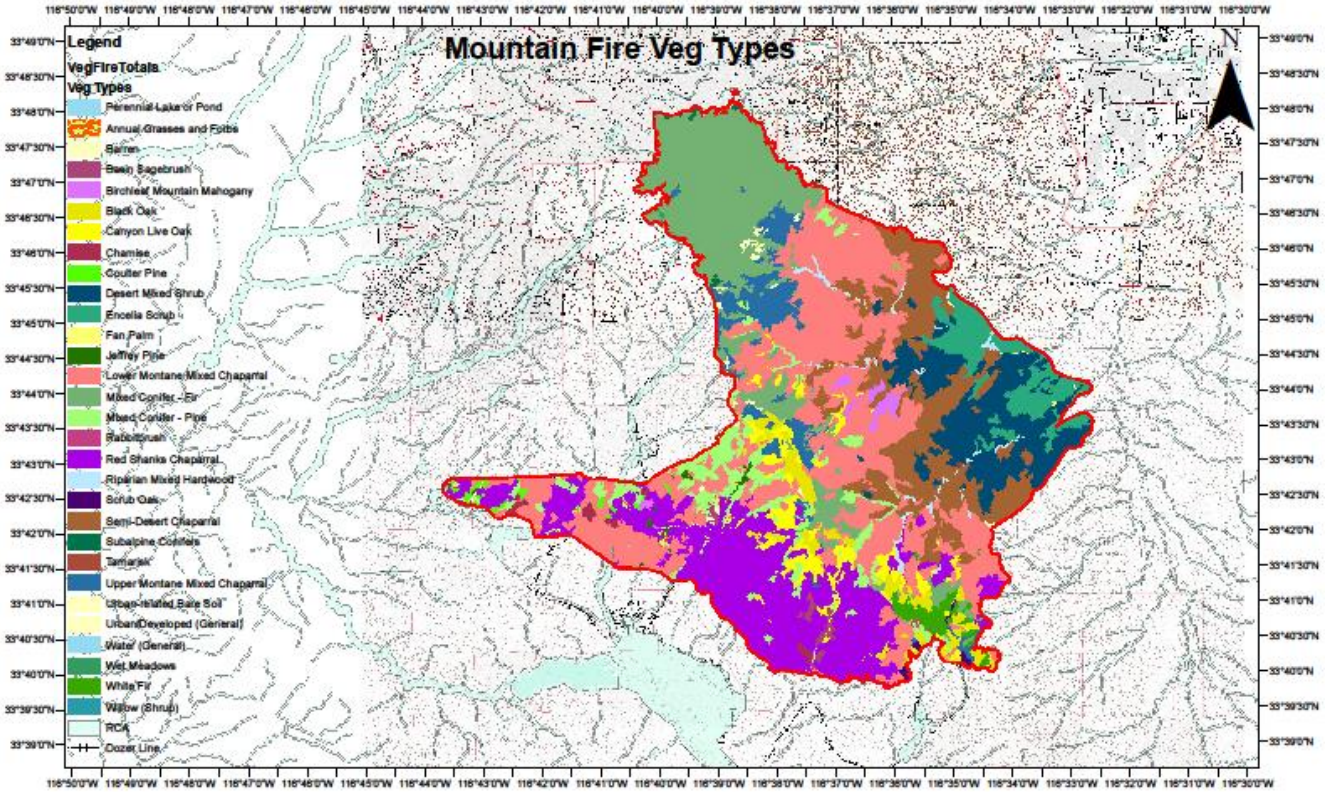
References:

CNPS. 1997. A Manual of California Vegetation. Sawyer, J. O. and Keeler-Wolf, Todd.

FEIS. 2013. http://www.fs.fed.us/database/feis/index.html

LMP. 2005. Land and Resources Management Plan SBNF. USDA Forest Service. http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev7_007719.pdf

Appendix A.



Coordinate System: NAD 1983 UTM Zone 11N
Projection: Transverse Mercator
Datum: North American 1983
False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: -117.0000
Scale Factor: 0.9996
Latitude Of Origin: 0.0000
Units: Meter

0 1.25 2.5 5 Miles

Author: Kayanna Warren
Date: 7/29/2013