

Monitoring Results of Non-Federal Post-Fire Salvage Logging in California Forests

Report on Post-Fire §1052 Notice of Emergency Timber Operations

Will Olsen, Drew Coe, Matt Boone – CAL FIRE Forest Practice Watershed Protection Program



Emergency Salvage Logging Monitoring Report

Legislative Monitoring Requirement

...SB901 – “Existing law requires the **department and the state forestry board**....to review and submit a report to the Legislature on the trends in the use of, compliance with, and **effectiveness of, timber harvest exemptions and emergency notice provisions, as provided**. Existing law requires the report to include an analysis of any barriers for small forest owners presented by the exemptions.

...The bill would require the department and the state forestry board, until a specified date, in consultation with the Department of Fish and Wildlife and the State Water Resources Control Board, to annually submit a report to the Legislature that also includes information on the number and type of violations and enforcement actions taken on each notice of exemption and emergency notice, **among other things.**”

Pilot Monitoring (2018)

1052 Emergency Notice (2019)

1038c 0-150 Foot Structure Clearance (2020/21)

1038c(6) 150-3000 Foot Structure Clearance (2020/21)

1038 Forest Fire Prevention (2022/23)

Exemption and Emergency Notice Monitoring Pilot Project Report



May 7, 2019



Thomas W. Porter, Director
California Department of Forestry and Fire Protection
J. Keith Gillespie, Chair
State Board of Forestry and Fire Protection
Wade Crowfoot, Secretary for Natural Resources
California Natural Resources Agency
Gavin Newsom, Governor
State of California

REPORT ON EMERGENCY NOTICE OF TIMBER OPERATIONS MONITORING RESULTS AND EXEMPTION NOTICE USE



December 31, 2019



Thomas W. Porter, Director
California Department of Forestry and Fire Protection
J. Keith Gillespie, Chair
State Board of Forestry and Fire Protection
Wade Crowfoot, Secretary for Natural Resources
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Report on Exempt Timber Harvesting for the Reduction of Fire Hazard Within 150 Feet of Structures And Non-Discretionary Timber Harvest Notice Use and Rule Compliance



July 14, 2021



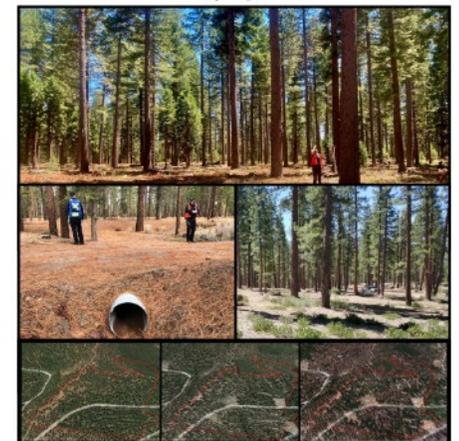
Thomas W. Porter, Director
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Beyond Zone 1: Monitoring of Fire Hazard Reduction Within 300 Feet of Residences Through Timber Harvest with the §1038(c)(6) Exemption



November 23, 2021
Thomas W. Porter, Director
California Department of Forestry and Fire Protection
J. Keith Gillespie, Chair
State Board of Forestry and Fire Protection
Wade Crowfoot, Secretary for Natural Resources
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Forest Fire Prevention, or Forest Resiliency? Monitoring Report on the §1038 Forest Fire Prevention Exemption



Top photo: A Shasta County Forest Fire Prevention Exemption being reviewed. Middle left and right: a young plantation, post-planting, and a more mature mixed conifer stand post-planting. Bottom: A Forest Fire Prevention Exemption, pre-planting, post-planting, and post-2021. CalFire.

Emergency Salvage Logging Monitoring Report

2019 Report on Emergency Notices

- Monitoring found a lower standard of water quality related performance when compared to previous monitoring efforts of Timber Harvest Plans and Non-Industrial Timber Management Plans, and subsequent green-tree Exemption monitoring
 - While some projects met or exceeded expectations, FPR shortcomings were frequently encountered
- Frequent sediment discharges were found to watercourses from roads, road-watercourse crossings, and operations on hillslopes (i.e., ground-based yarding or skidding)
- Results also indicated the post-fire environment is less resilient, but more quantitative data was needed to reflect that vs management effects
- Monitoring also found projects were **rarely devoid entirely of residual live and dead trees following operations**

REPORT ON EMERGENCY NOTICE OF TIMBER OPERATIONS MONITORING RESULTS AND EXEMPTION NOTICE USE



December 31, 2019

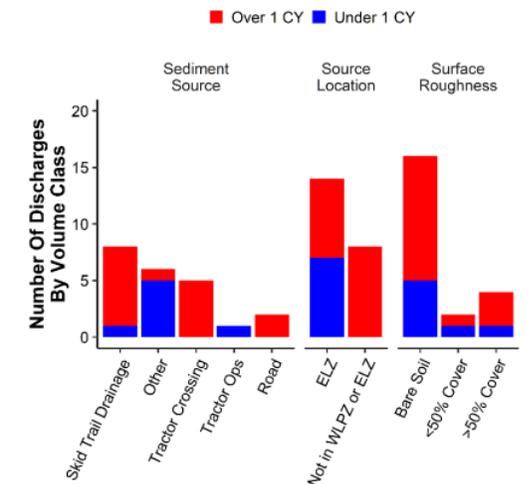


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Emergency Salvage Logging Monitoring Report

2019 Report on Emergency Notices

- The report offered four recommendations, summarized as:
 1. Better administration and implementation of planned salvage activities, along with clear guidance on the operational Forest Practice Rules (“FPRs”) required during salvage activities.
 2. Prioritizing the inspections of Emergency Notices by all Review Team Agencies, along with an emphasis on tracking inspections so that regulatory presence can be linked to changes in performance.
 3. Develop educational materials and conduct outreach to timberland owners on legal obligations when conducting post-fire salvage, as well as an understanding of the expectations and desired outcomes following salvage operations.
 4. Continued involvement of the Review Team agencies during monitoring activities.

....**CAL FIRE** has pursued all these recommendations (LTO training, outreach, **Forestry Report No. 7**)

....The Board of Forestry utilized this 2019 report to create rulemaking on RPF involvement and presence on Emergency Notices.

...Direct monitoring to real world change, via monitoring and reports.

Emergency Salvage Logging Monitoring Report

This is large, technical report. It is meant to close the adaptive management loop from 2019.

**This presentation is meant to relate the most important aspects....
But does leave out details that are meaningful.**

This report is a companion to the full monitoring report.

General Outline of Presentation

- **Background**
- **Methods**
- **Results**
- **Discussion**

Emergency Salvage Logging Monitoring Report

Background – Harvest Document Type

DISCRETIONARY versus NON-DISCRETIONARY

- Office Review
- Field Review
- Public Comment
- Professional discretion for non-standard practices
- Approval or Denial



Timber Harvest Plan (THP)
Non-Industrial Timber Management Plan (NTMP)
Working Forest Management Plan (WFMP)
Programmatic Timber EIR (PTEIR)

- Standard information requirements
- Non-standard practices not allowed
- No field review, discretionary office review, public comment
- Acceptance or Returned



Exemption

Emergency Notice of Timber Operations

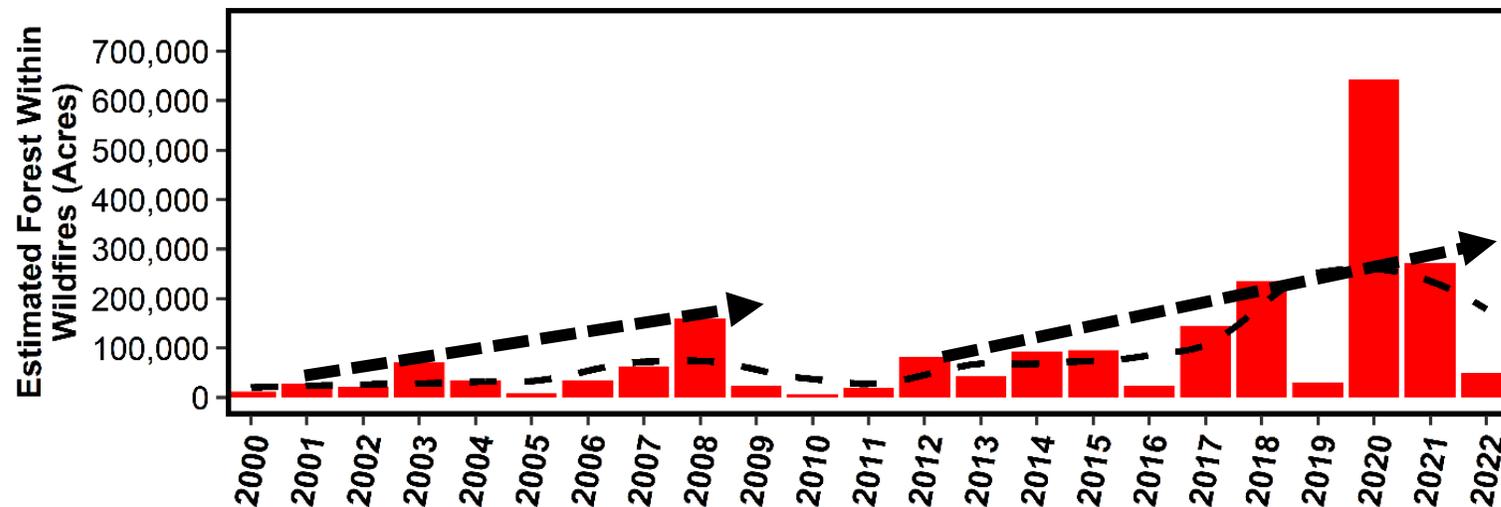
Emergency Salvage Logging Monitoring Report

Background

- Four of five **fire years** with $>100,000$ acres of non-Federal forestland have occurred since 2017
- Since 2018, $\sim 1,200,000$ acres of non-Federal forests fallen within a fire perimeter

Estimated Non-Federal Forest Area Within Wildfires

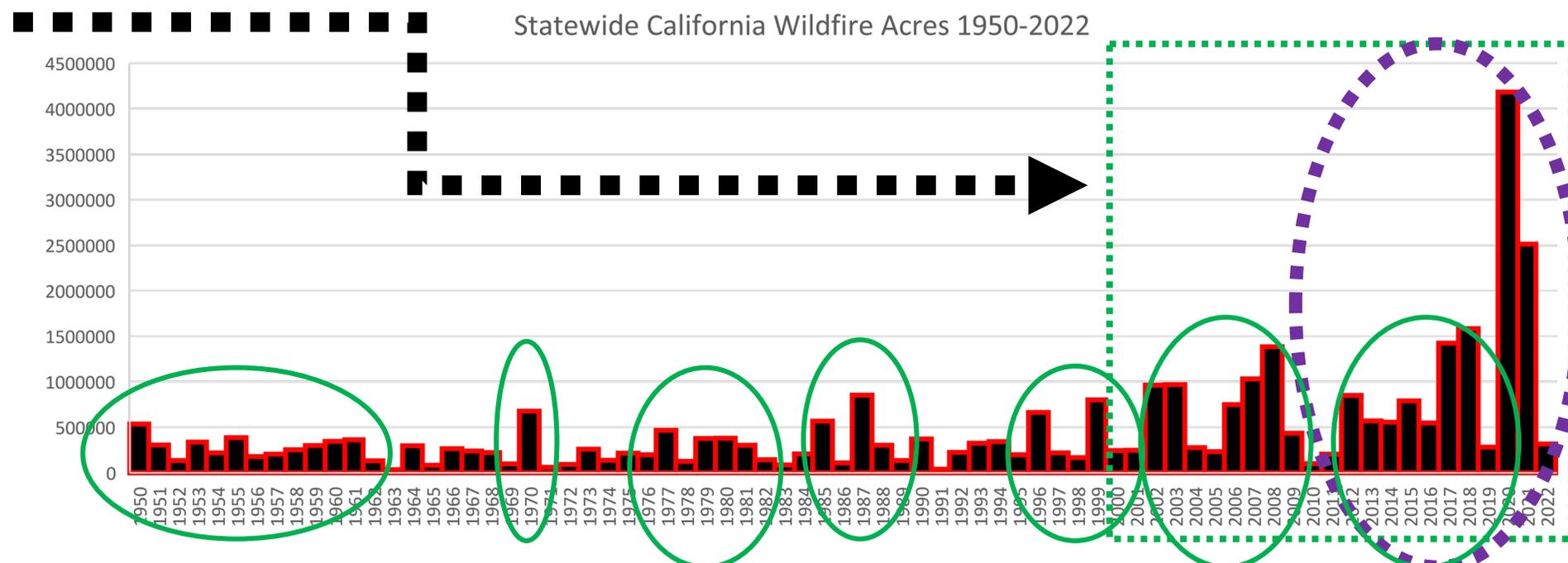
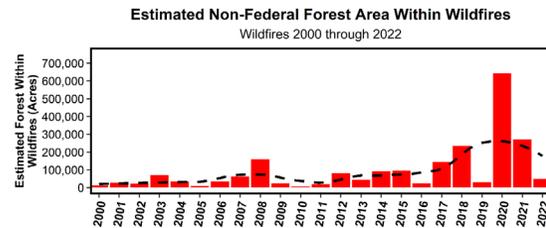
Wildfires 2000 through 2022



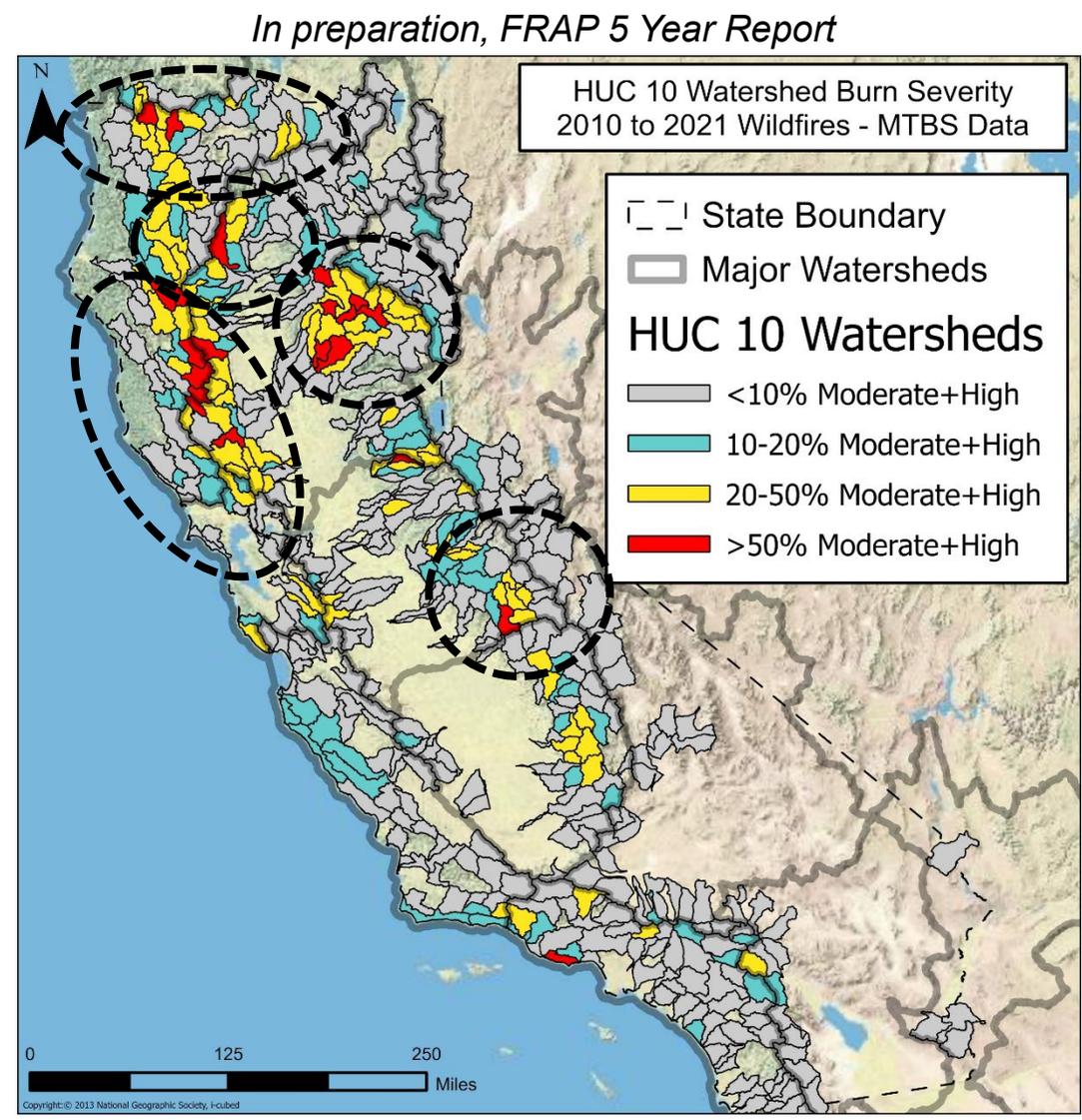
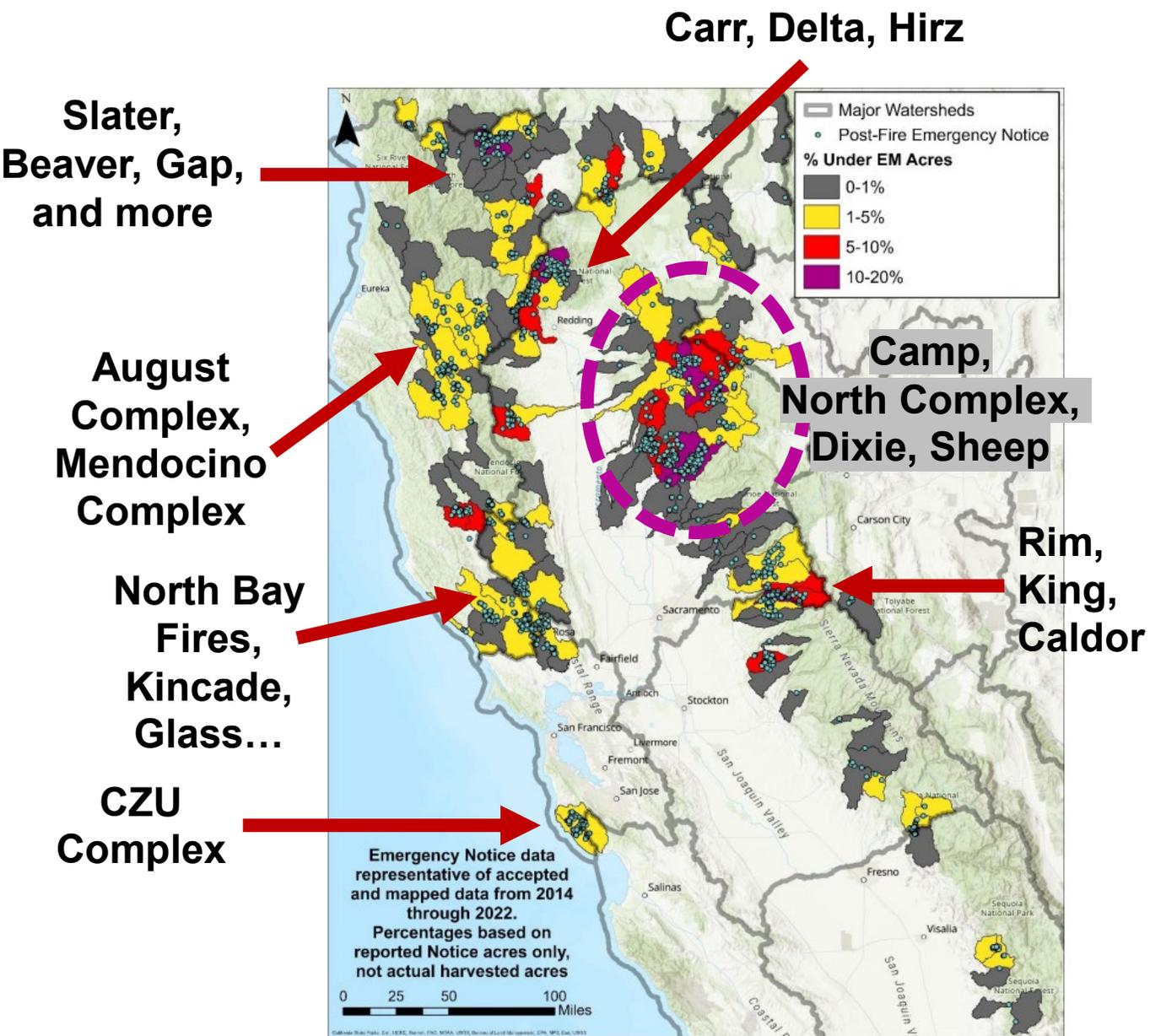
Emergency Salvage Logging Monitoring Report

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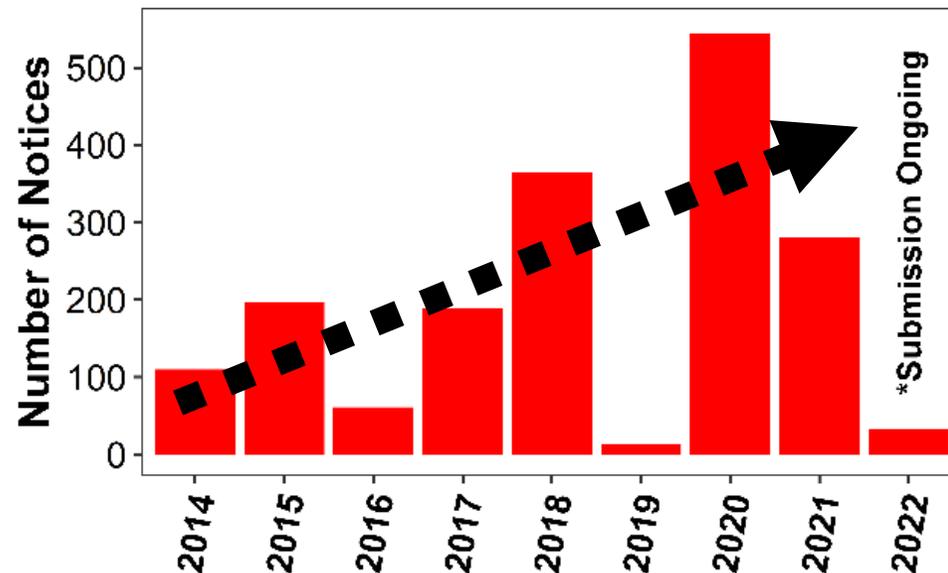


Emergency Salvage Logging Monitoring Report

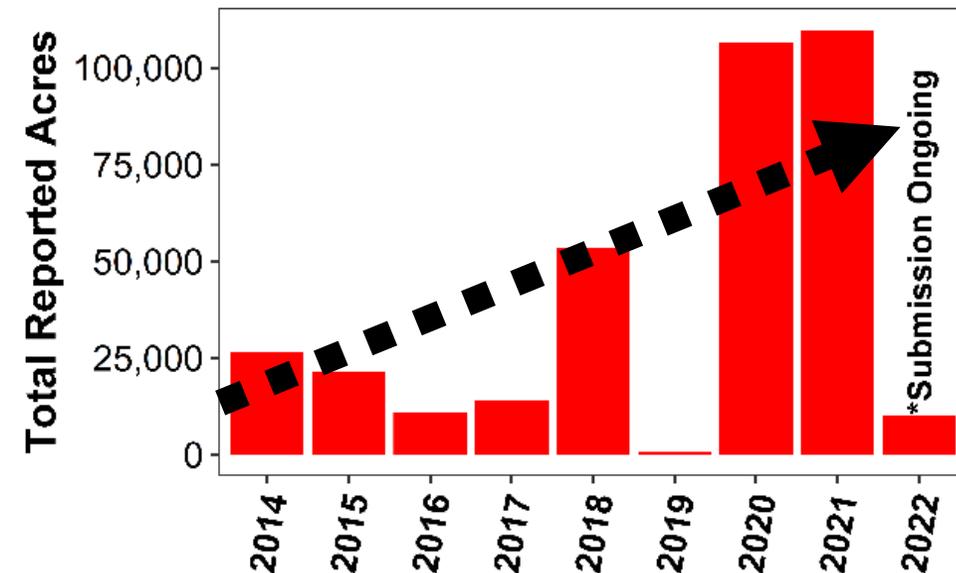
Background

- Fire impacts have led to substantial usage of **1052 Emergency Notice of Timber Operations** for post-fire salvage logging
 - 71% of Emergency Notices ***submitted the following year*** after a wildfire

A Accepted Post-Fire Notices By Fire Year
2014 through 2022



B Post-Fire Reported Acres By Fire Year
2014 through 2022



Emergency Salvage Logging Monitoring Report

Background – Harvest Document Type

Emergency Notice History

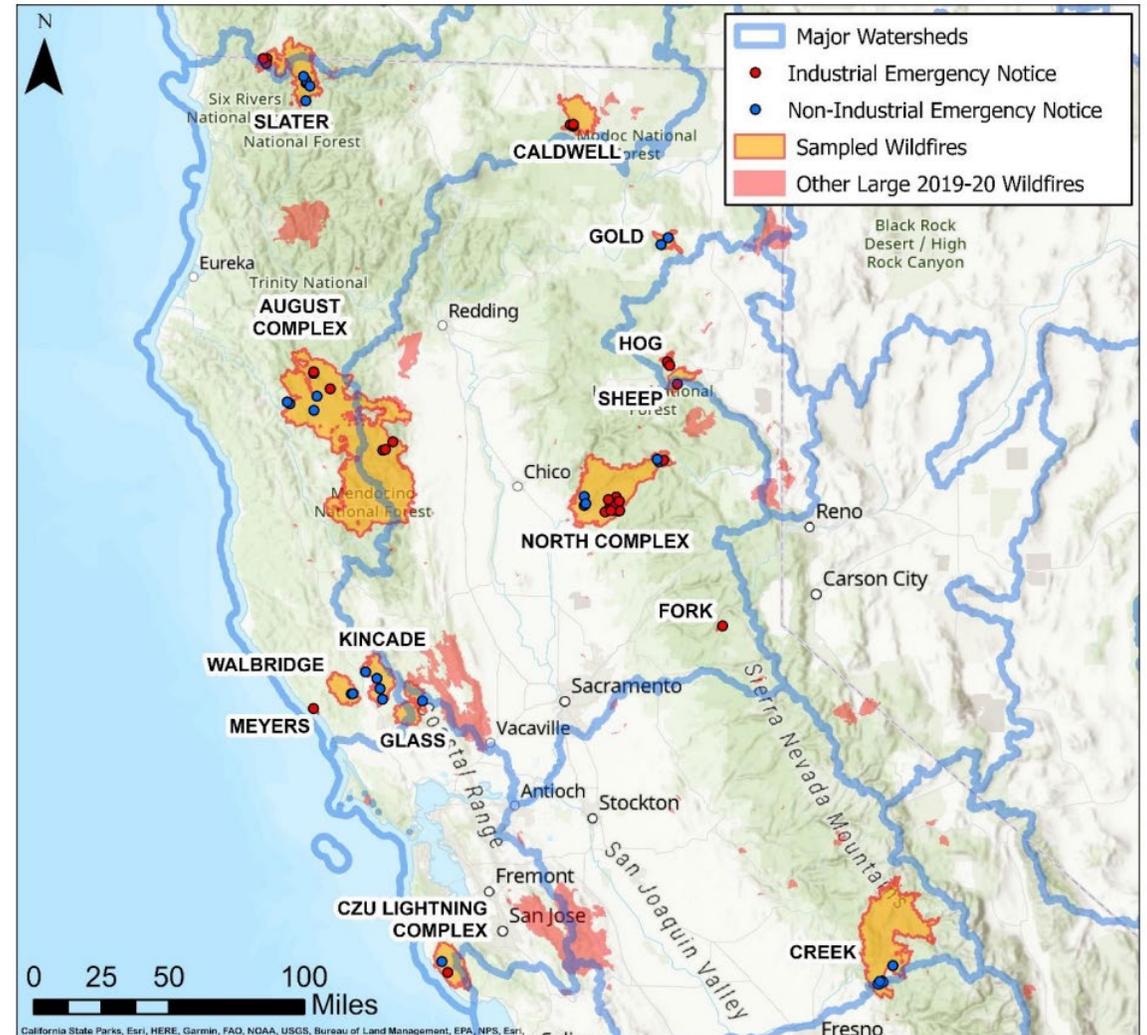
- Valid for 60 days, originally, after establishment by Statute
- 1995, increased to 120 days of validity for operations
- 2009, increased to one (1) year of validity for operations
- Since 2009, to continue ops beyond one year, need to get an approved THP
 - For sampled **2020 wildfires**, option to increase valid timeframe for the Emergency by one year (valid for 2 years)

.....A THP has not been demonstrated as a subsequent pathway pursued by landowners for post-fire harvesting

Emergency Salvage Logging Monitoring Report

Monitoring Approach and Methods

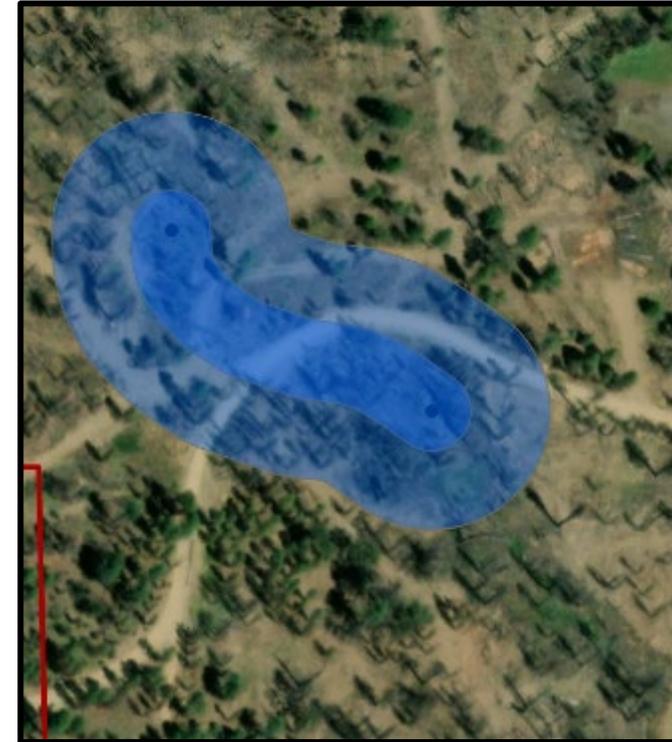
- Randomly selected 61 Emergency Notices from 160 eligible Notices accepted in 2020 related to either 2019 or 2020 wildfires
- 95% level of confidence in results, margin of error +/- 10%
- Covered 14 different wildfires
 - Sampled 18-33 months *post-acceptance*
- 51% of sample was on Industrial timberland ownerships
- 7% of sample was never operated on (unharvested) and thus replaced
 - Other replacements required due to access and/or safety concerns



Emergency Salvage Logging Monitoring Report

Monitoring Approach and Methods

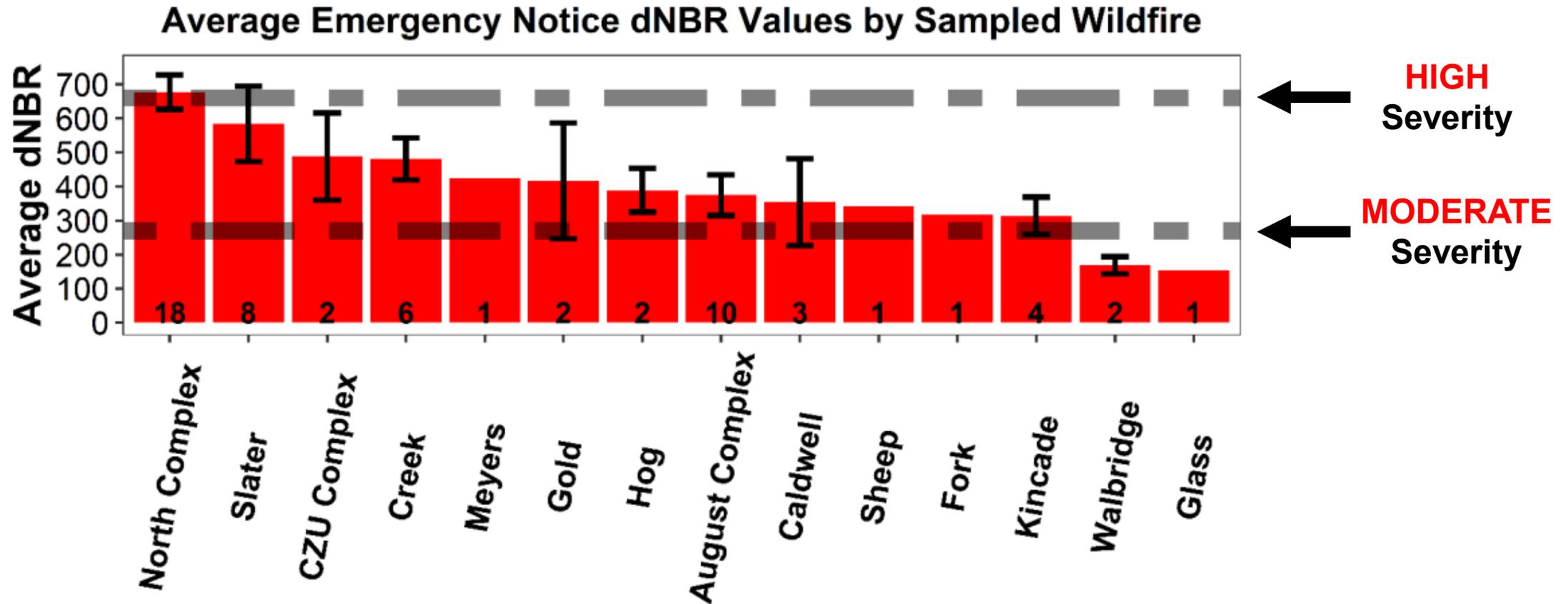
- Field work with CAL FIRE Field Crew is not an enforcement activity
- Monitoring utilized a rapid sampling approach (< 1 day, one time)
 - Quantitative and qualitative data was collected
- Additional analysis done via GIS using burn severity / remotely sensed data in conjunction with field data



Emergency Salvage Logging Monitoring Report

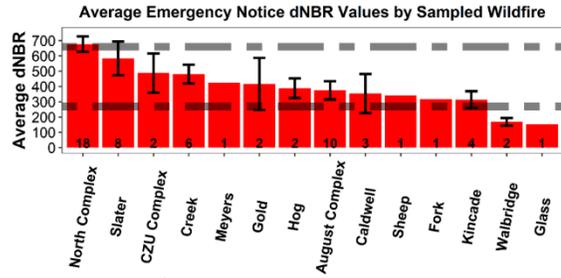
Monitoring Approach and Methods

- Sampled Notices/wildfires spanned a range of burn severity (via dNBR)
- All Emergency Notices had at least pockets of moderate-to-high severity fire



Emergency Salvage Logging Monitoring Report

Monitoring Approach and Methods



**Mean dNBR = 660
(High Severity)**

**Mean dNBR = 360
(Low to Moderate Severity)**



Emergency Salvage Logging Monitoring Report

Monitoring Approach and Methods

- Open to landowners, licensed professionals
 - When possible, landowners and/or licensed professionals participated in monitoring
 - Strong interest from many landowners (mostly small) in knowing the outcomes of the monitoring work and/or report
- All Review Team Agencies had notice of monitoring sessions

Post-Fire 1052 Monitoring

Review Team Agency	Participation %
CGS	70%
RWQCB	57%
CDFW	50%

Recent Monitoring Participation [FFP+Emergency Notice]

CDFW = 64%
RWQCB: 55%
CGS: 67%



Emergency Salvage Logging Monitoring Report

Results – Reported Length of Active Operations

- Most sampled Notices were active less than one year, more than one month
- Few Notices used the 1-year extension, mainly Industrial timberland ownerships
- Extensions were reported to be related to winter weather shutdowns and/or market based conditions for certain tree species and available mill capacity

	Reported Length of Active Operations			
	< 1 month	≥1 and ≤ 6 months	>6 and ≤ 12 months	> 12 months
All Notices	4%	63%	23%	10%
Industrial	4%	56%	26%	14%
Non-Industrial	4%	71%	21%	4%

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Results – Non-Industrial Financial Outcomes

- 87% of small, non-industrial timberland owners reported financial outcomes of operations (n = 26/30)
- 65% reported some level of profit
- 23% reported breaking “even”
- 12% reported an outright financial loss

....There is nuance to the information. Many small landowners indicated loss of values not related to timber – structure loss, quality of life, community

....Sometimes, subsequent costs to “clean up” property following salvage, re-plant

....27% of small landowners reported benefit from CFIP, NRCS, and other grants/funds

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Results – Non-Industrial Financial Outcomes

Residual untreated log decks following operations on small timberland ownership, 2020 Gold Fire, Lassen County



Grant funded reforestation following salvage on a small timberland ownership, 2020 North Complex, Butte County



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Results – Road-Watercourse Crossings Outcomes

- **72%** of sampled Notices had a crossing present (80 crossings sampled, 44 Notices)
- Most crossings were on Class III (61%) crossings, followed by II's (33%) and I's (6%)
- Most were culverts (60%) followed by fords (**38%**), and were pre-existing (**84%**) (only 4% sampled were new)
 - Entire sample, **5%** of Notices had new work / **21%** reconstruction
- **Construction, maintenance, BMPs - various levels**
 - Specific BMP use (**16%**), stabilized crossing soil (**60%**), diversion potential presence (**31%**), need for maintenance and/or replacement to pass water/debris (**28%** / **34% of Notices**)

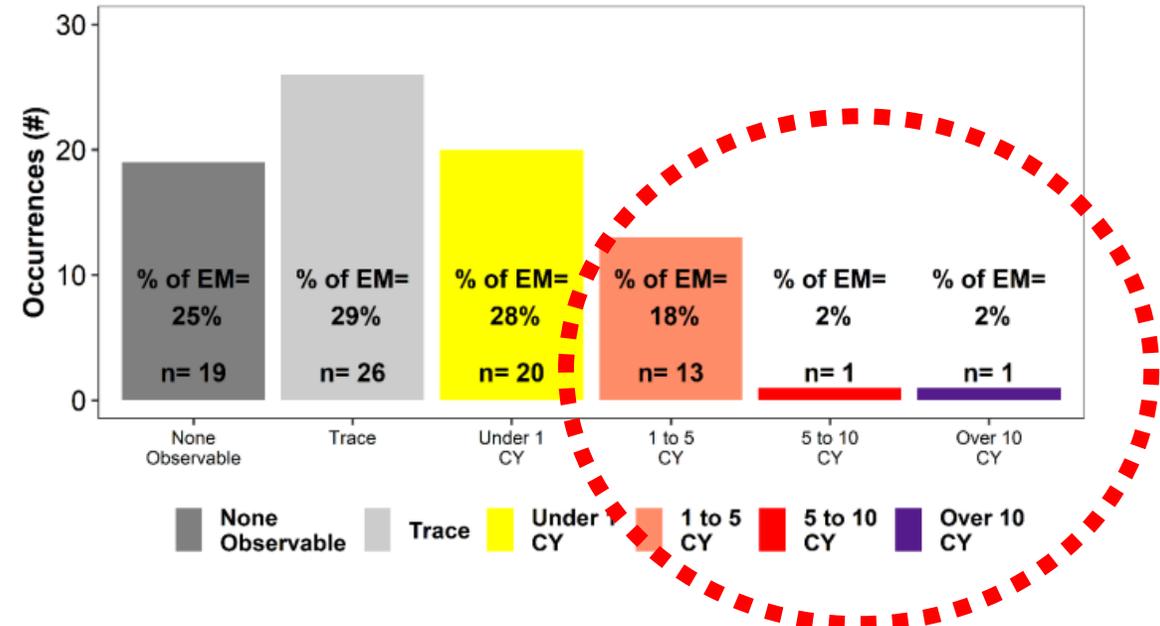
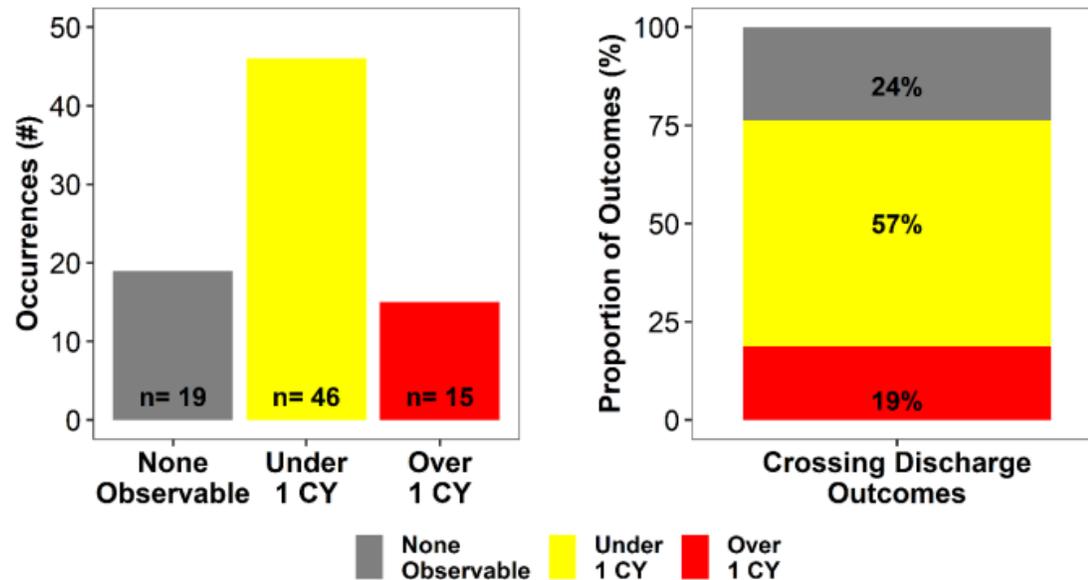


Emergency Salvage Logging Monitoring Report

Results – Road-Watercourse Crossings Outcomes

Sediment Delivery

- **76%** of crossings had some level of sediment delivery (**62%** of Notices)
- Occurrences over 1 cubic yard were found on **19%** of crossings
 - 5-10 CY and >10 CY deliveries were in the minority

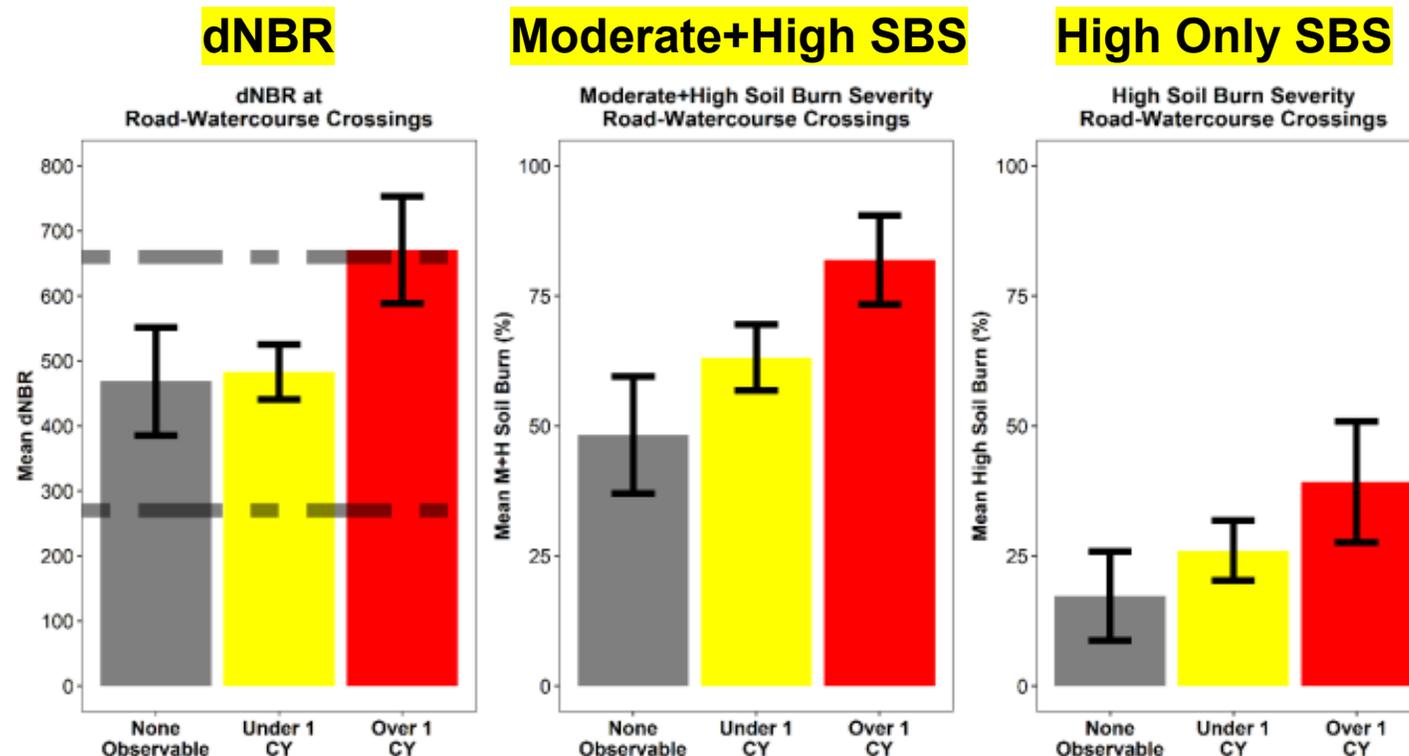


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Results – Road-Watercourse Crossings Outcomes

Sediment Delivery

- Generally, higher burn severity (dNBR and soil burn severity) tracked with greater sediment delivery at sampled crossings within 100 feet of the crossing.



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Results – Road-Watercourse Crossings Outcomes

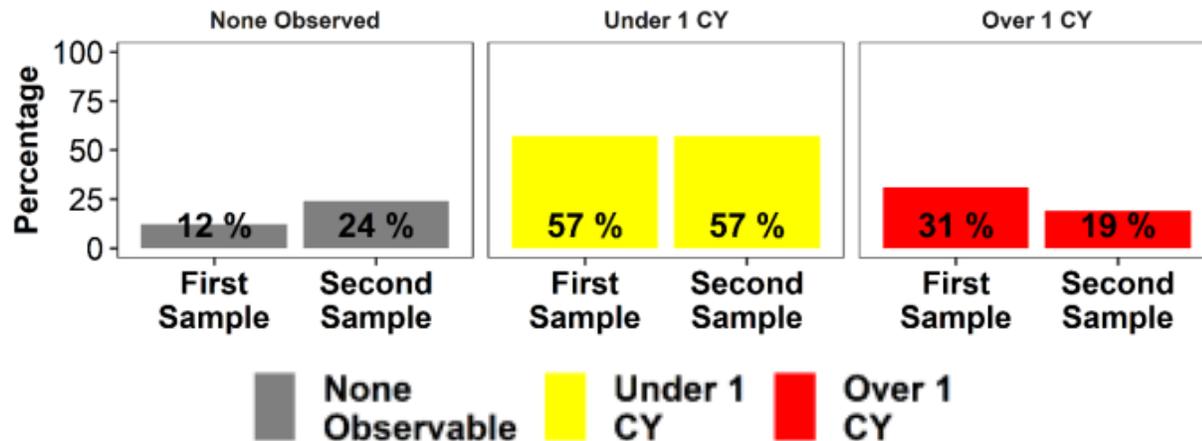
Sediment Delivery – Comparison to 2019

....**Increase** in no observed sediment deliveries, **decrease** in delivery >1CY, **no change** in “Trace” and 1CY delivery (“<1 CY”)

....All outcomes within the margin of error - **no significant change** in outcomes

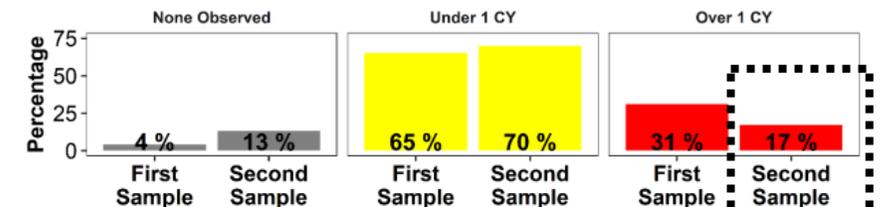
All Crossings

Sediment Delivery Class at Watercourse Crossings

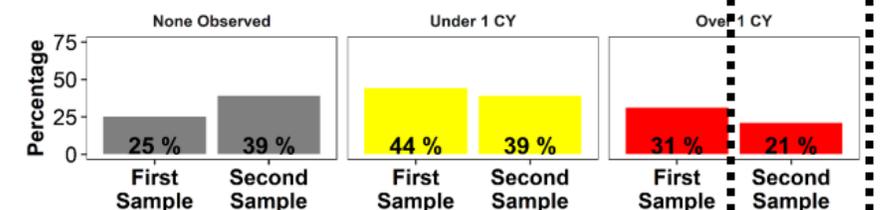


By Timberland Ownership

Sediment Delivery Class at Watercourse Crossings On Industrial Timberland Notices



Sediment Delivery Class at Watercourse Crossings On Non-Industrial Timberland Emergency Notices



Emergency Salvage Logging Monitoring Report

Results – Road Outcomes

- **104** road segments sampled, on **93%** of sampled Notices
- Mostly native surface, seasonal roads, that were pre-existing
 - New road construction / reconstruction was not overwhelmingly prevalent on sampled Notices (**<25%**)
- **11%** of haul roads / roads used for ops were also residential roads (**15%** of Notices)
- Small proportion had signs of road failure (**8%** of roads, **11%** of Notices)

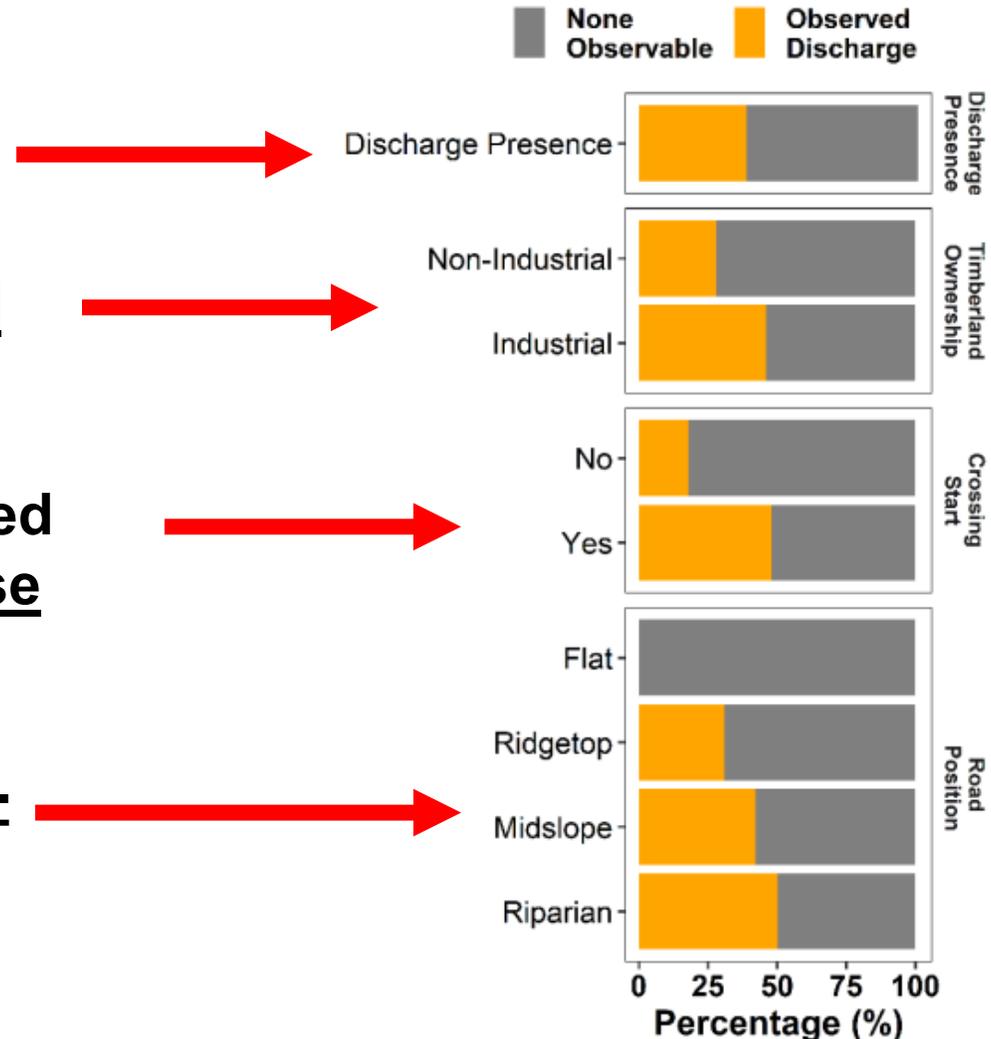


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Results – Road Outcomes

Sediment Delivery

- **38%** of roads had sediment discharge, found on **52%** of Notices
- Discharge more prevalent on Industrial Notice timberlands
- Discharge more prevalent when sampled roads started from a crossing (i.e., close proximity to watercourse)
- Moving down from ridgetop to riparian-located roads, proportion of sampled roads delivering sediment increased



Emergency Salvage Logging Monitoring Report

Results – Road Outcomes

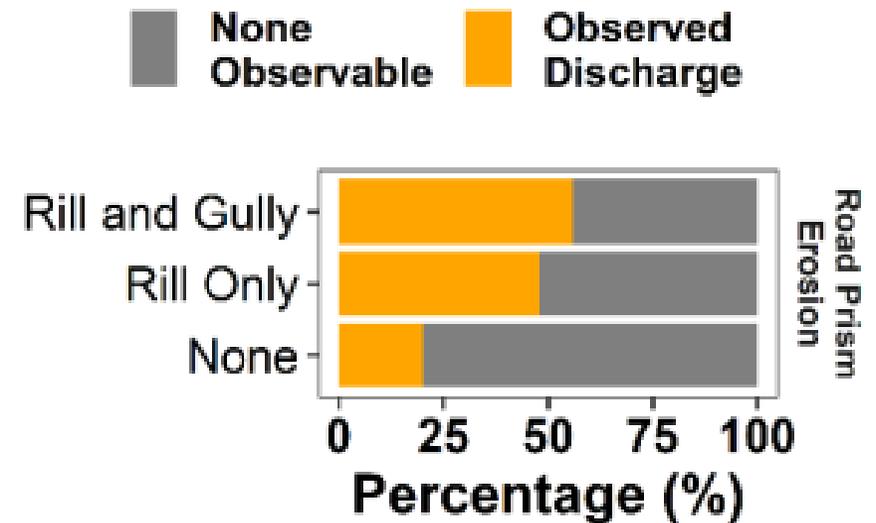
Sediment Delivery

....The presence of erosion features in the road prism (rill, gully, rill+gully) greatly increased the proportion of sampled roads delivering sediment

- Inadequate drainage design/maintenance

....Indicative of increased runoff and sediment movement on road surface and from the upper burned hillslopes

- **Similar to 2019 results**



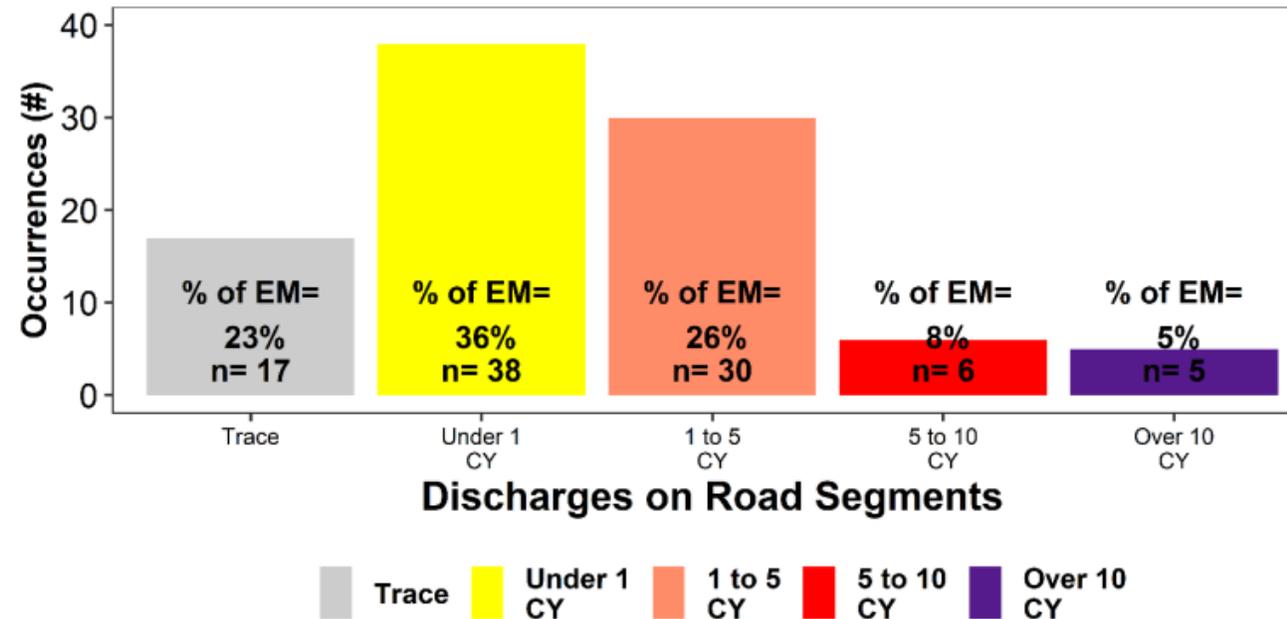
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Results – Road Outcomes

Sediment Delivery

....Most sediment deliveries from road segments were “Trace” or Under 1 CY in volume

....Less desirable sediment deliveries were dominated by 1-5 CY volumes, found on only 26% of Notices.



Emergency Salvage Logging Monitoring Report

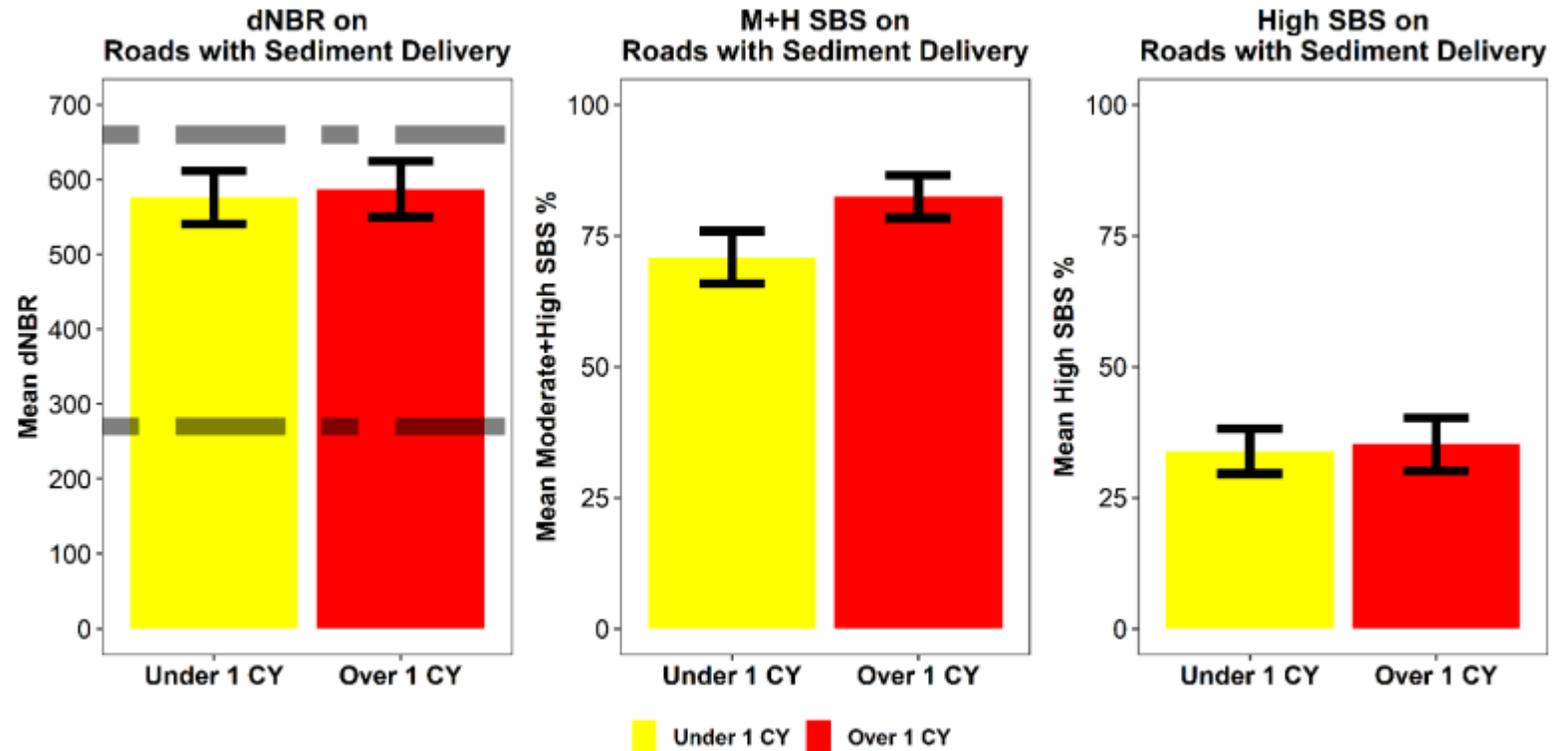
Results – Road Outcomes

Sediment Delivery

....Burn severity (within 200 feet each side) did not seem to matter as much for sediment delivery volume

....However, monitoring data pointed towards **high burn severity** influence on delivery on low gradient roads / hillslopes

....And **any level of burn** causing high gradient roads and hillslopes to more frequently deliver sediment



Emergency Salvage Logging Monitoring Report

Results – Road Outcomes

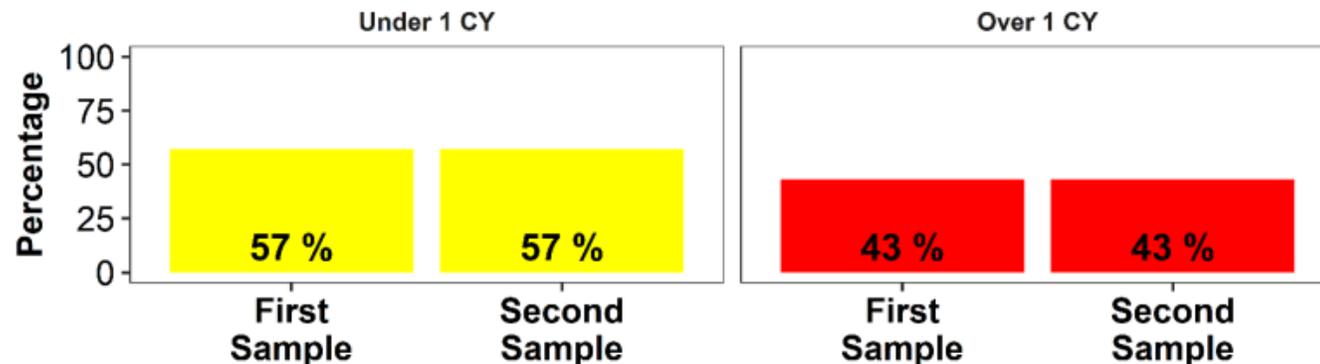
Sediment Delivery – Comparison to 2019

....Compared to 2019, where sediment delivery occurred, monitoring indicated no change in overall results

....Road outcomes reflect fire impacts, landscape, and management / maintenance

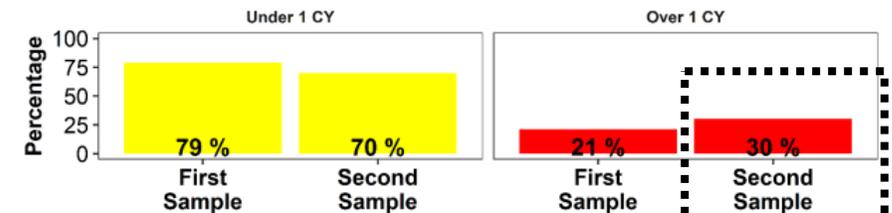
All Roads

Sediment Delivery From All Road Segments

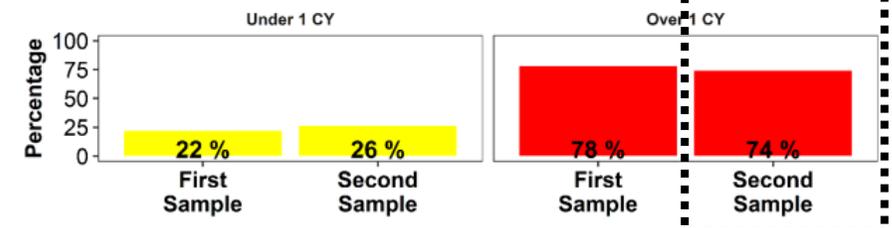


By Timberland Ownership

Sediment Delivery From All Road Segments On Industrial Timberland Emergency Notices



Sediment Delivery From All Road Segments On Non-Industrial Timberland Emergency Notices



Emergency Salvage Logging Monitoring Report

Results – Watercourse Segments

- **105** watercourse segments sampled, on **92%** of sampled Notices
- Mostly Class III watercourses (**58%**), followed by Class II's (**33%**) and I's (**9%**)
- Watercourses were more prevalent on Industrial timberland Notices than Non-Industrial timberland Notices
 - Function of Notice size and setting?



Class I watercourse in the 2020 Slater Fire and mapped Emergency Notice project area in Siskiyou County, with a dNBR >1000 and 100% moderate and high soil burn within 100 feet

Emergency Salvage Logging Monitoring Report

Results – Watercourse Segments

- More intensive post-fire harvesting was found largely only on Class III watercourses
- As dNBR increased within 100 feet of a channel, harvesting intensity increased

WLPZ/ELZ Volume Harvested	dNBR All Classifications	dNBR Class I	dNBR Class II	dNBR Class III
None	275	-	310	236
0 to 33%	531	677	583	473
33 to 66%	542	-	617	500
66 to 100%	744	-	-	744

- As watercourse protection increased, via classification, burn severity increased

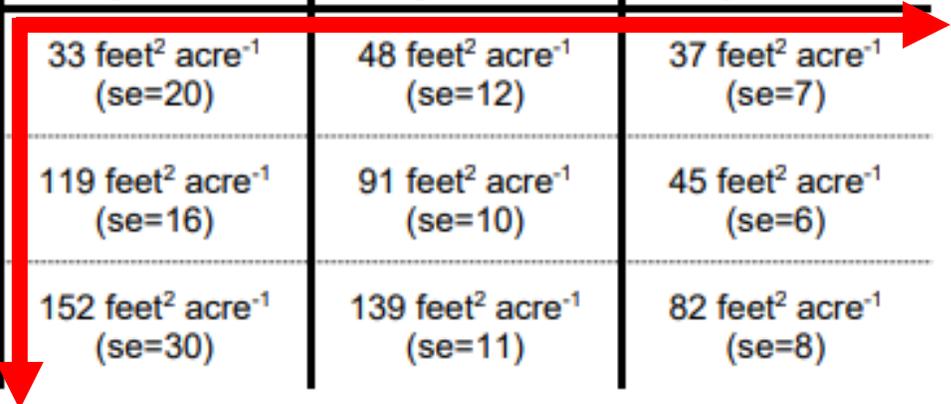
	Class I	Class II	Class III
All Watercourse Segments			
dNBR	677	524	467
Moderate+High SBS	84%	56%	58%
High SBS	34%	30%	21%

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Results – Watercourse Segments

- Variable live green tree basal area for Class I's, Class II's, Class III's
- Greater dead tree basal area in Class I's than Class II's, in Class II's than Class III's
- Decreasing post-fire, post-salvage, basal area from Class I to Class III watercourses

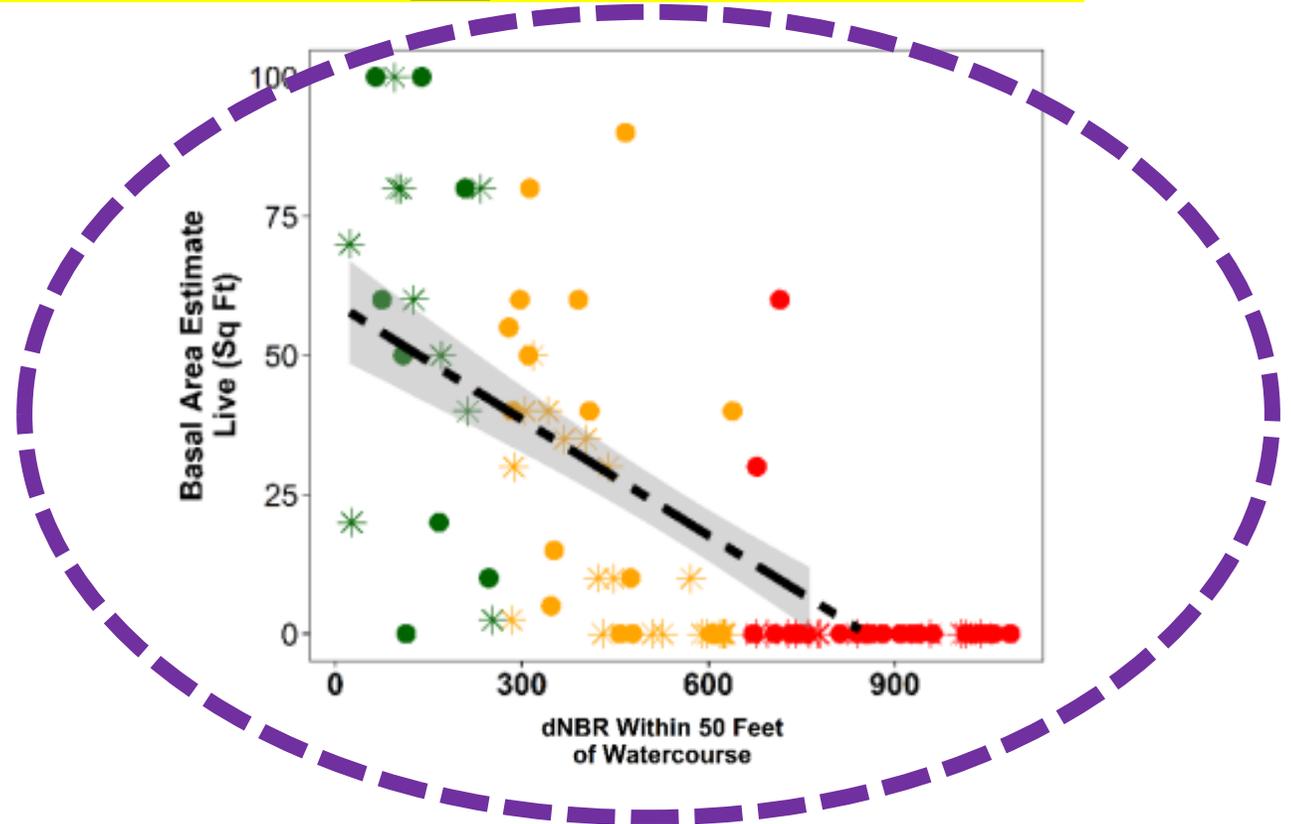
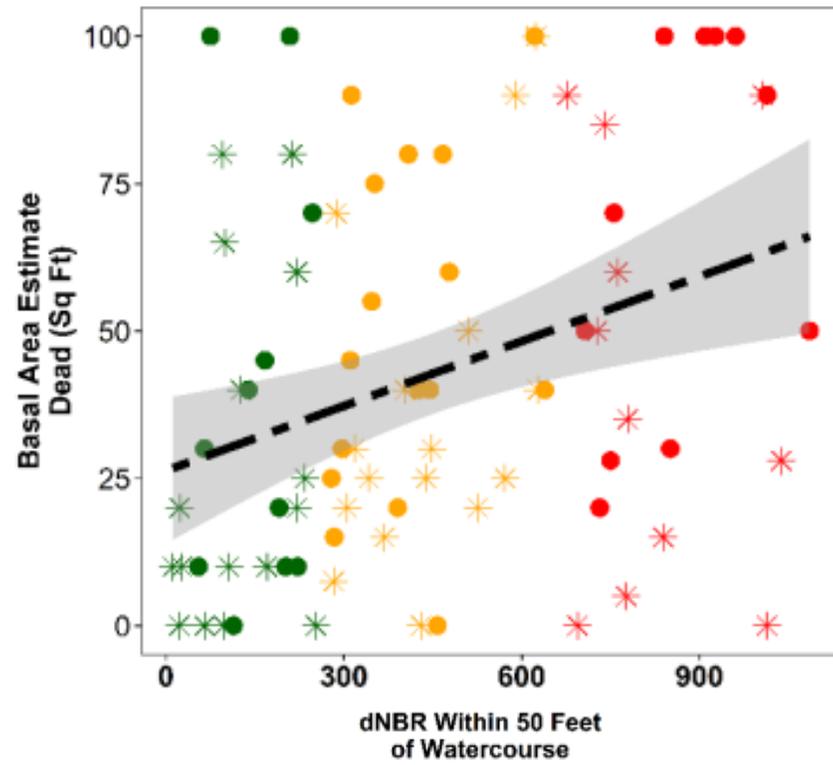
	Class I	Class II	Class III
Average Green Tree Basal Area (feet ² acre ⁻¹)	33 feet ² acre ⁻¹ (se=20)	48 feet ² acre ⁻¹ (se=12)	37 feet ² acre ⁻¹ (se=7)
Average Dead Tree Basal Area (feet ² acre ⁻¹)	119 feet ² acre ⁻¹ (se=16)	91 feet ² acre ⁻¹ (se=10)	45 feet ² acre ⁻¹ (se=6)
Average Total Basal Area (feet ² acre ⁻¹)	152 feet ² acre ⁻¹ (se=30)	139 feet ² acre ⁻¹ (se=11)	82 feet ² acre ⁻¹ (se=8)



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Results – Watercourse Segments

As dNBR increases, dead tree basal area is variable, but live tree basal area decreases



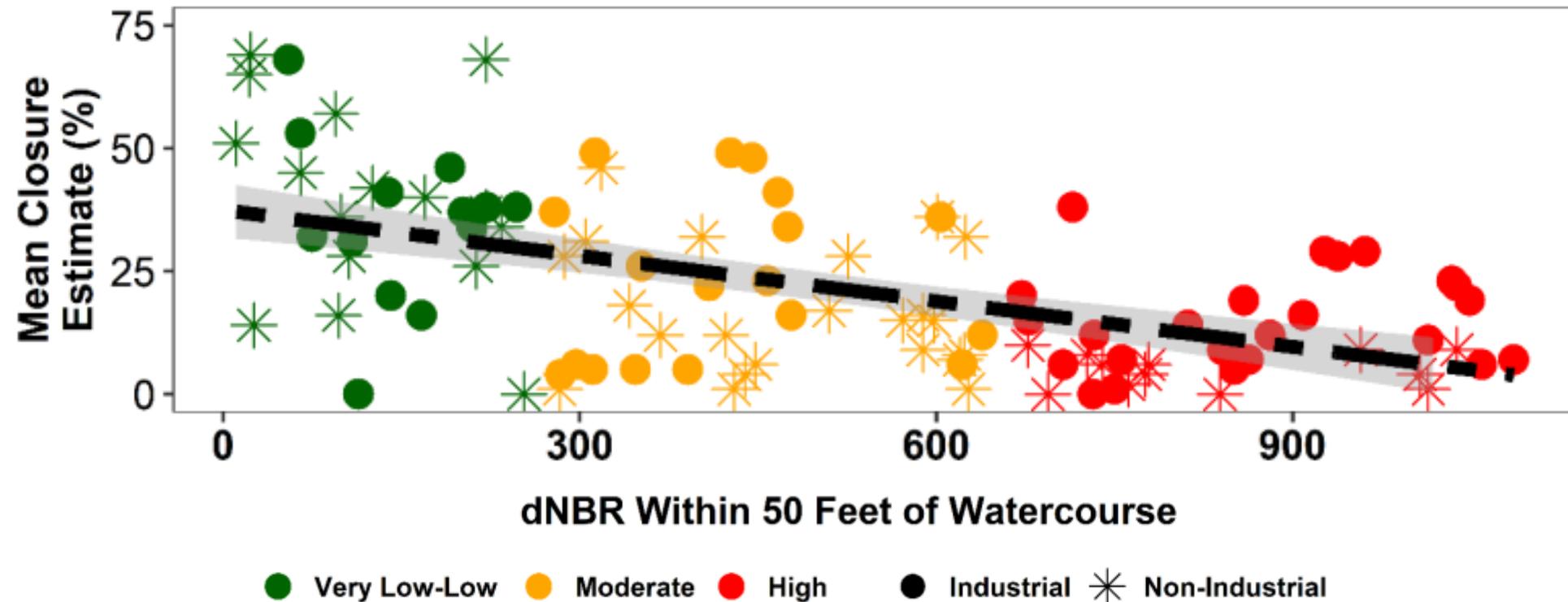
● Very Low-Low ● Moderate ● High

● Industrial * Non-Industrial

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Results – Watercourse Segments

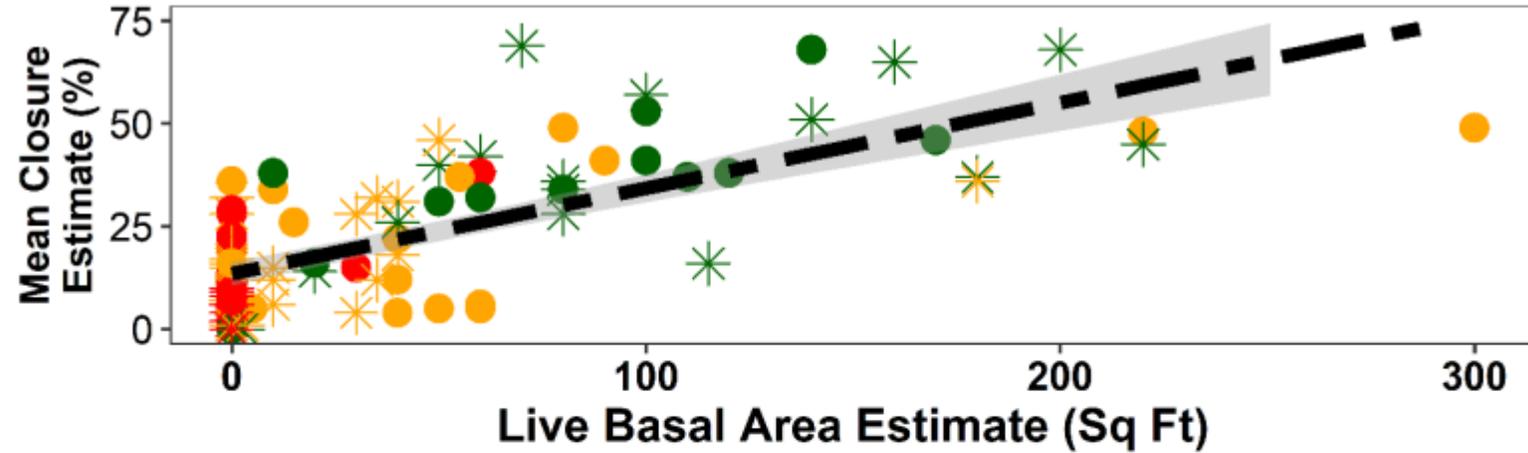
As dNBR increases, riparian closure estimates decrease
High severity fire reduced riparian watercourse overhead closure in this sample



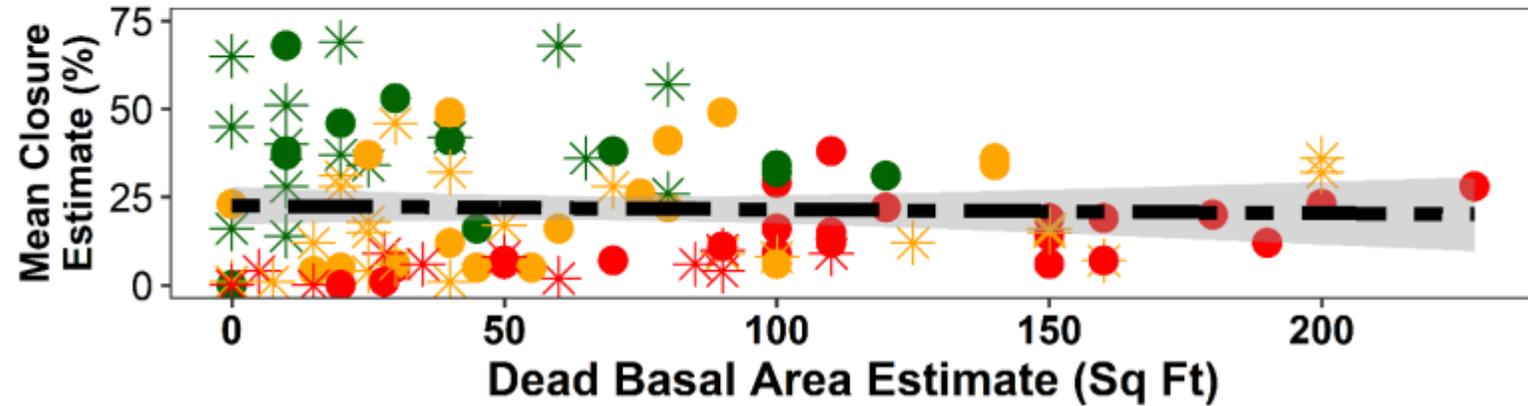
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Results – Watercourse Segments

As such, less live tree basal area due to Moderate and/or High severity fire leads to less canopy closure



Residual standing dead trees in riparian areas do not seemingly add to canopy closure outside of very low to low severity fire where green trees remain



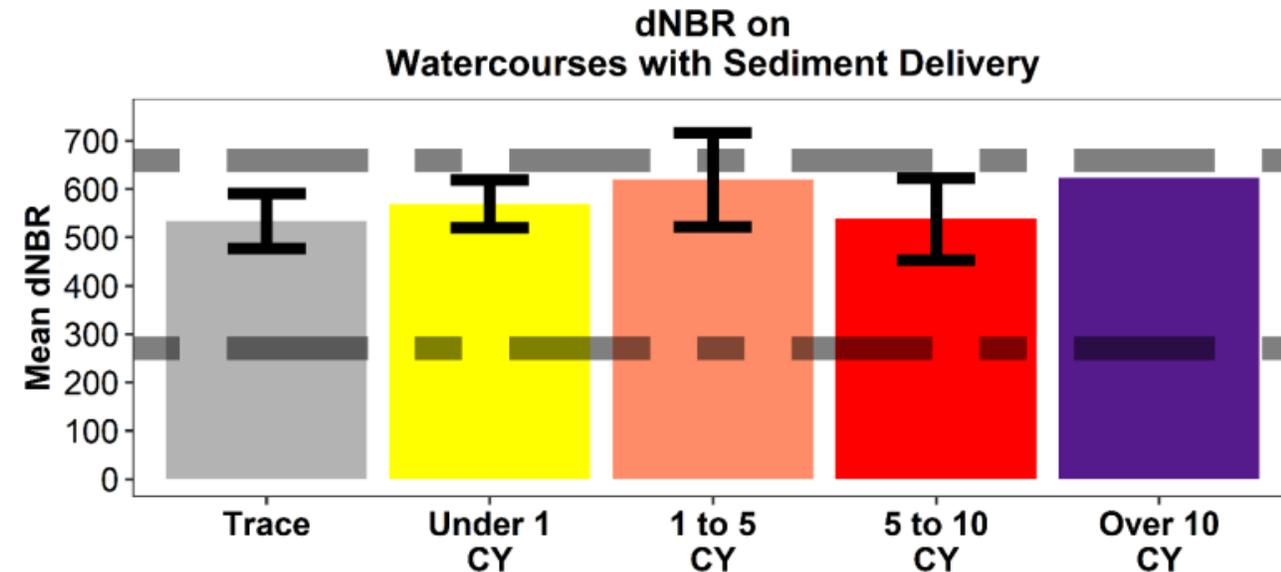
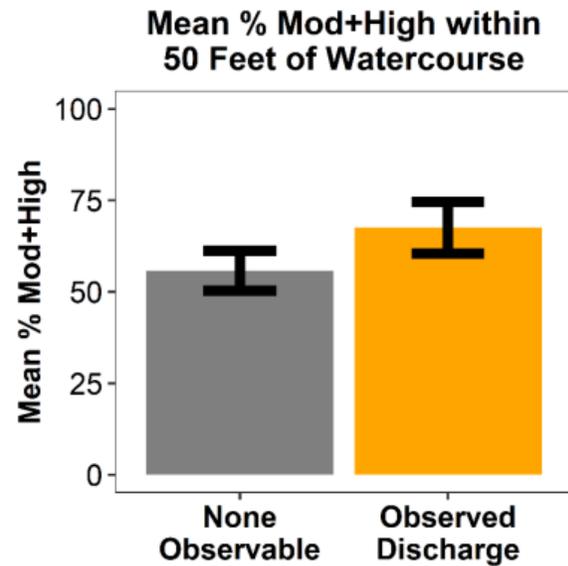
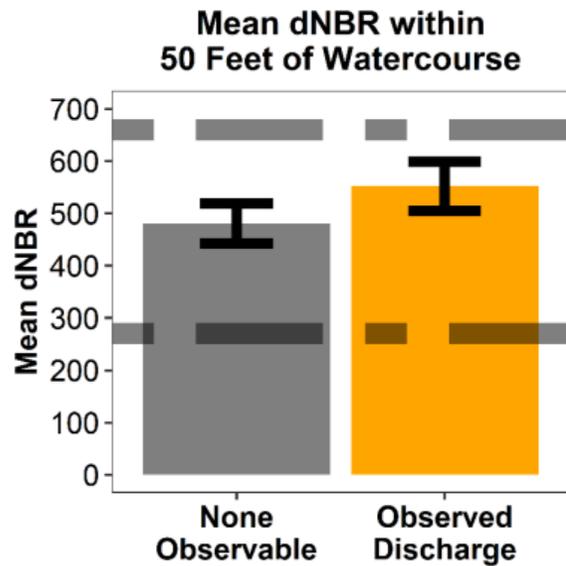
● Very Low-Low ● Moderate ● High ● Industrial * Non-Industrial

Emergency Salvage Logging Monitoring Report

Results – Watercourse Segments *Sediment Delivery*

...Where sediment discharge was present to a watercourse from operations, the mean dNBR and percent Moderate+High Soil Burn severity increased, but not significantly

...Mean dNBR was variable with sediment delivery classes as well



Emergency Salvage Logging Monitoring Report

Results – Watercourse Segments

Sediment Delivery

- **Tractor operations (ground based yarding / skidding) led to many sediment discharges**
 - **Steeper hillslopes, excessive bare exposed soil on/below skid trails**
- **Tree falling and yarding across/within the channel zone were also frequent, but low-level sediment discharges**

Source	"Trace"	Under 1 CY	1 to 5 CY	5 to 10 CY	Over 10 CY
Skidding/Tractor Operations and Drainage	13%	52%	26%	6%	3%
Tree Falling and Yarding Across/Within Channel Zone	54%	42%	4%	0%	0%
Forest Road	0%	50%	0%	50%	0%

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Results – Watercourse Segments *Sediment Delivery – Comparison to 2019*

....Between 2019 and this sample...

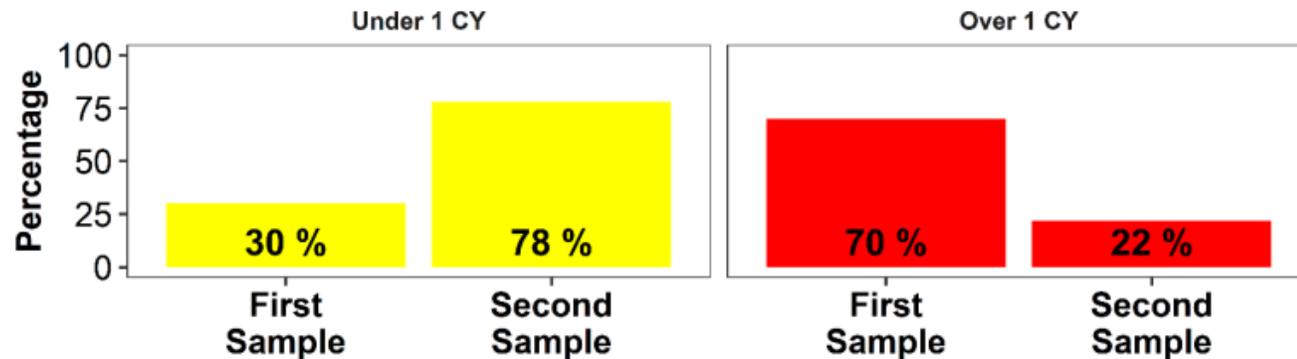
- Sediment deliveries **<1 CY** increased in this sample
- Sediment deliveries **>1 CY** there was a decrease

....These changes were significant and outside the margin of error

....Greater proportion of low magnitude sediment delivery to watercourses

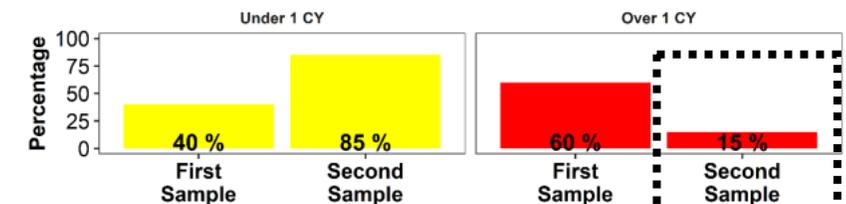
All Watercourses

Sediment Delivery to Watercourse Segments

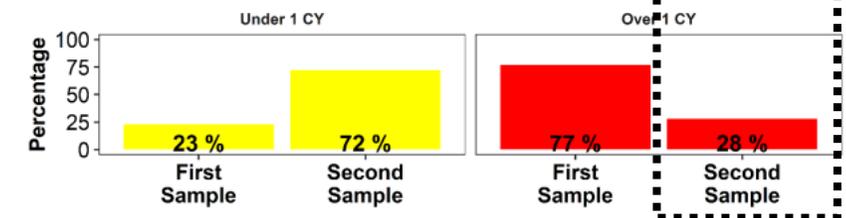


By Timberland Ownership

Sediment Delivery on Industrial Timberland Watercourse Segments



Sediment Delivery on Non-Industrial Timberland Watercourse Segments



Emergency Salvage Logging Monitoring Report

Results – Post-Salvage Forest Structure



*Unharvested plot burned at high severity
in the Kincadee Fire*



*Harvested plot burned at high severity in
the 2020 Hog Fire, Lassen County*

Emergency Salvage Logging Monitoring Report

Results – Post-Salvage Forest Structure



Plots of low severity fire within the 2020 August Complex in Tehama County, with no to minimal harvest activity

Emergency Salvage Logging Monitoring Report

Results – Silviculture

- **76%** of Notices sampled used clearcut / alternative clearcut “equivalent” methods
- Increasing burn severity (dNBR) tied to with more intensive harvesting
 - dNBR was typically greater in the interior than the coast

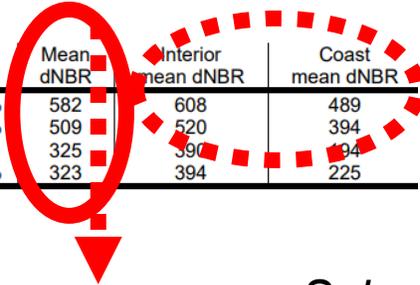
	#	%	Mean dNBR	Interior mean dNBR	Coast mean dNBR
Clearcut	23	38%	582	608	489
Alternative Clearcut	23	38%	509	520	394
Group	3	5%	325	390	194
Single Tree Selection	12	20%	323	394	225

- Generally, non-industrial Notices had less intensive harvesting methods
 - Monitoring results frequently indicated ownership boundaries were used for project areas, not reflecting actual area harvested or operated / disturbed mechanically.

Emergency Salvage Logging Monitoring Report

Results – Silviculture

	#	%	Mean dNBR	Interior mean dNBR	Coast mean dNBR
Clearcut	23	38%	582	608	489
Alternative Clearcut Group	3	5%	325	390	394
Single Tree Selection	12	20%	323	394	225



Salvage logged areas in the 2020 North Complex, Butte County



Emergency Salvage Logging Monitoring Report

Results – Silviculture

Industrial Clearcut

dNBR = 520 (High Severity)



Non-Industrial Alt Clearcut

dNBR = 520 (High Severity)



Non-Industrial Single Tree/Group Selection (0-25% harvest of project area) Mean dNBR = 334



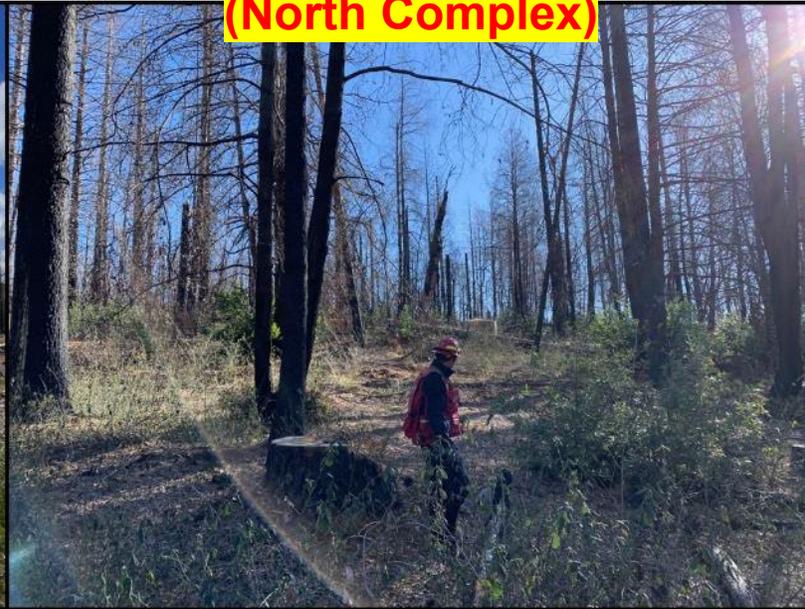
Emergency Salvage Logging Monitoring Report

Results – Silviculture

**Clearcut Salvage
(North Complex)**



**Single Tree Selection
(North Complex)**



**2020 CZU Lightning Complex
(Note residential structures,
resprouting redwoods)**



*All levels of forest management intensity,
both in “wildland” and “intermix” areas*

Emergency Salvage Logging Monitoring Report

Results – Post-Salvage Forest Structure

Increasing dNBR class = **decreasing** **live** conifer basal area, **increasing** **QMD**

Increasing dNBR class = **increasing** **dead** conifer basal area, **variable** **QMD**

Binned dNBR Severity	Live Conifer Basal Area	Dead Conifer Basal Area	Live Conifer QMD	Dead Conifer QMD
Unburned/Very Low	97 feet ² acre ⁻¹	9 feet ² acre ⁻¹	27 inch	16 inch
Low	48 feet ² acre ⁻¹	16 feet ² acre ⁻¹	25 inch	24 inch
Moderate	22 feet ² acre ⁻¹	25 feet ² acre ⁻¹	27 inch	16 inch
High	<1 feet ² acre ⁻¹	36 feet ² acre ⁻¹	44 inch	17 inch

....Even under moderate and high severity fire and salvage, there is not a lack of residual forest structure *overall* across projects / the state. Burn severity matters in outcomes

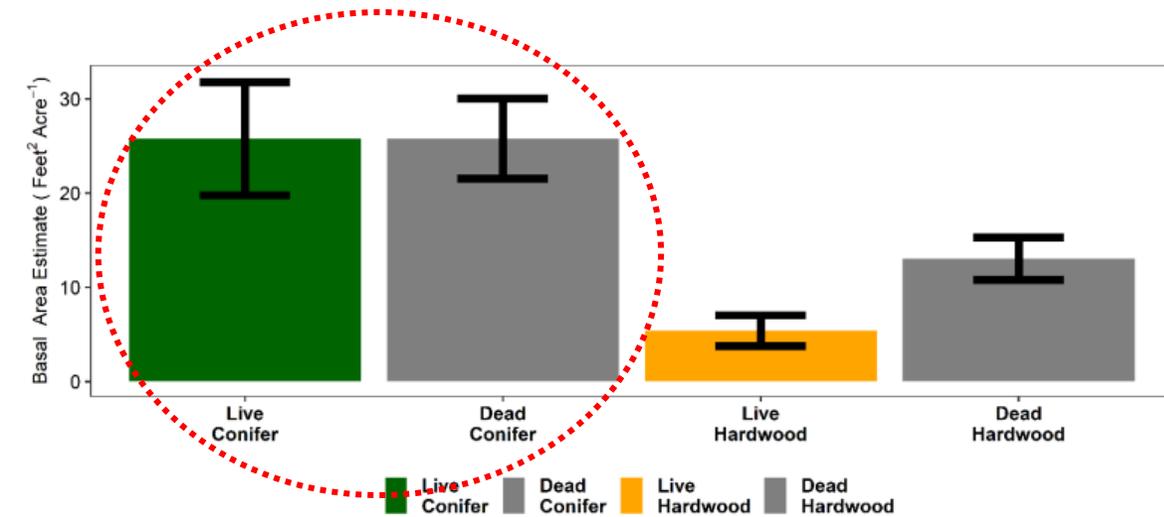
...Similar to silviculture results earlier, Notices are used as intended (i.e., salvage)

Emergency Salvage Logging Monitoring Report

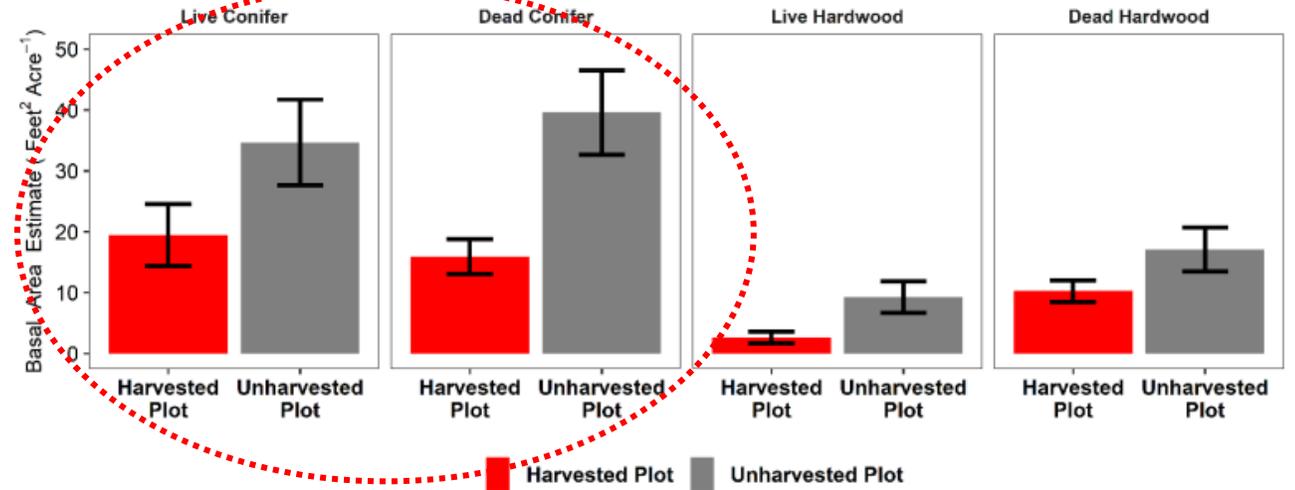
Results – Post-Salvage Forest Structure

- What does this look like overall?
- Near equal live and dead conifer mean basal area
 - Driven in part by greater residual forest structure in unharvested plots

Mean basal area estimates



Mean basal area estimates, by plot type



Emergency Salvage Logging Monitoring Report

Results – Post-Salvage Forest Structure

- What does this look like overall?

Intensively harvested area in 2020 Hog Fire, Lassen County



Emergency Salvage Logging Monitoring Report

Results – Post-Salvage Forest Structure

- **What does this look like overall?**

Unharvested, high severity plot (dNBR = 706) on a small non-industrial ownership in the 2020 Gold Fire, Lassen County



Emergency Salvage Logging Monitoring Report

Results – Unstable Areas

Note: Analysis done by the California Geological Survey

- **36%** of Notices had identifiable unstable areas (n = 22)
- **13%** of Notices with unstable areas (n = 8) had evidence of ground based operations on unstable areas
 - **5%** had road drainage onto unstable areas
 - **11%** had trees harvested from unstable areas
- **8 of the 22** Notices with unstable areas had existing, publicly available data on unstable areas in the project areas
 - **5 Notices** had mapped unstable areas where that information was available
 -Where mapped, no ground based equipment was observed on the unstable areas

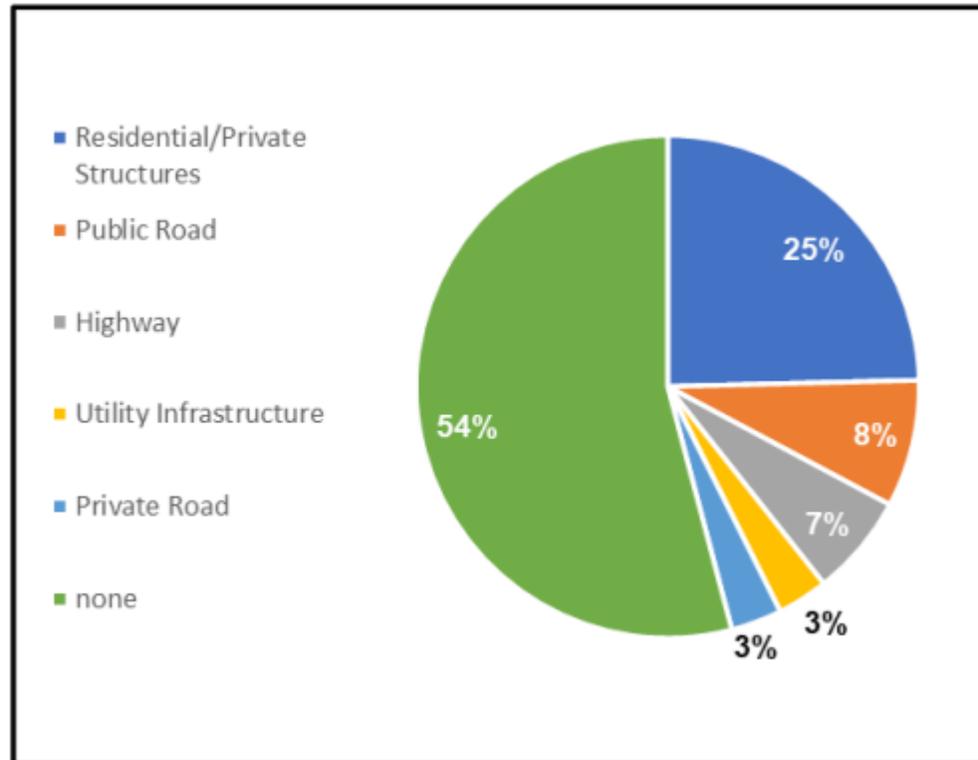
Emergency Salvage Logging Monitoring Report

Results – Unstable Areas

Note: Analysis done by the California Geological Survey

- **46%** of Notices contained potential public safety hazards due to unstable areas
 - I.E., downslope highways, residences, etc.

Proportion of Notices with operational areas set in locations that pose potential downslope risks to public safety



Emergency Salvage Logging Monitoring Report

Discussion....



Emergency Salvage Logging Monitoring Report

Discussion....

- Statute indicates a §1052 Emergency Notice is not necessarily meant to result in a THP
- Many project boundaries encompass large areas of timberland, and non-timberland, that is *sparingly or never harvested or operated on*
- Small timberland owners represent the largest number of post-fire Notices, yet frequently do not have the financial resources, knowledge, or desire to undertake watershed and forest restoration activity, particularly in **absence of grant programs**.



Emergency Salvage Logging Monitoring Report

Discussion....

- Harvest intensity and silvicultural types reflect **burn severity**
 - Clearcut / Clearcut equivalent harvesting aligns with **high severity** wildfire
 - Emergency Notices used appropriately to harvest dead, burned timber
- While some project areas may lack residual forest structure following harvest, this result is the exception and not the rule, typically
.....Also important to acknowledge fuel reduction outcomes (ongoing research)



Emergency Salvage Logging Monitoring Report

Discussion....

- **Water quality outcomes were variable on projects**
- **In general, results indicated (within the margin of error) that most outcomes were static**
- **Monitoring results indicate that overall small non-industrial ownerships had higher proportions of less desirable sediment delivery to watercourses than industrial ownerships, while industrial Notices had higher proportions of low-level delivery**

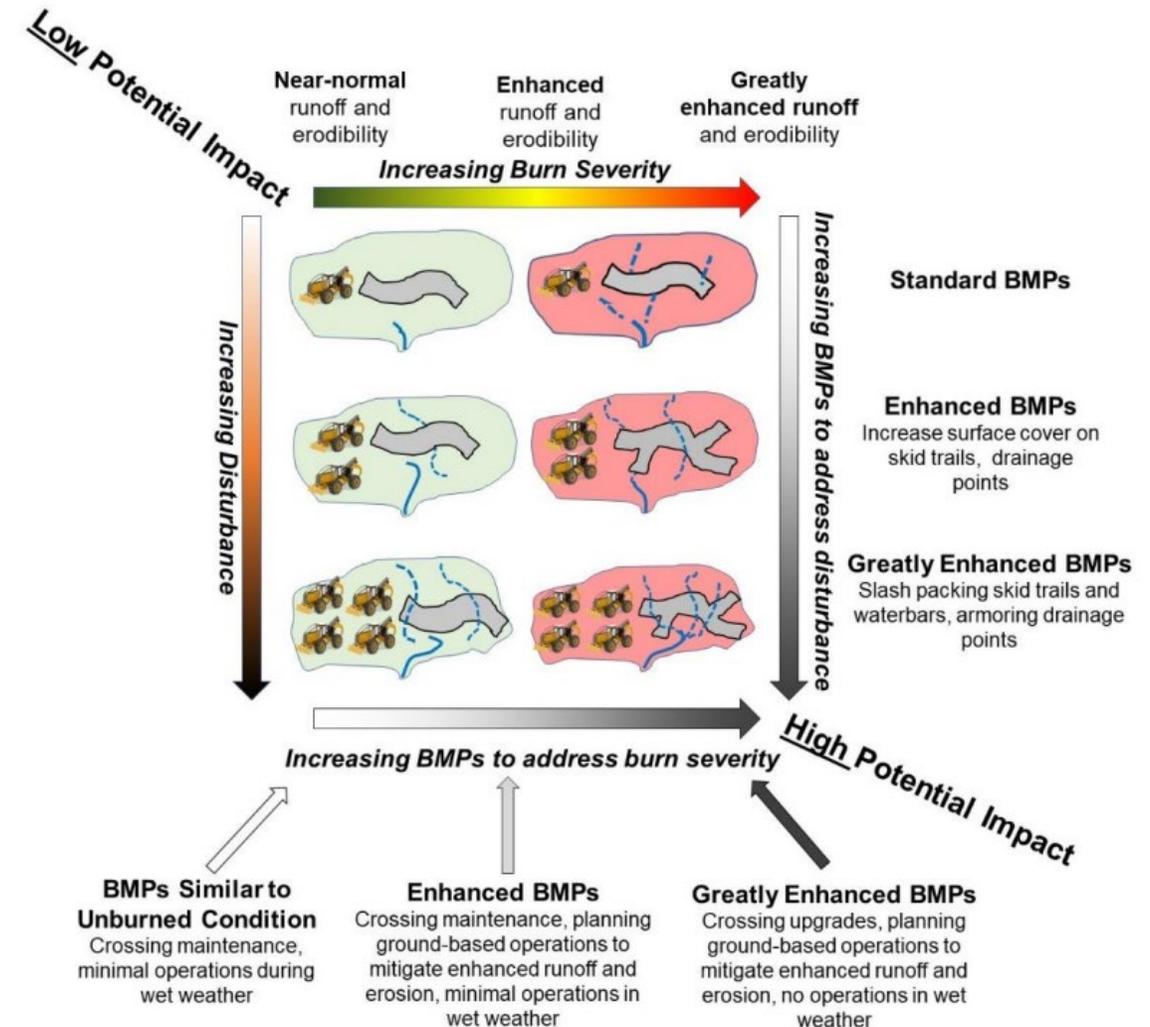
....Burn severity plays a role, as does slope position, BMP use, and how operations are done



Emergency Salvage Logging Monitoring Report

Discussion....

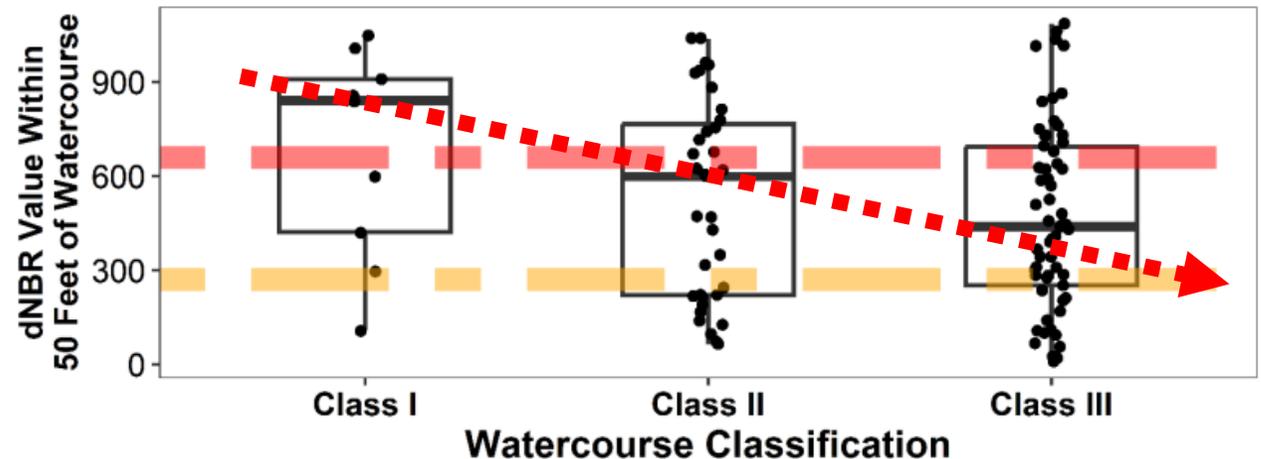
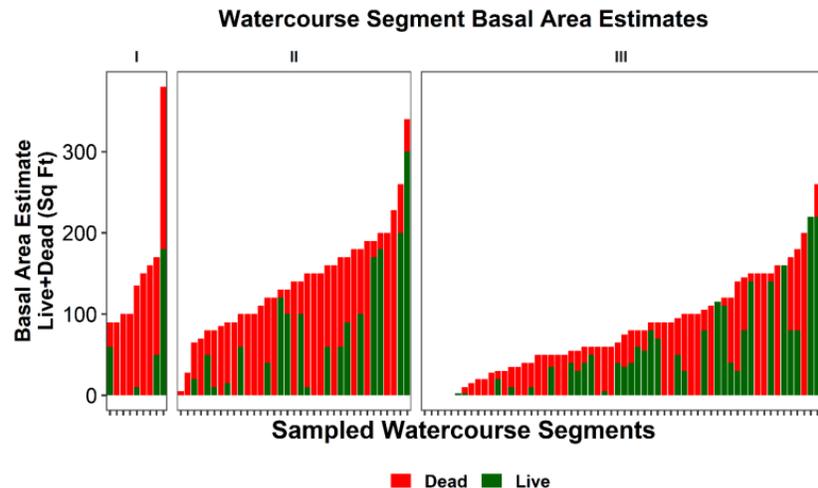
- Road-watercourse crossing and road segment results indicate a need for enhanced BMPs especially with **high burn** severity, and steeper hillslopes (>40%) burned at any level
- Mapping of targeted sites for BMP implementation and clear mitigation measures are critical for operator success in the post-fire environment



Emergency Salvage Logging Monitoring Report

Discussion....

- Higher **burn severity** within riparian areas, within this monitoring effort, indicate greater burn severity with increasing watercourse classification protection
- **Decreasing** live residual trees with **increasing** burn severity resulted in **decreasing** overhead canopy closure estimates
- Indicates the importance of retaining green trees, even those partially burned, in the riparian area



Emergency Salvage Logging Monitoring Report

Discussion....

- **Currently, unstable areas have no required mapping expectations under Emergency Notices**
- **Generally, potential and known unstable areas are not always being mapped on accepted Emergency Notices (per CGS desk analysis)**
- **Where unstable areas were mapped, potential downslope impacts are reduced by recognition and avoidance**

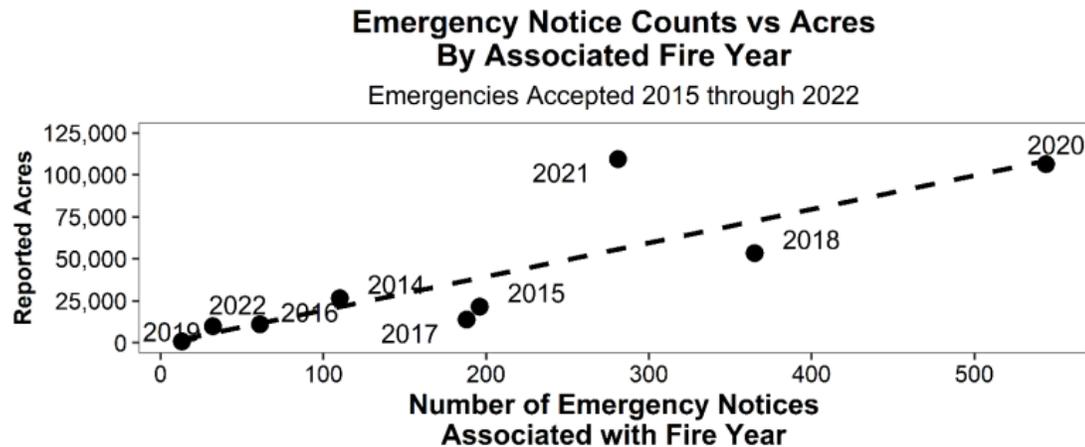


Emergency Salvage Logging Monitoring Report

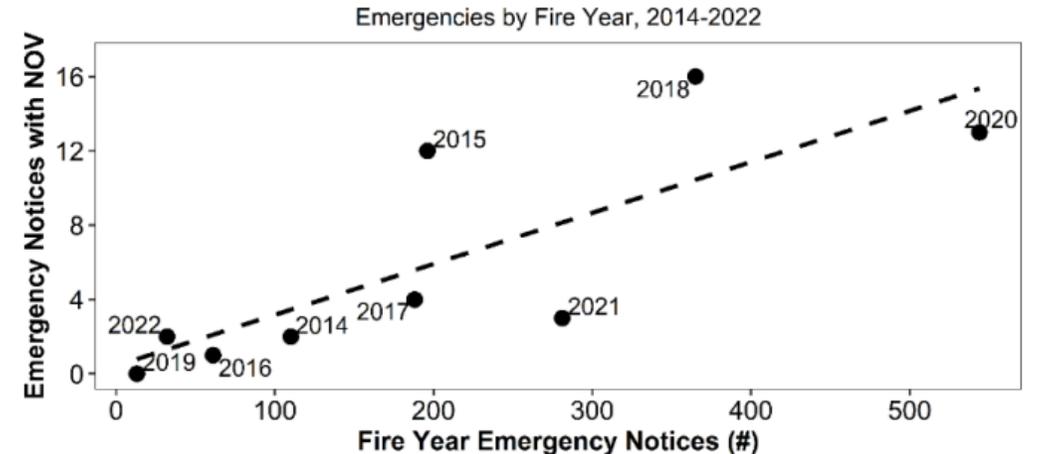
Discussion....

- Increasing regulatory presence to increase performance
 - More hours have been put towards inspections, but workload associated with post-fire Emergency Notices continued to increase for CAL FIRE, in conjunction with all other required work (THPs, wildfire response, vegetation treatment projects, all amongst Forest Practice Unit vacancies)

Reported acres vs Notice Numbers by Fire Year



Notices with an NOV vs Notice Numbers by Fire Year



Emergency Salvage Logging Monitoring Report

The Crew

- Ethan Gicker (Forester I, now with NEU)
 - Jessica Huang (Forester I)
 - Ross Matthewson (Forester I, now with California State Parks)
 - Michael Novak (Forester I)
 - Peter Smith (Forestry Assistant II)
- ...(Also thanks to Roberta Lim (Senior ES, Watershed Protection, former Field Crew member) and Dorus Van Goidsenhoven (Forester I, NEU, former Field Crew member))

...Continued development and advancement of field crew to new positions and promotions, including acquiring their RPF Licenses.

...Thanks also in order for assisting RPFs, LTOs, Timberland owners, CAL FIRE Foresters, and the other Review Team Agencies (CGS, RWQCB, CDFW)



Emergency Salvage Logging Monitoring Report

Questions and Comments

