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Vegetation Resource Assessment

I. OBJECTIVES

- Evaluate and assess fire and suppression impacts to vegetation resources
- Identify known locations of rare plant populations in relation to individual fires
- Identify noxious weed populations and pre- and post-fire suitable habitat for weeds
- Identify monitoring needs for prevention of noxious weed introduction as a result of the fire
- Determine rehabilitation and monitoring needs to prevent the introduction and spread of non-native invasive and noxious plant species.

II. ISSUES

- Alteration of native plant communities
- Impacts to habitat for rare plant species
- Potential for noxious weed colonization of healthy, unoccupied plant communities areas
- Impacts of noxious weeds on ecosystem stability and soil productivity

III. OBSERVATIONS

A. Background Information

The SHU Lightening Complex fires (Moon and Motion) and Lime Complex fires (Telephone, Noble, Deadshot, Deerlick, Lower, Southfork, China) started on June 14, 2008 from a multi-day lightening fire in northern California. Approximately 103,000 acres burned in the 9 fires with 5,535 acres of high burn-severity (5.3%), 33,765 moderate (33%), 33,907 low (33%), and 29,077 unburned (28%).

Complex	Fire Name	Fire Size in Acres	Dominant Plant Communities
SHU Lightening	Motion	28339	Knobcone and Ghost Pine Woodland Mixed conifer/hardwood Oak Woodland Montane shrubland
	Moon	35860	Knobcone and Ghost Pine Woodland Mixed conifer/hardwood Oak Woodlands Chaparral Montane shrubland
	Lower	1309	Mixed conifer/hardwood Oak Woodland

Complex	Fire Name	Fire Size in Acres	Dominant Plant Communities
Lime	Telephone	7058	Mixed conifer/hardwood Jeffrey pine/incense cedar serpentine barren Oak woodland
	Noble	14949	Chaparral Mixed conifer/hardwood Oak woodland
	Deadshot	1112	Mixed conifer/hardwood Oak woodland
	Deerlick	13930	Mixed conifer/hardwood Chaparral Oak woodland
	South Fork	83	Mixed conifer/hardwood serpentine barren
	China	35	Mixed conifer/hardwood Oak woodland

Plant Communities

Plant communities within the fire areas includes mixed conifer/hardwood, chaparral, montane shrubland, oak woodland, Jeffrey pine/incense cedar woodland, serpentine barren, and knobcone and grey pine woodland. Many of the woody shrub species contain resins that facilitate hot burning, such as manzanita (*Arctostaphylos sp.*, buckbrush (*Ceanothus cuneatus*), and yerba santa (*Eriodycton californicum*).

Mixed conifer/hardwood forest is found throughout all of the fires at mid to higher elevations, within riparian drainages, and on north and east slopes. Ponderosa pine (*Pinus ponderosa*) dominates, with Douglas fir (*Pseudotsuga menziesii*), black oak (*Quercus kelloggii*), and interior live oaks (*Quercus spp*.) as associates.

Foothill mixed chaparral, lower montane shrubland, and oak woodlands are intermixed and occassionally difficult to distinguish from each other. These communities are found on south and west aspects. Species include live oaks (*Quercus* spp.), black oak, white oak (*Quercus garryana*), knobcone pine, yerba santa, poison oak (*Toxicodendron diversiloba*), greenleaf manzanita (*Arctostaphylos patula*), and whiteleaf manzanita (*A. viscida*). The lower elevations in the Noble fire are completely dominated by foothill mixed chaparral with bay laurel (*Umbellaria californica), spiny redberry (Rhamnus crocea*), and California ash (*Fraxinus dipetala*) trees in secluded coves.

Knobcone pine (*Pinus attenuate*) and grey pine (*Pinus sabiniana*) woodlands occupy transition zones between lower elevation chaparral and higher elevation conifer forests. Stands are typically even-aged, and range from dense stands with few other associate tree species to open communities codominated by black oak , with scattered ghost pine, ponderosa pine, and other occasional hardwood and softwood species. Understory species in these stands are typically fire-

followers and regional endemics. These understory species include white leaf manzanita (*Arctostaphylos viscida)*, toyon, poison oak (*Heteromeles arbutifolia*), coffeeberry (*Rhamnus californica*.), yerba santa, and Ceanothus species. The ground cover, when present, can be quite diverse in all the above mentioned plant communities. Most areas have scattered perennial and annual grasses. More open areas have a variety of herbaceous species, such as buckwheat (*Eriogonum spp.*), woolly sunflower (*Eriophyllum lanatum*), bracken fern *(Pteridium aquilinum var. pubescens*) and everlasting (*Gnaphalium spp*.)*Rare Plants and Unique Habitats*

No threatened or endangered plant species are known from any of the nine fires.

Complex	Fire Name	Fire Size in Acres	Sensitive (FSS), Forest Plan Endemic (FPE), or BLM Sensitive (BLMS) Plant Populations	Serpentine Soils Present
SHU Lightening	Motion	28339	Arnica venosa (FPE)	No
	Moon	35860	None	No
	Lower	1309	None	No
Lime	Telephone	7058	*Minuartia rosei* (FSS) *Eriogonum libertini*	Yes
	Noble	14949	*Ericameria ophitidis* (FPE)	Yes
	Deadshot	1112	None	No
	Deerlick	13930	None	No
	South Fork	83	*Harmonia stebbinsii* (FSS) (BLMS) *Eriogonum libertini* (FPE)	Yes
	China	35	None	No

Veiny arnica (*Arnica venosa*) is known from eleven populations in the Motion fire. This species has a global and state ranking of G3 and S3.2, meaning it has 21-80 known occurrences, all of them in California in Shasta or Trinity County. It is a Forest Service Forest Plan Endemic species and a California Native Plant Society (CNPS) List 4 species. It seems to require periodic, light disturbance for perpetuation and responds favorably to low to moderate intensity wildfire. The species typically occupies road cuts and other areas with little or no surface litter and full sunlight.

Peanut sandwort (*Minuartia rosei*) is known from two populations in the Telephone fire. The species occupies gravelly serpentine barrens and openings in Jeffrey pine/mixed conifer forest between 2500-5800 feet. It is ranked G3 S3.2 meaning there are less than 100 populations worldwide and all are located in California. The species is a Forest Service Sensitive, and CNPS List 4. Peanut sandwort is restricted to open, high quality, serpentine soil, typically of peridotite mineralogy and most often within Jeffrey pine/incense cedar woodlands. Habitats the species occupies do not contain sufficient fuel to burn at more than a low intensity level, and no significant adverse effects from the fire are expected in these 2 populations.

Serpentine goldenbush (*Ericameria ophitidis*) occupies high quality serpentine openings, in both Jeffrey pine/incense cedar woodlands and serpentine barrens. It is known from 2 populations

within the Telephone fire and a single population in the Noble fire. It has a global and state rank of G3 and S3.3 respectively, meaning there are less than 100 populations worldwide and all are located in California within Trinity County. Like Peanut sandwort, habitats the species occupies do not contain sufficient fuel to burn at more than a low intensity level, and no significant adverse effects from the fire are expected in these 2 populations.

Stebbins' madia (*Harmonia stebbinsii*) is known from a single population in the South Fork fire. This species is restricted to serpentine openings, primarily of serpentinite mineralogy, and is typically found on roadsides or other gravelly, compacted soils. It has a global and state rank of G2 S1.1 meaning there are 20 or fewer populations worldwide and less than 1000 individuals in the State of California within Trinity County. In general, the species is fairly rare and it's abundance and population density fluctuates annually depending on the weather. It is a Forest Service Sensitive species, Bureau of Land Management Sensitive species, and CNPS List 1B species.

Dubakella Mountain buckwheat (*Eriogonum libertini*) is found in 2 populations in the South Fork fire and a single population in the Telephone fire. It occupies high quality serpentine soils, primarily of serpentinite mineralogy that are open and with little soil surface litter. It has a global and state rank of G3 S3.2 which meaning there are less than 100 populations worldwide and all are located in California within Trinity County.

Serpentine soils are found in concentrations in the Telephone, Noble, and South Fork fire areas. These soils are sensitive and do not recover quickly from moderate to heavy soil disturbance. Because they are extremely low in calcium and high in several heavy minerals, they support only a limited number of plant species and rarely carry woody fuels or surface litter. They rarely have enough woody fuels to carry fire and act well as a fire break, but they do not respond well to fire suppression activities such as dozer-made firelines.

Noxious Weeds

Noxious weeds are present in all nine fires. Weeds are mostly restricted to roadsides and harvested openings in fires at higher elevation that are primarily occupied by conifer forest (Telephone, Noble, South Fork, Deadshot, Deerlick, China). Weeds occupy interior areas in the fires at lower elevations (Moon, Motion, Lower).

Complex	Fire Name	Known Weed Species of Concern Within Burned Portion of Fires
SHU Lightening	Motion	Yellow starthistle (*Centaurea solstitialis*) Oleander (*Nerium oleander*) Spanish broom, scotch broom (*Spartium junceae, Cytisus scoparius*) Tree-of-heaven (*Ailanthus altissima*)
	Moon	Yellow starthistle
	Lower	None

Complex	Fire Name	Known Weed Species of Concern Within Burned Portion of Fires
Lime	Telephone	None
	Noble	Yellow starthistle
	Deadshot	Common groundsel (*Senecio vulgaris*) Bull thistle (*Cirsium vulgare*)
	Deerlick	Canada thistle (*Cirsium arvense*) Yellow starthistle
	South Fork	None
	China	None

Common invasive weeds in the SHU Lightening Complex include prickly lettuce (*Lactuca serriola*), mullein (*Verbascum thapsus) s*annual grasses (*Avena* spp, *Bromus* spp., *Taeniatherum captu-madusae, etc*.), filaree (*Erodium* spp.) Klamath weed (*Hypericum perforatum)* and hedge parsley (*Torilis arvensis*). Common invasive weeds in the Lime Complex include Klamath weed (*Hypericum perforatum*) but there are many more that make up the suite of early seral forbs and grasses common in Mediterranean ecosystems in California. These are abundant and widespread species that would be difficult and cost-prohibitive to control because of repeated recruitment from vehicles and other vectors.

Noxious weeds of localized concern within individual fires are shown in the table above.

Land Management Designations

Land management in the nine fires includes Forest Service, Bureau of Land Management, California State, Bureau of Reclamation, National Park Service, and private ownership.

Complex	Fire Name	Land Management Designations and Acres	
SHU Lightening	Motion	Forest Service	5542
		BLM	5482
		California State or Private	14623
		National Park Service	2456
		Bureau of Reclamation	236
	Moon	BLM	1202
		National Park Service Private	6608
			28050
	Lower	BLM	1236
		Bureau of Reclamation Private	3
			70

Complex	Fire Name	Land Management Designations and Acres	
Lime	Telephone	Forest Service	6969
		Private	89
	Noble	Forest Service	5942
		BLM	3310
		Private	5697
	Deadshot	Forest Service	399
		BLM	24
		California State or Private	689
	Deerlick	Forest Service	605
		BLM	4642
		California State or Private	7723
	South Fork	Forest Service	83
	China	Forest Service	35
TOTAL			**102,938**

B. Reconnaissance Methodology

Information on noxious weeds and on rare plant habitat and populations was derived from visits to the fire areas in late July 2008, Shasta-Trinity National Forest noxious weed records, Bureau of Land Management, Redding Field Office weed records, and personal conversations with Shasta-Trinity National Forest Botanist Julie Nelson and Whiskeytown National Recreation Area Ecologist Jennifer Gibson.

Flights were conducted over the entire burn area to assess burn intensity, fire effects, and vegetation types. Field visits were made in unburned areas of the fire to observe the condition and composition of stands prior to the fire.

Information on vegetation communities and tree mortality was gathered from visits to the fire areas in late July 2008, Shasta-Trinity National Forest GIS records, and personal conversations with BLM Wildlife Biologist, Gary Diridoni.

Field visits to the Motion, Moon, Deadshot, Deerlick, Noble and Telephone fires were made July 28 – 31, 2008. The China, South Fork, and Lower fires were not visited because of their small size, lack of suppression actions, and low to moderate fire intensities.

Results

Rare Plants

All rare plant populations on Forest Service and BLM lands within the Telephone, Noble, and South Fork fire areas are found on serpentine or other bare soil habitats that do not carry fire easily. Field visits to monitor fire effects were not considered necessary because of the low probability of incurring fire effects in any of the nine fire areas.

Upon comparison of mapped dozer lines and rare plant populations, mapped dozer lines within the Telephone, Noble, and South Fork fires appeared to be well away from the location of all mapped rare plant populations and mapped serpentine soils in general.

Noxious Weeds

Noxious weeds impact healthy ecosystems in a number of ways, including replacing parts or all of native plant communities, loss of wildlife habitat and forage, loss of pollinators, and reductions in recreational and scenic values. Noxious weeds are usually superior competitors to native species and have developed growth strategies that allow them to survive on harsh sites better than native species.

In most of California, especially where the Mediterranean climate is present, annual non-native grasses have largely displaced perennial native grasses and a full 30% of species present in the State are non-natives. 65% of the none-native species in California considered to be invasive are known to be present in northwestern California (CalIPC, 2006). Annual grasses and other exotic forbs provide much less soil stabilization than their native perennial counterparts. Over time this leads to increased soil erosion and possible subsequent sediment delivery to streams and loss of nutrient-rich topsoil to the atmosphere.

Soil disturbance creates optimum habitat for noxious weed introduction and establishment. It also disrupts underground growth processes for native plants; further giving weeds a competitive edge. The greater the soil disturbance, the greater the competitive edge for noxious weeds.

Roadways are the greatest source of invasive species introduction. Weed seeds and plant parts are carried on primarily by motorized vehicles, but also on boots and animals. Soil freshly disturbed by dozers creates a suitable seedbed for invasive species carried in by vehicles and other vectors.

Low to moderate intensity fire is beneficial for native plants (nutrient release, growth invigoration, reduction of duff layer) and usually only topkills, but it also stimulates weed growth. High intensity fire also stimulates weed growth, but is not as beneficial to native plants because plants are killed entirely and soil can be sterilized deeper than the depth of the local native seedbed. In the case of high-intensity wildfire, noxious weeds have a greater advantage for post-fire site establishment. No more than 10% of wildfire acres in each fire area burned at high-intensity, resulting in little damage to native plants and only minor increases in noxious weed suitable habitat from fire stimulus.

Complex	**Fire Name**	**Miles of Dozer Line Created**	**Percent of High-Intensity Burn**
SHU Lightening	Motion	62.7	4.6
	Moon	3.2	8.4
	Lower	0	0.2
Lime	Telephone	11.3	2.1
	Noble	27.9	1.7
	Deadshot	3.2	1.4
	Deerlick	24.2	5.7
	South Fork	0	0.0
	China	0	no data available
TOTAL		**132.5**	

Fireline construction is the most significant source of soil disturbance during fire suppression activities. Handline and mule drag construction are light and disturbed only a narrow line of soil, usually no more than 5 feet for mule drag and less than 2 feet for handline. Dozer line construction results in heavy soil disturbance because the ground is thoroughly scraped off to remove surface vegetation, shrubs and trees are pulled out by their roots or sawn at the soil surface, and blades are invasive in the soil to create a wide surface of bare mineral soil. Dozer line construction creates optimum habitat for noxious weed introduction and establishment because it both exposes a bare mineral soil seedbed and it heavily disrupts above and belowground growth processes of native plants.

Approximately 133 miles of dozer lines were constructed associated with the six largest fires in this analysis. No dozer line was constructed for the Lower, South Fork, or China fires. Dozer line width varied from ten to thirty feet on average. Within each fire average of 5 safety zones on average (dozed areas of 2 acres each on average) were created for firefighter evacuation purposes. Together, dozer work caused significant soil disturbance on approximately 382 acres throughout 6 of the 9 fires.

The largest 6 fires areas were visited to assess impacts of wildfire and fire suppression activities. The focus of survey was on number and quality of firelines and safety zones, the overall damage caused by the fire, and to determine the scope of existing weed populations for each of the nine fires. The remaining 3 fires (South Fork, China, and Lower) were small and burned mostly or wholly at low or moderate fire intensity with few to no suppression actions.

Motion Fire

This is one of the lowest elevation fires, closest to an urban area, and part of the fire area is a designated OHV park. Noxious weeds are established along the designated roadways in the Chappie-Shasta OHV area, primarily along Route 3. Non-native species are present in uplands, but not in great enough quantities to significantly impact the health of native plant communities. 62.7 miles of dozer line were constructed in this fire and 4.6% of burned acres were in high intensity.

Chappie-Shasta OHV Area

Oleander, tree-of-heaven, and Spanish broom are common in concentrations along trails and roads. OHV traffic is expected to continue at some level, even if area closures are implemented, and increase substantially after any possible closure orders are lifted. Route 3 appears to be the most well used of the trails because of it's proximity to the Sacramento River and ease of use for all OHV skill levels. Outside of the designated OHV staging area, all of this part of the fire is under BLM management or private ownership.

While invasive weeds are present along roadsides, they are found in much less density in uplands away from the fire. Monitoring and treatment should be done for up to 3 years to determine if dozer disturbance and wildfire has facilitated the spread of invasive weeds into uplands surrounding the OHV trails.

Iron Mountain Superfund Site

The area had low amounts of resident invasive weeds, probably because of the poor ecosystem health originating from the smelter years. This large portion of the fire is closed to the general public and did not show signs of illegal OHV incursion. Because of the low resident density of weeds and restricted vehicle access, noxious weeds are not expected to significantly degrade the existing ecosystem. FS BAER treatments or noxious weed detection surveys may not be necessary in this area. Because most of this land is under private or BLM ownership, other post-fire rehab programs may be appropriate for noxious weed treatment and monitoring, such as the NRCS Emergency Watershed Program and Dept. of Interior Burned Area Rehab funding.

South of Iron Mountain Area

This area includes several residential areas and there is a high density of invasive species present because of high vehicle use. Invasive species are present along roadsides, but decrease in density quickly as you move into uplands away from roads. Monitoring and treatment should be done for up to 3 years to determine if dozer disturbance and wildfire has facilitated the spread of invasive weeds into uplands surrounding homes and other structures.

Remaining areas in Motion Fire

All other areas in the Motion fire have only a minor component of noxious weeds. Monitoring and treatment are recommended for all routes outside of Route 3 because of the lack of existing weed populations and the anticipated threat of increased OHV travel and introduction of invasive species.

Moon Fire

78% of the Moon fire is under private ownership and the remaining area is under BLM and NPS management. Lands directly adjacent to Platina Road and accessible by vehicles are occupied moderately to heavily by several non-native species including yellow starthistle. There are no roads in the interior of this fire north of the residential areas surrounding Rainbow Lake. While invasive species are present in moderate to high densities adjacent to Platina Rd., the lack of road access in the interior of the fire would indicate a weeds are in low densities. Monitoring and treatments in the interior part of the Moon fire should occur for 3 years to determine if wildfire has facilitated the introduction of noxious weeds.

Lower Fire

95% of the Lower Fire is under BLM management, with the remaining 6% under private ownership. Less than 1% of this fire burned with high intensity. 97% of the fire area burned at low intensity or didn't burn at all. No dozer line was constructed and public access is restricted. Because of the low occupation by noxious weeds, lack of disturbance from dozers, and restricted vehicle access, noxious weed treatments or detection surveys are not recommended.

Noble Fire

Ownership of this fire area is divided roughly equally between Forest Service to the west with BLM and private ownership occupying the eastern half. FS Road 45 (Tedoc Rd.) is well occupied by starthistle and other invasive weeds where it passes through chaparral at the north end, but few invasive species were seen in the uplands adjacent to roadsides. All other parts of the Noble fire, including the portion of FS Road 45 outside of chaparral, FS 29N06 (Beegum Gorge Rd.) and other roads through National Forest lands are not heavily occupied by noxious

weeds. 27.9 miles of dozer line were constructed in association with the Noble fire, including an extensively wide line through chaparral adjacent to the Tedoc Mtn. Rd. Most ridgelines and the 22N22D jeep road were widened with dozers. Monitoring and treatments in the interior part of the Noble fire should occur for 3 years to determine if wildfire and dozer disturbance has facilitated the introduction of noxious weeds.

Deerlick Fire

The BLM manages 33% of the land in the Deerlick fire, with 62% of the remaining land under private ownership and 5% under Forest Service management. 5.7% of the area burned with high fire intensity. Yellow starthistle and other common invasive species are present in dry opening that don't support high amounts of vegetation, but most forested uplands carry low amounts of weeds.

FS Road 31N02 travels north to south between the Deadshot and Deerlick Fires. FS Road 30N05Y spurs off of FS 31N02 and accesses several newer private timber harvest units that have existing populations of bull thistle (*Cirsium vulgare*) and western groundsel (*Senecio vulgaris*), both aggressively invasive species in freshly disturbed open areas. Both species spread seeds on the wind and there is a high chance nearby dozer lines will be affected. Left untreated, bull thistle and western groundsel could easily enter and establish in Chachelulla Wilderness area located less than 1 mile away.

Several roads traverse the interior of the Deerlick fire providing access for vehicles that have the potential to import weeds into areas disturbed by wildfire and dozers. Monitoring and treatments in the interior part of the Deerlick fire should occur for 3 years to determine if wildfire and dozer disturbance has facilitated the introduction of noxious weeds.

Deadshot

62% of this fire is under private ownership, primarily by Sierra Pacific Industries, a private timber company. SPI was in the process of harvesting trees in the Middleton Gulch area when the July 20 fires began and there is additional soil disturbance in the Deadshot fire from logging activity as well. 24.7 miles of dozer line were constructed in this 1112 acre fire area; a high amount relative to the size of the fire. Wildfire impacts were minor with only 1.4% of the area burning at high-intensity.

This fire occurred directly adjacent to the Chanchelulla Wilderness Area which is known to have few, if any, resident noxious weed populations. Because of the high amount of dozer disturbance and proximity to pristine plant communities in the Chanchelulla Wilderness area, monitoring and treatments in the interior part of the Deadshot fire should occur for 3 years to determine if wildfire and dozer disturbance have facilitated the introduction of noxious weeds.

Telephone Fire

The Forest Service manages all but 89 acres of this 7058 acre fire area. There are roads along 2/3 of the perimeter of the fire area. Only one road, 13 Dips Road, enters the interior of the fire, but it is very rough and does not get extensive use except by residents of that neighborhood. Weed densities are low along roads and on uplands, but 11.3 miles of dozer line were constructed during suppression activities. 2.1% of the 7058 acre fire area burned with high intensity. The wildfire did little damage to this area, but dozer disturbance is high, so monitoring

and treatments in the interior part of the Telephone fire should occur for 3 years to determine if wildfire and dozer disturbance has facilitated the introduction of noxious weeds.

South Fork Fire

This fire burned 83 acres, none at high intensity. No dozer lines were constructed during suppression activities and there are no roads within or surrounding the fire. This fire is located in a large Jeffrey pine/incense cedar woodland whose habitat is very open with little woody fuel on the ground. Wildfire had positive impacts on the habitat and no dozer disturbance occurred. There is no need for any noxious weed monitoring in this fire area.

China Fire

The Forest Service manages all 35 acres of the China fire area, which burned entirely at low to moderate intensity and no significant wildfire impacts. No dozer line was constructed during suppression activities. There is no need for any noxious weed monitoring in this fire area.

Private Lands

Private lands within each of the fires contain varying amounts of invasive weeds. The Moon fire is almost entirely private land with a small amount of BLM land on the west side and it contains the most significant amount of private land in either complex. 7.6 miles of dozer line were constructed within this fire area. Private landowners within the nine fires were contacted by the NRCS but to date no landowner has requested assistance with noxious weed control or restoration seeding.

C. Findings/Description of Emergency

Value at Risk: Ecosystem Stability

Noxious weeds weaken ecosystem stability by displacing native species and causing losses in wildlife habitat and forage, and recreational and scenic values. Ecosystem stability is threatened because noxious weeds can be responsible for accelerated soil erosion, loss of ability to hold soil underground, loss of wildlife forage and habitat, and loss of plant species diversity.

Fire burned primarily at low to moderate intensity throughout the nine fire areas leading to a beneficial effect to resident ecosystems. Fire suppression activities, in particular dozer line and safety zone construction caused highly invasive soil disturbance and created optimum habitat for invasive, noxious weeds to be introduced and established. Dozers were not cleaned prior to suppression activities or when moving between or within fires. Weeds have a high potential for introduction by vehicles on roads and trails, especially in the Chappie-Shasta OHV area.

Priority Threats

All fires with constructed dozer line (Motion, Moon, Telephone, Noble, Deerlick, Deadshot) have potential to established noxious weeds for a minimum of three years. All firelines should be monitored in the following year and any new noxious weed populations should be removed. Removal will be by manual pulling on Forest Service lands and a combination of manual pulling and herbicide treatment on BLM lands.

Off-road vehicle use is expected within the Chappie-Shasta OHV area. An area closure with patrol is proposed but there is no guarantee of funding or that OHV traffic will cease. Illegal use of closure areas has occurred in the past. All dozed soil outside of areas that are already infested

with noxious weeds should be monitored for at least one year, with emphasis on uninfested areas directly adjacent to infested areas. Treatment should occur where new individuals area found. All dozer-created firelines in the Deadshot fire are within one mile of the Chanchelulla Wilderness. This wilderness is not free of non-native plant species, but a field inventory in 2007 indicated an absence of any invasive noxious weeds. The ecologic integrity of the Chanchelulla Wilderness is threatened by introduction of noxious weeds from nearby dozer lines in the Deadshot fire. There are intermixed private timberlands in the 2 fires areas with recent harvesting activity. Several individuals of bull thistle and western groundselAll Deadshot dozer lines should be monitored closely with removal of new individuals in 2009.

IV. TREATMENT RECOMMENTATIONS

Noxious Weed Detection Surveys

FSM 2523.3 gives direction to monitor burned areas to ensure emergency stabilization measures are functioning as planned and effective.

Areas that were excavated by dozers and their adjacent uplands in six fires should be surveyed in 2009 to determine if new noxious weed infestations have occurred as described in the table below.

Complex	Fire Name	Monitor Entire Dozer Lines	Monitor First 200 feet of Dozer Lines	Remove New Noxious Weed Individuals	Seed and Mulch First 50 Feet of Dozer Line-Road Intersections and All Safety Zones
SHU Lightening	Motion		X	X	X
	Moon (pvt)				X
	Lower		X	X	
Lime	Telephone		X	X	X
	Noble		X	X	X
	Deadshot	X		X	X
	Deerlick	X		X	X
	South Fork		X	X	
	China		X	X	

There are 133 miles of mapped dozer line in the six largest fires, plus additional miles of unmapped line. Surveys should be more thorough in the Deadshot and Deerlick fire areas where nearby isolated patches of bull thistle and western groundsel threaten healthy plant communities in the Chanchelulla Wilderness.

Safety zones should be monitored rigorously for noxious weeds because large areas up to 2 acres were heavily disturbed with dozers. Safety zones were not mapped reliably, so an average of 5 zones per fire is assumed. These should be monitored for up to 3 years to determine the presence of new noxious weed individuals.

There are no mapped dozer lines in the South Fork, China, and Lower fires, but a single visit in 2009 is recommended to validate the absence of dozer lines and noxious weed introductions.

Noxious Weed Control Treatments

Spot treatments of new introductions of noxious weeds should happen in conjunction with noxious weed detection surveys. Treatments options include handpulling on Forest Service, private, and BLM lands and targeted herbicide treatments on private and BLM lands. Herbicide use for the treatment of invasive weeds is authorized on BLM lands and legal on private lands. Herbicide weed treatment is not authorized on Shasta-Trinity National Forest lands.

Seeding and Mulching

Seeding with native grass seed and mulching with weed-free straw is recommended in heavily disturbed areas such as dozer lines and safety zones. Seeding the first 50 feet of all dozer lines that intersect with roads should be sufficient in most cases to discourage noxious weed introductions and encourage native plant species establishment. Seeding additional distance may be necessary on some lines. All safety zones in their entirety should be seeded and mulched. Weed-free mulch will facilitate native seed germination and growth and will suppress non-native seed germination.

Locally-adapted native grass and forb seed, sown by hand to reduce the rate, is limited in supply. A mix of locally-collected native seed, locally or regionally-adapted native seed from commercial sources, and cereal grains will help distribute locally-adapted native seed to more fire areas, yet reduce off-site impacts of non-locally-adapted native grass seed.

All discovered weed infestations and seeded dozer lines and safety zones will be mapped using GPS technology and compiled into a GIS database to track for monitoring purposes.

TREATMENT COSTS

	SHU Lightning		**Lime**		
	FS	**BLM**	**FS**	**BLM**	
monitoring	3425	3450	5325	0	
seed	5038	2860	18320	660	
straw	16698	10626	60720	1518	
labor	4110	12080	20705	900	
vehicles	1000	500	3125	1875	
TOTAL COST	**30271**	**29516**	**108195**	**4953**	**172935**

V. LITERATURE REVIEWED AND CITED

GIS database. 2004. Shasta-Trinity Geographic Information System Database. Vegetation and sensitive plant shapefiles.