



BURNED AREA EMERGENCY RESPONSE (BAER)

Smith River Complex Post Fire BAER Assessment August-September 2023



Six Rivers & Rogue River-Siskiyou National Forests



Smith River Complex BAER Assessment

Two BAER teams were assembled for the assessment of Smith River Complex burned areas:

One large team for Six River NF side; and
A smaller team for Rogue River-Siskiyou NF



BAER specialists assess the burned areas from the air and on the ground.

Smith River Complex BAER Assessment



BAER addresses immediate post-fire emergency situations with the goal of protecting life, property, natural, and cultural resources.

The BAER Process

The BAER process has 3 phases:

1. Assessment and the prescription of recommended emergency stabilization treatments
2. Implementation of treatments
3. Monitoring of treatments

Smith River Complex BAER Assessment

BAER Team Products:

- Soil Burn Severity Map
- Soil Erosion Response Analysis
- Watershed Response Analysis
- Debris Flow Response Analysis
- Threats to Critical Values
- Proposed Treatments
 - Develop Burned Area Report
 - 1 Year Implementation of treatments



Smith River Complex BAER Assessment

Smith River Complex Fires

Start date: August 15, 2023

Causes: Lightning

Date of containment: 95% (10/13/23)

Assessment Acres: 92,347 acres (94,616 reported)

NFS 88,617 acres

Private 3,730 acres

BAER Team focused on a watershed approach to assessment ...



Hwy 199 from helicopter

Smith River Complex BAER Assessment

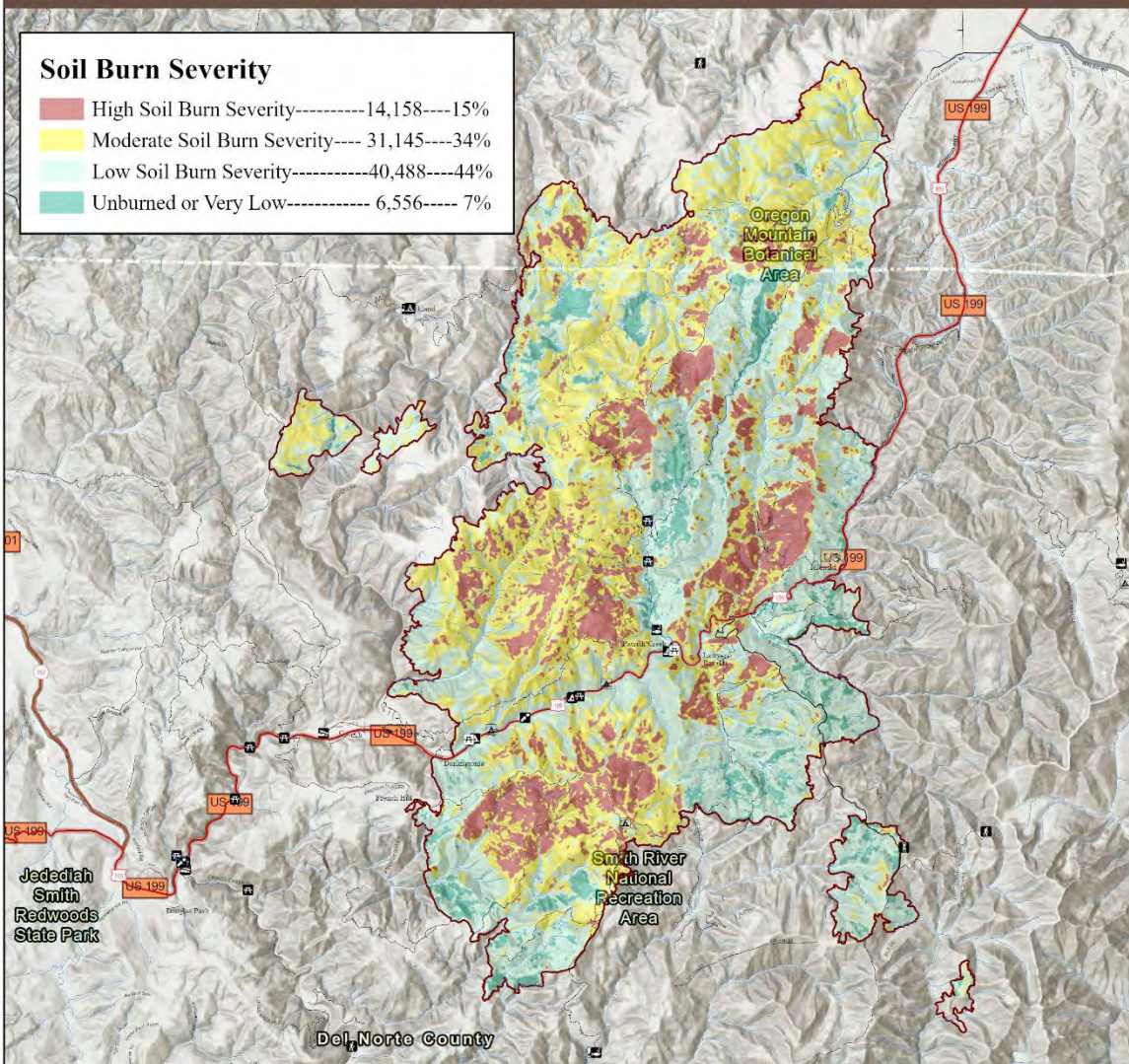


Soil Burn Severity - Smith River Complex Burned Area Emergency Response (BAER)

Six Rivers National Forest and Rogue River Siskiyou National Forest

Soil Burn Severity

High Soil Burn Severity	-----14,158-----15%
Moderate Soil Burn Severity	---- 31,145----34%
Low Soil Burn Severity	-----40,488-----44%
Unburned or Very Low	----- 6,556----- 7%



Soil Burn Severity

- Soil Burn Severity (SBS) is based on an initial BARC image which took the difference in reflectance of the post-fire and pre-fire satellite images.
- SBS also considers ash characteristics, roots and soil structure, soil hydrophobicity, and vegetation burn severity.



Disclaimer

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CALIFORNIA & OREGON



Date: 9/29/2023

Curry, Josephine and Del Norte Counties



Smith River Complex BAER Assessment

Soil Burn Severity Determinations



Date: 9/24/23 7:57 AM
Lon: 123.947160°W
Lat: 41.842677°N
Elev: 267.6607449166477
Bearing: 8°

Unburned



Low Soil Burn Severity

- Soil structure unchanged.
- Roots unchanged



Moderate Soil Burn Severity

- Soil structure weakened.
- Roots dry and brittle or charred



High Soil Burn Severity

- Surface soil structure weakened or destroyed.
- Roots charred or consumed

Smith River Complex BAER Assessment



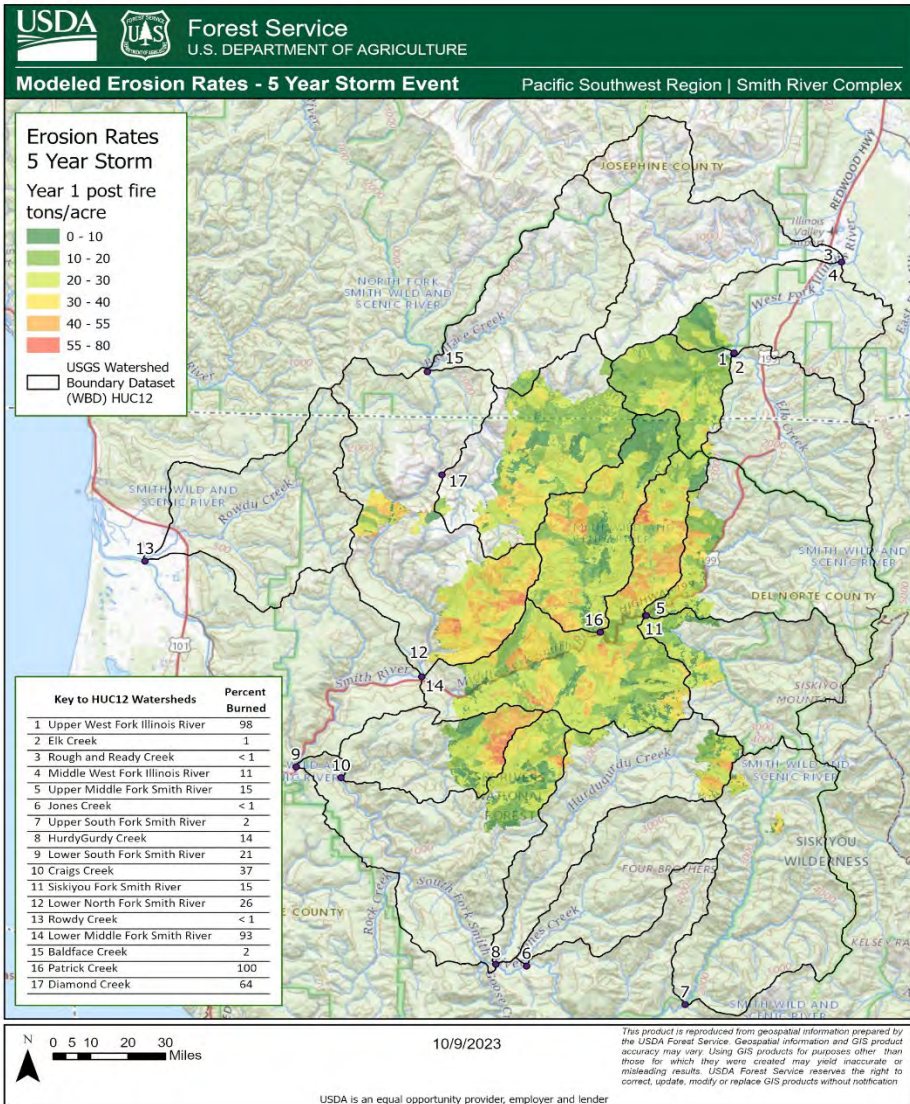
Water Repellent Soil

Watershed Response - Soil Burn Severity



Smith River Complex BAER Assessment

Erosion Rates under a 5-year storm event



BAER Critical Value- Soil Productivity

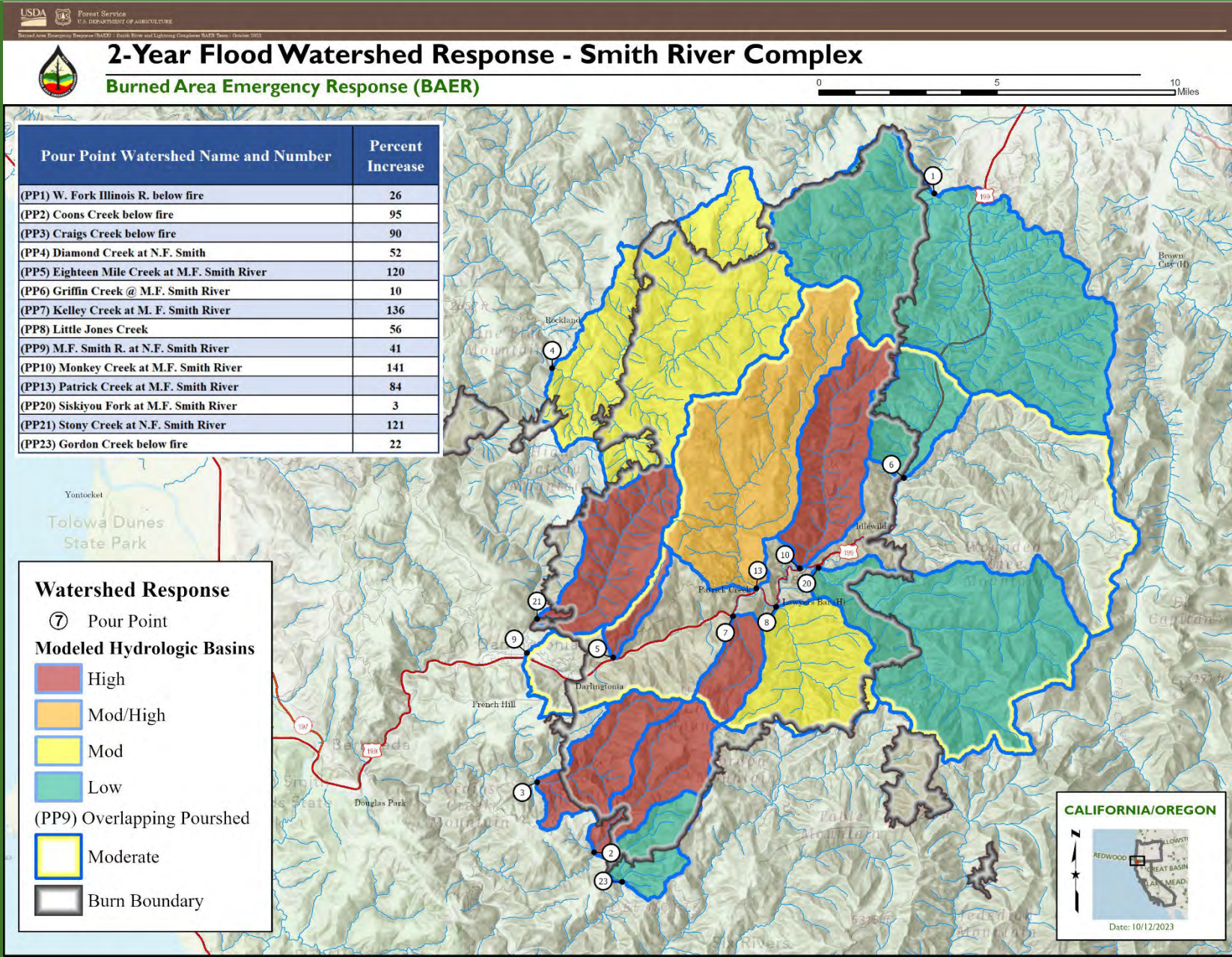
Magnitude of Consequence	Rationale for Magnitude	Risk	Treatment Options Considered	Recommended Treatment
Major	Post-fire erosion rates could result in long-term damage to soil productivity	High	Natural Recovery	No treatment



Smith Complex BAER Assessment Hydrology

Observations and Findings

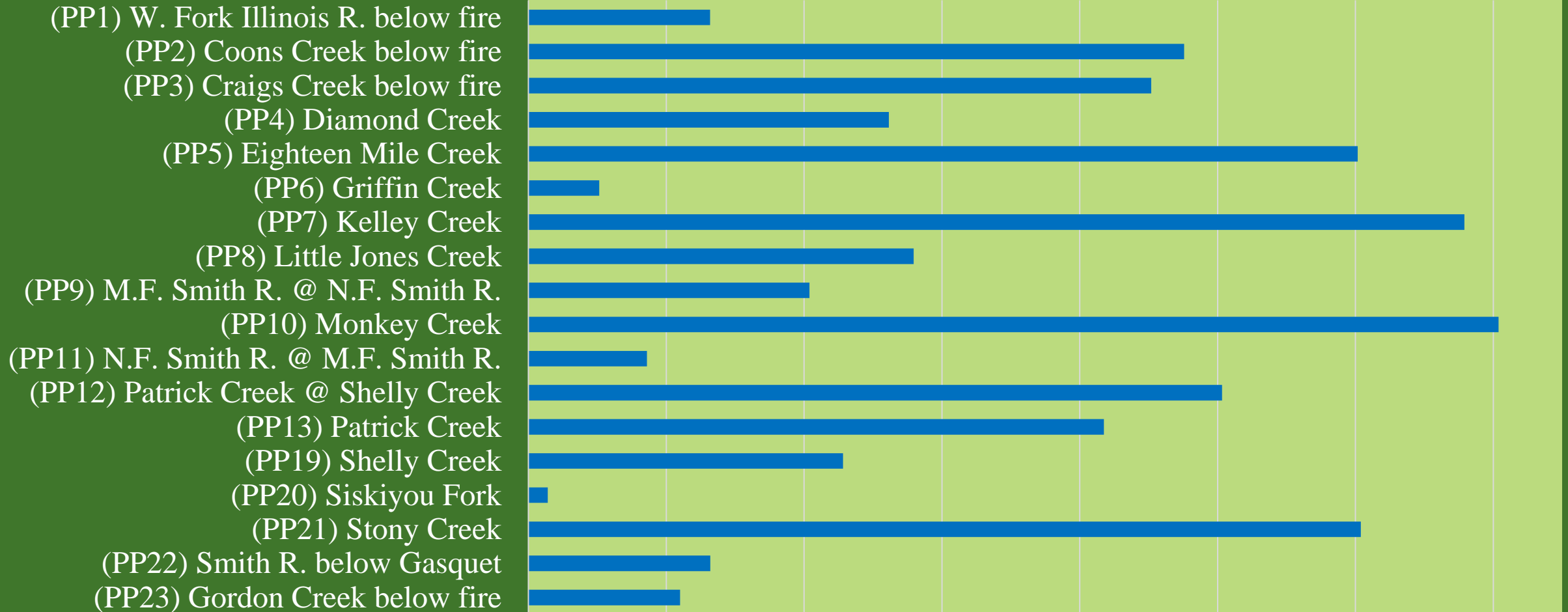
- Expect flashy flows with sudden rises in water levels due to heavy rainfall, steep slopes, and efficient transport channels.
- Some watersheds were severely burned. Hydrologic modeling predicted post fire watershed response.
- Expect high watershed response with runoff and sediment from the fire area watersheds, up to 140% increase from primary drainages.



Smith Complex Hydrologic Modeling Results

Post-fire percent increase from pre-fire flow
2-year design storm (Q2) peak flows

0 20 40 60 80 100 120 140



Smith Complex BAER Hydrology

Values at Risk

- Human life and safety
 - Rain events can yield flashy water and debris flows, with sudden instream flow rises in the Smith River and its tributaries.

Treatment

- Warning Sign Purchase and Installation
 - River access sites, including popular dispersed camping sites



Madrona River Access Site

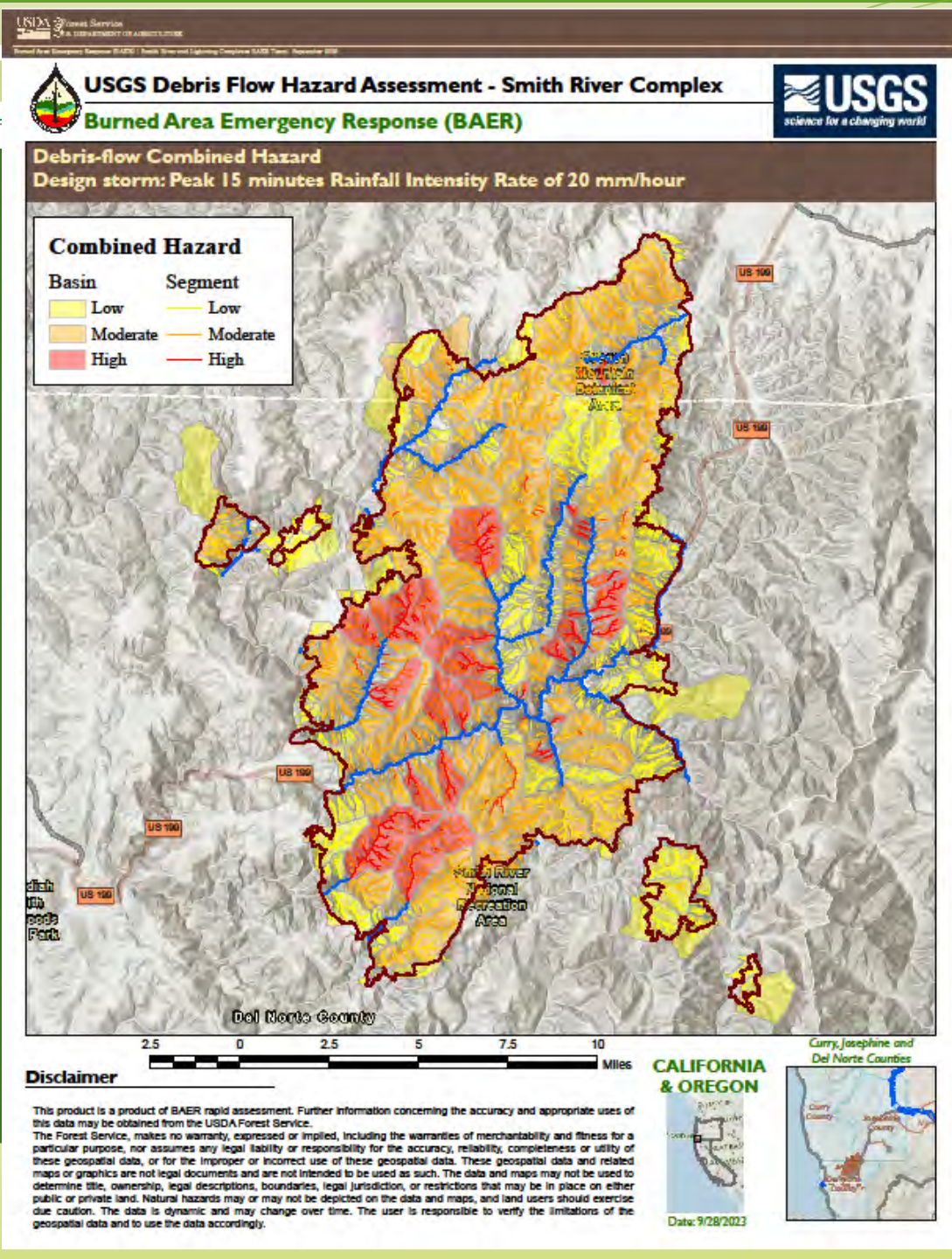


Stony Creek



Patrick Creek Lodge

Smith River Complex BAER Assessment



Geological Hazards:

Post-fire Geological Hazards include:

- Rock-fall & Debris slides
- Debris flows and/or sediment laden flooding

Potential Threats from geological hazards include:

- People living, traveling through, working, or recreating in or below the burned areas during and after storm events
- Impacts to FS roads & trails
- Impacts to T&E's and their critical habitat

Impacts to State, County & Private roads & properties

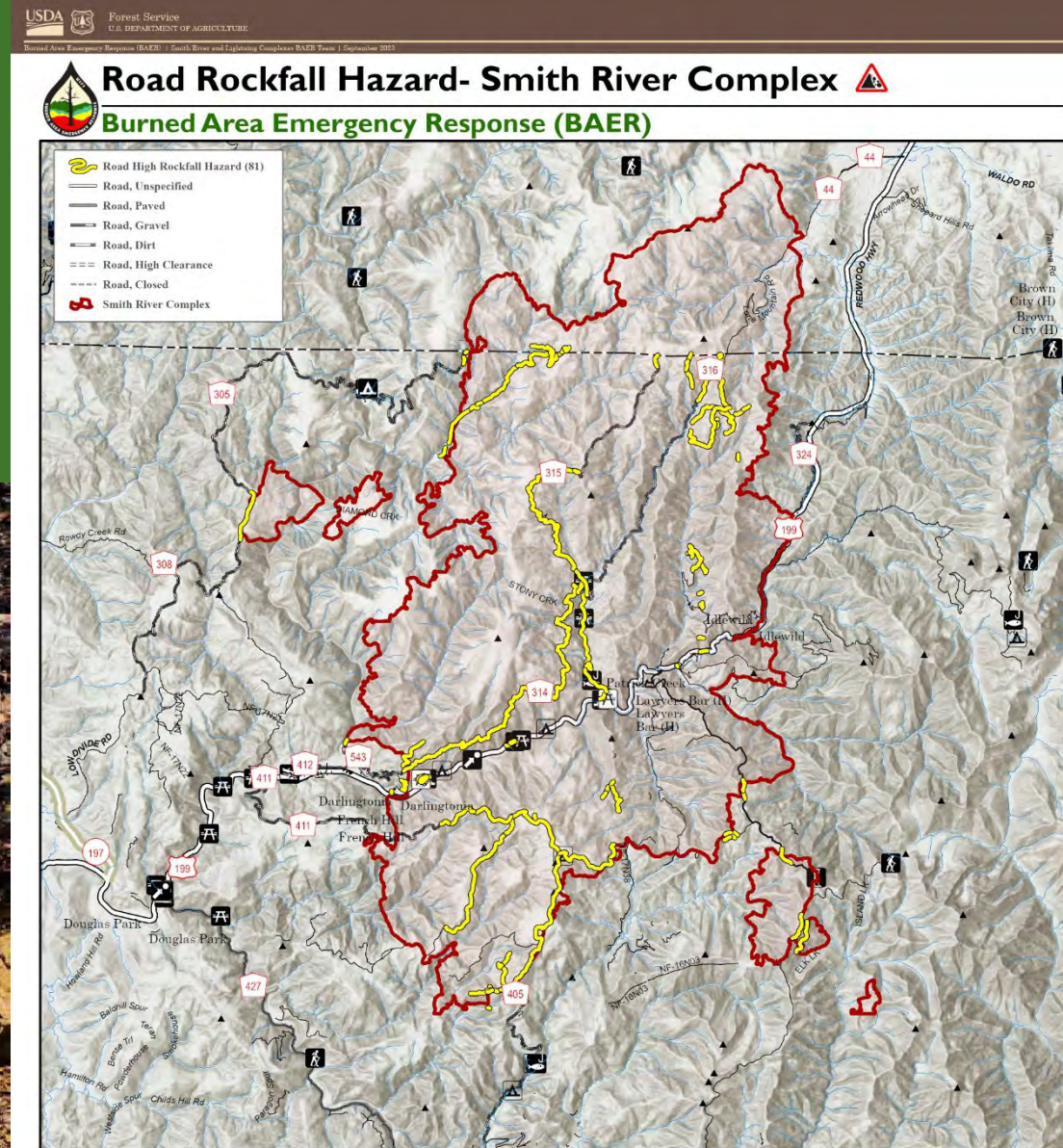


Smith River Complex BAER Assessment

Geological Hazards

Rockfall hazards on roads:

- Depending by the parent material, Some segments of roads present high potential for rockfall While other segments are void of any surface rocks.



Smith River Complex BAER Assessment

Geological Hazards:

Recommendations:

- Coordinate warning notifications with the National Weather Service
- Post warning signs and enforce administrative closures
- Road storm proofing and storm patrols



Smith River Complex Roads BAER Assessment

Road Assessment

Smith River Complex Area

- 67.9 miles of the roads burned in Moderate or High Soil Burn Severity areas
- Erosion exacerbated by rainstorms that occurred after the fire
- Future storms could lead to erosion that damage culverts which lead to road failures



18N17 ridge near repeater



Plugged Culvert

Smith River Complex BAER Assessment

Road Assessment

Values at Risk

- Road Loss
 - Rain events creating high erosion potential to block culverts leading to road failure
- Human life and safety
 - Rain events putting debris on the road leading to closures, destroyed roads, and potential for human loss
 - Hazard trees along roads



Old Gasquet Toll Road



Metal Culvert



Patrick Creek Historic Structure

Smith River Complex BAER Assessment

Recommended Road Treatments

Treatment	Units	# of Units
R1. Storm Proofing	Miles	44.9
R1. Clear Culvert Inlet Basin	Each	9
R2.a Drainage Dip (10CY Riprap)	Each	36
R3. Storm Inspection & Response	Miles	23.2
R3. Storm Response w/ Heavy Equipment	Each	4
R5. Critical Dip	Each	2
R6. Culvert Mod – Riser Pipe	Each	46
R13. Shoulder Burnout Repair	Each	55



Old Gasquet Toll Road



Burned Bridge

Smith River Complex BAER Assessment

Recreation Assessment

1. Developed Recreation

- I. All Campgrounds and Day Use areas along Middle Fork Smith River
- II. Shelly Creek Restroom along Patrick Creek Rd.



2. Dispersed Recreation

- I. Patrick Creek Rd (316)
- II. Holiday Mine Rd (315)
- III. Gasquet Toll Rd (314)



3. Trails

- I. 2E19 Stony Creek
- II. 2E04 Elk Camp Ridge Trail
- III. 3E02 High Dome
- IV. 3E02A High Dome Lookout
- V. 3E02B High Dome Meadow
- VI. 2E01 Darlingtonia Botanical Trail
- VII. 3E16 Patrick Creek Trail



Smith River Complex BAER Assessment

Recreation Assessment

Developed Recreation

Recommended treatments:

- Winter Seasonal Closure of Developed Campgrounds
- Warning Signs
- Continued Monitoring of Risk

**BURNED AREA
FLASH FLOODS
FALLEN TREES
ROCK AND DEBRIS**



\$40,600.00 for roads and rec warning signage



Smith River Complex BAER Assessment

Recreation Assessment

NFS System Trails

Trail surfaces are mostly composed of rock and located on ridge lines.

Trails will be more resistant to erosion due to surface composition and location.

No treatments to trail treads are recommended.

Smith Fire Miles of Trail by Soil Burn Severity

Unburned	0.5
Low	5.3
Moderate	5.7
High	2.4
Total Miles	13.9



Botany Assessment

Values at Risk

Special Interest Areas: Botanical Areas and Critical Serpentine Wetlands

- 4 of 7 SIA Botanical Areas are within the Smith River NRA, 3 of which were impacted by the fire
- Serpentine wetlands support a unique assemblage of wetland species, a number of which are restricted to nutrient-poor ultramafic substrates.



Smith River Complex BAER Assessment

Botany Assessment

Values at Risk

Native and naturalized plant communities

- Spread of Port Orford Cedar Root Disease and Sudden Oak Death
 - Introduction of invasive plant pathogens would cause loss of the critical natural resource values associated with native plant communities
 - Plant pathogen progression can lead to loss of shade canopy and overstory of Smith River and tributaries



Mature healthy Port Orford cedar



Phytophthora lateralis
infected Port Orford cedar

Smith River Complex BAER Assessment

Botany Treatments

Recommended Treatments

- BAER Early Detection Rapid Response EDRR – invasive noxious weeds
- P1b Suppression Disturbance EDRR - invasive noxious weeds
- P3 Other Plant Treatments - Plant Pathogen Testing/Monitoring/Treatments



Testing using bait trees



yellow star-thistle seeds



Dozer line disturbed ground

Smith River Complex BAER Assessment

HERITAGE VALUES CONSIDERED S106 response needed for proposed treatments



Previously recorded Heritage sites located within and adjacent the burn areas

Rapid Field Assessment included:

- 2 = NRHP listed historic properties
- 2 = concurrence NRHP eligible properties
- 6 = public use sites with historic context or infrastructure – dev rec/trails/dispersed sites, etc.
- 2 = pre-contact sites, TCPs, and other values at risk communicated by forest Heritage professionals and/or consulting tribes
- 3 = Unevaluated and potentially eligible sites

Smith River Complex BAER Assessment

Heritage = Collaborative Assessments



Historic trails and road features



overlapping cultural sites and dispersed Recreation



Hydrology consultation and modeling for values at risk



Developed Recreation as historic assets and public use

Smith River Complex BAER Assessment

Patrick Creek Campground 2 levels of threat



Burned
Hazard
Trees
around
historic
features

Hydrological
models
project
accelerated
erosion of
historic
masonry
along stream
(historic
swimming
area)



Smith River Complex BAER Assessment

Fisheries Assessment

Values at Risk

ESA-listed SONCC Coho salmon

- Middle Fork Smith River
- Diamond Creek and tributaries
- Stony Creek
- Patrick Creek and tributaries
- Monkey Creek



Smith River Complex BAER Assessment

Fisheries Assessment

Threats to Fisheries Values

- Warming water temps and leaf litter reduction as 43% of Riparian Reserves burned had >50% basal area mortality
- Increases in expected peak flows and associated sediment delivery in some catchments
- High potential for debris flows in some areas



Smith River Complex BAER Assessment

Fisheries Treatments

Treatments consideration

- Wood additions to Diamond Creek
- Remove/upsized certain culverts
- Mitigate cannabis cultivation sites
- Remove wood from burnt bridges
- Soil stabilization/planting if prescribed by other specialists

No BAER treatments recommended



Imagery Date: 7/2/2016 lat 41.963750° lon -123.920505° elev 1108 ft eye alt 1361 ft

Diamond Creek location where wood could be added



Smith River BAER Assessment

Cannabis Cultivation in Burned Areas

43 Sites Throughout

- 40 in Pacific Marten Suitable Habitat
 - 3 in Northern Spotted Owl Core Habitat
 - 24 in Coho Salmon Occupied Waters
-
- 100% Sites in R5 have Pesticides
 - 80% have Banned Pesticide
-
- Fire Exacerbates the Problem
 - Flames Compromise Containment
 - Hazmat Containment gets Liberated
-
- SBS Exposure & Transport
 - Erosion transports
 - Footprint Increases
 - Soils & Water Contaminated



Fertilizers, Batteries Pesticide Sprayers

Smith River BAER Assessment

Threatened ESA Species

Northern Spotted Owl (Strix occidentalis caurina)

Pacific Marten, Coastal DPS (Martes caurina)

Coho Salmon (Oncorhynchus kisutch)



Trespass Cannabis Cultivation

Toxicants:

- ✓ Anticoagulant rodenticides (direct exposure)
- ✓ Banned Pesticides carbofuran or methamidophos (water quality & soil)
- ✓ High Gradient Fertilizers (water quality & soil)



Threats:

- Burnt packaging & containers of toxicants accessible to woodrats & deer mice, NSO primary prey
- Prey increase their exposure
- Burn area increase prey availability
- Toxicants store in soils & transport to water bodies
- Human safety from direct exposure to hunters year-round



Smith River BAER Assessment

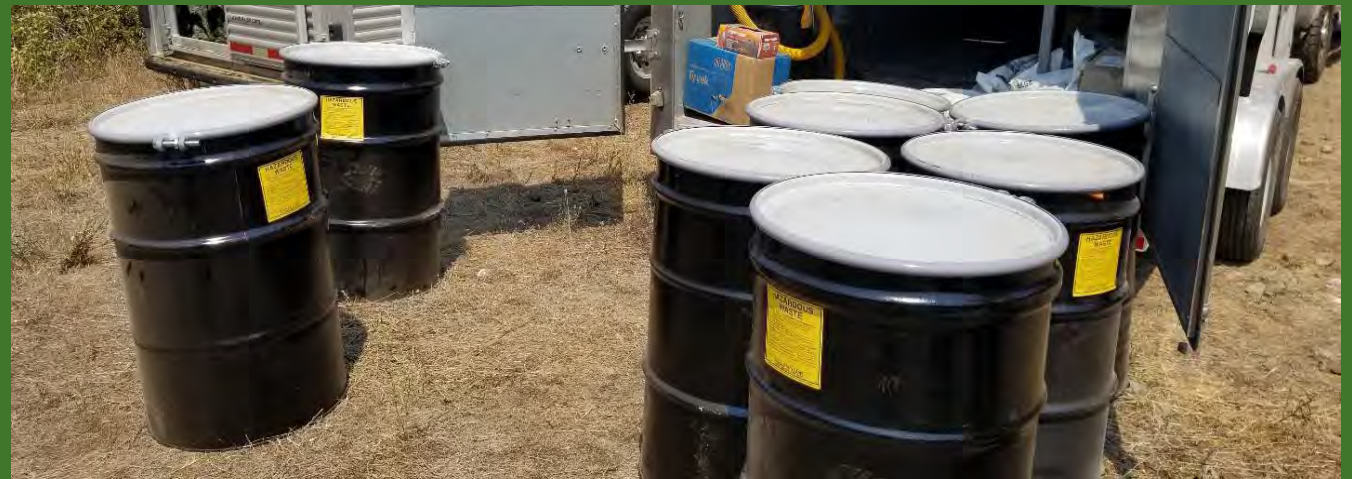
Recommended Containment Treatments

BAER Treatment

- Hazmat Stabilization
 - LEI hazmat team or contractors stabilize, contain, mitigate, & transport for disposal
- 24 Sites Selected to Prioritize
 - Coho salmon drainages
 - Grouped sites for greatest number & least amount of days
- Multiple Benefits from Removal of Hazmat
 - 100% Owl core habitat improved
 - 16,000 acres Marten habitat improved
 - 16,515 acres of recreation, hunting & gathering improved
 - Public health & safety improved



Class X supersacks and Class X buckets



Hazmat Removal & Disposal Contractor – Not funded by BAER)

Smith River Complex BAER Assessment

THREE PHASES OF WILDFIRE RECOVERY

There are **three phases of recovery** following wildfires on federal lands:

- Fire Suppression Repair
 - Emergency Stabilization-Burned Area Emergency Response (BAER)
 - Long-Term Recovery and Restoration
-
- **Fire Suppression Repair** is a series of immediate post-fire actions taken to repair damages and minimize potential soil erosion and impacts resulting from fire suppression activities and usually begins before the fire is contained, and before the demobilization of an Incident Management Team. This work repairs the hand and dozer fire lines, roads, trails, staging areas, safety zones, and drop points used during fire suppression efforts.
 - **Emergency Stabilization-Burned Area Emergency Response (BAER)** is a rapid assessment of burned watersheds by a BAER team to identify imminent post-wildfire threats to human life and safety, property, and critical natural or cultural resources on **National Forest System** lands and take immediate actions to implement emergency stabilization measures before the first post-fire damaging events. Fires result in loss of vegetation, exposure of soil to erosion, and increased water runoff that may lead to flooding, increased sediment, debris flows, and damage to critical natural and cultural resources. BAER actions such as: mulching, seeding, installation of erosion and water run-off control structures, temporary barriers to protect recovering areas, and installation of warning signs may be implemented. BAER work may also replace safety related facilities; remove safety hazards; prevent permanent loss of habitat for threatened and endangered species; prevent the spread of noxious weeds and protect critical cultural resources.
 - **Long-Term Recovery and Restoration** utilizes non-emergency actions to improve fire-damaged lands that are unlikely to recover naturally and to repair or replace facilities damaged by the fire that are not critical to life and safety. This phase may include restoring burned habitat, reforestation, other planting or seeding, monitoring fire effects, replacing burned fences, interpreting cultural sites, treating noxious weed infestations, and installing interpretive signs.

