OAK FIRE

Burned Area Emergency Response Assessment

August
2022

BAER Objectives/Process

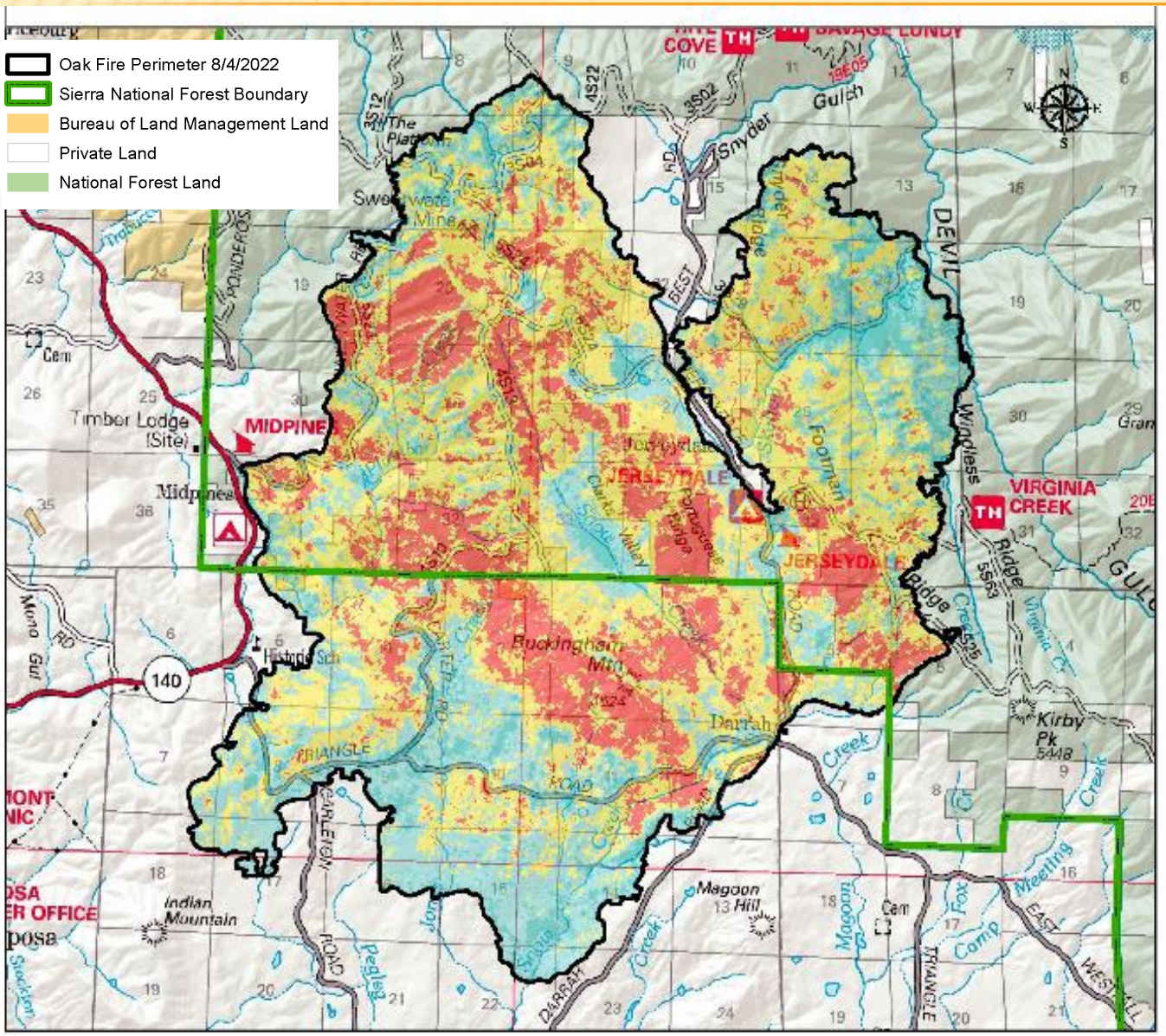
OBJECTIVES

- Assess post-fire threats to Human Life, Safety and Property.
- Assess post-fire threats to Critical Natural and Cultural Resources.
- Take immediate actions to manage unacceptable risk.

PROCESS

- Identify Values at Risk (Critical Values)
- Conduct post-fire watershed assessment
- Determine if an emergency exists - Risk Assessment Matrix
- Identify treatments to reduce risk
- Line Officer Briefing
- Implementation
- Monitoring

SOILS- SOIL BURN SEVERITY (SBS)



Acres of Soil Burn Severity by Land Ownership		
USDA Forest Service	Bureau of Land Management	Private
2,324.07	23.46	1,655.88
4,569.92	17.05	4,213.19
1,763.29	12.50	3,503.50
546.97	1.83	848.62
9,204.26	54.84	10,221.20

Oak Fire Soil Burn Severity :		
Soil Burn Severity	%	Total Acres (Approx.)
High	21	4,003.41
Moderate	45	8,800.17
Low	27	5,279.29
Unburned	7	1,397.42
Grand Total	100	*19,480.29

LOW SOIL BURN SEVERITY

Mixed Conifer

Oak woodland

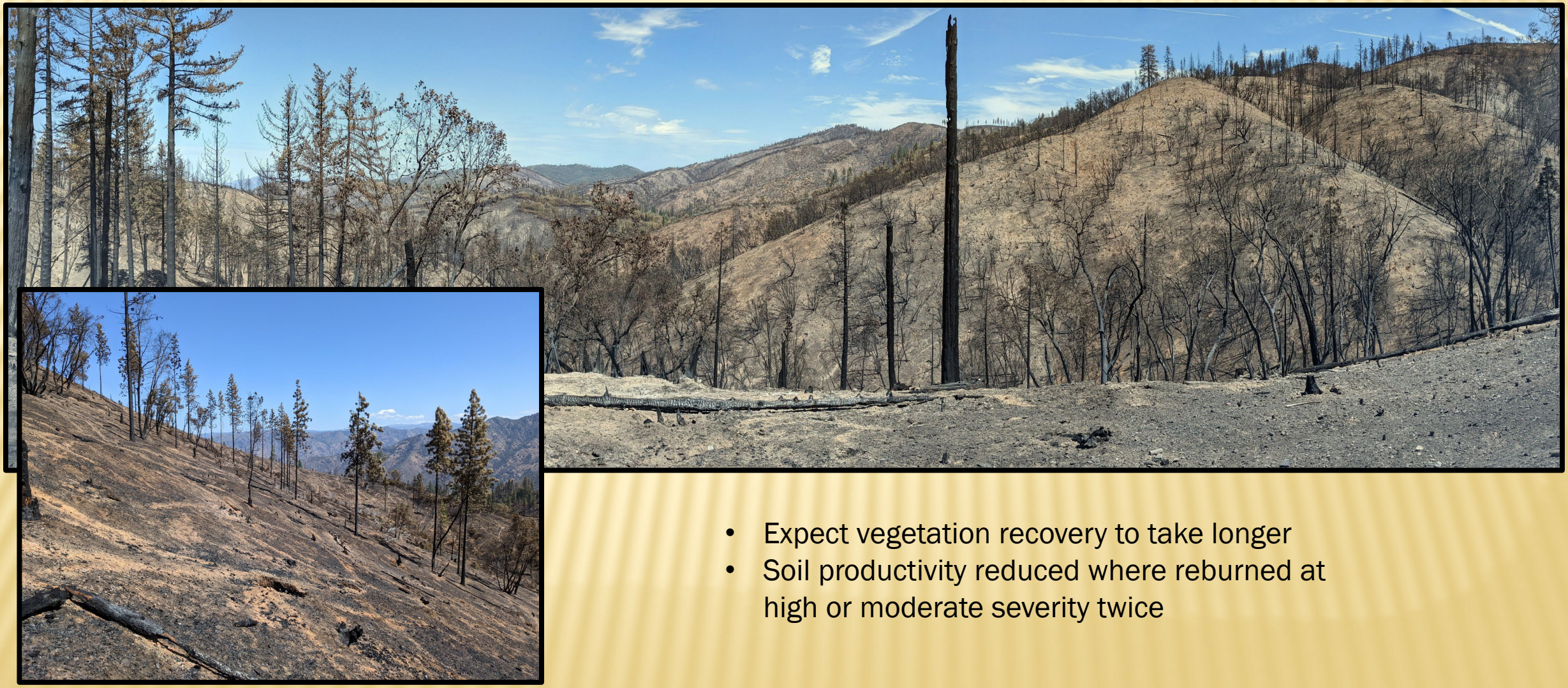
Shrub

MODERATE & HIGH SOIL BURN SEVERITY

Forest Setting- Moderate and High SBS

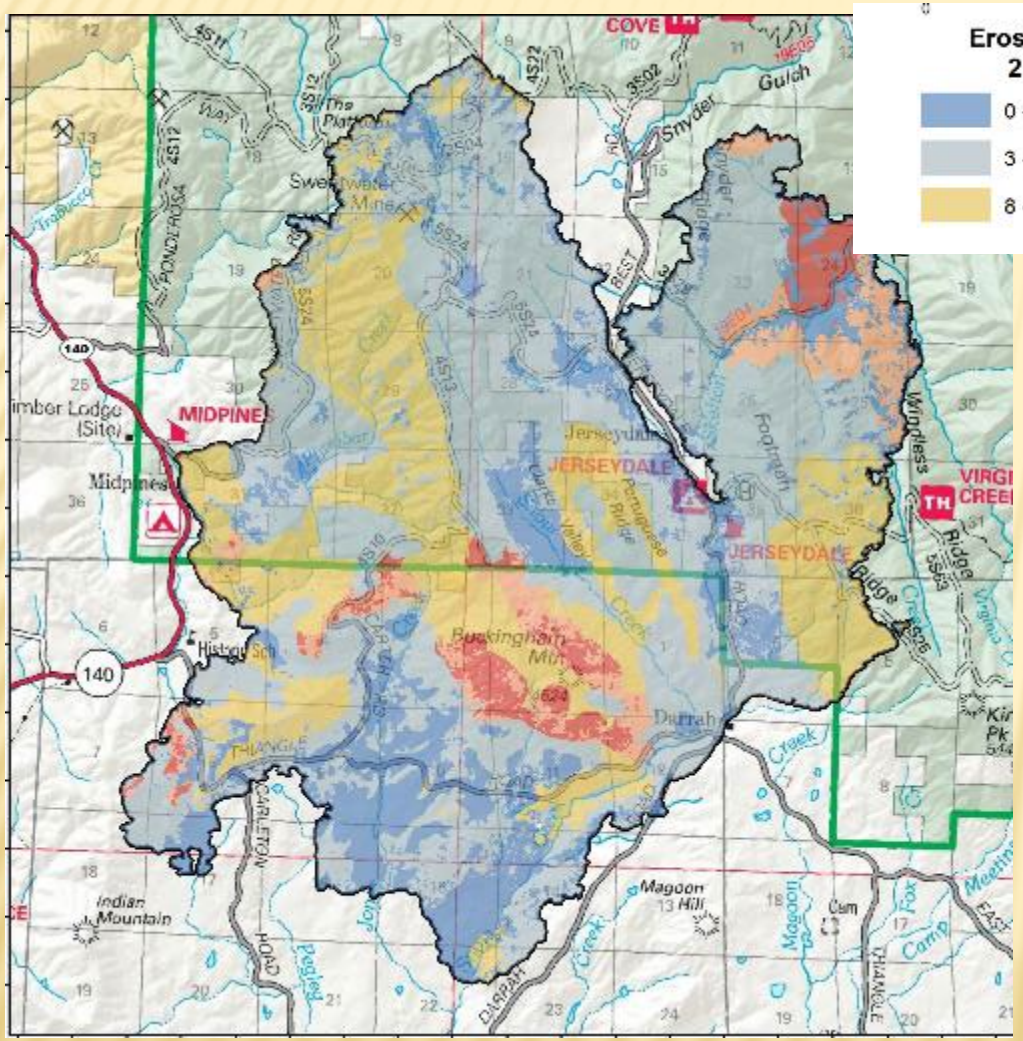
Oak Stetting-
Mod. & High SBS

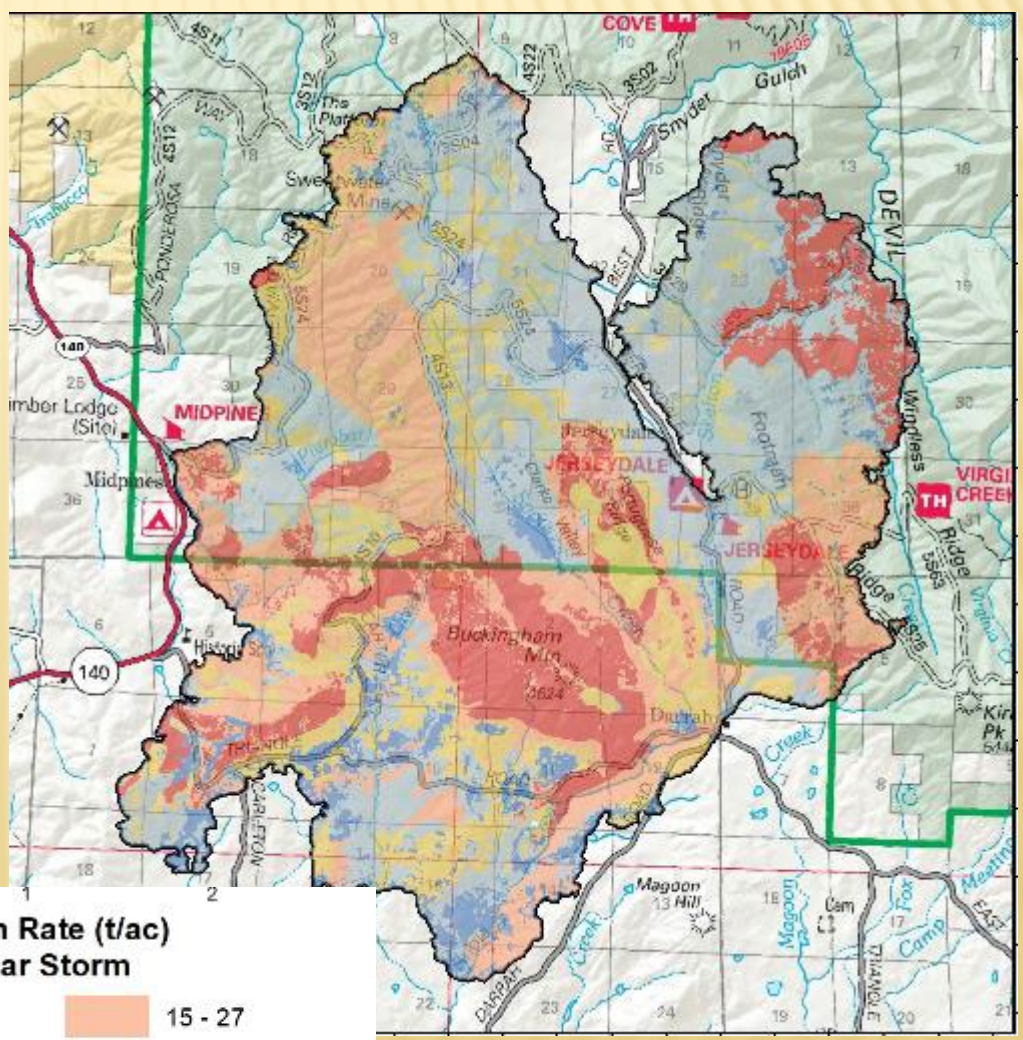
REBURN – CARSTENS AND FERGUSON FIRES



- Expect vegetation recovery to take longer
- Soil productivity reduced where reburned at high or moderate severity twice

EROSION

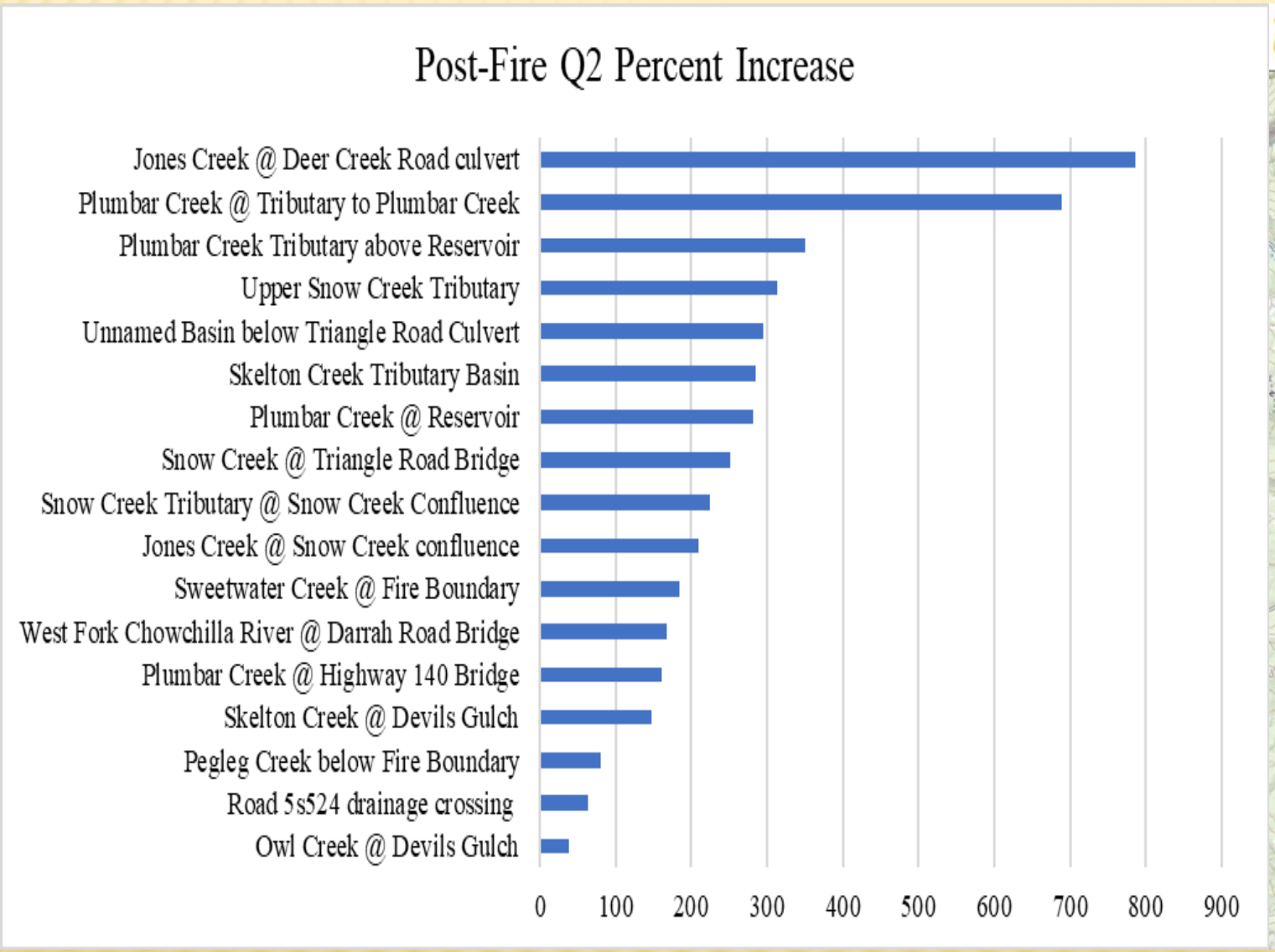

Erosion Rate (t/ac)
2 Year Storm
0 - 3
3 - 8
8 - 15
15 - 27
27 - 43.2 (max)
COVE
MIDPINE
JERSEYDALE
Buckingham Mtn
Indian Mountain
Magoon Hill
Durrah
Gulch
Snyder
Ridge
Creek
140

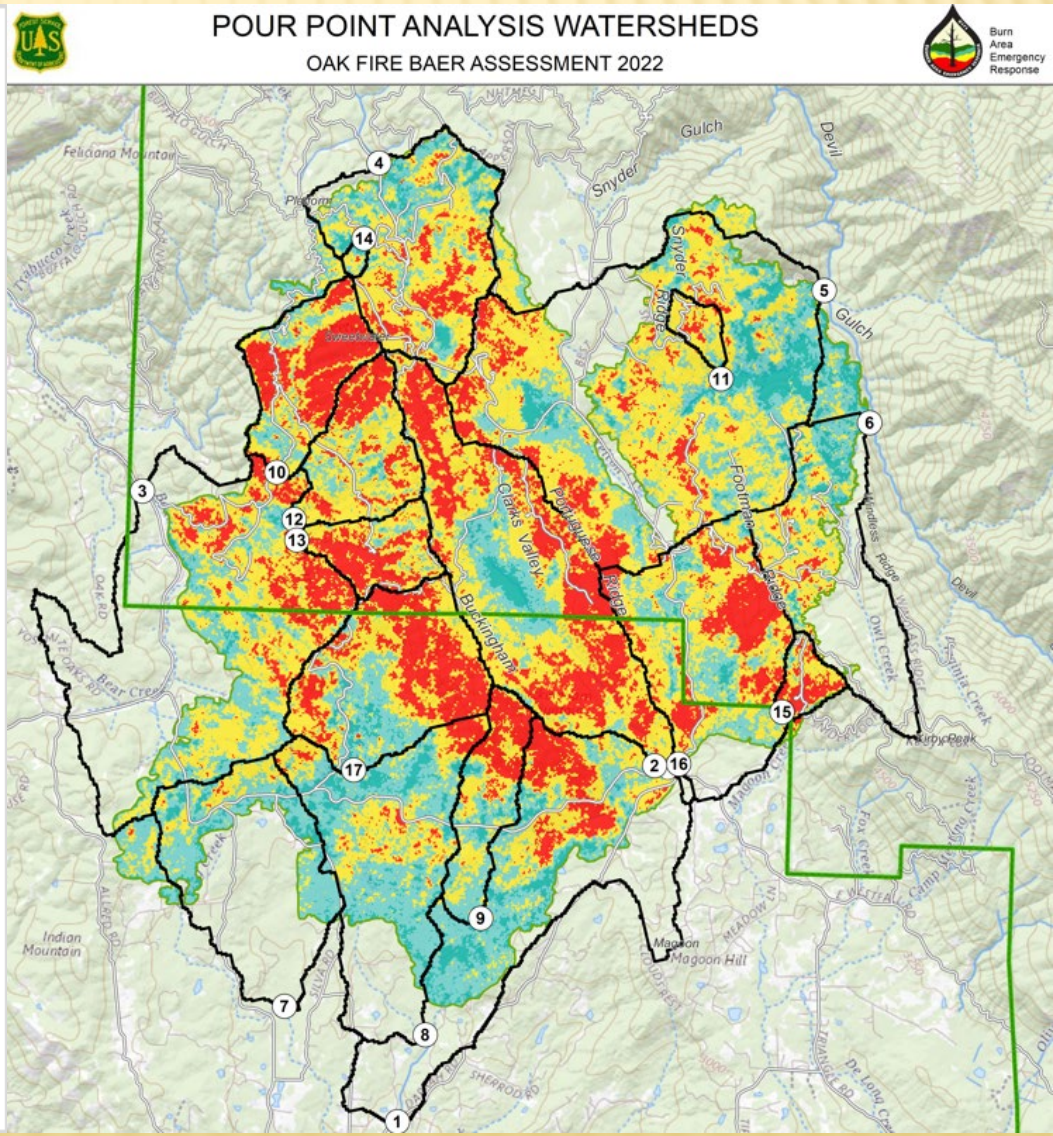

Erosion Rate (t/ac)
5 Year Storm
0 - 3
3 - 8
8 - 15
15 - 27
27 - 89.9 (max)
COVE
MIDPINE
JERSEYDALE
Buckingham Mtn
Magoon Hill
Durrah
Gulch
Snyder
Ridge
Creek
140

WATERSHED OBSERVATIONS & FINDINGS – HYDROLOGY

- Hydrologic modeling was completed to determine post fire watershed response. Much of the watersheds were burned severely.
- High watershed response with runoff and sediment is expected from the fire area watersheds, up to 400 percent increase from primary drainages.
- Forest Roads and Trails could be impacted and damaged as a result of a 2-year design storm or larger, with possible flooding and sedimentation to roads at drainage crossings.
- Burned watershed channels have existing sediment exposed and ready to be mobilized downstream.

WATERSHED OBSERVATIONS & FINDINGS – HYDROLOGIC MODELING RESULTS





Post Fire 2-year design storm peak flows (Q2) in Percent above Pre-Fire Q2 flows

OPEN MINE SHAFTS/ADITS

VALUES

- Life & Safety

Six adits and shafts at Early and Sweetwater Abandoned Mine sites have been exposed by the fire. Thus presents a threat to Life and Safety to the public visiting the site. Propose fencing around the openings with hazard warning signs to protect the public from accidental injury.

HAZARDOUS MATERIALS

Values
- Life & Safety
- Water Quality
- Soil Productivity

Threats
- Mobilization off-site
- Contamination
- Human/animal contact

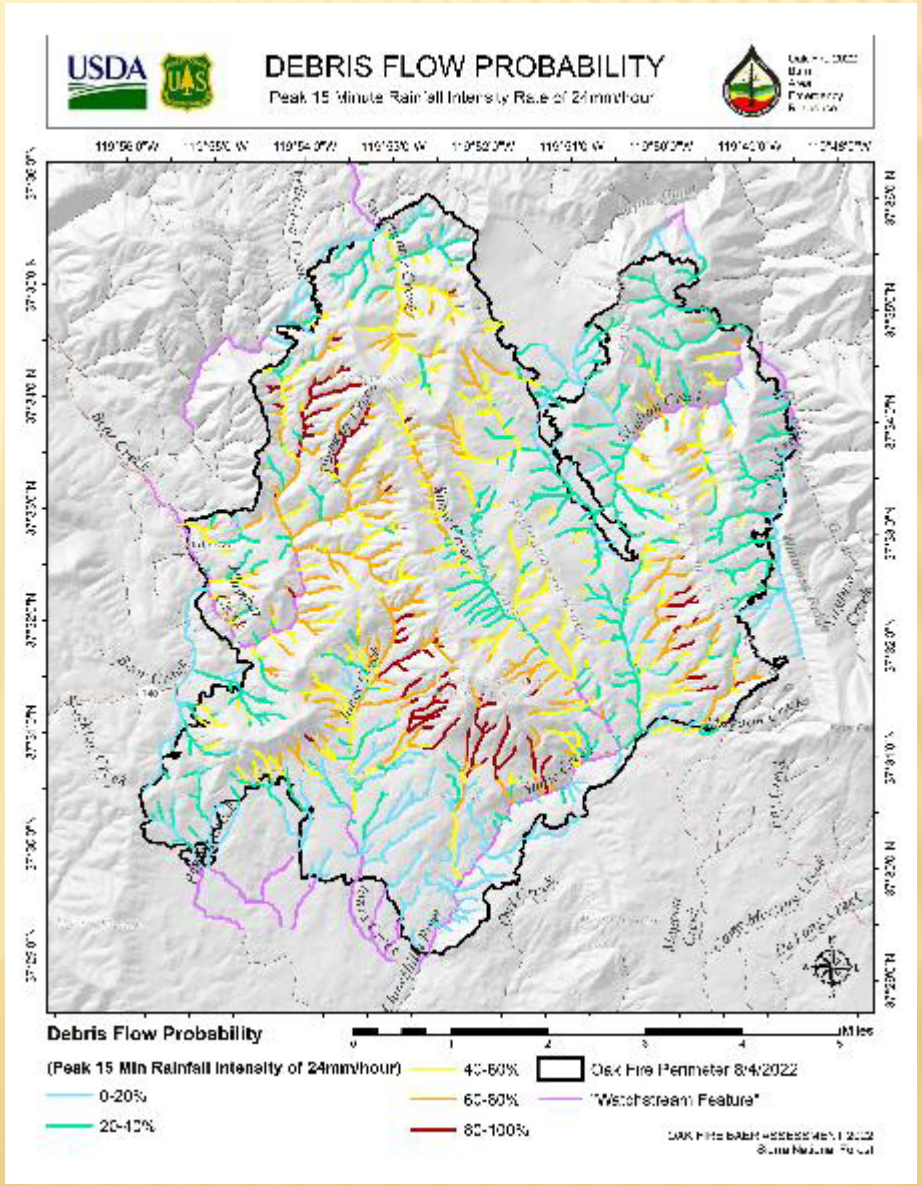
Jerseydale Work Center burned buildings with hazmat refuse

Burned Mine Site - Early Mine threat of hazmat refuse release to Forest Service lands

GEOLOGY HAZARDS ASSESSMENT

Post Fire Geological Hazards Include:

- Rock-fall
- Debris flows
- Sediment laden flooding
- Sediment bulking, and
- Channel flushing along some slopes and drainages in and below the burn areas



GEOLOGY HAZARDS ASSESSMENT

Potential Threats to Critical Value Include:

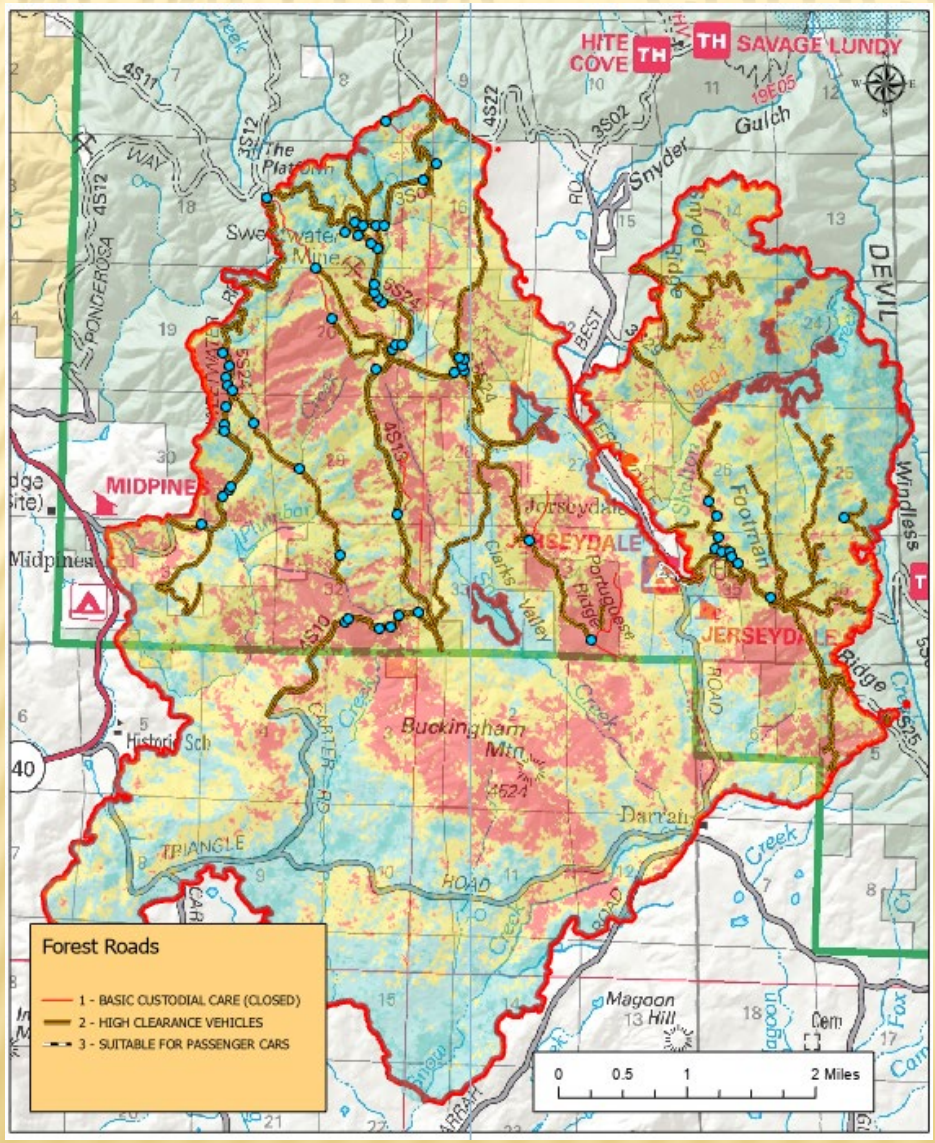
- **People living, traveling through, working, or recreating in or below the burned areas during and after storm events.**
- **FS roads and trails**
- **Impacts to Natural and Cultural Resources**
- **County roads as - Triangle Road, and Jersey-Dale Road**
- **Private roads and properties, water systems and other facilities**

GEOLOGY – PROPOSED TREATMENTS

Recommendations - Treatments:

- Post warning signs and enforce administrative closures along some FS roads & trails
- Road storm proofing and storm patrols
- Coordinate warning notifications with the National Weather Service

ENGINEERING – CRITICAL VALUE AT RISK



Oak Fire & NFSR

- National Forest Service Roads
  - Road Failure or Damage Due to Increased Flow
  - Rock Fall
  - Overwhelmed Drainage Crossings
- Culvert Crossing
  - Debris flow leading to drainage structure failure.

Jurisdiction	Length
C - COUNTY, PARISH, BOROUGH	13.7
FS - FOREST SERVICE	45.6
P - PRIVATE	3.1
Grand Total	**62.4**

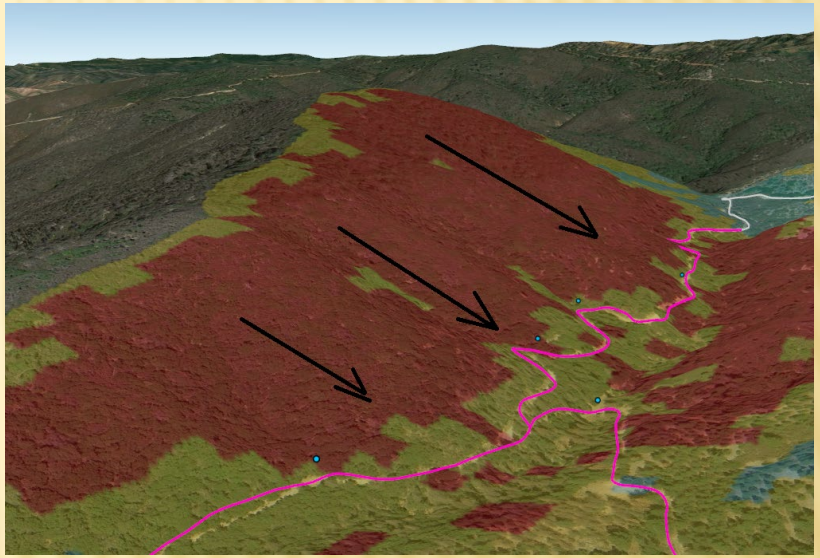
Probability of Damage or Loss: Likely.

Magnitude of Consequences: Major

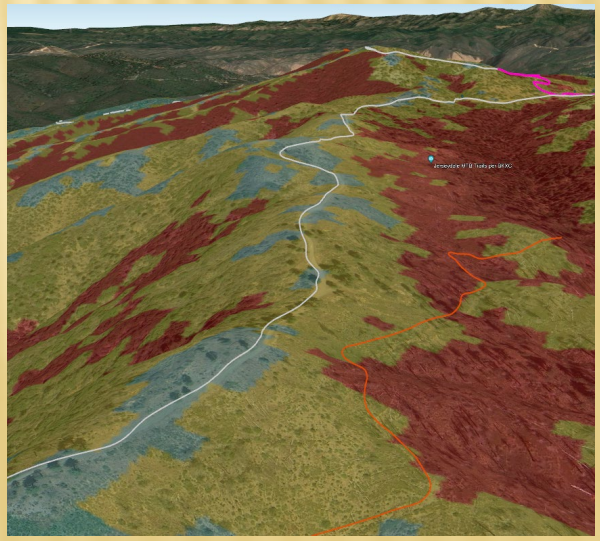
Overall Risk: Very High

ENGINEERING - FINDINGS

- National Forest System Roads
  - 45.57 miles are within the Oak Fire footprint
  - Approximately 30 miles were evaluated for assessment
    - 28.88 miles of roads were assessed to have **Likely** Probability of Damage and will have a **Major** Magnitude of Consequence leading to a **High Risk.**
      - Roads located on moderate/high burn severity upslope, steep drainages, and roads with steep grades



    - 13.29 miles of roads were assessed to have **Unlikely** Probability of Damage but will have a **Moderate** Magnitude of Consequence leading to a **Low Risk.**
      - Roads located on ridgetops, in locations with low to unburned upslope, or in flat terrain

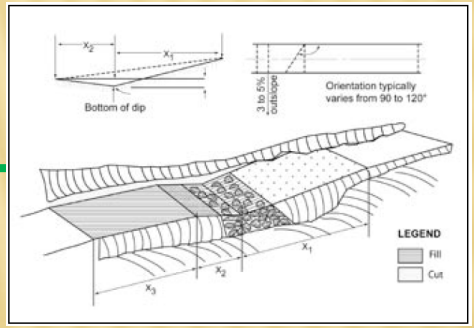


- Priority Roads
  - NFS Road 3S04 (Ferguson Ridge), 4S38 (Portuguese Ridge), 5S24 (Sweetwater) & 5S25(Footman ridge).

ENGINEERING – PROPOSED TREATMENTS

- Restore Drainage
  - Includes road grading, cleaning culverts, and ditch cleaning to allow water to drain off the road during storm events.
- Armor Drainage Crossings
  - Armor existing crossings to reduce road failure and reduce impacts downslope of road to protect fish habitat and water quality.
- Gates
  - • Install gates for public safety especially during periods of expected moderate to high rainfall events .
- Storm Inspection and Response
  - Allows the forest to inspect roads after storm events and repair any road damage found during inspection.
- Warning Sign
  - Alert drivers and recreational users of existing or potentially hazardous conditions created by the wildfire.

Metal End Section



Armor Drain Crossing

Warning Sign

Metal Overside Drain

DEVELOPED RECREATION

Critical Value at Risk

Jerseydale Campground

- New Renovations
  - Substantial Recent Investment
- Threats to Infrastructure
  - Hazard Trees

TRAILS – MOTORIZED AND NON-MOTORIZED

Critical Value at Risk

- Forest System Trails
  - Non-Motorized Trail
    - Skelton Creek Hiking Trail
  - Motorized
    - Windlass Ridge (v50)
    - Footman Loop (MC)

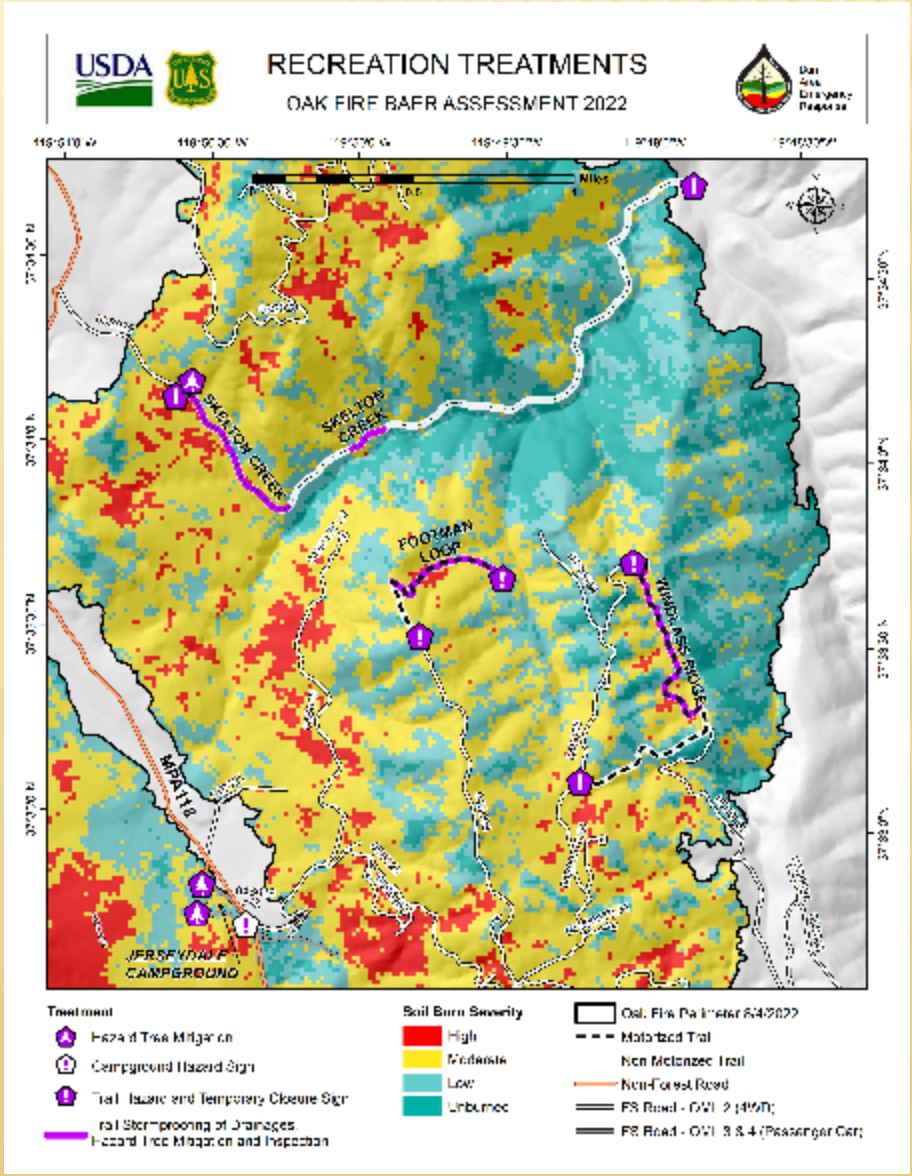
- Threats to Trails
  - Increased Erosion,
  - Debris Flows
  - Flooding

Summary of Soil Burn Severity by Trail Type					
Non-Motorized Trail		**Motorized OHV Trail**		**Motorcycle Trail**	
High	0	High	0.02	High	0.08
Moderate	0.69	Moderate	0.71	Moderate	0.49
Low	1.47	Low	0.36	Low	0.08
Unburned/Very Low	0.28	Unburned/Very Low	0.14	Unburned/Very Low	
Total Miles:	**2.43**	**Total Miles:**	**1.23**	**Total Miles:**	**0.65**

RECREATION – PROPOSED TREATMENTS

- Storm-proofing treatments
- Warning signs
- Focused hazard tree removal (trail crew safety and Forest Service property protection)

- Another Treatment
  - Trail Temporary Closure
  - Closure Signs



NATIVE VEGETATION RECOVERY – SUPPRESSION RELATED

Repeatedly dozed since 2018 (Ferguson, Briceburg, Oak). Seeds were likely transported to new sites, firelines, and other suppression features.

Yellow starthistle at Jerseydale helipad was dozed through

Known invasive/ noxious weeds:

- Bull thistle
- Klamathweed
- French broom
- Italian thistle
- Medusahead
- Woolly mullein
- Yellow starthistle

Critical Value at Risk

Vegetation recovery along 57 miles of dozer line within and outside the burn perimeter, 8 miles of hand line, 6 drop points, 3 helispots, 3 staging areas and 21 dozer pushes.

- Critical Value: Timely recovery of native vegetation via seedlings and sprouting provides protective soil cover, slope stability, return of plant and wildlife diversity.
- Threats to Value:
  - New infestations and/or new invasive weed species were likely introduced because there was little to no equipment or vehicle washing done prior to deployment to firelines.
  - Invasive/Noxious weeds can establish more rapidly than native plants, impeding vegetation recovery.
  - Existing weeds were spread along some dozer lines and at other suppression features.

Probability of Damage or Loss: Very Likely.

Magnitude of Consequences: Moderate

Overall Risk: Very High

NATIVE VEGETATION RECOVERY– BAER (BURNED SLOPES)

5/17/2022 looking east toward Snyder Ridge.

Burned watersheds reestablish vegetation cover from seeds stored in the soil ("seed bank") and by stump-sprouting.

5/17/2022 Black oak already sprouting in Oak Fire.

Critical Value at Risk

Recovery of Native Vegetation in Moderate and High SBS

- Critical Value: **Intact native vegetation** covers soil protectively, and the deeper roots of native shrubs and trees reduce the risk of mudslides on extremely steep slopes.
- Threats to Value: In some areas with moderate and high SBS, the soil seed bank may be depleted, and invasives carried by wind, water, wildlife, or vehicles can establish quickly before native plants become re-established.

- Critical Value: **Fire followers.** Native plants cued to germinate by smoke or heat are only present the first year or two after fire.

- Threats to Value: Fire followers could be prevented from emerging or outcompeted by invasive weeds, which often germinate or sprout earlier than natives.

Probability of Damage or Loss: Likely.

Magnitude of Consequences: Moderate

Overall Risk: High

NATIVE VEGETATION RECOVERY – PROPOSED TREATMENTS

- **Fire Suppression**: Early Detection, Rapid Response Treatment for Invasive Weeds (EDRR) over 472 acres
  - Survey and promptly treat new invasive plants/infestations along 45 of 57 miles of dozer lines, prioritizing those that have been re-dozed twice or three times since 2013 (Carstens, Ferguson, and Briceburg Fires)
  - Survey and promptly treat invasives along a sampling of 3 of 7 miles of handline.
  - Survey and treat invasives at 3 staging areas, 6 drop points, 3 helispots, and 11 of the 21 dozer pushes.
  - Hire a contractor to spray the yellow starthistle at the dozer line by Jerseydale helipad (and new infestations that arise as a result at admin site).

- **BAER: Burned slopes/watershed**: Early Detection, Rapid Response Treatment for Invasive Weeds (EDRR) –
  - BAER funding is requested for EDRR over a sampling of 20% of the 6894 acres of moderate and high SBS (1379 acres). Binoculars will be used to some extent, reducing the time spent scaling steep slopes on foot. Focus would be near known or newly discovered infestations in the burned area and where wind, water, wildlife, vehicles, and OHVs are likely to move seeds onto steep, vulnerable, newly burned slopes that may not have an intact soil seed bank.

NOTE: Suppression-related and BAER invasives surveys and treatment must be timed to detect both spring and late summer active invasives – some areas will need to be visited twice by EDRR crews.

PACIFIC FISHER & PROPOSED CRITICAL HABITAT (PCH)

SSN (Southern Sierra Nevada) DPS (distinct population segment) Fisher using an existing culvert to cross a busy highway at night (photo taken from a trail camera while monitoring culverts along Highway 41 in 2013

Critical Value at Risk

- Southern Sierra Nevada Distinct Population Segment of Fisher
- Federally Endangered Species with Proposed Critical Habitat
- The table below shows the acreage burned for each fisher habitat element important for fisher ecology within the Oak Fire footprint.

Oak Fire Soil Burn Severity					
Fisher Habitat Element	Unburned (Acres)	Low (Acres)	Moderate (Acres)	High (Acres)	Total (Acres)
Fisher Reproductive Habitat	87	355	687	563	1,692
Fisher CWHR Habitat	194	646	1,332	647	2,819
Fisher Den Clusters	20	87	64	6	177
Fisher Proposed Critical Habitat	48	268	753	87	1,156

- Hillslope Erosion, Severe Flooding/Severe Debris Flow, Hazmat contamination of water, and OHV incursion would be the possible hazards

FOR SSN DPS FISHER

Probability of Damage or Loss: Unlikely.

Magnitude of Consequences: Major

Overall Risk: Intermediate

FOR PROPOSED CRITICAL HABITAT

Probability of Damage or Loss: Possible

Magnitude of Consequences: Minor

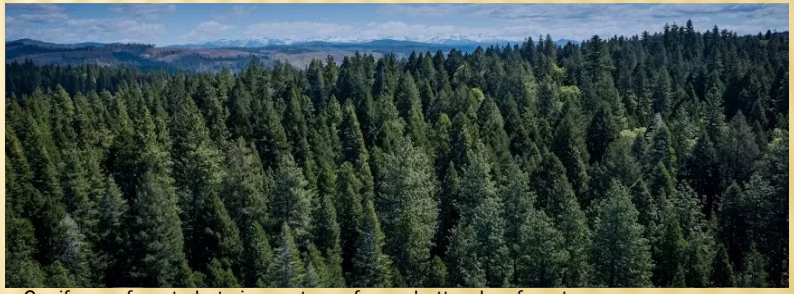
Overall Risk: Low

PACIFIC FISHER & PROPOSED CRITICAL HABITAT – PROPOSED TREATMENTS

Adult Fisher photo courtesy of the fs.usda.gov website

- Natural Recovery was chosen as the treatment for Pacific Fisher:
  - Erosion effects to denning are expected to be lower due to fishers being highly mobile and, therefore, a greater chance of them escaping the discrete hazards.
  - There are no known hazmat concerns located upstream of fisher denning habitat within the Oak Fire.

- Natural Recovery was chosen as the treatment for the proposed critical habitat for Pacific Fisher
  - Moderate debris flow capability is predicted for the PCH. Skelton Creek drainage being a basin to watch. Hazmat contamination leaching is not predicted upstream of PCH within the Oak Fire.

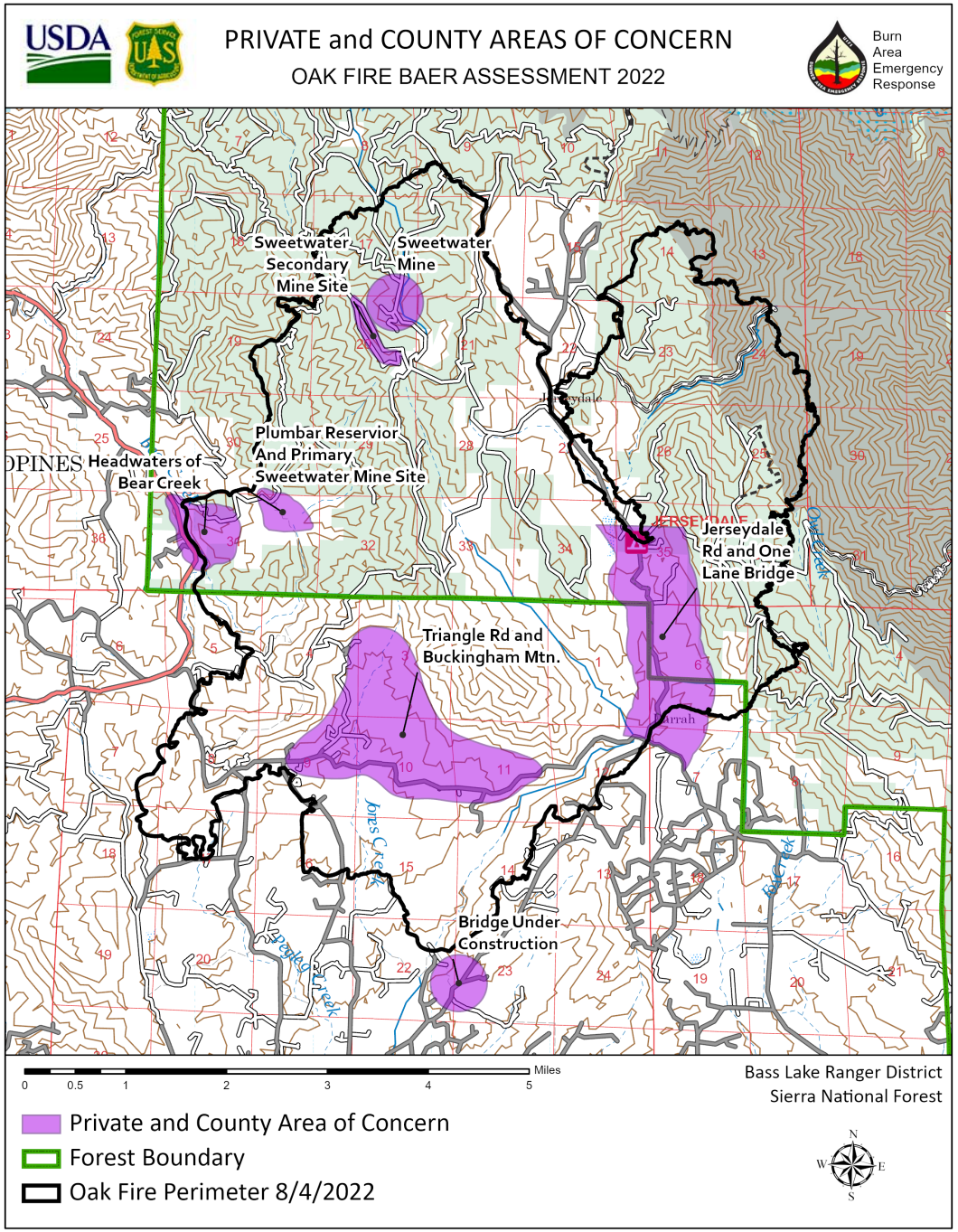


Coniferous forest photo is courtesy of www.betterplaceforests.com

Emergency consultation with USFWS has begun and the specialist report will likely be considered the BA for that consultation

- Recommend post-fire monitoring of fisher habitat elements
  - Documenting if the den trees are still standing and adjusting boundaries as needed since both areas have been burned twice in four years

OTHER AREAS OF POST-FIRE CONCERN



PROPOSED TREATMENTS

Human Health & Safety

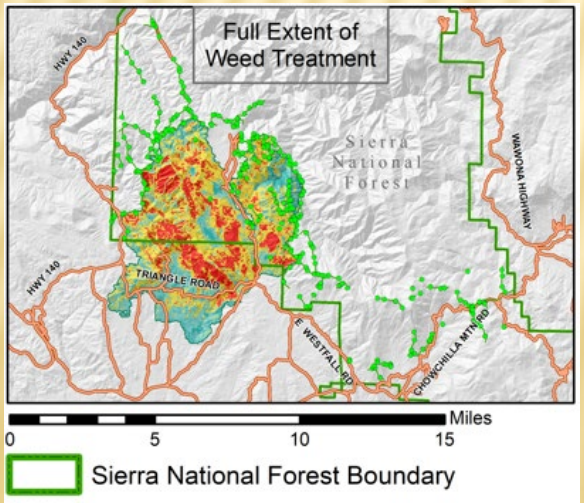
- Burned Area Sign
- Gate Installation
- Abandoned Mine (AML)
- Hazardous Materials
- Hazard Tree Mitigation
- Trail Hazard/Closure Sign
- Road Barrier Installation

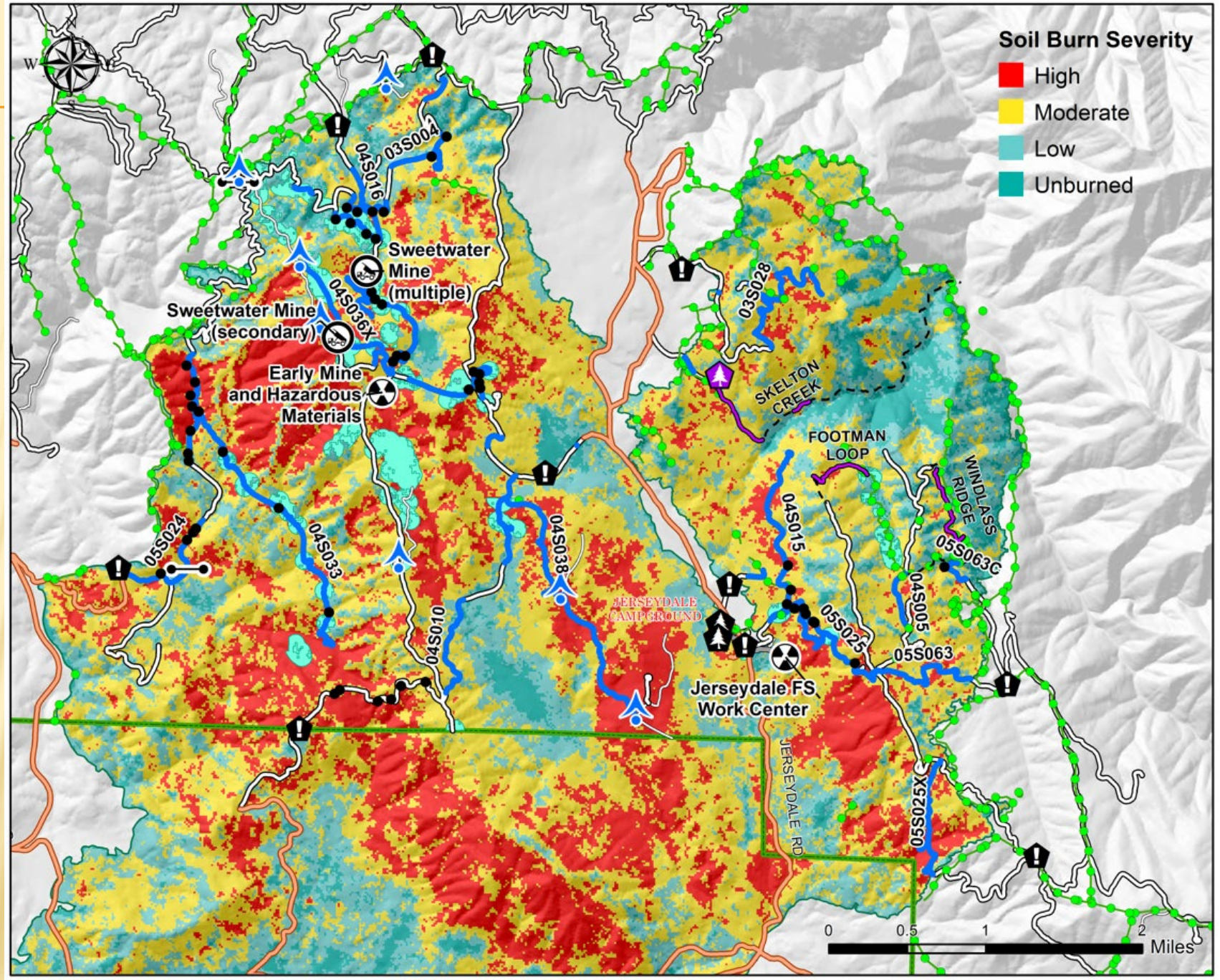
Stabilization

- Road Drainage
- Campground Hazard Tree Removal
- Road Stabilization
- Trail Storm Proofing

Weed Treatment

- EDRR - Suppression
- EDRR - BAER





3D View

Oak Fire
Soil Burn Severity
3D Aerial View