Advisory Report

ODOT Worked Quickly to Oversee the Largest Wildfire Debris Removal Operation in State History

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Advisory Report Highlights

ODOT Worked Quickly to Oversee the Largest Wildfire Debris Removal Operation in State History


Source: ODOT

By the Numbers

Oregon's wildfire recovery operation

120
state highway miles to clear of hazards

93,259
damaged trees inspected as of August 19, 2021

62,042
trees cut as of August 19, 2021

3,080
lots enrolled for private property cleanup as of September 29, 2021

163
contractors and consultants working on the cleanup in August 2021

67%
of total contract employees were Oregonians in August 2021

On August 20, 2020, Oregon Governor Kate Brown declared a statewide state of emergency due to the imminent threat of wildfire. Within weeks of the declaration, a significant windstorm triggered a series of catastrophic wildfires, known generally as the Labor Day fires, that burned across significant portions of the state.

This was the biggest and most expensive emergency disaster event in Oregon history, and the state had never before undertaken such a widespread and complex recovery effort. The wildfires burned over 1.2 million acres and affected multiple counties. Eight of these counties were approved for Federal Emergency Management Agency (FEMA) Public Assistance to help with debris removal. The cost alone for the cleanup of household hazardous waste, hazardous trees, ash, and other debris to safely access and rebuild homes and communities was initially estimated at $622 million. Work is estimated to be completed in Summer 2022.

A newly formed Oregon Debris Management Task Force coordinated debris removal, and Oregon Department of Transportation (ODOT) led the removal operations. This was the first time ODOT conducted major debris removal operations, a key part of the state's wildfire recovery efforts.

At the request of ODOT, we performed a limited, review of its hazardous tree removal operations due to public concerns over the extent of trees tagged and cut down in the fire corridors.

This report was produced to provide real-time information on recovery operations underway. It has undergone the same quality assurance process as audit reports from the Oregon Audits Division.

Continued on next page

Key Areas

This advisory report answers five questions about the ODOT wildfire debris removal work underway across the state.

Question 1: Who cut down trees due to the 2020 wildfires on or near highway corridors?

Answer: ODOT and many other entities were involved in cutting down trees in the fire areas. During emergency response, tree cutting crews worked to clear imminent tree hazards, prevent fires from spreading, and open roadways. During recovery, with different landowners and easements along Oregon's highway corridors, there were multiple public and private parties who cut down damaged trees. ODOT has been removing trees around the highways to ensure the safety of the corridors as well as removing trees to facilitate recovery and rebuilding. (pg. 7)

Question 2: How was ODOT's criteria for assessing hazardous trees determined, what were the criteria factors, and were any changes made to it during recovery efforts?

Answer: FEMA has insufficient criteria for what constitutes a hazardous tree from a wildfire event. ODOT's contractor developed hazardous tree removal criteria that used industry and Forest Service publications. ODOT's criteria builds on FEMA's criteria and additionally considers factors such as a tree's ability to strike the road, the tree species, fire damage to the tree structure, and the likelihood of the tree's survival. The criteria was revised several times after implementation in the field. (pg. 20)

Question 3: What efforts has ODOT made to preserve and consider ecologically sensitive areas and cultural resources when removing hazardous trees?

Answer: ODOT worked with various stakeholders and incorporated multiple, complex federal and state regulations to create an Environmental Protection Plan (EPP). The EPP is the guide used by ODOT, consultants, and contractors to address environmental needs while removing hazardous trees. (pg. 27)

Question 4: What happens to the trees that ODOT had cut on or near highway corridors?

Answer: ODOT has stored cut trees from its removal operations in the corridors since operations started as the trees are the property of the landowner. Much of the trees cut were from Forest Service lands. Under a newly developed process, ODOT will sell hazardous trees removed from federal land. (pg. 34)

Question 5: What mechanisms are in place for evaluating the recovery efforts? (e.g., after action reports for continuous improvement mechanisms and capturing lessons learned)

Answer: The Governor's Office completed an after action review of emergency response efforts but there is no solidified plan for a state-level review of the recovery effort. However, ODOT intends to hire a consultant to conduct an after action review on debris removal operations, one part of the state's recovery efforts. ODOT management recognizes there are areas for improvement, and we identified some additional areas that should be considered in future planning efforts. (pg. 37)

ODOT Response

ODOT agrees with the opportunities listed in the report for continuous improvement. A reply from ODOT is at the end of this advisory report. We greatly appreciate the agency's collaboration and assistance on this review.

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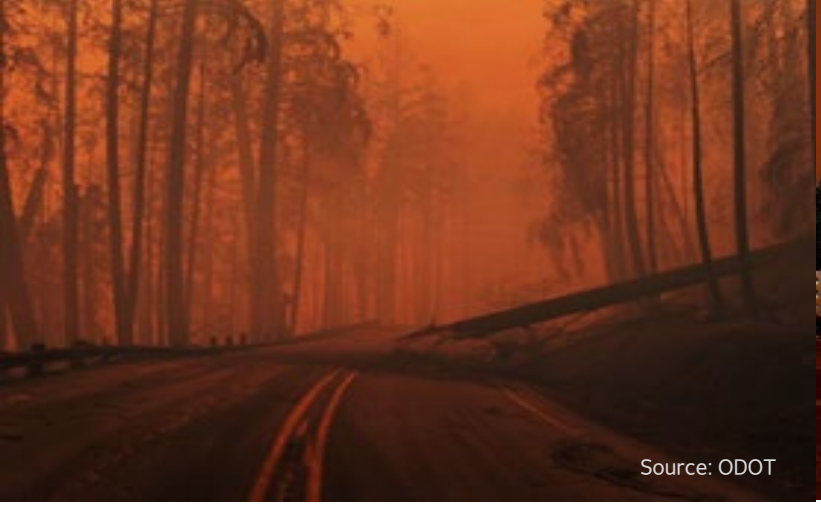


Source: ODOT

Source: Oregon State Police

Introduction

Wildfires are one of Oregon's natural hazards that pose a significant threat to many Oregon communities. The 2020 Labor Day wildfires burned more than 1.2 million acres spanning many counties, destroyed more than 5,000 homes and businesses, and killed 9 people. The 2020 wildfires were the most extreme fires the state has ever experienced in severity and expanse.

Labor Day fires burned across significant portions of the state

On August 20, 2020, Oregon Governor Kate Brown declared a statewide state of emergency due to the imminent threat of wildfire. Within weeks of the declaration, a significant windstorm triggered a series of catastrophic wildfires, known generally as the Labor Day fires, that burned across significant portions of the state. The Oregon Department of Forestry (ODF) describes the Labor Day event as "unparalleled in Oregon's history." On the morning of September 7, atop an expanding drought and historically low fuel moisture and humidity, the National Weather Service issued a red flag warning that conditions were ideal for wildfires to start and spread rapidly. On the afternoon of September 7, a strong cold front arrived, bringing east-northeast winds, which had wind gusts over 106 mph recorded. ODF reported this was the strongest three-day wind event during the fire season since at least 1950. During this period, both the national and northwest fire preparedness levels were at their highest, meaning major incidents had the potential to exhaust all agency fire resources. Under these conditions, a number of fires erupted and quickly grew out of control. Within 24 hours, there were 12 counties battling extensive fires. Five fires spread west and became among the top 20 largest wildfires in Oregon's history. Five fires — Archie Creek, Beachie Creek, Holiday Farm, Lionshead, and Riverside — each grew into megafires (100,000+ acres).

State Press Conference on September 9, 2020:

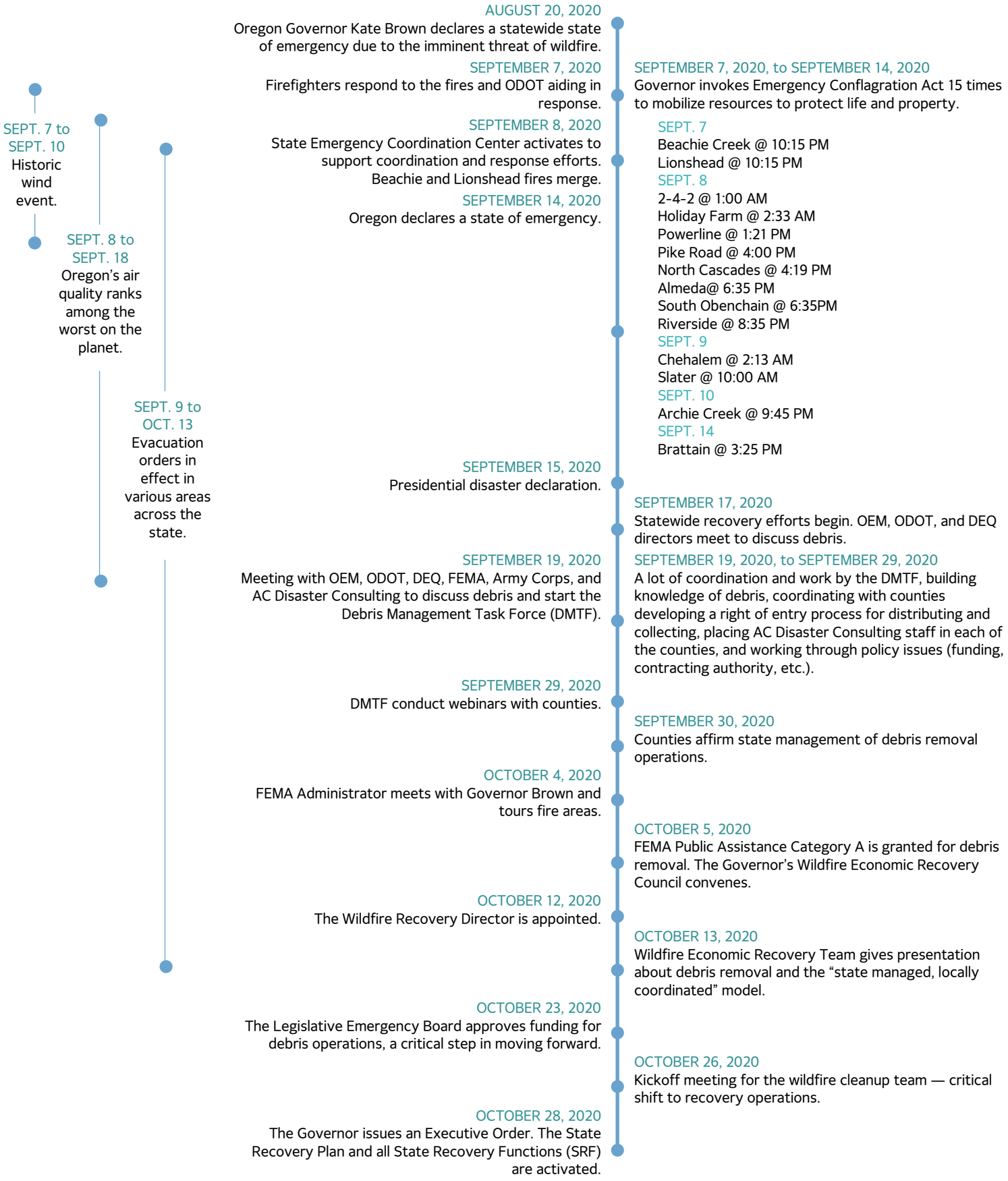
"This is truly an all-hands-on-deck moment for Oregon… Hundreds of homes have been lost and we continue to carry out mass evacuations across the entire state."
- Governor Brown

"… this is a statewide event. Absolutely no area in the state is free from fire."
- Doug Grafe, ODF Chief of Fire Protection

"… at this time in western Oregon, in fact, anywhere in the state, all individuals should be prepared [to leave] at a moment's notice."
- Mariana Ruiz-Temple, OSFM Deputy Chief State Fire Marshal

Over 500,000 Oregonians were placed under some level of evacuation notice as the fires threatened and crossed the wildland-urban boundaries. Smoke from the wildfires blanketed much of the state. Wildfire smoke emits a wide variety of pollutants into the air, and Oregonians experienced some of the worst air quality ever recorded in the state in 2020. Oregon air reached unhealthy, very unhealthy, or hazardous levels across the state, with all but one city having never previously experienced hazardous air quality. Figure 1 depicts some major events from the state's response to the 2020 Labor Day fires.

Figure 1: Oregon's emergency response to the Labor Day wildfires



The Labor Day fires were mostly contained by late September or October. Even when a fire is fully contained, it often will keep burning for weeks or months. As of November 4, 2020, ODF reported that the six largest fires had stopped growing, but the fires were not fully contained. Figure 2 shows overall and individual impacts of the fires.

Figure 2: Labor Day fires locations and statistics

Overall

Acres of land burned: **1.2 million**
Homes or housing structures destroyed: **4,021**
Structures destroyed: **1,193**
People sought shelter: **2,100**
Lives lost: **9**

Acres Burned by Fire

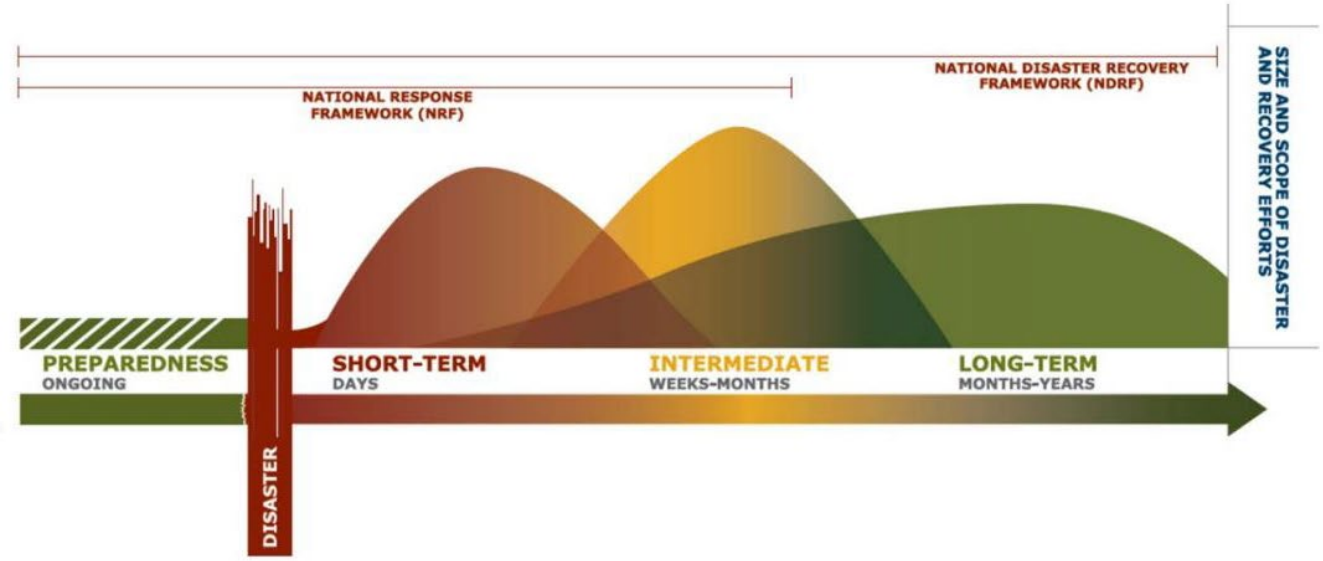
2-4-2 Fire: **14,468**
Almeda: **2,977**
Archie Creek: **131,596**
Beachie Creek: **193,566**
Brattain: **50,952**
Echo Mtn.: **2,240**
Holiday Farm: **173,395**
Lionshead: **204,586**
Riverside: **138,151**
Slater: **45,369**
S. Obenchain: **32,671**
Thielsen: **9,951**

Note: This map contains some of the major Labor Day fires but is not a complete representation of all of the fires that erupted during the Labor Day wildfire event.
Source: Oregon Emergency Management and Governor's Wildfire Economic Recovery Council report, January 2021.

Wildfire recovery efforts begin early to address Labor Day fire destruction

In emergency management terms, both short- and long-term recovery efforts begin in the midst of responding to the emergency, as shown in Figure 3. The September 2020 wildfires required the state to address fire recovery on an unprecedented scale in eight counties (Clackamas, Douglas, Jackson, Klamath, Lane, Lincoln, Linn, and Marion). As firefighting agencies were working to contain the wildfires, state and partner agencies were coordinating needed response resources and preparing for recovery operations.

Figure 3: The recovery process is a continuum of overlapping activities that can span months to years



Source: FEMA, National Recovery Framework

Oregon had not previously handled debris of this magnitude that needed to be addressed as a part of recovery. There was coordination between multiple governmental groups to provide direction and support for recovery efforts to address the magnitude of this event, including:[1]

Governor's Disaster Cabinet

As a part of the Governor's disaster management framework, this group makes recommendations to the Governor regarding statewide priorities and the allocation of state emergency resources.

Wildfire Economic Recovery Council

Comprised of over 40 elected officials, community leaders, congressional members, and state agencies charged with evaluating the economic and community needs of Oregonians. The council established a regional response team that included representatives from the Federal Emergency Management Agency (FEMA), Regional Solutions,[2] and key state and local agencies to identify recommendations and next steps needed in the areas of housing and sheltering, debris and cleanup, and recovery and rebuilding.

[1] See Appendix A for a statewide organizational chart of recovery efforts.
[2] The Regional Solutions program within the Governor's Office works with state and local government, public and private entities, and philanthropic organizations to develop and coordinate regional implementation projects and identify regional priorities for community and economic development, address issues and seize opportunities.

Oregon Debris Management Task Force

This task force, which includes the Oregon Office of Emergency Management (OEM), Oregon Department of Transportation (ODOT), and Oregon Department of Environmental Quality (DEQ) agency directors and deputy directors, was formed to coordinate the removal of household hazardous waste and ash and debris, such as hazardous trees, with counties, residents, and property owners. According to OEM, a higher level of agency representation was needed to address the extensive policy issues that the Debris Management Task Force would undertake.

Source: ODOT

The 2020 wildfires are the most expansive and expensive emergency disaster event in Oregon history, and the state had never before undertaken such a widespread and complex recovery effort. The cost alone for the cleanup of household hazardous waste, hazardous trees, ash, and debris to safely access and rebuild homes and communities was initially estimated at $622 million. The state's focus on recovery and rebuilding efforts centered around Oregonians — how to make lives better for those affected by the fires and how to help get livelihoods back. Those involved recognized that cleanup would be complex and challenging. Part of the process involved key decisions and considerations to be made regarding the state's immediate and long-term role in emergency recovery work, including: total cost of cleanup, cash flow and timing, who would perform the work, federally ineligible costs to support long-term recovery, and accountability and oversight.

The resulting policy decisions regarding funding for the cleanup effort in the counties impacted included:

- removal operations would be state managed, locally coordinated;[3]
- all homes and businesses destroyed by the fires would be eligible for state-led cleanup, regardless of whether there was federal funding assistance; and
- foundation concrete removed as a part of site cleanup would be done at the expense of the state, which was estimated at $21 million.

FEMA indicated the total eligible costs of more than $570 million could trigger a 90% reimbursement with 10% state cost share.

Besides the use of federal funds and State Highway Fund reserves to help pay for wildfire debris removal, the Legislative Emergency Board (E-Board) started making investments for recovery beginning in late September 2020. ODOT was tasked with leading debris cleanup activities from the wildfires. On October 23, 2020, the E-Board allocated $50 million from the General Fund to ODOT for debris removal, which was a final piece needed to get cleanup operations started, and later allotted $7 million more in December 2020. ODOT anticipates it will request $83.3 million more from the General Fund to cover remaining estimated costs for debris cleanup.

ODOT organized staff to manage debris operations and contracted with entities to perform the cleanup work. Agency management dedicated staff to oversee the work of over 160 contractors and subcontractors hired for debris removal operations to evaluate the condition of trees and remove ash, debris, and hazardous trees. ODOT hired a contractor to act as an independent monitor of debris management activities, as FEMA requires. Also, as a part of their role, the monitor is responsible for ensuring cleanup work is conducted in a way that is sensitive to and protective of natural and cultural resources.

At the request of ODOT and with legislative interest, we performed a limited review of its hazardous tree removal operations due to public concerns over the extent of trees tagged and cut down in the fire corridors. We focused our review on five areas of concern — which entities were involved in cutting trees in the fire corridors, the development of the criteria used for identifying hazardous trees, environmental protections in place during the tree removal process, tree disposal, and the extent of after action reviews to learn and improve debris management operations for the next wildfire event.

[3] State managed, locally coordinated means the state facilitates bringing in resources while cities and counties prioritize what to clear, handle permitting issues, remove barriers to the work, and coordinate the right-of-entry process. Under emergency management practices, local jurisdictions are initially responsible for response and recovery, but the state will step in to coordinate those efforts when more than one county is affected or when local jurisdictions cannot respond. This was the case, as the wildfire recovery tasks were too big for all the affected counties to handle on their own, and most did not have the capacity and experience to address debris removal. Counties submitted delegations of authority, supporting the state taking on responsibility; the Wildfire Economic Recovery Council also supported this approach.

2020 Oregon Wildfire Hazardous Tree Removal Questions and Answers

The 2020 wildfires provided Oregon an opportunity to better prepare for future disasters. ODOT appears to be doing well managing hazardous tree removal operations; nonetheless, this incident was unprecedented in Oregon's history and the state could learn from the experience to be better prepared.

This report provides the results of our review in the form of questions-and-answers to critical questions and risks we identified based on public concerns and conversations or correspondence with ODOT and stakeholders.

Question 1: Who cut down trees due to the 2020 wildfires on or near highway corridors?

Answer: ODOT and many other entities were involved in cutting down trees in the fire areas. During emergency response, tree cutting crews worked to clear imminent tree hazards, prevent fires from spreading, and open roadways. During recovery, with different landowners and easements along Oregon's highway corridors, there were multiple public and private parties who cut down damaged trees. ODOT has been removing trees around the highways to ensure the safety of the corridors as well as removing trees to facilitate recovery and rebuilding.

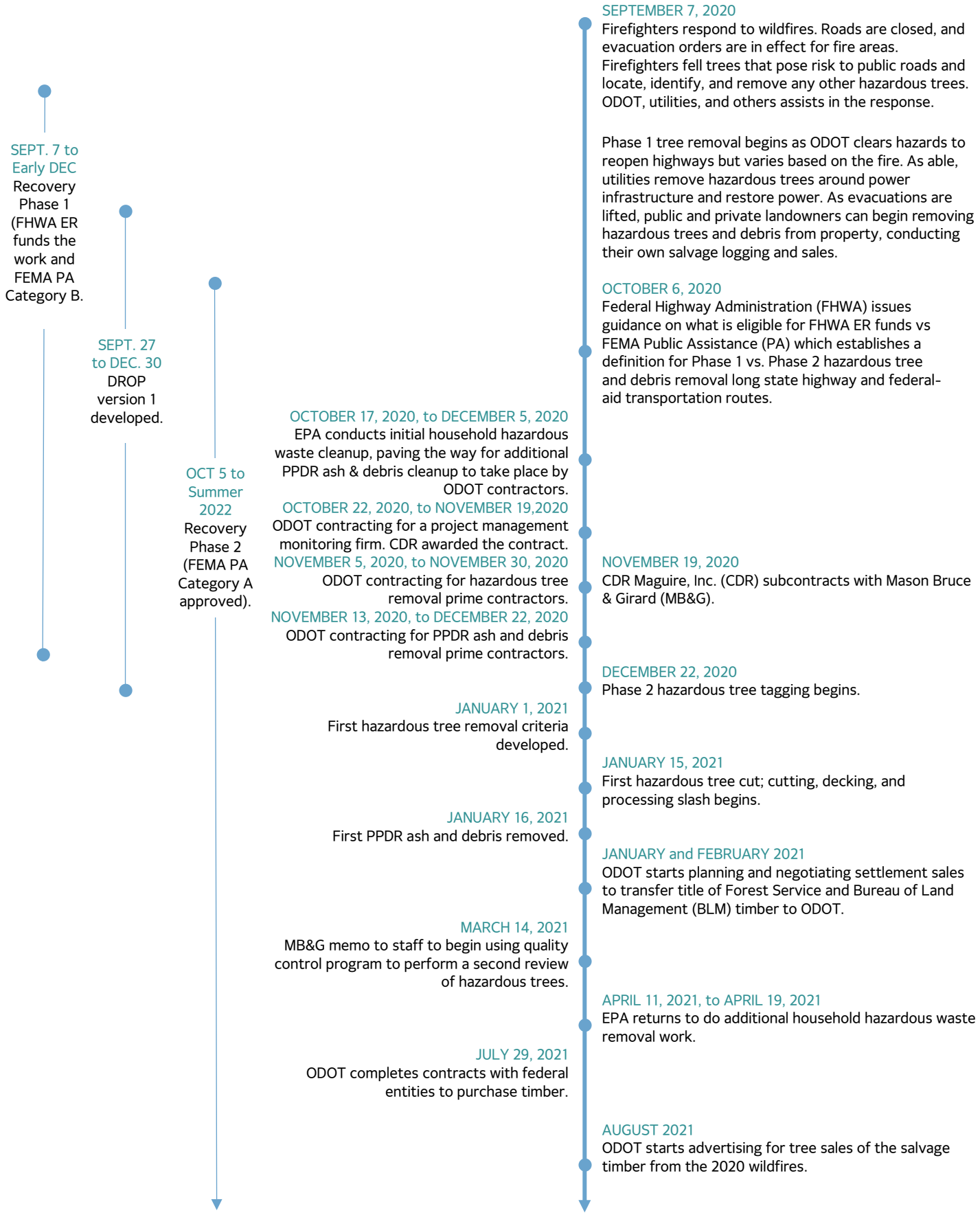
Emergency response for the 2020 wildfires was the largest in Oregon's history

Oregon's Governor, Oregon Department of Forestry, and the Oregon State Fire Marshal (OSFM) led the response to the wildfires. Oregon's Emergency Coordination Center and Joint Information Center were activated on September 8, 2020, to support coordination of the expanded response efforts across the state. ODF and OSFM leveraged state, regional, and national firefighting resources. The Governor declared emergency conflagrations for individual fires as well as one statewide between September 7 and September 14, which allows mobilizing firefighters to assist local resources battling fires. The President declared a Major Disaster Declaration on September 15. FEMA sent requested resources to the state to help combat the fires. During the peak of fire activity, there were over 7,500 personnel from across the nation and Canada who were assigned to help battle Oregon's wildfires.

ODF's goal for firefighting is to put the fires out quickly, at the smallest possible size, to protect forest resources and save lives. Fire-damaged trees can pose a fire hazard to the safety of firefighting crews. Tree cutting during emergency response removes imminent hazards along highways and in fire areas to ensure safe movement of fire crews through the fire corridor. This includes cutting down trees that threaten public roadways and locating, identifying, and mitigating hazardous trees to help create fire control lines to help contain and stop the fire's spread.

Recovery work starts shortly after emergency response starts. Figure 4 shows the timeline of key recovery events that occurred following the emergency response to the wildfires.

Figure 4: Oregon's recovery to the Labor Day wildfires



ODOT embedded during emergency response to Holiday Farm Fire

Unique within the Holiday Farm Fire corridor, ODOT was embedded into the emergency response operations. Between the time when the fires ignited and September 19, 2020, the area was in a state of emergency and under the control of ODF Fire Command and the Lane County Sheriff. During this period, ODOT aided and assessed highway conditions, closed roads, and set up roadblocks. At the request of Fire Command, ODOT, escorted by firefighters, plowed Highway 126 to push rocks and debris out of the roadway to help free trapped engines. Fire Command's tree cutting crews worked to clear tree hazards from the highway and later, Fire Command and ODOT established a joint operation with contracted tree cutting crews and ODOT staff to remove imminent hazards to the fire crews along the highway. ODOT staff remained embedded within the fire operations as Fire Command sought to ensure safe travel through the highway corridor. On September 20, 2020, the emergency abated and ODOT regained control over the highway.


Source: ODOT

Early recovery work focused on hazardous waste and clearing immediate hazards from roadways

Wildfire recovery efforts were separated into two phases: Phase 1 and Phase 2. This was due to the different federal funding sources authorized for the recovery work.

Recognizing the scale of the wildfire emergency event, OEM contracted with AC Disaster Consulting, LLC, a private emergency management firm with offices nationwide. AC Disaster Consulting, which has national expertise in debris monitoring and management operations, had previously worked with OEM as the state's owner representative on prior declared disasters. The firm assisted the Oregon Debris Management Task Force with federal funding processes and information to local governments to make decisions on how to do the debris cleanup.

Phase 1 recovery work started roughly around mid-September 2020 and involved hazardous waste removal and initial roadway cleanup. On September 21, 2020, staff from federal and state agencies jointly began preliminary damage assessments of public infrastructure and private property.

DEQ partnered with the US Environmental Protection Agency (EPA) to evaluate property within the counties affected by the fires for household hazardous waste and other dangerous substances, and safely remove them as necessary.[4] Examples of hazardous waste include propane tanks, ammunition, oil, gasoline, solvents, paints, pesticides, and bulk asbestos. This cleanup work started in mid-October

[4] This work fell under FEMA Public Assistance Category B (Emergency Protective Measures), with the state share coming from the General Fund that the Legislature approved in DEQ's budget. This assistance was granted to the eight counties as well as most neighboring counties affected by the fires.

and was predominantly completed by early December 2020 and paved the way for ODOT's ash and debris removal efforts to then complete site cleanup.[5] The household hazardous waste was cleaned up at no cost to the property owner.

Source: ODOT

Work to reopen highways, which included clearing immediate hazards, was eligible for funding from the Federal Highway Administration's Emergency Relief Program. As the fires were still burning and firefighters were trying to gain containment, ODOT began clearing trees and other debris from roadways, pushing it off to the side of the road to open one lane of traffic for essential personnel to access areas within the corridors.

While the fires were still active, ODOT staff also began surveying the damage in accessible areas for emergency protective measures. ODOT foresters reported tens of thousands of hazardous trees needed to be removed and reported it would not be practical to have ODOT foresters mark all those trees. In some areas, ODOT worked with contractors to remove immediate danger trees on public and private land along the highway rights of way to facilitate highway re-opening. ODOT did not remove any trees out of the fire corridors during this time.

While ODOT was addressing debris impacting the roadways, other parties were in the area assessing their properties and some also were cutting down trees. For example:

[5] Property owners who did not sign up while the EPA was doing work in their area were still allowed to participate in the state-led cleanup. Property owners had till September 15, 2021, to sign up to participate.

- The US Department of Agriculture (USDA) Forest Service assembled a Burned Area Emergency Response team of experts in soils, geology, hydrology, engineering, botany, recreation, archaeology, wildlife, fisheries, and Geographic Information Systems in late September 2020 to assess post-fire effects to their managed lands.
- Utility companies, which have easements on public and private lands that allow them to cut vegetation and trees in order to manage and maintain their power infrastructure, were cutting trees.[6] ODOT forester reports documented utility companies had crews removing trees that threatened powerlines or impacted reconstructing powerlines within different fire corridors. Trees that utilities fell were left at the site for the property owner.
- When evacuation orders were lifted — which was dynamic based on address conditions — and roads were accessible to the public, private landowners (both individual and commercial) were able to address any tree damage on their property.[7] They could cut and remove trees off their property as they saw fit.

Source: ODOT

During the emergency, there was no tracking or quantifying the number or location of trees cut during the response and Phase 1 recovery period. There are no reliable figures on the quantities of trees cut by whom.

[6] The scope of our review did not include utility easements on federal and private property as these are not lands managed by the state. The easements are between the utility companies and federal entities or private landowners.
[7] Evacuation orders were in place as of September 9th and reached their peak on September 12th, when about 698,100 people were under some form of evacuation level. The most significant decline in evacuations occurred on September 22nd, and all evacuation orders in the state were lifted as of October 14, 2020.

As part of its everyday work, ODOT has authority and removes hazardous trees on public and private property to ensure the safety of the highways

As part of regular highway maintenance, ODOT maintenance managers determine immediate tree hazards and remove the trees to help maintain a safe and efficient transportation system.

State laws and rules (ORS 366.365 and OAR 734-035-0150) allow ODOT to cut and remove any tree located on private property that threatens the highway and creates an immediate and substantial risk of damage or injury, which occurs when the tree:

- interferes with the safe, unrestricted movement of traffic;
- is encroaching on the state highway; or
- is in a condition that creates a reasonable likelihood it will, in the foreseeable future, encroach on the state highway to a degree that traffic should be restricted or prohibited from using the highway.

ODOT is allowed to enter private property to remove the tree if the owner is not readily available; the agency must provide a written notice to the property owner after the fact. Trees are left on the property if it reasonable to do so, otherwise the owner has 30 days to claim or recover the tree at the property owner's expense.

ODOT maintains a Memorandum of Understanding with the Forest Service regarding construction, maintenance, and operation of state highways within federal forests. As part of this memorandum, ODOT may identify and remove imminent hazardous trees, leaving the logs in a safe location to dispose of.

Additional recovery work focused on removing widespread hazards to highway safety and assisting with personal property cleanup

When FEMA approved the state for FEMA Public Assistance Category A – Debris Removal[8] on October 5, 2020, debris removal became the responsibility of FEMA and use of funds from the Federal Highway Administration's Emergency Relief Program for roadway cleanup became ineligible. This is where recovery efforts started to transition to Phase 2.

Phase 2 recovery work focused on hazardous tree and ash and debris removal.[9]

- Right-of-Way hazardous tree removal (ROW) - removal of cut trees, slash, debris, and log decks left from wildfire response efforts and trees located along public roadways that would impact travel safety.[10] There were nearly 120 miles of highway affected by the wildfires.
- Private Property Debris Removal (PPDR) - removal of ash, debris, and hazardous trees from burned properties as well as property soil testing for all cleaned properties for individuals who elected to have the state do the cleanup for them. As of September 29, 2021, there were 3,080 private property lots enrolled for cleanup.

[8] FEMA Public Assistance Category A (Debris Removal) provides funding for the clearance, removal, and disposal of wreckage from the emergency work or other disaster-related wreckage (e.g., trees, woody debris, mud, damaged building pieces and contents). Government agencies are responsible for the debris removal.
[9] See Appendix C for examples of ODOT's right-of-way hazardous tree removal and PPDR work.
[10] Where ODOT has rights of way within the fire corridors, the area width varies from 80 to 200 feet; otherwise, there are easements that set the area around the paved highway that ODOT maintains to ensure highway safety. The actual work zone for the Phase 2 recovery work may extend beyond ODOT's rights of way or easements.

AC Disaster Consulting continued providing FEMA Public Assistance Program technical assistance during Phase 2. Additionally, the firm provides project management and compliance monitoring for the project, as well as providing customer service to PPDR subrecipients and working directly with FEMA to facilitate public assistance delivery.

As part of Phase 2 recovery, a number of contractors and consultants were brought in to help organize and conduct the debris removal work. Beginning in October and continuing through December 2020, ODOT contracted for debris removal operation services. ODOT required all of its contracted firms to submit a diversity plan to provide opportunities for local and diverse contractors.[11]

While FEMA does not require contractual or aspiration goals for diversity, ODOT included goals and values into its contracts and required contractors to report demographic figures to ensure alignment. For August 2021, **Oregon-based firms reportedly made up 155 of the 163 subcontractors (95%). Oregonians make up 67% of total project employees.** The Debris Management Task Force also reported greater gender diversity than post-disaster recovery work worldwide and a higher racial and ethnic diversity than ODOT's Aspiration Diversity Targets for federally funded projects.

ODOT contracted with an external monitoring firm, as FEMA requires monitoring of all debris operations as a condition of public assistance. ODOT selected CDR Maguire, Inc. (CDR) through a competitive bidding process.[12] Monitoring activities eligible for FEMA reimbursement included overseeing actual cleanup activities by hazardous tree and debris removal subcontractors; documenting hazardous tree and debris removal and related support services from burned areas; assisting ODOT in developing a system to review invoices and track costs of removal operations at each cleanup site; and ensuring that key people are properly trained to conduct the assigned work. CDR subcontracted with Mason, Bruce, & Girard, Inc. (MB&G) for additional arborists and foresters for hazardous tree identification. All arborists and foresters were required to have an arborist credential or forestry degree as well as at least five years of post-fire assessment in northwest forests.[13] CDR also subcontracted with MB&G and Historical Research Associates Inc. (HRA) for identifying and helping to protect environmental and cultural resources during tree removal operations. ODOT pays an hourly rate for CDR's monitoring work.

Given the large geographic area and immense volume of work, ODOT elected to award the hazardous tree and ash and debris removal contracts over multiple operational areas and not as a single statewide contract. ODOT contracted with five prime contractors to perform the hazardous tree and debris removal work: AshBritt, Inc. and K&E Excavating, Inc. for ash and debris; and Ceres Environmental Services, Inc., ECC Constructors, LLC., and Suulutaaq, Inc. for hazardous trees. Examples of FEMA-eligible activities performed by prime contractors conducting tree removal services included:

- mobilizing and demobilizing work crews from the site of operations;

[11] This included promoting and supporting entrepreneurs and small businesses, expanding business development, connecting rural communities to urban markets, promoting mentoring for enterprises that are disadvantaged, minority-owned, women-owned, emerging small businesses, service-disable veteran's businesses (DBE, MBE, WBE, ESB, and SDV) that are certified COBID, as well as self-certified Small Businesses, and supporting local communities.
[12] ODOT used a modified form of emergency contracting to satisfy FEMA's requirements for competitive contracting.
[13] A Certified Arborist credential from the International Society of Arboriculture (ISA) or a Forestry degree from a Society of American Foresters accredit forestry school as well as at least five verifiable years of post-fire assessment in Northwest conifer forests along with mixed deciduous tree stands – for tree health and stability and demonstrated understanding of forest management practice.

- removing marketable logs, loading the logs onto trucks, transporting them to designated log decking areas, off-loading and decking the logs;
- transporting debris tree slash to chipping sites, and spreading the chips at designated areas for erosion and sediment control purposes; and,
- controlling traffic around work zones.[14]

ODOT's tree removal prime contractors are paid a set rate based on the size of log or tree for their hazardous tree removal work. FEMA requires extensive documentation to substantiate work performed and determine reimbursement eligibility. Each tree removed must be cataloged and photographed.[15] Contractor invoices are reviewed by CDR, AC Disaster Consulting, and ODOT prior to payment.

Contractors are not allowed to remove any tree not previously identified, documented, and marked for removal by arborists or foresters. Contractors may be fined $2,000 per tree for removing any unmarked tree. As of the beginning of August 2021, seven trees that may have been improperly removed were under review by ODOT management.

To oversee contractor work, ODOT managed the Phase 2 work under the Incident Command System (ICS).[16] CDR, as the project monitor, was also required to staff key positions that reflected ICS's five functional areas: command, operations, planning, logistics, and finance/administration. These contract positions supported ODOT's Incident Management Team; for example, implementing the Debris Removal Operations Plan and developing strategies to accomplish incident objectives.[17]

Phase 2 recovery work began in December 2020, with contractors ready. Within each fire corridor, there were multiple organizations and people on-site involved in the hazardous tree removal process. This included CDR arborists identifying and tagging trees, CDR staff recording tree information, MB&G staff reviewing tagging trees and consulting on environmental requirements, Historical Research Associates consulting on cultural resources, prime contractor crews cutting trees, ODOT staff ensuring contractors are adhering to contract terms and resolving issues, AC Disaster Consulting staff making sure FEMA reimbursement requirements are being met, and Army Corps of Engineers staff monitoring operations for FEMA. Together these contractors have a broad range of environmental, natural resource, regulatory, and subject matter expertise. ODOT on-scene incident commanders monitor and provide broad oversight of the full operation and all project teams to ensure recovery work is done in accordance with contract terms and the Debris Removal Operations Plan. The ODOT on-scene incident commanders also have ODOT staff to support them in a variety of operational roles, such as geological and forestry expertise, safety, and staff support. Figure 5 shows the staff working within the fire corridors and their roles.

Daily, project teams work their way through fire-impacted corridors to assess, re-assess, and perform signoffs for quality control and regulatory compliance before fire-damaged trees are cut. Team members meet on site each morning to receive safety and operational briefings, assignments, and objectives for the day. In addition to daily field briefings, these project teams stay connected through

[14] Debris tree slash consists of an assortment of tree limbs, non-marketable logs of all sizes, and other vegetative materials.
[15] Full details are shown in Appendix D.
[16] The Incident Command System is a standardized approach to the command, control, and coordination of on-scene incident management that provides a common structure within which personnel from multiple organizations can be effective. The structure integrates and coordinates procedures, personnel, equipment, facilities, and communications.
[17] See Appendix B for the organizational structure for the hazardous tree and debris removal effort.

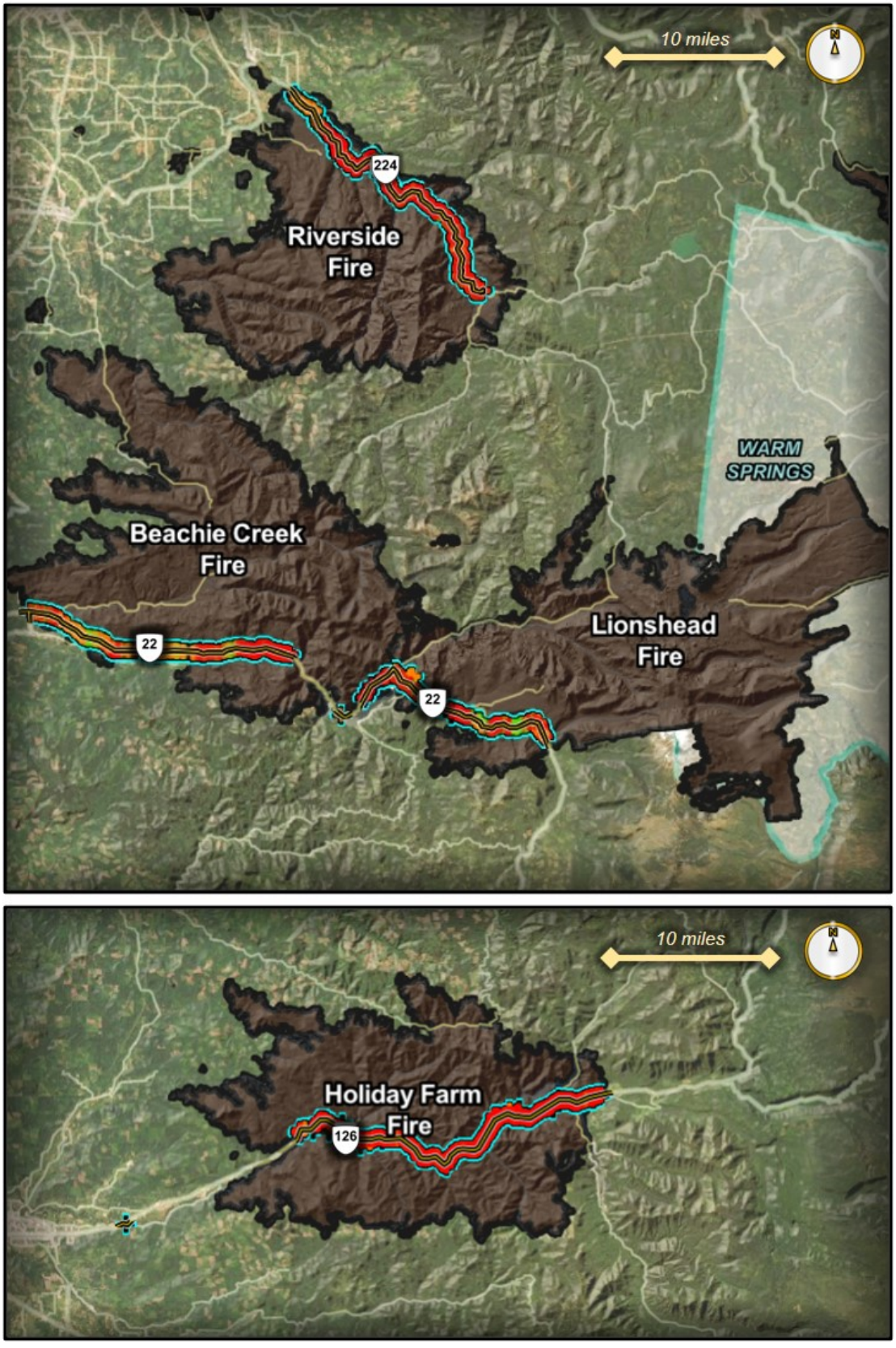
weekly coordination calls, weekly task force leadership check-ins, and daily oversight and coordination with on-scene incident commanders. Figure 6 and Figure 7 show where these teams are working along the highways in the three largest fire corridors.

Figure 5: Numerous staff were involved in the right-of-way hazardous tree work within the fire corridors

Those Involved in Hazardous Tree Removal Operations Within the Fire Corridors	Roles and Responsibilities	Total Staff in the Fire Corridors May 2021	Total Staff in the Fire Corridors Aug. 2021
ODOT	Performing oversight and management of operations	13	10
Project Monitoring Consultant – CDR	Tagging damaged trees deemed hazardous and monitoring that work	114	67
Project Monitoring Consultant Subcontractor –MB&G	Conducting tree tagging, tree removal quality control review, and environmental monitoring	40	35
Project Monitoring Consultant Subcontractor – HRA	Mapping, monitoring, and notifying of cultural resources in work zones	15	10
Owner's Representative Consultant – AC Disaster Consulting	Monitoring to help ensure work meets FEMA requirements	4	2
Prime Contractors - Suulutaaq, Ceres, and ECC	Cutting the trees tagged as hazardous for removal	126	105
Prime Contractors – Suulutaaq, Ceres, and ECC	Hauling cut trees, debris, and processing and decking cut logs as well as grinding slash into wood chips	14	27
Prime Contractors – Suulutaaq, Ceres, and ECC	Providing traffic control for safe travel through the fire corridors during the removal operations	84	71
Prime Contractors – Suulutaaq, Ceres, and ECC	Implementing erosion control measures	14	3
US Army Corps of Engineers	Providing overall supervision for FEMA	8	3
	Totals	**432**	**333**

Source: ODOT

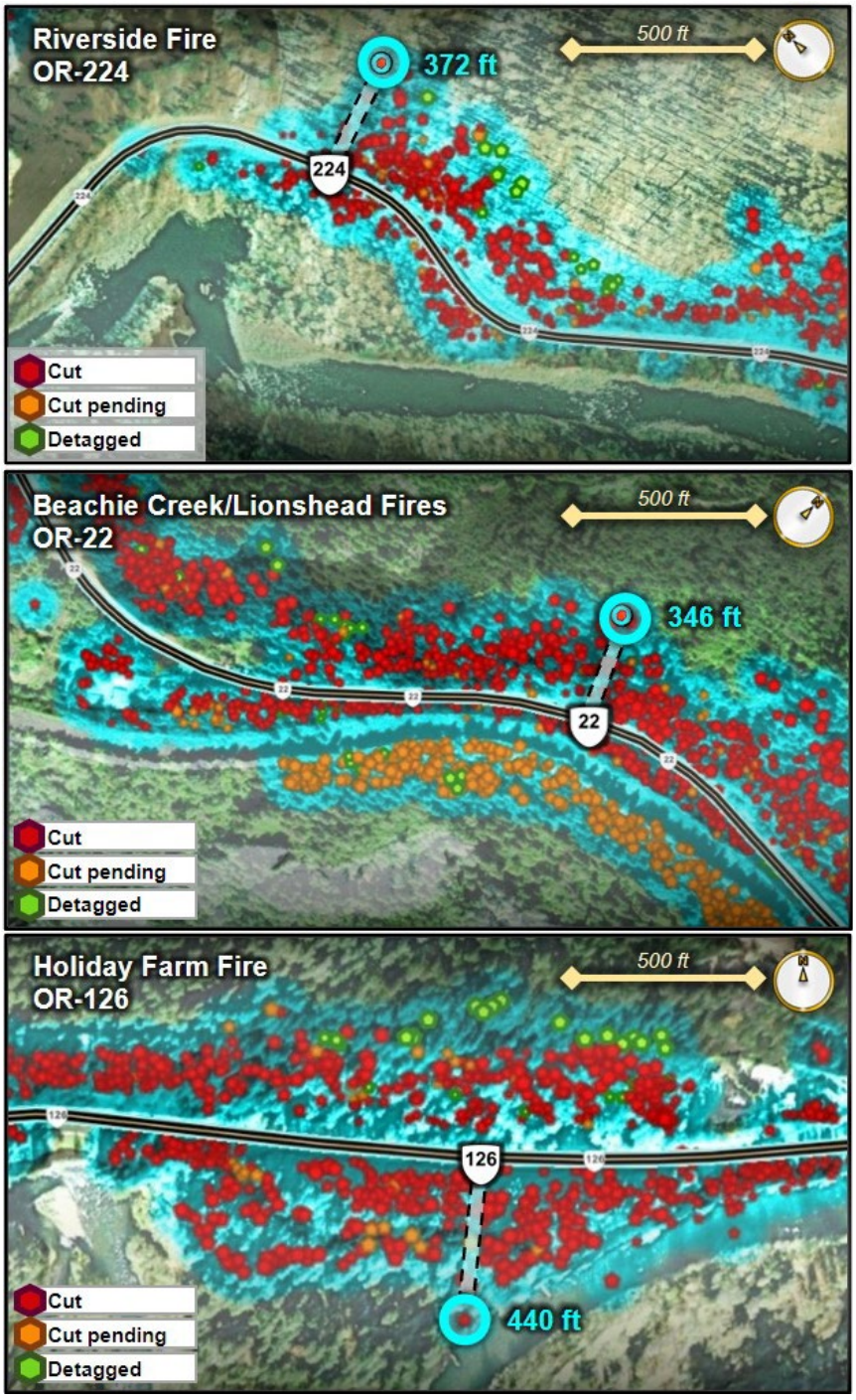
Figure 6: Hazardous tree removal along the highway right of way in the three largest fire corridors



Notes: Figures depict right-of-way trees cut or tagged to be removed as of September 15, 2021. PPDR hazardous trees are not included in the figure.
Source: CDR data.

Figure 7: Close up views of sections of right-of-way hazardous tree removal in the largest fire corridors

The dots represent individual trees inspected by arborists or foresters because the trees had visible fire damage. ODOT's right-of-way work zone varies based on the terrain. One of the farthest distances from the road is depicted on each map. According to ODOT, the trees being removed are hazardous and within striking distance of the road. Different factors, like the height of the tree and slope of the terrain, impact how far from the road trees need to be removed to make the highways safe.

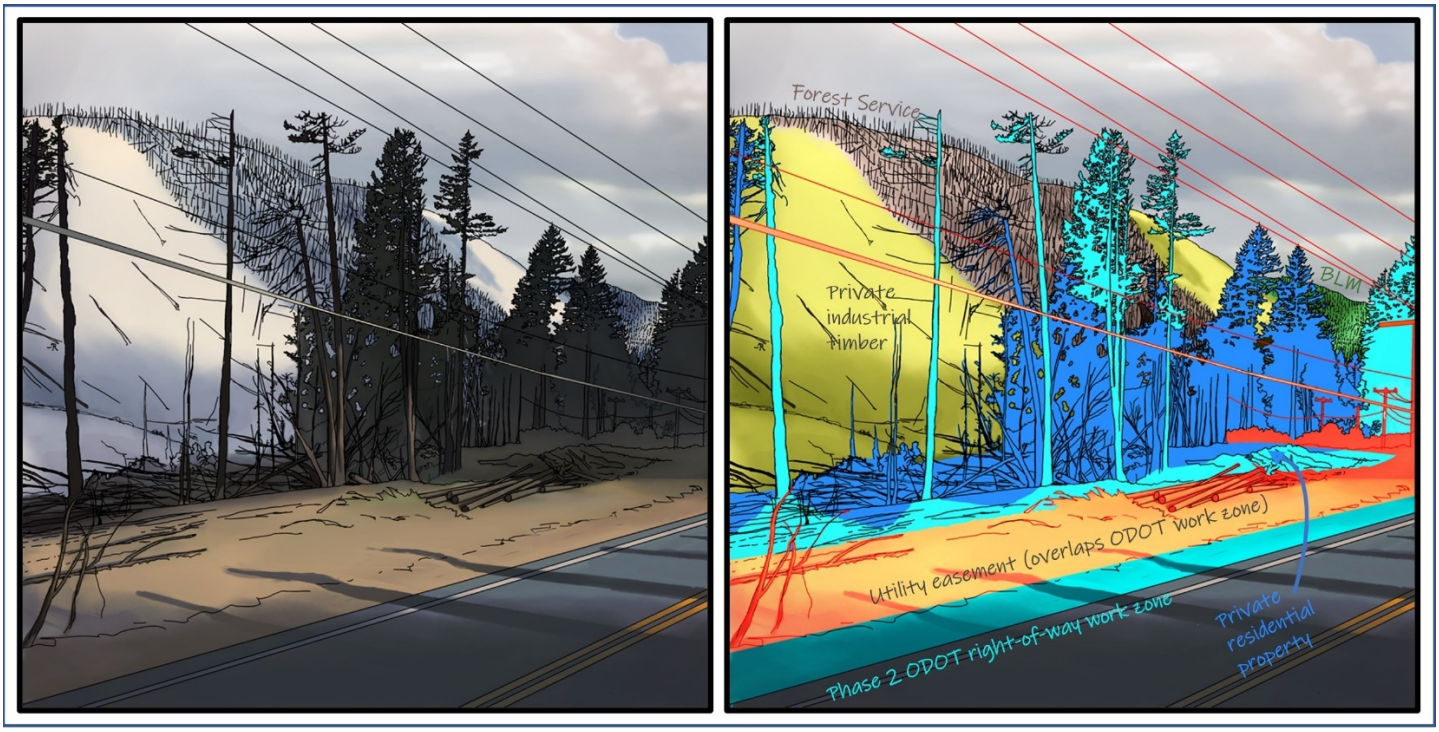


Notes: Figures depict right-of-way trees cut or tagged to be removed as of September 15, 2021. PPDR hazardous trees are not included in the figure.

Source: CDR data.

Figure 8 illustrates what someone might see driving though a fire corridor. One view may include the lands of multiple owners. For example, ODOT has easements or rights of way along the highways, and utilities may also have easements that overlap in the same area.

Figure 8: ODOT, private landowners, and utilities perform work visible from the highways – sometimes adjacent to or on top of one another – making it difficult to discern whose work the public is viewing



Note: The distance of ODOT's work zone from the road varies based on the slope of the terrain and height of trees.
Source: Auditor-produced representative illustration. Illustrations do not depict a specific location but rather are a compilation of photos of damage across multiple 2020 Oregon wildfire work areas.

Up until at least September 2021, ODOT had not removed trees from the fire corridors as the trees cut down from ODOT's work were legally owned by other entities and no sales had been completed. ODOT was awaiting agreements with the Forest Service and Bureau of Land Management (BLM) to transfer ownership so it could advertise and sell the timber on the open market. This arrangement is intended to expedite removing the timber from the fire corridors where there is limited storage space.

ODOT's Phase 2 debris removal responsibilities does not include replanting and restoration of trees in the fire affected corridors. Most of the hazardous trees removed were on private or federal lands and it is the landowner's choice of what they want to do on their property. According to ODOT management, native grasses, shrubs, forbs, and deciduous tree sprouts have reestablished this past spring in most areas where removal work occurred. From collaborative efforts with federal and state partners, it is also anticipated that many of the habitat trees left in the corridors will help provide dynamic forest conditions for regeneration and growth as well has habitat benefits. There are also some local organizations that have programs to partner with private landowners with replanting and restoration efforts.

Phase 2 recovery work was estimated to take around six to 18 months to complete. As of September 24, 2021, the percentage of completed work was about 66% for hazardous tree removal and 88% for clearing individual home and commercial properties. Yet there have been factors affecting the work,

such as difficult terrain to access in some corridors, weather conditions, fire season restrictions, and concerns with contractor work. For example, Oregon had record-breaking heatwaves in 2021 that further stressed fire-damaged trees, fire season restrictions limiting or stopping work in a corridor, delays with a prime contractor to complete work, and the changing of the prime contractor working on the Beachie/Lionshead and Riverside fire corridors.

Source: ODOT

Question 2: How was ODOT's criteria for assessing hazardous trees determined, what were the criteria factors, and were any changes made to it during recovery efforts?

Answer: FEMA has insufficient criteria for what constitutes a hazardous tree from a wildfire event. ODOT's contractor developed hazardous tree removal criteria that used industry and Forest Service publications. ODOT's criteria builds on FEMA's criteria and additionally considers factors such as a tree's ability to strike the road, the tree species, fire damage to the tree structure, and the likelihood of the tree's survival. The criteria was revised several times after implementation in the field.

September 7, 2020
Historic wildfire event begins.

September 27, 2020
ODOT begins to develop the Oregon Wildfire DROP.

November 17, 2020
FEMA directs ODOT/DMTF to proceed with hazard tree work for reimbursement.

November 19, 2020
CDR hired as debris monitoring firm; CDR hires MB&G as sub-contractor.

January 1, 2021
CDR completes the first version of the hazardous tree removal criteria. Hazardous tree removal criteria being used in the field.

January 1, 2021 through May 27 2021
Hazardous tree removal criteria revised 10 times.

ODOT had criteria and protocols created to assess whether damaged trees were hazardous, as FEMA criteria was not designed for wildfire disasters

FEMA has criteria defining what constitutes a hazardous tree, but it is geared toward disaster events like hurricanes, ice storms, and tornadoes, not wildfires. With no specific FEMA guidance, ODOT and AC Disaster Consulting had early conversations with FEMA to define a "hazardous tree" in the wildfire landscape to make sure the state would be eligible for federal public assistance to help pay for the cleanup. A primary goal for ODOT when removing hazardous trees is safety for those traveling through the corridors and preventing trees that would later fall onto roadways or structures. Additional factors considered for tree removal were adhering to state and local regulations, laws, and ordinances for environmental and historical preservation.

The 2020 wildfires left many damaged trees adjacent to the highways. The number of trees to remove was initially estimated at 300,000 and later reduced to around 140,000. With the multiple parties involved, ODOT had its contractor, CDR, establish the criteria to use in determining which damaged trees are hazardous that need to be removed. CDR hired an arborist, in partnership with a MB&G forester, to lead in developing the tree removal criteria specifications. According to the arborist and forester involved, the protocols were formed from researching International Society of Arboriculture and Forest Service hazardous tree assessment publications, academic papers for specific tree species mortality after a wildfire, and criteria used by California and other arborists and foresters for similar situations.

The first protocols were released in early January 2021, and project arborists were trained on them. They used debris management software applications to capture data on damaged trees deemed hazardous to meet FEMA reimbursement documentation requirements. The criteria was revised after it was implemented in the field as staff realized more clarification and modifications were needed to recognize operational realities in the field. The criteria continued to evolve, with multiple versions, up until May 2021. Whenever there were changes to the criteria, consultants stated that trees were reassessed to make sure they met the existing criteria prior to being cut down.

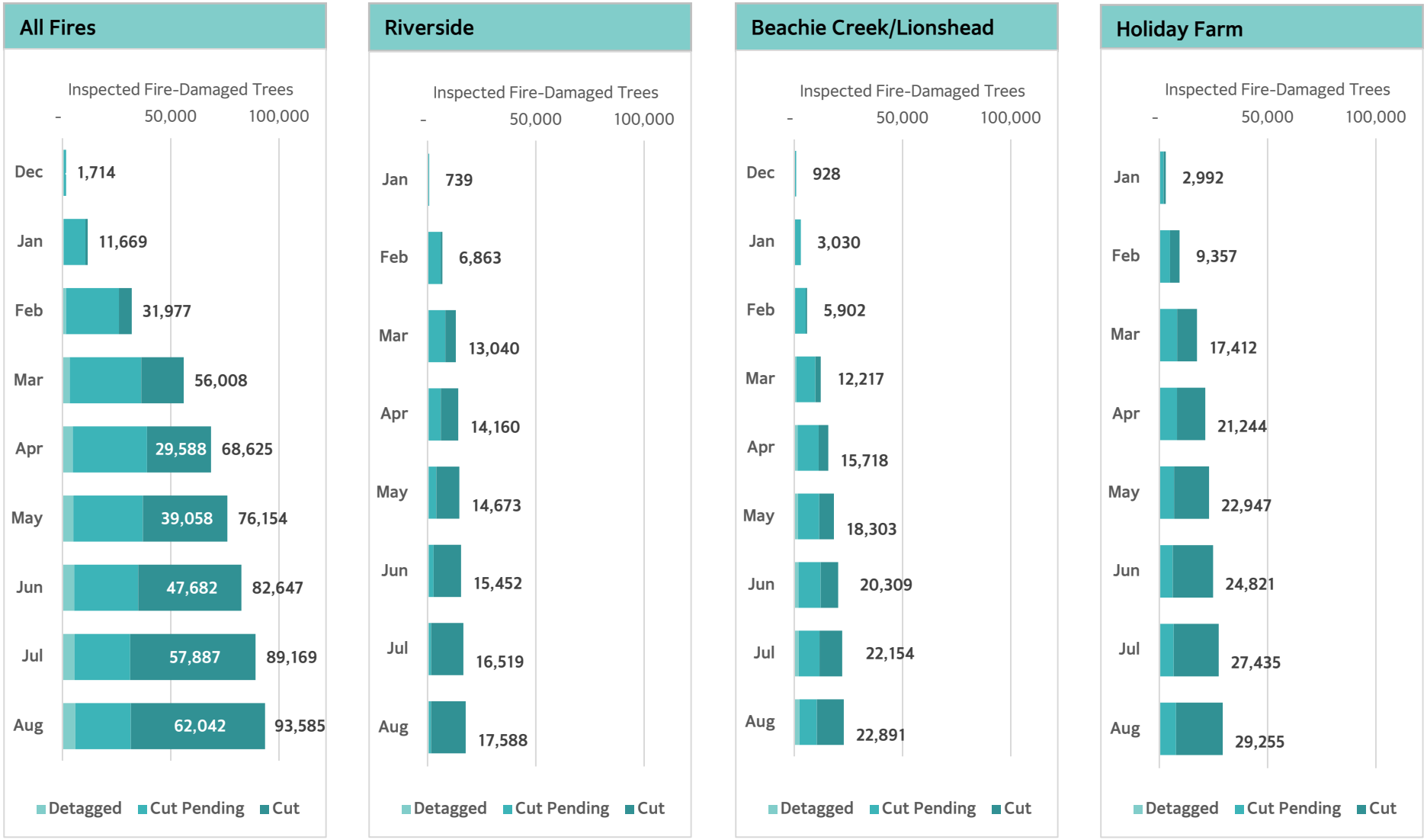
Figure 9 shows the cumulative status of inspected trees for all of the fire corridors as well as the status of trees in the three largest fire corridors. This includes trees tagged but yet to be cut, trees that have been cut, and trees detagged after another review deemed them not hazardous.

Top: A cutting crew member working atop the steep cliffs in the Riverside Fire along Highway 224.

Bottom: A chainsaw perched on the edge of a cliff in the Riverside Fire corridor.

Source: Suulutaaq, Inc.

Figure 9: Cumulative status of inspected damaged trees as of August 19, 2021



Note: Only trees that suffered damage from the wildfires are inspected and included in the data. The data does include trees without visible damage. Additional trees will continue to be assessed as the work progresses.

Source: CDR data.

March 14, 2021
MB&G issues memo to staff to begin using QC guide.

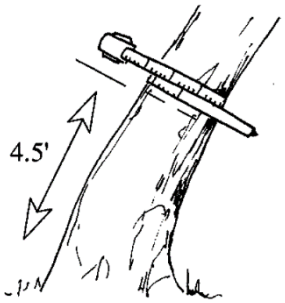
March 20, 2021
Second and final version of QC program guide issued.

May 27, 2021
Current version of tree assessment protocol, version 10, completed.

June 2, 2021
Independent arborist issues report on ODOT hazardous tree operation.

ODOT criteria includes multiple factors to assess whether damaged trees pose a hazard

Key components of ODOT's hazardous tree removal criteria include FEMA's definition of a hazardous tree, information about specific tree species, the extent of fire damage to a tree's structure, characteristics of the terrain, and a tree's likelihood of survival.



FEMA considers a tree to be hazardous if its condition was caused by a disaster; it is an immediate threat to lives, public health and safety, or improved property — meaning any structure, facility, or equipment that was built, constructed, or manufactured; it has a diameter breast height, or the diameter of a tree taken 4.5 feet above the ground line on the uphill side of a tree, of six inches or greater; and one or more of the following criteria are met:

- 50% or more of the branches, leaves, and structures extending from the trunk are damaged or destroyed;
- a split trunk or broken branches exposes the heartwood, or central, supporting pillar of a tree;
- it has fallen or been uprooted within a public-use area; or
- it is leaning at an angle greater than 30 degrees.

ODOT's hazardous tree criteria have several additional factors to help assess wildfire damage. A key criterion is whether a tree is within what is known as striking distance of the road, which considers the height of a tree.[18] Arborists assessing trees also look at the slope of the landscape and how much a tree leans to determine if a tree threatens a road. In addition, they assess:

- the species of a tree, which provides information about a tree's resilience;
- the fire damage to a tree's structure — including the extent to which a tree's branches and leaves has been scorched — bark char, which is how much the base of the tree and stem are damaged, and whether the root system is burned out or the growing part of the trunk is dry or brittle; and
- insect damage and disease.

[18] Striking distance is defined as 1.5 times the tree's total height. If a tree is 100 feet tall, the striking distance is 150 feet from the road right of way, defined as the edge of the asphalt. While this is one criteria, the slope of the terrain may necessitate removing trees farther than 1.5 times a tree's total height.

ODOT's criteria are tailored to the different topography within each fire corridor, which ranges from flat and gentle to the presence of vertical cliffs. Collateral trees are cut if needed to safely fell hazardous trees in the area. For trees atop steep cliffs, the initial assessment is done using a drone. An analyst assesses the data and makes the determination about whether the tree needs to be removed. If it does, then cutters rope to the tree to remove it. In this way, Oregon's drone program, which is supported by FEMA, limits the risk to workers.

Left: Flat ground along Highway 22 in the Beachie Creek/Lionshead Fire corridor.
Center: Sloped ground along Highway 22 in the Beachie Creek/Lionshead Fire corridor.
Right: Steep cliffs along Highway 224 in the Riverside Fire corridor.

ODOT appeared to take measures to conserve trees. The agency uses a three-year timeframe, instead of FEMA's five-year period, for evaluating the potential risk of hazardous trees to roads, which reduced the number of trees removed. Additionally, trees on the cusp of being a safety risk were not removed and will be monitored to see how they respond to the dry summer months, the ongoing drought, wind events, winter storms, and soil erosion due to the fires. Such was the case for the Eagle Creek Fire in 2016, where additional hazardous trees were removed for years after the fire.

Oregon's extreme heat and drought conditions in the summer of 2021 has affected already stressed trees that were left within the fire corridors. According to ODOT, the agency plans to take another pass through each corridor as part of the final cleanup process, and while FEMA is still helping to pay for the removal, to make sure all hazardous trees have been removed. As of mid-August 2021, consultants visually estimated there are another 750 trees need to be reassessed as they may now meet the criteria to be considered hazardous.

ODOT instituted a quality control review process for right-of-way tree removal

As this was the first time the state was conducting this magnitude of debris management work, multiple organizations and people were involved with the hazardous tree identification and removal (e.g., multiple arborists, tree cutting firms, and consultants), and there was public scrutiny of how trees were being identified and removed. MB&G conducted a quality control review process to provide assurance and further consistency in hazardous tree determinations. This is not required by FEMA and is atypical according to the consultants we spoke with. The purpose of the quality control review was

to limit misinterpretation of the tree removal criteria by the many arborists assessing the trees and ensure all trees have been identified correctly and only remove trees according to hazardous tree criteria.

The quality control process begins after arborists assess and tag hazardous trees for removal in a fire corridor. Personnel from MB&G conduct this process in two phases. First, before cutting operations, MB&G arborists or foresters reassess trees that have been marked, or not marked if they note damage that appears to meet the hazardous criteria, for removal. Trees that had been previously marked for removal can be detagged and trees not previously marked can be newly tagged, in accordance with current hazardous tree criteria. Second, during cutting operations, MB&G arborists or foresters work directly with the cutters to make a final assessment on the trees and they assist with marking collateral trees that may need to be taken out to safely remove hazardous trees.

Criteria for this quality control process was drafted as of the start of January 2021, at which point no trees had been cut, and the final criteria were implemented by early March 2021. As CDR arborists and tree cutters were already in the field, there were about 12,400 trees initially cut and removed prior to the March implementation of the formal quality control process. The vast majority of trees removed (over 80%) were subject to the finalized quality control review process.

Left: A hazardous tree marked for removal.
Center: A tree tag.
Right: Tree tags that have been removed through the quality control process. | Source: CDR

ODOT had an independent consultant review its hazardous tree identification process

ODOT retained Washington Forestry Consultants, Inc. to conduct an independent review of the agency's hazardous tree operations. The focus of the review was to help address concerns raised about tree operations, how trees were determined to be hazardous, and the qualifications of individuals making those determinations. For the evaluation, the consultant reviewed documents used to implement and manage the hazardous tree removal program, a sample of trees, qualifications of contracted arborists and foresters, and data gathered on hazardous trees for accuracy and completeness.

The consultant's June 2021 report[19] concluded that no changes were needed to ODOT's current protocols. The review found:

- ODOT had the necessary operational plan, protocols, contracts, and requirements necessary to conduct the operation and provide quality assurance. Protocols and data were consistent with industry standards.
- Over 96% of the trees were correctly marked. This level of agreement was considered very good given the variability of the tree populations and tree damage, the difficult terrain, and weather challenges.
- 99% of the trees marked for removal were dead or in poor condition.
- 98% of the arborists and foresters were qualified to do the work.
- The quality control review of the trees after the arborists and foresters have inspected them was adequate.

The consultant estimated about 42% of the tree population along the three largest fire corridors had been marked for removal, meaning that 58% of the trees were preserved.

[19] Read the independent consultant's report here.

Question 3: What efforts has ODOT made to preserve and consider ecologically sensitive areas and cultural resources when removing hazardous trees?

Answer: ODOT worked with various stakeholders and incorporated multiple, complex federal and state regulations to create an Environmental Protection Plan (EPP). The EPP is the guide used by ODOT, consultants, and contractors to address environmental needs while removing hazardous trees.

September 7, 2020
Historic wildfire event begins.

September 27, 2020
ODOT begins to develop the Oregon Wildfire DROP.

October 2, 2020
ODOT Environmental Manager tapped to lead EPP development.

October 6, 2020
ODOT begins work on EPP development.

December 28, 2020
Fist iteration of the EPP finalized.

December 30, 2020
DROP, version 1 published.

January 4, 2021
DROP/EPP training held for Phase 2 personnel.

January 15, 2021
First hazardous tree cut.

ODOT's statewide Environmental Protection Plan incorporated complex regulations and involved input from a variety of stakeholders

Environmental laws are in place to protect human health and natural resources, both at a federal and state level. For emergency recovery, the Governor can waive environmental regulations. While this may have been the case in other states, Oregon preserved environmental regulations. Oregon has a wealth of natural resources of great importance to its people.

With limited state plans in place for debris removal, ODOT had to rapidly develop an Environmental Protection Plan (EPP), a part of its Debris Removal Operations Plan (DROP), to help protect public safety, health, and the environment during emergency recovery efforts.

In creating the EPP, ODOT staff faced the challenge of addressing an unprecedented crisis while maintaining compliance with a myriad of regulations – at least 11 federal and 17 state laws – as well as adhering to several forest management plans. The requirements can differ or conflict for various areas of the state and within specific sites. For example, an environmental goal is to move large woody debris into streams to support fish habitat, but in FEMA-regulated floodplains, this can trigger extensive analysis to ensure there is not a rise in flood waters. This is an example of the complex nature of multiple regulations that was addressed in developing the EPP.

ODOT staff hurried to draft an initial version of the EPP in just over a month by quickly organizing with state agencies, such as DEQ, and federal agencies, such as the Forest Service and Bureau of Land Management (BLM), for input on drafts. ODOT also coordinated with regulatory agencies to obtain necessary permits and clearances, and to bridge competing requirements.

March 10, 2021
EPP version 2 produced.

March 11, 2021
Interim email guidance on fish log request process issued.

April 2, 2021
Interim email guidance on large wood in tributary streams issued.

June 15, 2021
Interim email guidance on removal of large trees issued.

Throughout initial drafting and after, ODOT worked with over 13 regulatory agencies to determine guidelines or obtain permits and clearances for project requirements to incorporate into the plan. For example:

- Within a few weeks, ODOT convened a workgroup with the Forest Service, BLM, and the Oregon Parks and Recreation Department to define a single set of leading management practices for hazardous tree removal in scenic corridors, which are regulated by overlapping laws and forest management plans.
- ODOT staff coordinated with the U.S. Fish and Wildlife Service Migratory Bird Treaty Act Office to clarify permit requirements for the project to balance the safety concern of the hazardous trees with protections for the birds.
- ODOT partnered with FEMA to hold meetings with tribal governments, Forest Service and BLM archaeologists and historians, and the State Historic Preservation Office, and shared drafts with tribal governments and agencies for their input on the protection of cultural and historic resources.
- ODOT worked with FEMA and the University of Oregon Museum of Natural and Cultural History to gather cultural resource data for the affected areas from federal and state agencies. The data would be used to help flag known sensitive areas to avoid.

After the initial EPP draft, ODOT staff acquired additional time to continue working on it. ODOT worked with partners and involve additional stakeholders in further developing the plan. The agency also shared drafts for review and input from key ODOT staff and a contractor involved in the plan's implementation. According to agency staff, the first EPP was finalized on December 28, 2020.

The plan provides guidance for activities such as erosion and sediment control, use of equipment, and vegetation clearing. It also details many conditions and scenarios under which crews are to delay or stop work to consult with ODOT staff and others such as FEMA and Forest Service.

The EPP has continued to evolve. ODOT staff continued to update the EPP to address unanticipated scenarios, changing conditions, and feedback from the field. Since releasing the latest version in March 2021, ODOT staff have issued additional supplemental guidance.

Cultural resource protection is one area of prominent focus in the EPP. Minimizing impacts to these resources is critical for respecting the ancestral homelands of federally recognized tribes and the shared history of Oregon lands. According to archeological consultants, the 2020 wildfires spanned areas with roughly 300 resources known and uncovered in the field as crews worked to identify hazardous trees and clear debris; see Figure 10.

Figure 10: Within the fire corridors, almost as many archeological resources were inadvertently discovered as were previously recorded

Fire Corridor	Previously Recorded Archeological Resources	Inadvertent Discoveries of Archeological Resources
Riverside	33	11
Beachie Creek/Lionshead	38	33
Holiday Farm	11	31
Archie Creek	36	26
Thielsen	5	3
2-4-2	43	37
South Obenchain	14	2
Totals	166	141

Note: Figures are as of August 15, 2021, and are subject to change as work continues.
Source: Historical Research Associates, Inc.

Consultants noted the fire areas included a wide variety of archaeological sites and artifacts, including historic resources from as far back as the 1800s, such as railroad grades, wagon roads, and stone foundations, and resources dating back several thousand years such as lithic tools, like arrowheads. The EPP includes guidance and processes for archeological monitoring and discovery of potential resources, and outlines procedures for preventing damage to resources such as stone tools, ceramics, historical logging equipment, and foundations of structures.

From our communications with stakeholders involved in the recovery efforts, the majority felt their input was adequately incorporated, and generally described the EPP as a document that provided useful guidance for those in the field. Some noted the plan could use further refinements beyond the updates made, and several recommended ODOT incorporate lessons learned into an updated version for future disasters. Stakeholders from multiple regulatory agencies working with ODOT on developing the EPP praised ODOT staff for their responsive and collaborative communication approach. Some highlighted their longstanding effective partnership with ODOT, and commended staff's openness to change to make successful process improvements during recovery efforts.

ODOT staff, contractors, and consultants took efforts to ensure EPP guidance and environmental permits were followed during the tree removal process

ODOT staff and its contractors and consultants put in measures to help obtain required permits and ensure compliance with the EPP and project permits. These measures included: hiring environmental consultants to map natural resource locations, training for tree cutting monitors and crew, holding regular meetings, and having ODOT and consultant staff onsite while crews were cutting trees.

Before tree cutting began, environmental monitors mapped and cataloged natural areas in the fire corridors. They used a mapping tool and multiple data sources to identify and record the natural resources in the areas. For cultural resources, archeological consultants said they worked closely with ODOT, tribal monitors, and FEMA cultural staff to identify and safeguard cultural resources in the areas. Both environmental and archeological consultants flagged buffers around sensitive areas, so cutters could avoid dropping trees in these areas, and are on site to monitor tree cutting activities.

ODOT took efforts to ensure all staff involved in recovery efforts understood and adhered to the EPP's guidelines before and after work started. All contractors are contractually obligated to adhere to the EPP. Before recovery efforts began in December 2020, ODOT staff stated they met with contractor leadership to discuss the EPP requirements in detail, and later met with staff on how to apply the EPP in the field. ODOT staff have also held weekly calls with FEMA, environmental and archeological consultants, contractors, and the tribes to discuss developments in the field.

Prior to starting work, all ODOT staff, contractors, and monitors were also asked to take a training on the DROP and cultural resources, which highlighted the importance of the EPP and discussed some of the provisions. Environmental and archeological consultants are on site to assess conditions and meet with cutting crews. Consultants point out flagged environmental and cultural resource areas, discuss permit requirements, and any unusual circumstances. Typically, at least one environmental consultant and an archaeologist was devoted to each fire corridor to ensure compliance with the EPP and protection of cultural sites.

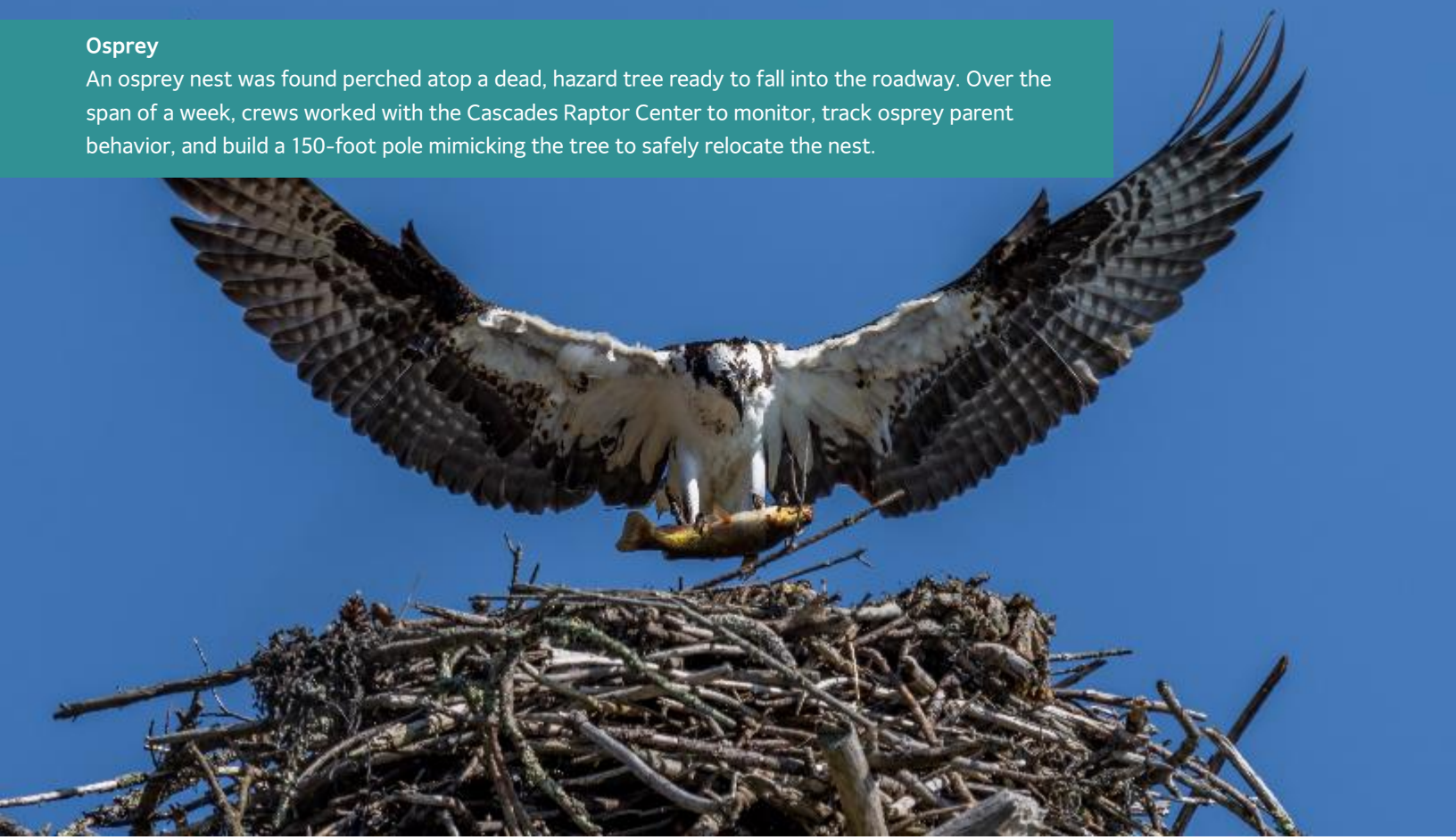
ODOT designated four regional environmental coordinators to act as the initial point of contact for environmental consultants to offer guidance on implementation of EPP when questions or issues arise, such as when a cultural site may be impacted. ODOT coordinators also work with regulatory agencies and other ODOT staff as needed to ensure permits and clearance is obtained for ODOT projects.

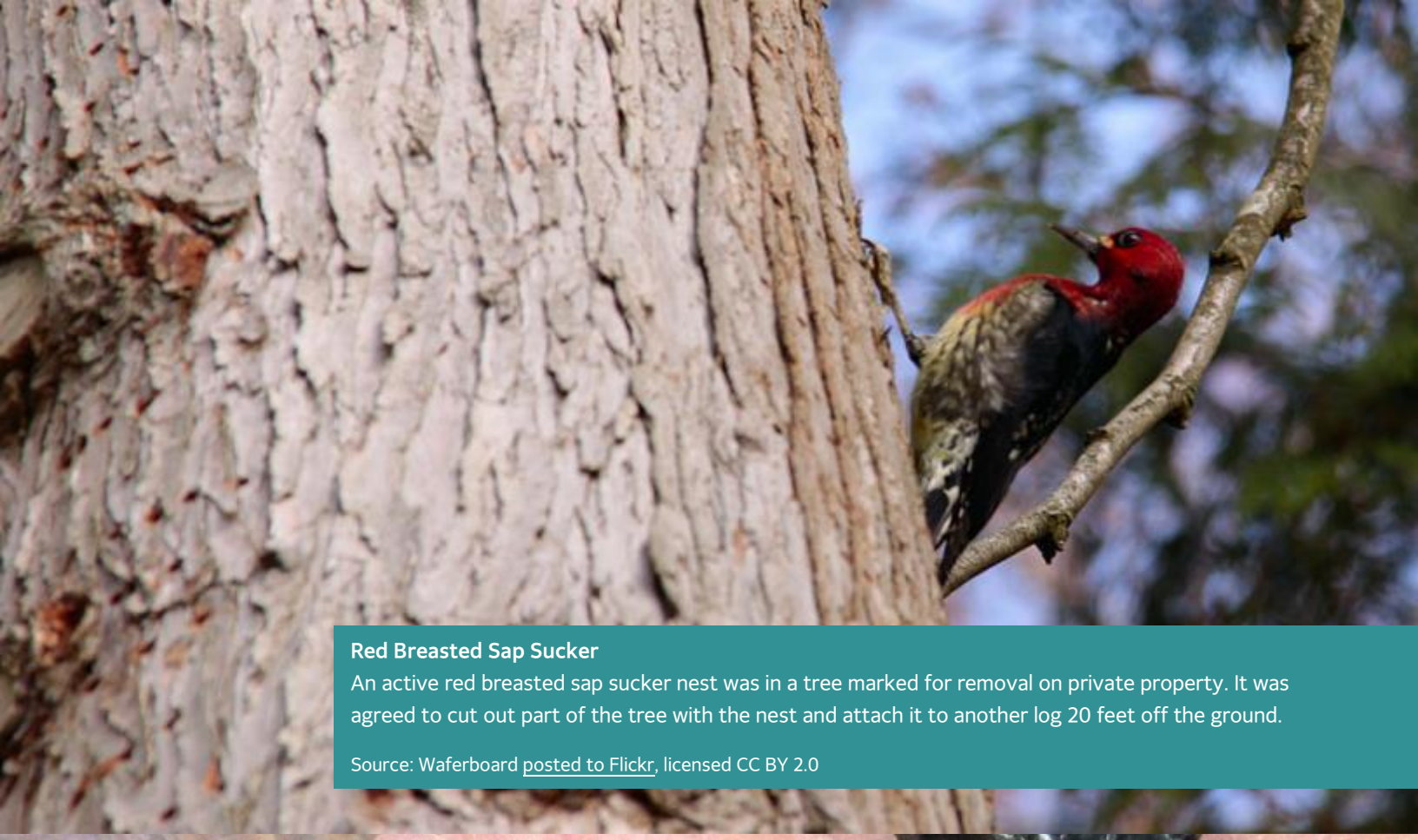
Forest Service representatives that worked closely with ODOT staff described ODOT as effective at making sure needed mitigations were taking place on the landscape and achieving cultural resource protections. Multiple stakeholders described ODOT's efforts to protect nesting birds as effective. A tribal representative praised ODOT crew coordination in the field that resulted in cultural resource discoveries.

Stories in the Field

Peregrine Falcons
Tree removal crews paused work near the Big Cliff area of the highway along the Clackamas River to allow its team of environmental experts to monitor a known bird nesting site. After three peregrine chicks were found nesting in the cliffs, the tree cutting crews temporarily avoided that area of the highway to stay out of the chicks' line of site until they fledged.

Osprey
An osprey nest was found perched atop a dead, hazard tree ready to fall into the roadway. Over the span of a week, crews worked with the Cascades Raptor Center to monitor, track osprey parent behavior, and build a 150-foot pole mimicking the tree to safely relocate the nest.





Red Breasted Sap Sucker
An active red breasted sap sucker nest was in a tree marked for removal on private property. It was agreed to cut out part of the tree with the nest and attach it to another log 20 feet off the ground.

Source: Waferboard posted to Flickr, licensed CC BY 2.0

Protecting Cultural Resources
Heavy machinery is not allowed within flagged cultural site boundaries unless it is on paved or gravel surfaces, or protective matting is placed under vehicle tires to minimize ground disturbance. Trees are picked up and lifted off the ground surface to avoid dragging logs within cultural site boundaries.

Source: ODOT

Culturally Modified Trees (CMTs)
Indigenous people in the Pacific Northwest both past and present modify trees for a variety of different purposes, including the collection of sap, production of textiles (e.g., basketry, hats, clothing), marking trails or locations of cultural importance, and using the cambium for food.

As of August 2021, 163 CMTs had been identified in the project including those that were previously recorded and relocated, according to ODOT's monitoring consultants.

Within the 242 Fire area, ponderosa pine CMTs are a common resource. ODOT's monitoring consultant teamed with the Klamath Tribes to ensure that a tribal monitor was present with arborists as trees were being evaluated and marked as hazards. The team effort resulted in the identification of over a dozen previously unidentified CMTs.

Source: National Park Service/K. Langley

Logs for Fish Habitat Improvement Project
ODOT transferred 30 to 40 large, dead conifer trees removed in the Almeda Fire area to the Oregon Department of Fish and Wildlife for use in a fish habitat improvement project. Large logs in streams improve habitat for native fish including salmon, trout, and steelhead and provide cover for small fish from predators.

Source: BLM, posted to Flickr, licensed CC BY 2.0

Logs in Riparian Areas
ODOT left a number of cut hazard trees in riparian areas and in uplands in both the Archie Creek and Thielsen Fire corridors. Logs left in riparian areas, especially when felled across small streams, improve fish habitat and logs left in upland and riparian areas also provide habitat for a variety of small mammals, birds, reptiles, and amphibians. Further, these logs release nutrients back to the soil as they decompose.

Question 4: What happens to the trees that ODOT had cut on or near highway corridors?

Answer: ODOT has stored cut trees from its removal operations in the corridors since operations started as the trees are the property of the landowner. Many of the trees cut were from Forest Service lands. Under a newly developed process, ODOT will sell hazardous trees removed from federal land.

While ODOT is to maintain safe and reliable transportation on state roads, the lands bordering the sides of the roadways are often owned by other entities. Of the fire-damaged trees evaluated along state highways, the vast majority of the hazardous trees are on private property or Forest Service public lands, not on lands owned by the state or ODOT. When ODOT cuts a hazardous tree along the highway corridors, as allowed by easement or state statute, that tree is not state property but belongs to the landowner and is therefore the landowner's responsibility to dispose of or sell. This is true for regular highway maintenance as well as wildfire emergency efforts.

Figure 11 shows trees being cut during Phase 2 operations by ownership. These figures include trees cut along the highways as well as on PPDR sites.

Figure 11: Majority of trees cut and planned to be cut were on private individual and Forest Service lands

Ownership	Percent of Total
Individual Property Owners	44%
Forest Service	38%
BLM	8%
State Agencies (ODF, ODFW, ODSL, and OPRD)	6%
Private – Industry	2%
Local Government	1%
Other (US Army Corps of Engineers, PGE)	Less than 1%

Note: Figures are as of August 19, 2021, and subject to change as work continues.
Source: ODOT and CDR data.

Forest Service and BLM have agreements with ODOT to help expedite timber sales

The scale of debris from this emergency was something the state and federal partners in the area had not previously dealt with. ODOT stacked (decked) and stored marketable logs as part of its removal operations. Logs have been decked in the fire corridors since the operations started, and much of that timber is Forest Service and BLM property. Some corridors had limited space for decking all the logs. After discussions, the Forest Service determined that ODOT would have more flexibility to sell the trees quickly on the open market. In early 2021, ODOT began negotiating settlement sales with the Forest Service and BLM to transfer title on logs cut on federal lands. ODOT completed property transfer agreements by August 2021. The development of these agreements has taken some time due to the unprecedented scale of the project and to ensure compliance with both state and federal requirements.

Forest Service agreements with ODOT also included trees cut by utilities during the first phase of the recovery in two fire corridors. These trees block or limit access to cut and process trees ODOT is responsible for or could create future fire hazards adjacent to the highway system.

September 7, 2020
Responders begin cutting and clearing hazardous trees and debris. Phase 1 hazardous trees felled and processed.

January 15, 2021
Phase 2 hazardous trees felled and processed.

February and March 2021
ODOT begins negotiating with USFS and BLM for salvage timber purchase.

March 30, 2021
ODOT awards no-costs contract for Almeda fire woody debris removal.

June 4, 2021
ODOT executes contract with BLM to purchase timber.

July 19, 2021
ODOT signs no-cost agreement for Archie Creek fire for excess chip removal.

July 29, 2021
ODOT executes contracts with USFS to purchase timber.

August 23, 2021
ODOT advertises first timber sale from hazard tree operations.

The sale of trees from federal land is not intended to earn a profit — money from the sales will offset tree removal costs. The initial cost estimate for overall hazardous tree removal was $296 million.

We assessed the potential for profit with log sales using Riverside as an example, as 95% of the logs in that area belong to the Forest Service. In Riverside, the contractor's cost estimate for hazardous tree removal is over $70 million. The appraisal estimates the market rate value of the marketable logs from Riverside at nearly $1 million, or just 1.4% of the estimated cost of removal, without factoring in the price ODOT will pay for the trees. The final value of the logs will be determined when logs are actually sold and removed from the corridor. If ODOT were to realize a profit on the tree sales, any remaining proceeds would go to offset funds that would otherwise be provided by FEMA before any cost sharing is calculated.

In other fire corridors, ODOT is cutting a large number of trees on private property that pose a threat to the highways or are otherwise an imminent public threat. Although disposing of those trees is the responsibility of the landowners, they may choose to have ODOT remove the trees. In these instances, trees are considered donations that ODOT can include in its sales if the trees are marketable. Yet the number of donated trees will likely come nowhere close to closing the gap between the overall value of the wood and the cost to remove it, meaning revenues from this cut timber will not cover costs.

ODOT has been processing slash and some non-marketable timber into chips and seeking disposal options

The hazardous tree removal effort, from emergency response and recovery combined, involved so many trees that it created a lot of slash. There were also non-marketable logs that were heavily damaged and unusable for creating wood products. Contractors in the field are processing some of these logs and the slash into wood chips, but the sheer volume of chips is too much to remain in the corridors.

ODOT had contractors spread wood chips on the forest floor to the extent possible, which can vary depending on location. This practice helps improve wildlife and riparian habitat, protect soils from erosion, promote moisture retention in soil for replanting, cover ground disturbed by tree removal activities, and reduce the visual impacts of tree removal operations. ODOT's instructions to

contractors specify that no more than three inches of woody material should be left on the forest floor after hazardous tree removal.

Left: Stack of decked logs.
Middle: Logs decked and ready for sale.
Right: Slash, woody debris such as treetops and limbs, is mostly processed into wood chips.

After operations began around the state, ODOT recognized there is too much material to safely spread on the forest floor, creating a possible future fire hazard. As a result, ODOT entered into two agreements, one with a biofuel facility and one with a wood products manufacturer, to remove some of the excess chip material at no cost to the state: one from the Almeda Fire corridor and the other from the Archie Creek Fire. As of September 2021, ODOT is looking for similar opportunities with other entities to productively use the wood chips. Otherwise, ODOT may need to burn the excess chips remaining in the corridors.

Question 5: What mechanisms are in place for evaluating the recovery efforts? (e.g., after action reports for continuous improvement mechanisms and capturing lessons learned)

Answer: The Governor's Office completed an after action review of emergency response efforts but there is no solidified plan for a state-level review of the recovery effort. However, ODOT intends to hire a consultant to conduct an after action review on debris removal operations, one part of the state's recovery efforts. ODOT management recognizes there are areas for improvement, and we identified some additional areas that should be considered in future planning efforts.

ODOT is laying the work for better debris removal operations in future disasters

Any emergency response and recovery should have a period of reflection to look over the actions taken and adjust plans to be better prepared for the next event. Oregon's 2020 wildfires, and the scale of debris removal executed by the state, were unprecedented. Much of the planning and work was done in a rapid timeframe with staff who had little to no prior experience with disaster debris management. Lessons learned from the experience should be carried forward for future preparedness efforts, which include planning, training, and exercising, to better respond and recover from disasters. This ongoing emergency management cycle is depicted in Figure 12.

Figure 12: The four phases of emergency management operate as a cycle

The Governor's Office completed an after action review of emergency response and initial recovery in May 2021. As of the beginning of October 2021, there is no solidified plan for a state-level after action review of the full recovery effort. However, ODOT intends to conduct one for debris removal operations. In our discussions with those involved with debris cleanup, they recognized areas for improvement, such as:

Exercising state plans to improve planning and preparedness: Oregon's 2018 Disaster Recovery Plan[20] had never been exercised, and the state's 2015 Debris Management Plan covered basic policy

[20] State of Oregon Comprehensive Emergency Management Plan (CEMP), Volume IV – State Recovery Plan, March 2018.

but not operations. As a result,[21,22] the state plans contained little about the Disaster Management Task Force, which turned out to be a key group for the recovery effort. Key task force members met for the first time during the incident and had to identify and learn quickly about debris management, their roles and responsibilities, and navigate large policy decisions during an emergency response.

ICS training for ODOT staff: ODOT plans to identify a core group of people to retain the knowledge gained from the September 2020 wildfires and train them to be ready for recovery work in future emergencies. The May 2021 after action report, which looked at lessons learned early in the wildfire response, noted that people staffing emergency support functions are rarely activated to support operations in Oregon's Emergency Coordination Center. As a result, they struggled to integrate into the Incident Command System structure and planning process. ODOT could further consider its approach to ICS training and exercising for employees to better ready the agency to respond to emergency incidents.

Precontracting disaster debris monitoring and removal: Other states have contracts in place prior to the disaster (precontracts) for debris removal services, allowing operations to start as soon as it is safe to conduct work. Having firms precontracted allows the state to involve those firms in annual planning work to prepare to respond quickly when disasters occur. Oregon did not have firms retained. ODOT leadership and stakeholders both suggested precontracting and developing contract templates ahead of time. ODOT leadership reported that its procurement team is researching contacts in other states to discuss precontracting later this fall.

Staggering contract start times: Recovery operations of this nature requires some contractor work to be done ahead of other work. For example, assessing and marking hazardous trees must be done before cutting crews can remove trees. ODOT recognized it would be better to stagger the timing of contracts so that preliminary work like asbestos testing and tagging trees is done before cutting crews arrive.

Allocating field operations staff to the fire corridors differently: ODOT split its field operations into north and south branches. In hindsight, ODOT management said they should have further split the north branch to better allocate the resources required to manage the large northern fire corridors.

Codifying Right-of-Entry process: Navigating the legal right-of-entry to properties complicated recovery efforts. After disasters, property owners can move debris to public rights of way for responders to pick up. FEMA's own guidance assumes property owners will move debris to public spaces. However, wildfires leave behind dangerous hazardous waste on private property making it unsafe to cleanup without protective equipment and proper disposal methods. The state's existing

[21] Planners were brought to Oregon through the Emergency Management Assistance Compact, a national mutual aid system.
[22] Our 2018 audit report, "The State Must Do More to Prepare Oregon for a Catastrophic Disaster," Report 2018-03, found the state needed to do more to prepare, including completing and implementing critical plans, fulfilling minimum standards for an effective emergency management program, and adequately staffing the agency charged with coordinating emergency management efforts.

Debris Management Plan did not consider legal issues surrounding rights of entry to properties needed for cleanup efforts.

Maintaining procedures and protocols: ODOT hurried to develop the Debris Removal Operations Plan, the EPP, and hazard tree removal criteria in the aftermath of the wildfires. Stakeholders reported that the EPP needs refinement beyond the updates incorporated to-date, and they would like to see a plan that has been vetted and approved by all agencies and tribal nations before the next debris-generating event.

ODOT management stated they plan to hire a consultant this fall to facilitate the after action process and produce interim and final reports, which will be made public.[23] We were told that the after action reports will examine all areas of debris mission planning, including permitting and clearances, and processes around insurance recovery and FEMA reimbursement. Revising plans and preparing for the next disaster are key reasons to produce an after action report.[24] The consultant will also assist the state with updating plans and other documents. ODOT's goal is to have a useful product to inform pre-disaster planning efforts and contracts for spring or summer of 2022, but a final report may take longer given the lengthy processes around insurance recovery and FEMA reimbursement.

ODOT could consider additional areas to help improve debris removal operations

Given the state's inexperience with recovery operations and debris management, we expect there will be many lessons to learn from this experience. An in-depth examination of these topics is out of the scope of work for this report, but they could be addressed in after action reports and improvement plans.[25]

Quality control documentation: CDR did not have an established method for tracking the quality control process for hazardous trees, so MB&G initially used maps then later notes and spreadsheets to track and manage efforts along the way. However, there was not reliable or comprehensive data maintained to ensure damaged trees had a complete review.

Internal and cross-stakeholder coordination and communications: Internal communication and the coordination between many different jurisdictions and contractors is an area that can often be improved upon, especially when there are multiple layers and parties involved during an emergency operation. Stakeholders commented on instances of disconnected communications and information not being disseminated in a timely manner. We also heard some concerns from counties about not

[23] In 2003, Homeland Security Presidential Directive 5 established that a single, comprehensive approach to domestic incident management – the National Incident Management System (NIMS) – to ensure that all levels of government have the capability to work efficiently and effectively together. Under NIMS, a primary function of the incident commander is to ensure that after action reports are completed.
[24] In its January 2021 report, Oregon's Wildfire Economic Recovery Council recommended a review of the state recovery plan and debris management plan. SB 762, which passed during the 2021 Legislative session, requires the Office of Emergency Management to update Oregon's statewide emergency plan to prepare for or respond to wildfire emergencies.
[25] After action reports and improvement plans include an overview of an emergency event or preparedness exercise, an analysis of capabilities, and a list of corrective actions.

having accurate and timely information on where PPDR operations were occurring for people in the PPDR program.

Staff, contractors, and monitors training: We reviewed the training required of all ODOT staff, contractors, and monitors assigned to recovery efforts prior to starting work. The training covers the Debris Removal Operations Plan and cultural resources but contains little information on protecting environmental resources. Revising the training to cover both cultural and environmental protections and adding an assessment in lieu of a self-attestation of completion, may reduce the risk of contractors not understanding key concepts or protection regulations.

Cultural resource surveys: Stakeholders suggested conducting surveys of sites where cultural resources were likely to be discovered, ahead of debris removal work and in addition to the site monitoring during operations. Stakeholders also commented on the cultural resources data, noting there were issues with the accuracy and reliability of the data. As of August 15, 2021, field crews have inadvertently discovered nearly as many new sites as were previously known. Conducting surveys ahead of cutting crews could help prevent work stoppages when inadvertent resources are discovered.

Project Approach

This advisory project was conducted to address concerns about ODOT hazardous tree removal operations. This report resulted from a research-based project conducted by state auditors.

We spoke or corresponded with state employees, contractors, and stakeholders involved in debris removal, specifically for hazardous trees, including:

- management and staff on the wildfire recovery crew from ODOT;
- management, staff, and prior staff from the contracted project monitor (CDR Maguire);
- managers and staff from the consulting firms (AC Disaster Consulting, LLC; Mason, Bruce, & Girard, Inc.; Maul Foster & Alongi, Inc.; and Historical Research Associates, Inc.);
- management with OEM and DEQ;
- Oregon's Wildfire Recovery Director;
- Oregon Senator Jeff Golden;
- representatives from the Forest Service and the U.S. Fish and Wildlife Service;
- representatives from the BLM;
- environmental specialists from FEMA;
- an independent reviewer of ODOT's hazardous tree operation;
- members of two Oregon's tribal nations;
- Public Works, Road Maintenance, and Solid Waste managers from counties within the fire corridors;
- staff from the Oregon State Historic Preservation Office; and
- Oregonians concerned with hazardous tree removal operations.

We reviewed state laws and rules for emergency recovery, the Oregon Debris Management Plan within the State of Oregon Comprehensive Emergency Management Plan, 2020 wildfire emergency declarations, testimony during hearings of the Oregon House Special Committee on Wildfire Recovery and Oregon Senate Committee on Natural Resources and Wildfire Recovery, recovery presentations and updates, the Governor's Wildfire Economic Recovery Council report, an after action report on the response to the 2020 wildfires, and FEMA materials (e.g., frameworks, debris management guidance, public assistance program information).

Specific to ODOT's debris removal operations, we reviewed its forester reports, contracts and related materials for hazardous tree contractors, Debris Removal Operations Plan (including the EPP), debris management tree assessment field guides, debris management quality control program procedures, contracted independent report on its hazardous tree operation, chip and woody debris agreements, and timber sale contracts. We also reviewed daily incident action plans for debris recovery operations.

We conducted site visits in June 2021 through the three largest fire corridors: Beachie Creek/Lionshead, Holiday Farm, and Riverside. During our visits, we spoke with ODOT on scene incident commanders and, as available, contractors and monitoring staff.

We reviewed wildfire cleanup website information and data provided by ODOT and CDR that tracked hazardous tree removal operations. Based on interviews, the data appeared to be reasonable and sufficient for our purposes, but we did not test the reliability of the hazardous tree removal data.

Lastly, we reviewed the online training provided to recovery participants (ODOT staff, contractors, monitors).

Our limited review did not include evaluating the adequacy of the criteria used to evaluate whether a tree was hazardous, testing the application of the hazardous tree removal criteria or the effectiveness of natural and cultural resource protections to be in place. Further, the scope of our review did not include reviewing the easements between utility companies and federal entities or private landowners.

We chose to perform this work as a non-audit project to produce this advisory report quickly and timely to be as useful as possible. Accordingly, this report does not adhere to the full set of government auditing standards. This advisory report has undergone the same rigorous quality assurance process as does each audit from the Oregon Audits Division, with auditors not involved in the project checking evidence for each assertion in the report. We also consulted with ODOT leadership prior to initiating the project, provided the agency with a copy of the report, and gave them the opportunity to provide feedback.

We would like to thank ODOT management and staff for their cooperation as well as the many consultants and participants in the recovery efforts that provided their time and information to us for this project.

Audit team

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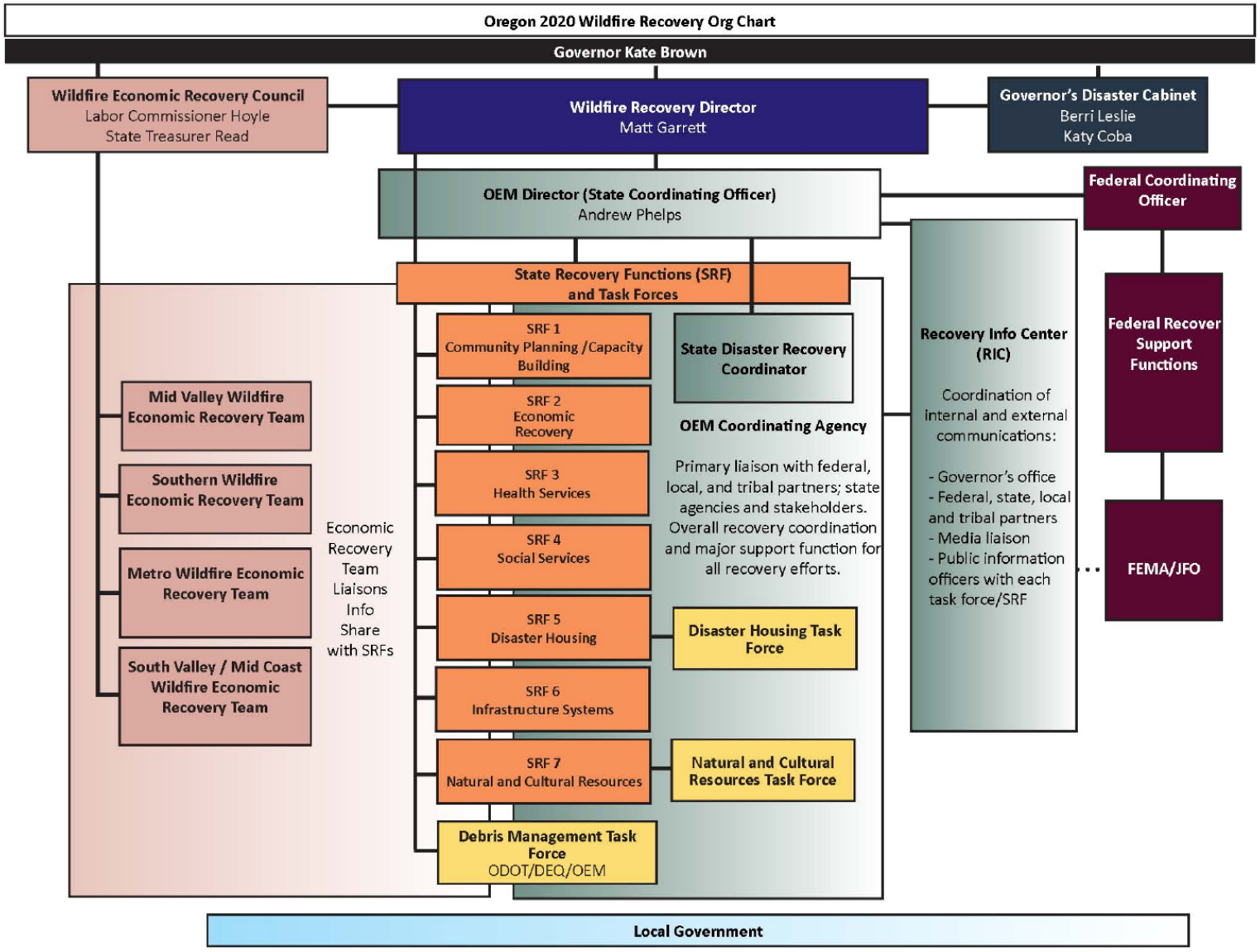
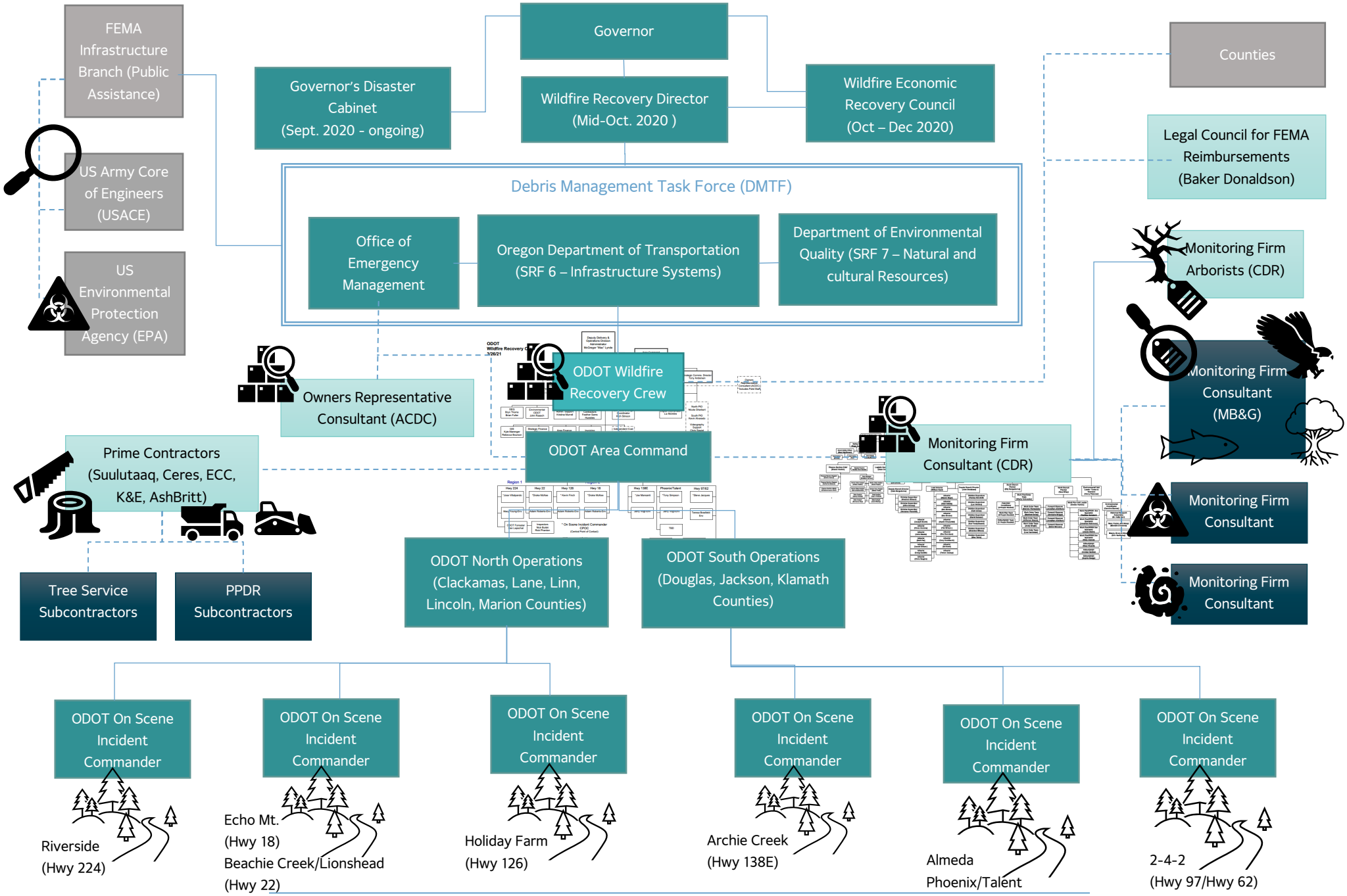
The Oregon Constitution provides that the Secretary of State shall be, by virtue of the office, Auditor of Public Accounts. The Audits Division performs this duty. The division reports to the elected Secretary of State and is independent of other agencies within the Executive, Legislative, and Judicial branches of Oregon government. The division has constitutional authority to audit all state officers, agencies, boards and commissions as well as administer municipal audit law.

Appendix A: Oregon Wildfire Recovery Organizational Chart



Source: Governor's Wildfire Economic Recovery Council report, January 2021.

Appendix B: Debris Cleanup Organizational Chart



Appendix C: Recovery Photos

ODOT photos of private property debris removal and right-of-way hazardous tree removal.[26]

Before (top) and after (bottom) photos from Kane's Marina in Detroit, Oregon. According to ODOT, the marina is a major economic development and tourism driver for the area. The Debris Management Task Force was able to work with the local community to help re-open the area by Memorial Day 2021. | Source: ODOT

[26] Additional photos of ODOT's 2020 wildfire response and recovery are available on the agency's Flickr account.

Before (top) and after (bottom) photos the Private Property Debris Removal work done at Salmon Mobile Home Park in Otis, Oregon. | Source: ODOT

Top: An aerial photo of the right-of-way work zone in Beachie Creek/Lionshead fire corridor.
Bottom left: Property designated free of household hazardous waste and ready for ash and debris cleanup.
Bottom right: Ash and debris along Highway 22.
Source: ODOT

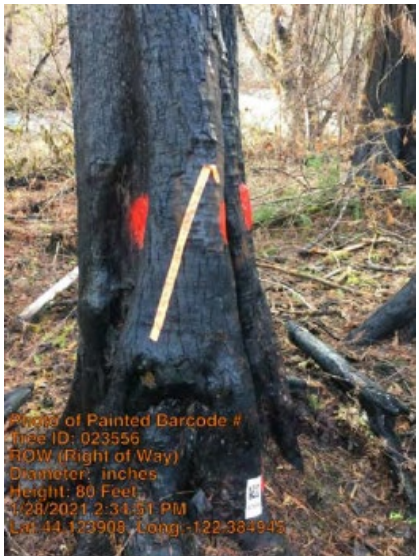
Top: An aerial photo of the Holiday Farm right-of-way work zone.
Bottom left: Crews in personal protective gear gather samples to test for asbestos. Upon clear results, crews will mobilize to begin ash and debris removal.
Bottom right: Crews remove ash and debris from Bear Lake Estates Mobile Home Park in Phoenix, OR.
Source: ODOT

Appendix D: Invoice Documentation

The documentation for hazardous tree removal is immense. There were over 500 pages of documentation for one day of a tree service contractor's work in one fire corridor. This appendix shows supporting documentation for one tree cut and one load hauled on February 16, 2020.

Documentation for a cut tree

As the documentation shows, on January 28, 2021, contractors took two pictures of a big leaf maple tree in the right-of-way work zone on the Holiday Farm Fire. One picture shows the tree painted for removal and the barcode attached to the tree, and a second photo shows the measured diameter of the tree. When the tree was cut on February 16, 2021, a printed cut ticket was created, and contractors took a third photo showing the remaining tree stump. The contractor logs the ticket number and bar code of the tree in a monitoring log for the day. The information for each tree is also entered into a table containing 17 columns of information about each tree.



Printable Tree Cut Ticket

Powered by KrinkleADMS.com

Cut Ticket ID	U7FKE3
Ticket Created Time	2/16/2021 9:17 AM
Personnel	
Full Name of Task Force Leader	
Subcontractor Info	
Property/ROW Info	
Select Property Type	ROW (Right of Way)

Stump 1	
Scan Barcode on Stump - 1	023556

Source: ODOT.

CDR|MAGUIRE
EMERGENCY MANAGEMENT

OREGON WILDFIRE ODOT HAZARD TREE

MONITOR NAME [redacted]
CONTRACTOR Sunlu Haag
COUNTY / ROAD/ MARKER Lane / HWY 126
DATE 2·16·21

MONITORING LOG

TIME	ADDRESS	TICKET NUMBER	TRUCK ID	BAR CODE	MEASUREMENT LENGTH FT	MEASUREMENT DIAMETER	DEBRIS OWNER/COMMENTS
0917	OR-126	U7FKE3		023556			
0920		6D83G7		197413			
0922		9WEP7		053507			STWEP7
1024		JJ5RZK		023559			
1026		CX775N		023558			
1101		TNE6WQ		023560			
1104		D8LKW2		197415			
1210		WYNLD5		197418			
1222		73DTHM		199002			
1224		23VYD3		199003			
1316		P7C688		053538			
1319		8WFGEC		197416			
1321		VZWANT		197417			
1451		4E54H8		199024			
1455		2RKA9P		199012			
1458		NVEVGK		053544			
1501		D9CXVX		199026			
1503		MHL4AL		199027			
1504		RB6NRD		199028			
1506		XZL93X		199032			
1507		9M7HHQ		199033			
150	—	—	—	—			
1522	OR-126	ZLDZWW		199023			
1521		XHYJBX		053549			

TOTAL TICKETS 22 23

MONITOR NAME: [redacted]
MONITOR SIGNATURE: [redacted]
02-16-21

TASK FORCE LEADER NAME: [redacted]
TASK FORCE LEADER SIGNATURE: [redacted]

Assessment Date /Time	Barcode of Tree	Labeled As	Cut Ticket ID	Cut Ticket Date/Time	Tree Species	Latitude	Longitude	Highway	Tree Property Type
2/15/21 15:26	080173	Cut	U2KN5J	2/16/21 8:05	Alder, Red	44.1297446	-122.3811363	OR-126	ROW (Right of Way)
2/1/21 11:03	199574	Cut	63PLVS	2/16/21 8:08	Cottonwood	44.16134031	-122.2946313	OR-126	ROW (Right of Way)
2/1/21 10:57	198967	Cut	A9NKUB	2/16/21 8:10	Other Hardwood	44.16121568	-122.2947872	OR-126	ROW (Right of Way)
2/15/21 14:47	080170	Cut	WN88R8	2/16/21 8:10	Maple, Bigleaf	44.1296472	-122.3807136	OR-126	ROW (Right of Way)
2/1/21 11:05	198946	Cut	THXALH	2/16/21 8:11	Maple, Bigleaf	44.1610857	-122.2947091	OR-126	ROW (Right of Way)
2/15/21 14:12	080169	Cut	49322Z	2/16/21 8:14	Maple, Bigleaf	44.1297493	-122.3810581	OR-126	ROW (Right of Way)
2/1/21 11:03	198968	Cut	HCTHMX	2/16/21 8:14	Alder, Red	44.16125085	-122.294887	OR-126	ROW (Right of Way)
2/1/21 11:08	198969	Cut	H9DKXH	2/16/21 8:15	Cedar, Western red	44.16118025	-122.2949065	OR-126	ROW (Right of Way)
2/1/21 11:11	198970	Cut	Q5/VXH	2/16/21 8:17	Alder, Red	44.16111366	-122.2950222	OR-126	ROW (Right of Way)
2/1/21 11:17	198971	Cut	PAJNC7	2/16/21 8:18	Alder, Red	44.16109165	-122.2951119	OR-126	ROW (Right of Way)
2/15/21 14:53	080171	Cut	ZZHAQ3	2/16/21 8:19	Maple, Bigleaf	44.1296374	-122.3808779	OR-126	ROW (Right of Way)
2/1/21 11:19	198972	Cut	ZVAV5U	2/16/21 8:20	Cedar, Western red	44.16115847	-122.2952396	OR-126	ROW (Right of Way)
2/10/21 13:51	051244	Cut	4ZL89H	2/16/21 8:23	Fir, Douglas	44.12988012	-122.3812226	OR-126	ROW (Right of Way)
2/15/21 15:06	080172	Cut	L8RQ6	2/16/21 8:26	Fir, Douglas	44.1297161	-122.3812066	OR-126	ROW (Right of Way)
2/11/21 8:09	079520	Cut	EMJG3X	2/16/21 8:32	Maple, Bigleaf	44.1299025	-122.3808209	OR-126	ROW (Right of Way)
2/10/21 9:51	051234	Cut	ZAXZRC	2/16/21 8:36	Maple, Bigleaf	44.12950865	-122.3810978	OR-126	ROW (Right of Way)
2/10/21 9:45	051233	Cut	6W48M3	2/16/21 8:38	Maple, Bigleaf	44.1295809	-122.3811512	OR-126	ROW (Right of Way)
2/10/21 9:56	051235	Cut	7KAT98	2/16/21 8:42	Fir, Douglas	44.12949521	-122.3810921	OR-126	ROW (Right of Way)
2/10/21 14:13	051273	Cut	WPXA9C	2/16/21 8:45	Maple, Bigleaf	44.1294821	-122.3810949	OR-126	ROW (Right of Way)
2/1/21 11:11	198947	Cut	MGT3YV	2/16/21 8:45	Maple, Bigleaf	44.16109713	-122.2946359	OR-126	ROW (Right of Way)
2/10/21 14:07	051272	Cut	TVYKW3	2/16/21 8:48	Maple, Bigleaf	44.129429	-122.3809481	OR-126	ROW (Right of Way)
2/10/21 14:19	051274	Cut	6GQLMR	2/16/21 8:52	Maple, Bigleaf	44.1293524	-122.380895	OR-126	ROW (Right of Way)
2/15/21 13:58	080168	Cut	X6N7X	2/16/21 8:59	Maple, Bigleaf	44.1296575	-122.3810313	OR-126	ROW (Right of Way)
2/1/21 10:51	198944	Cut	PB4SUJ	2/16/21 9:13	Maple, Bigleaf	44.16145377	-122.2944105	OR-126	ROW (Right of Way)
2/1/21 10:35	198964	Cut	VPAGLY	2/16/21 9:15	Maple, Bigleaf	44.16113693	-122.2941015	OR-126	ROW (Right of Way)
1/28/21 14:29	023556	Cut	U7FKE3	2/16/21 9:17	Maple, Bigleaf	44.12399183	-122.3849394	OR-126	ROW (Right of Way)
2/1/21 10:48	199568	Cut	BKXFR5	2/16/21 9:18	Hemlock, Western	44.16130109	-122.2941363	OR-126	ROW (Right of Way)
1/28/21 14:38	197413	Cut	6D83G7	2/16/21 9:20	Cedar, Western red	44.12388157	-122.3851198	OR-126	ROW (Right of Way)

Source: ODOT.

Documentation for a load hauled

Tree service contractors also submit documentation for hauling the cut logs to be processed. Each load hauled receives a printed load ticket. The loads are also noted in a monitoring log. The load hauling information is also entered into a 26-column table of information about each load hauled.

CDR | MAGUIRE EMERGENCY MANAGEMENT

OREGON WILDFIRE ODOT TOWER — **MONITORING LOG**

MONITOR NAME: [redacted]
CONTRACTOR: Suulutaaq
COUNTY / SITE LOCATION: Lane Milepost 29
DEBRIS TYPE: merchantable logs
DATE: 2/16/21

	DROP TIME	TICKET ID	TRUCK ID	TRUCK CY	LOAD CALL: LOAD CALL %	LOAD CALL: ACTUAL CY	COMMENTS
1	857	DQYHYB	8PWJ	20			
2	1051	XCQ72U	MB3M	20			
3	1150	38F4KI	YPWJ	13			
4	1240	N4U4BM	YPWJ	14			
5	1340	96RC7O	MB3M	17			

TOTAL TICKETS: 5 — TOTAL ACTUAL CY: 84

MONITOR NAME: [redacted]
MONITOR SIGNATURE: [redacted]
TASK FORCE LEADER NAME: [redacted]
TASK FORCE LEADER SIGNATURE: [redacted]

Final Printable CLOSE Haul Ticket CYs or Piece Work

Powered by KrinkleADMS.com

Ticket ID	XCQ72U
Truck ID	MB3M
Location Type	Logging Deck
Tower Location	Milepost 29
Ticket Created Date/Time	2/16/2021 10:58:41 AM
Monitor's Name (logged in)	[redacted]
Arrival Info	
Enter 4-character TRUCK ID on PLACARD	Mb3m
Please Classify the Debris Type you see in the Truck Bed	Merchantable Logs
Final Comments and Signature	
Enter Tower Monitor's (your) Full Name	[redacted]
Additional Comments	
Signature of Tower Monitor	[redacted]
Location Info	
Current Location	Milepost 29
Select the Logging Deck	Milepost 29
Open Ticket Info	
Open Ticket ID	XCQ72U
Open Ticket Lat/Long	44.1338918 -122.51038686
Open Ticket Creation Time	2/16/2021 10:45 AM
Open Ticket Haul Monitor	[redacted]
Truck ID from Open Ticket	mb3m
Open Location	OR-126
Open Subcontractor	Suulutaaq
Open Merchantable Log Count	20
Certified Truck Info	
Truck Driver's Name	[redacted]
Prime Contractor Name	Suulutaaq
Truck Type	Log Truck
Truck Certification Type	Log Truck
Tail Gate Type	None
License Plate Number and State	LP: (YAFH847, OR)
GPS Unit Serial Number	NONE

Reconciliation Status	Open Ticket ID	Open Ticket Creation Time	Open Latitude	Open Longitude	Open Truck ID	Truck Certification	Open Debris Type	Contractor
OK	QSL4KA	2/16/21 9:21	44.13395029	-122.5096579	2GZW	For Cubic Yardage	Debris Trees and Slash (CY)	Suulutaaq
OK	DQYHYB	2/16/21 9:52	44.13400541	-122.5117929	YPWJ	For Piece Work ONLY!	Merchantable Logs	Suulutaaq
OK	93T54A	2/16/21 10:06	44.13413143	-122.5110973	2GZW	For Cubic Yardage	Debris Trees and Slash (CY)	Suulutaaq
OK	JXUXECA	2/16/21 11:19	44.13390603	-122.5095914	2GZW	For Cubic Yardage	Debris Trees and Slash (CY)	Suulutaaq
OK	XCQ72U	2/16/21 11:45	44.1338918	-122.5103868	MB3M	For Piece Work ONLY!	Merchantable Logs	Suulutaaq
OK	FY5C5C	2/16/21 12:29	44.13418566	-122.5102709	2GZW	For Cubic Yardage	Debris Trees and Slash (CY)	Suulutaaq
OK	38F4KI	2/16/21 12:44	44.13402817	-122.5102709	YPWJ	For Piece Work ONLY!	Merchantable Logs	Suulutaaq

Source: ODOT.

Oregon
Kate Brown, Governor

Department of Transportation
Office of the Director
355 Capitol St NE
Salem, OR 97301

October 7, 2021

ODOT Debris Management Task Force Management Response to *"Advisory Report: ODOT Worked Quickly to Oversee the Largest Wildfire Debris Removal Operation in State History"*

MANAGEMENT RESPONSE FROM:
-Mac Lynde, ODOT Deputy Administrator, Delivery & Operations Division;
-Frank Reading, ODOT Wildfire Cleanup Area Commander, Debris Management Task Force

The 2020 September wildfires serve as one of Oregon's most devastating disasters, burning more than one million acres, destroying thousands of homes, and claiming the lives of nine Oregonians. Following these tragic events, Oregon communities were confronted with an immediate need to remove the structural debris left behind and more than one hundred thousand fire-damaged, dead trees blocking roads and interfering with rebuilding and recovery efforts.

Providing the critical first step for helping these communities rebuild, the Oregon Governor's Office and the Wildfire Economic Recovery Council created the Debris Management Task Force (Task Force)—led by ODOT for its contract management expertise—to immediately begin work clearing the aftermath of these fires, and significant, unprecedented progress continues today. Ahead of the initial eighteen-month schedule, 90% of home sites have been cleared, 70% of hazard trees have been cut or removed, and communities have started rebuilding and moving forward with next steps in their multi-year recovery process.

As an emergency response operation built to adapt and change over time, the work of the Task Force has remained nimble and has evolved to respond to the critical needs of wildfire survivors, operational discoveries in the field, emergency management best practices, and important Oregon values such as community safety, local jobs, a diverse workforce, and environmental stewardship.

Earlier this year, as progress ramped up and emergency recovery work was more visible in communities, questions were raised specifically about hazard tree removal, the criteria used to determine which trees posed safety threats, and the qualifications of the crews making decisions. To further investigate, ODOT sought out the assistance of an experienced independent forester and arborist with in-depth hazard tree expertise to review this work and make any potential recommendations. The findings from this report provided an 'A' grade to the operation underway and suggested that no substantive changes be made.

To further investigate as requested by ODOT, this initial review provided context and background for the Secretary of State Audits Division to conduct a supplemental independent, multi-month review. ODOT and the Task Force appreciate the findings of this review and emphasize the descriptions provided that highlight the complex and unprecedented nature of the hazard tree removal process.

In response to the advisory report

Throughout, ODOT and the Task Force have appreciated and welcomed the engaged participation of public officials, legislative partners, community and advocacy organizations, wildfire survivors and others to inform and guide this work. When this work began, there was no detailed playbook available for Oregon, but we all came together to efficiently and collaboratively develop a blueprint that can be both carried forward, and revised and improved upon as necessary, for years to come in the event of future disasters.

In response to specific items included in the review, we appreciate both the comprehensive story that was shared outlining the details of this complex operation, and the thorough and comprehensive analysis,

acknowledging that emergency response work will always exist as an iterative and evolving process. The review also serves as a definitive summary of the massive undertaking accomplished to date to provide the critical first step towards recovery for Oregon's fire-impacted communities. In the spirit of continuous improvement, we support and agree with the opportunities listed in the report and elaborate further below:

- **Future planning:** Much has been accomplished for Oregon thus far, and we want to build on successes and lessons learned even further in the event of another disaster. This work leveraged a broad range of expertise and state and federally required plans to structure and guide operations, navigate regulatory frameworks, protect the environment and culturally sensitive areas, and manage teams. While no single framework for an event of this scope and magnitude existed previously, the past year has provided many lessons to incorporate into an extensive After Action Review process and report for future planning efforts. We look forward to ongoing collaborative discussions as we plan ahead and reflect.

- **Training and documentation:** Due to an immediate and urgent need, the training of more than 1,200 contractors, crews, and staff occurred simultaneously in real-time, while documenting the many items required for federal reimbursement, and while also delivering an emergency response operation in the field. In turn, this experience has provided a checklist for responding to and addressing similar events. The past year has identified key areas for targeted training opportunities for all crews, including ongoing training for implementing project-specific Environmental Protection Plans which remains a top priority and opportunity for improvement.

- **Delivering Oregon values and an equitable workforce:** Embracing an "Oregon helping Oregon" approach, we are proud that our contracting process reflected a strong commitment to Oregon values, a diverse workforce, and providing equitable contracting opportunities to a range of businesses. This includes building a team of contractors that delivered nearly a thousand local Oregon jobs, formed an equitable and diverse workforce, and provided training and apprenticeship opportunities for traditionally underserved communities.

- **Contractor capacity and pre-contracting:** For future events, having a "bench" of contractors—and Oregon-based contractors now skilled in this type of emergency response work—to call upon will serve the state well going forward. With this infrastructure now in place, we look forward to applying this system for future rapid response when necessary and appreciate the outreach work contracting staff undertook to bring new and underserved businesses into the operation. Additionally, best practices for oversight and accountability for overseeing such a massive contract administration effort were developed. Having created this framework from scratch, Oregon will now have the benefit of pre-planning for next time and having contractors ready to go pre-disaster.

- **Organizational development and field operation staffing:** Standing up an operation of more than a thousand crew members, more than a hundred contracts, and recruiting a core leadership team required quickly developing an organizational structure that could adapt along the way. This also required a need to recruit top talent quickly, taking many staff away from their regular positions for an extended period of time. Similar to having a bench of contractors on-call and available, having a dedicated team versed in Incident Command training, and processes and procedures in place for the next event, will be critical for future success.

- **Coordination and information flow amongst stakeholders and jurisdictions:** Internal coordination and communication is a critical part of any emergency response operation. To be expected—given the large number of state and federal agencies, contractors, statewide recovery staff, county partners and others working towards a common cause at the same time—a brief period of creating structure and finding the right "glue" for the most effective internal communication channels was navigated and explored.

> As a state-managed, locally-coordinated operation, there were instances where coordination and the flow of operational information could have been improved between and amongst state staff, local public officials, and field crews. After some initial challenges, however, a cadence was developed as the correct stakeholders were plugged into relevant meetings, and as processes and expectations were implemented ensuring that information was shared from briefings and then dispersed widely to local stakeholders— from weekly coordination meetings, presentations, proactive calls from the call center hotline, and the large volume of external communication channels provided digitally, in-person, and by mail. Once stakeholders tuned into the operation, learned more about and became comfortable with the many coordination tools at their disposal, a rhythm was established, and statewide stakeholder coordination and communication improved.

The unfortunate reality that Oregon may experience another devastating wildfire event in coming years is not taken lightly. Looking forward, we invite future discussions and look forward to input and feedback that balances a range of perspectives rooted in safety and recovery to further guide all statewide emergency response planning. As this work continues to wind down, we will continue to both solicit and apply lessons learned, and also investigate or take corrective action in response to any concerns that may arise.

We want to sincerely thank Oregonians for their collaboration, grit and resilient spirit. Together, this work has helped reopen schools, summer camps, local businesses, fish hatcheries and recreation areas. It has cleared the way for rebuilding new lives and housing options and kept highways open and free of falling trees and other debris while providing wood for habitat, conservation projects and energy programs. Cleanup work has strived to equitably provide Oregon jobs while ultimately making sure that no more lives are lost to the 2020 wildfires.

We know that there are always opportunities for improvement, and we will continue to build these lessons learned into all facets of our work for next time. While we sincerely hope that Oregon never relives this traumatic experience, ODOT and the Task Force stand ready to help and we were honored to be called upon during Oregon's time of need.

Front and back picture courtesy of ODOT

This report is intended to promote the best possible management of public resources.
Copies may be obtained from:

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