Secretary of State Audit Report

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Oregon Department of Forestry: Actions Needed to Address Strain on Workforce and Programs from Wildfires

Executive Summary

Three consecutive severe fire seasons have forced the Oregon Department of Forestry (ODF) to spend more time fighting fires and less time on its other programs. Recent fires have also strained ODF personnel, who often work long hours away from home.

ODF needs to take action to reduce these impacts on personnel and programs. Systematic, long-term workforce planning that takes into account resources needed for both fire and non-fire programs; development of a more effective business improvement process; better evaluation of wildfire prevention and detection measures; and increased mitigation efforts are steps ODF should take to help address current and future challenges.

ODF needs to analyze and clearly communicate full impacts of wildfires on the agency

(Photo by Oregon Department of Forestry, CC BY)

Since 2013, intense fire seasons have resulted in ODF staff spending more time on fire assignments. However, ODF does not currently collect, analyze and communicate to the Legislature and its stakeholders the full impacts of fires on its programs and personnel. This information is necessary for ODF to adequately plan and manage its workforce to meet existing and future demands.

Not only are more employees participating in fire related assignments, but these employees are working much longer hours. Overtime hours spent on fire protection by permanent employees have increased by 197% in recent years.

While the wildfire suppression workload has increased, staffing has not kept pace. ODF is fighting more severe fires with about the same full-time equivalent employees it had nearly 20 years ago. Fires have also created more administrative work, including preparing claims for cost reimbursement from the Federal Emergency Management Agency and

other federal agencies, and making catastrophic wildfire insurance claims and emergency funding requests. To date several of these claims have not been completely processed, which resulted in ODF borrowing to finance these fire related costs. During the past three fire seasons, ODF paid $1.5 million in interest on this borrowing.

ODF staff in Salem and field offices are feeling overworked and are experiencing stress and fatigue as a result of fire related work. Despite the strain of consecutive severe fire seasons, ODF Management reports that employees remain committed to participating in the agency's firefighting efforts. However, as staff devote more time to wildfire seasons, employees and agency leadership have expressed concerns about ODF's ability to continue performing at current service levels.

Recent fires have caused delays in work for ODF's non-fire programs, as employees in these programs are deployed to fire incidents. Examples include delays in developing annual operations plans for state forests, completing Forest Practices Act compliance reporting, and updating bald eagle protection rules. Fires have also created more work for employees in these programs after fires are controlled, such as salvage logging operations and developing and implementing reforestation plans.

Non-fire program contributions to fire response capacity are not fully known

(Photo by Oregon Department of Forestry, CC BY)

Non-fire programs contribute to ODF's firefighting and to maintaining fire readiness. But ODF is not tracking the contributions these programs make, which are absorbed into their respective budgets. While we identified some of these contributions, ODF needs a full accounting of the contributions and related costs to adequately plan for both fire and non-fire work.

Non-fire programs contribute staff hours to fight fires and to Incident Management command and support teams. For example during the last three fire seasons, the average number of hours State Forests Program staff billed to fire protection doubled to 19,038 hours.

These programs also pay other fire-related expenses such as the cost of specialized fire qualification training, and certain fire equipment and supplies. ODF needs better information on these costs and how changes to staffing, funding and workload in these non-fire programs affect fire operation capacity.

Agency wide workforce planning needed

ODF needs a systematic workforce planning process to effectively address current and emerging challenges to its programs and workforce. Workforce analysis is needed to identify gaps and to monitor, evaluate, and revise resources in order to meet the agency's strategic goals now and in the

future. ODF has completed some analysis, but more is needed, and it should include all necessary firefighting resources.

At ODF, workforce planning is complicated by staff who have program duties and firefighting responsibilities; long training times for fire duties; and the need to meet multiple program missions, including responding to wildfires. But complete workforce analysis and planning, that takes these factors into account, can help ODF ensure it sustainably meets both its fire and non-fire responsibilities.

Systematic process for business improvements needed

As fires have increased in recent years, so have the complexity and number of financial transactions associated with suppressing those fires. Today, ODF has systems in place to collect and assess process improvement suggestions, but some are fragmented and incomplete. We found that sometimes suggestions were not fully reviewed and/or implemented, and decisions were not made or communicated.

A better system that fully reviews, implements and communicates decisions made could help ODF address its increased workload by reducing unnecessary costs and inefficiencies. It could also help to improve the alignment between existing resources and program objectives and priorities.

Evaluation of prevention and detection efforts can be improved

ODF takes some proactive steps to prevent and detect wildfires, but the agency does not systematically evaluate the costs and relative effectiveness of different strategies. Evaluating these strategies could help ODF focus its resources on the most cost-effective strategies to keep suppression costs and wildfire damages low. Better information about the money and staff time spent on different prevention and detection activities and fire causes could aid this evaluation.

More work needed to mitigate wildfire risks and target strategies

Fuel reduction (Photo by Oregon State University, CC BY-SA)

ODF, private landowners, and federal agencies work to reduce wildfire risks posed by the accumulation of small trees and vegetation in forests resulting from decades of fire suppression, land use changes, past land management practices, and other factors. Despite these efforts, there are millions of acres of land in Oregon in high wildfire risk areas across all ownerships, including federal, state and private lands. Some of this land is highly important to our water supply. The resources currently dedicated to mitigation work are unlikely to meet this challenge. To reduce wildfire risks, some of these areas may need treatment through methods such as

prescribed burning, thinning, or removal of forest underbrush in forests and around homes.

Recommendations

This audit recommends ways ODF can build on its current efforts and accomplishments, and make improvements to address current and future challenges. Our detailed recommendations for ODF management are included on Page 31. They include recommendations for collecting and analyzing better information on fire impacts and costs, developing a systematic, future oriented workforce planning process, and enhancing the agency's business improvement process. We also recommend actions for ODF to improve wildfire prevention, detection, and mitigation efforts.

Agency Response

The agency agrees with the report findings and recommendations. The full agency response can be found at the end of this report.

Background

ODF serves multiple roles but fire protection is the agency's top priority

The Oregon Department of Forestry (ODF) was established over 100 years ago to protect forest lands, prevent fires, and enforce laws. ODF's mission is to serve the people of Oregon by protecting, managing, and promoting stewardship of Oregon's forests to enhance environmental, economic, and community sustainability. Fire protection remains a top priority today.

ODF's field operations are comprised of three geographic areas, Northwest, Southern, and Eastern, which include 12 fire protection districts. Wildfire protection services in three districts are provided by private, nonprofit associations under agreements with the state.

To fulfill its mission, ODF operates in various roles, including: fire protection regulator and provider, fire prevention educator, environmental regulator, technical services provider, land manager, recreation manager, natural resource manager for the Oregon Department of State Lands (DSL) and fire protection provider for the federal Bureau of Land Management (BLM). The differences and tensions between these roles can complicate decision-making.

ODF also works with stakeholders, such as forest land owners, environmental groups and recreation users, whose interests are often seen as competing. Fulfilling its various roles while also planning for and accommodating these interests adds time and complexity to decision-making.

ODF has three operating programs: Fire Protection, State Forests, and Private Forests. These programs are supported by ODF's Agency Administration Program and other business services divisions. Oregon law defines many responsibilities of the State Forester and ODF's programs. The most publicly recognizable mandates include administering the Forest Practices Act on non-federal forests, managing over 800,000 acres of state-owned forestland, and providing fire protection on private and some public land.

ODF develops annual operation plans for its business units to describe the planned work for the year, based on general assumptions such as the department's funding and the fire season. These plans identify ongoing or recurring work, priority projects, and projects that can be added if conditions change.

The ODF 2015-17 legislatively adopted budget is about $330 million and includes 1,197 positions (875 Full Time Equivalent Employees). As shown in Figure 1, Fire Protection has the largest program budget. The Legislature approves funds for emergency fire costs after each fire season. The adopted 2013-15 fire protection budget of $116 million was increased to $365 million after additional emergency fire costs were approved.

Figure 1: ODF 2015-17 Adopted Budget

Program	FTE	Budget	Primary Revenue
Fire Protection	395	$126 million*	Landowner assessments, General Fund, commercial/catastrophic fire insurance
State Forests	233	$94 million	Timber harvest proceeds, recreation fees, some federal grants
Private Forests	112	$40 million	General Fund, harvest tax,, federal funds
Agency Administration & Business Services	135	$70 million	Other operating programs

*Additional funds appropriated after the fire season are not included.

Oregon's fire protection system is funded through a mix of public and private funding. Private and public landowners directly finance part of the protection costs through forest protection assessments.

Fires and containment costs have escalated in the last three years

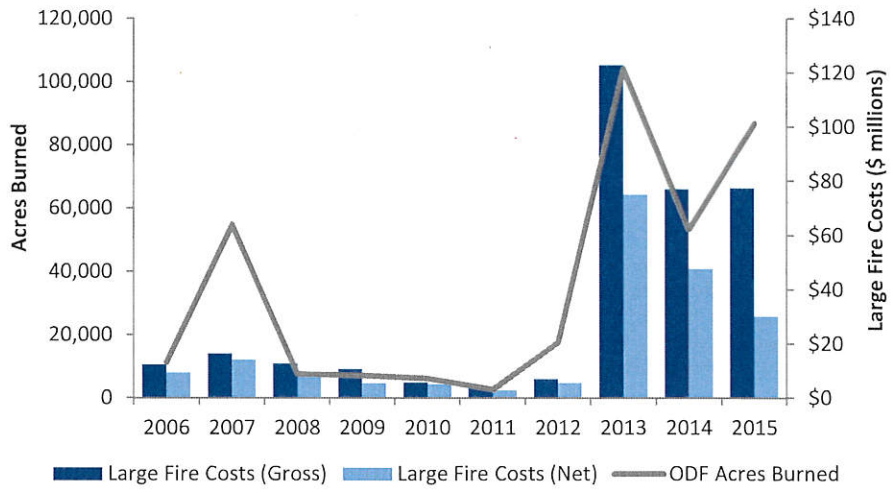
ODF is responsible for providing fire protection on about 16 million acres of private and public forest land in Oregon. This represents about half of the forest land and about a quarter of all land in the state. In 2015, there were approximately 2,500 fires reported across Oregon and roughly 1,100 or 44% were on ODF-protected land. On average, ODF responds to about 1,000 fires each year.

Fire in the urban fringe (Photo by Oregon State University, CC BY-SA)

The fire season generally runs from May to October with most fires detected and controlled at 10 acres or less. In fact, one of ODF's Key Performance Measures is to control 98% of the fires at 10 acres or less. ODF fell just short of this goal in 2015 at 95%. The small percentage that escape initial containment efforts can grow to large fires that cost millions of dollars to control. In 2015, there were 56 large fires on ODF-protected lands with an estimated gross cost of $76 million.

As Figure 2 shows, wildfire costs and acres burned have increased in the past three years. Prior to 2013, the seven-year average gross cost to ODF for suppressing large fires was $9.7 million dollars per year. Since 2013, the average gross cost has climbed to $92.4 million dollars per year. Gross costs are the total cost to contain ODF managed fires. Net costs are less and reflect reimbursements from the Federal Emergency Management Agency (FEMA), cost recoveries from other agencies, and insurance payments for catastrophic fire seasons. ODF's 10-year average for net large fire costs is $20.4 million dollars per year.

Figure 2: Large Fire Costs and Acres Burned Under ODF Protection, 2006 - 2015



Notes: Large fire costs for 2012-2015 are estimated costs.

ODF fire management model

The ODF model for managing wildfire combines the traditional program elements of prevention, mitigation, detection, readiness and suppression in a system that was established more than 100 years ago.

- Prevention activities seek to ensure wildfires do not start and include education and outreach, public fire use restrictions, and enforcing industrial fire precautions.
- Mitigation activities are designed to reduce the risks and effects of a fire. These include activities such as brush removal from high-risk areas, including where residences interface with forest land.
- Detection activities seek to spot or detect wildfires as quickly as possible, and include methods such as traditional fire "lookouts," remotely-operated camera surveillance, and/or fixed wing aircraft reconnaissance.
- Readiness activities aim to prepare the agency to extinguish wildfires. Suppression activities to control wildfires include things such as hand crews digging a fire line, a bulldozer cutting a line, or an air tanker dropping water or retardant.

Overall, a larger share of ODF's fire protection resources is dedicated to readiness and suppression operations, compared to other wildfire management activities. The agency estimates that, on average, district staff spend about 5-10% of their time and less than10% of district fire protection budgets doing prevention work.

ODF operates in a "militia model" designed to lessen the need for a larger permanent "fire department." This approach combines permanent staff

with call-when-needed, trained personnel. ODF's fire response strategy can be scaled up or down to address the inconsistent nature of fire. Every year, the agency's fire staff grows during the summer as it brings on seasonal employees and, as needed, staff from other programs and retirees.

ODF mobilizes its fire militia from its other non-fire programs (State Forests, Private Forests, and Administrative Services) to assist in managing fires and support districts with high fire activity. Staff temporarily assigned to fire operations are paid by the Fire Protection program.

ODF can also call on outside resources to help with fires and, in turn, ODF assists other agencies when needed. ODF is part of a "complete and coordinated system" comprised of many organizations ready to respond to fires – landowners, government entities, and private organizations – who have an interest in minimizing wildfire losses. ODF stakeholders often identify close working relationships and trust as the cornerstone of the system.

The "complete and coordinated system" is comprised of many organizations ready to respond when wildfires occur. In 2015, some of the groups that assisted in protecting Oregon from wildfires included:

Oregon Department of Forestry
Oregon Forest Protection Associations
Oregon Landowners
Rural Fire Departments
Contractors
U.S. Forest Service
U.S. Bureau of Land Management
Oregon Fire Chief Association
Private contractors and businesses
Lloyds of London
Northwest Coordinating Center
National Interagency Coordinating Center
Oregon Small Woodlands Association
CalFire
Washington State Department of Land and Natural Resources
Alaska Department of Natural Resources
Oregon Forest Industries Council
Keep Oregon Green
Natural Resources Conservation Service
U.S. Fish and Wildlife
National Park Service
Washington State Fire Marshal
Oregon State Fire Marshal
Oregon National Guard
Oregon Office of Emergency Management
Other state agencies

One important advantage of the complete and coordinated system is that participants share the risk of year-to-year variations in fire activity and help one another during bad fire seasons. However, when fire seasons are severe across many states such as in 2015, resources across the system may be insufficient. Additionally, the department and other experts expect severe wildfire seasons to continue into the future, further straining personnel and other resources.

Fire incident management

Fire response starts at the district level, often with local firefighters or landowners attempting to contain fires. If a fire overwhelms local resources, ODF may send one of its three Incident Management Teams (IMTs). These teams are specially trained to manage fire and other hazard incidents, and provide fire line leadership and direction. IMTs are scalable based on the situation to manage hundreds or thousands of firefighters. A full-scale deployment includes 32 command staff, about 90 support staff, and multiple pieces of equipment to set up a fire camp and command center. The team is supplemented with additional staff and equipment from other districts, contract crews and equipment, and landowners. After a large fire is controlled, the local district assumes responsibility.

ODF's IMT staff come from all of the agency's programs. For example, district foresters, accountants, and information technology staff from across the state leave their assigned jobs and become incident commanders, operations section chiefs, or time keepers on Incident Management Teams.

ODF fire program reviews

ODF includes multiple levels of post-fire reviews as part of its standard operating procedures, such as after action reviews, fire season reviews, and cooperator/landowner reviews. In addition to these procedures, ODF reviewed its Fire Protection program in 2004 and 2016. ODF involved its

staff and management, stakeholders, agency partners, the Governor's Office, and members of the Legislature in the reviews. Each review focused on multiple topic areas and provided recommendations to the State Forester. The 2016 review focused on: (1) sustainable large wildfire funding, examining Oregon's funding challenges; (2) sustainable wildfire organization, examining challenges inherent in supporting all ODF programs in the context of more challenging fire seasons; and, (3) wildfire policy, examining policy options to help mitigate complex wildfire conditions.

Audit Results

With three consecutive seasons of severe fire activity since 2013, ODF employees have dedicated significantly more time to fire suppression operations. As a result, work in other ODF programs has been delayed and employees are feeling the strain of working long hours and being away from their regular jobs and homes for extended periods of time.

With challenging fire seasons expected to continue in the future, ODF is likely to see an increase in its fire related workload, which could be difficult to handle if non-fire programs experience budget reductions. Other programs may also face increasing work due to various factors that affect the health and use of forests, such as climate change, expansion of the wildland-urban interface, and a higher demand for recreational opportunities.

This audit examines these challenges and recommends ways ODF can build on its current efforts and accomplishments to make improvements that address current and future challenges.

ODF needs to take action to reduce the impacts of fire operations on its staff and programs so that it can continue to meet its broader mission in a sustainable way. Workforce planning that considers impacts and resource needs for both fire and non-fire programs, a systematic business improvement process, and better evaluation of wildfire prevention and detection efforts can help ODF meet these challenges.

Despite current efforts, Oregon has millions of acres at high wildfire risk and in need of restoration. More work is needed to mitigate risks across Oregon's public and private lands.

If ODF's operational needs continue to exceed available resources, it risks being unable to adequately accomplish core fire or forestry services in the future.

ODF needs to analyze and communicate the impacts of wildfires on programs and workforce

Intense fire activity since 2013 has led to a significant increase in the time ODF employees spend on fire assignments, resulting in less time spent on regularly assigned job duties. However, ODF does not know the full impacts to programs and resources.

Currently, ODF does not collect, analyze and communicate the full impacts of fire seasons on programs and personnel, including impacts to core services and annual plans.

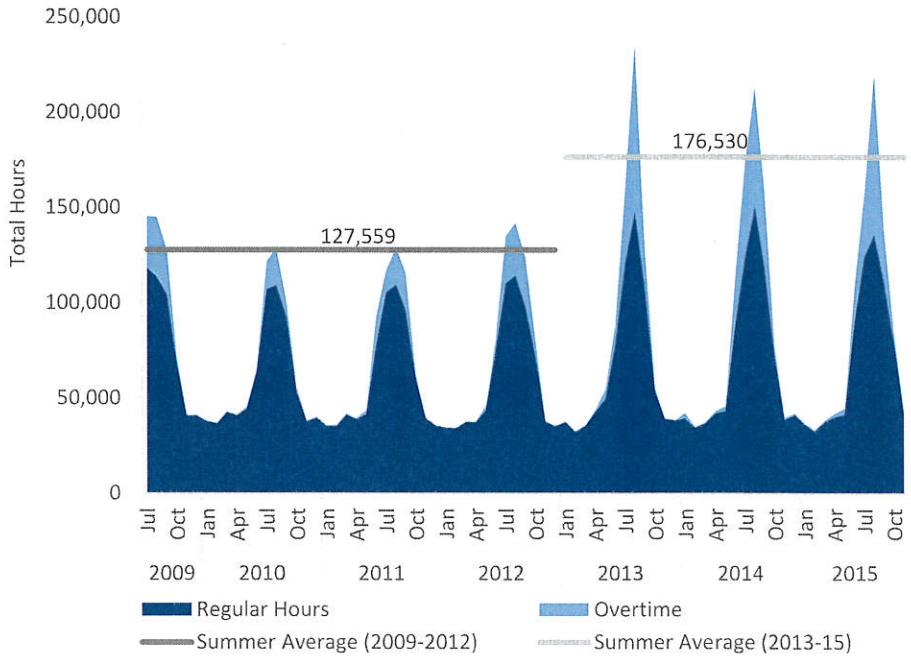
To assess the impacts of the recent fire seasons, we used state payroll data to calculate the regular and overtime hours billed each month to the Fire Protection program. We analyzed hours billed by all ODF employees

(permanent, temporary, and seasonal) between July 2009 and November 2015.

The data does not account for time spent by non-ODF employees on fires (e.g., contract firefighters, inmate crews, private forest protection association employees, and other federal and state agencies).

As shown in Figure 3, the number of hours for Fire Protection increased from an average of 127,559 hours per month during the summer peak months in 2009-2012 to 176,530 in 2013-2015. This 38% increase is equivalent to adding an extra 282 employees working 40 hours per week during the summer peak months.

Figure 3: Payroll Hours Billed to Fire Protection by All ODF Employees



Notes: Overtime also includes work during holidays and stand-by hours.

Between 2009 and 2015, the number of seasonal employees hired by ODF to fight fires each summer remained fairly stable, ranging from 423 to 462 employees per year. The increase in Fire Protection hours during the last three fire seasons has been due to ODF permanent employees in non-fire programs participating in fire suppression activities at a much higher rate (using the militia model), and to an increase in temporary employees hired for short periods of time or for single assignments.

Participation in fire suppression activities by ODF permanent staff each August has increased from an average of 52% of all permanent employees during the 2009-2012 period to 71% between 2013 and 2015. This

corresponds to an additional 124 permanent employees contributing to ODF's firefighting efforts in the last three years.

Not only are more permanent employees participating in fire suppression activities, but these employees are working much longer hours than before. Compared to 2009-2012, the average number of regular hours spent on fire protection during the summer months increased by 19% in 2013-2015, while overtime hours increased by 197% during the same period.

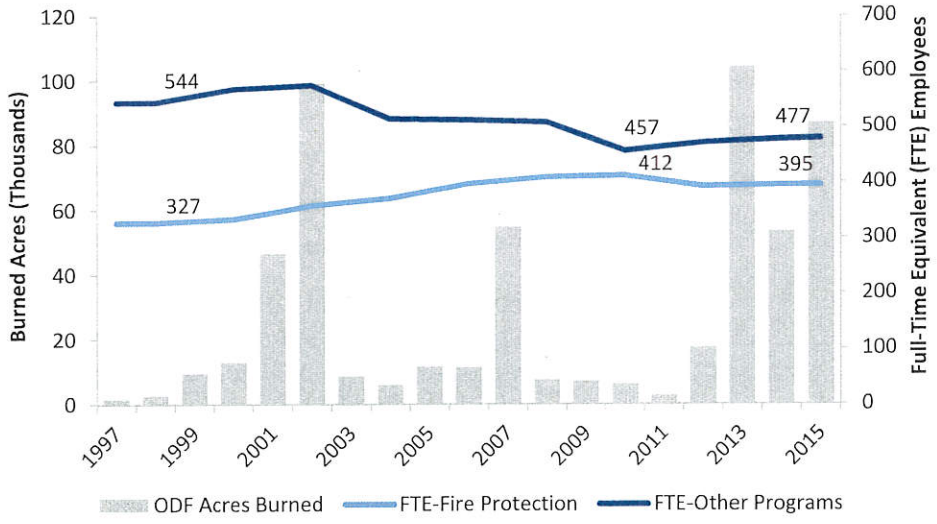
According to ODF staff, during the last three fire seasons, many employees have been working well beyond their scheduled hours. For those who qualify for overtime, their hours are recorded in the payroll system. Others – particularly employees in executive and management positions – do not qualify for overtime, and hours beyond their regular schedules are not included in the data above.

Wildfire suppression workload has increased, staffing has not kept pace

ODF has dealt with consecutive seasons of severe fire activity with little increase in staff. The total number of full-time equivalent staff has remained at about 870 over the last several years, but the proportion of agency staff in Fire Protetion and the non-fire programs has changed over time.

In previous budget cycles, staffing levels in non-fire programs were reduced, effectively reducing the size of the fire militia. During this time, the size of the Fire Protection program grew, effectively increasing the size of the agency's "fire department."

Figure 4: ODF Full-Time Equivalent (FTE) Employees and Protected Acres Burned



Source: ODF FIRES database, legislative budget information.

ODF employees are feeling the strain from recent fire seasons

ODF staff in Salem and field offices are feeling overworked and are experiencing stress and fatigue after three consecutive seasons of severe fire activity.

Large fire camp

For the ODF employees who participate in firefighting and serve on Incident Management Teams (IMTs) each year, the last three fire seasons included long deployments. Fire camp conditions may involve living and working in smoke-inundated conditions during hot summer days and nights. Employees often sleep in tents and live without normal home conveniences. After long shifts, staff wait in line for food and showers.

According to deployment records, ODF's Incident Management Teams were deployed 24 times for an average of 82 days during 2013, 2014, and 2015. Each team deployed for an average of 27 days or about 5.5 work weeks. By comparison, these teams were not deployed in 2012 and only one was assigned to a 2011 fire incident in Alaska. Prior to recent years, staff reported they spent about 1-2 weeks each summer deployed to fire incidents.

Fire administration workload has resulted in backlog, additional costs and delayed reimbursements

Intensified fire suppression efforts have also created more administrative work, including processing tens of millions of dollars of additional payments to employees and contractors, and preparing claims for reimbursement from the Federal Emergency Management Administration (FEMA) and other agencies.

To date, only two cost reimbursements have been submitted for the 15 FEMA-eligible fires that have occurred in the past three years, and only one has been paid. As a result, the agency borrows money from the Oregon Treasury to finance these cash flow needs. For the past three fire seasons, ODF has paid a total of $1.5 million in interest on this borrowing. These interest costs are paid by the General Fund and are not shared by public and private landowners.

ODF hires hundreds of seasonal staff to help with fire suppression activites, but does not employ the needed resources to assist with the increase in administrative work that accompanies these intense fire seasons. This work largely falls to the agency's permanent employees who have other regular responsibilities.

ODF has not increased the permanent staff available for this work. It has relied on temporary hires, retirees, and other agency employees to perform a limited range of payment tasks. To date, ODF has not conducted an analysis to identify current staffing needs or address risks to the agency if they are not met.

Severe fire activity has increased the workload for non-fire programs

ODF staff in the State Forests and Private Forests programs participate in many fire related activities, but fire related work often does not end for employees in non-fire programs after the fires are contained.

Salvaged logs

To address the effects of catastrophic wildfires on private lands, ODF Stewardship Foresters help connect landowners to resources, provide technical assistance, help develop policy guidance and restoration plans, and provide information to help landowners procure tree seedlings.

ODF also addresses wildfire damage to state-owned land through salvage operations, replanting, and vegetation management. For example, the 2013 Douglas Complex fire severely burned thousands of acres, including 200 acres of state land in southwest Oregon. The merchantable timber from state lands was sold, and the area replanted to replace the salvaged timber and young stands lost to the fire.

To prevent major work delays to core functions such as timber sales, ODF districts have drawdown plans that establish the minimum number of employees needed to support core functions. In some cases, this has meant keeping employees with key fire management qualifications from assisting on fire incidents in order to support major projects in non-fire programs.

The impacts of firefighting on non-fire programs is being discussed at the national level. The USFS is putting more money into firefighting efforts and less into its planning, recreation and restoration work. Implications of this include less investment in fire prevention and protecting watersheds and cultural resources

Despite consecutive severe fire seasons, ODF management reports that employees remain committed to participating in the agency's firefighting efforts. However, as staff devote more time to severe wildfire seasons, employees and agency leadership have expressed concerns about ODF's ability to continue performing at current service levels.

With less time for regular duties, ODF faces a potential deterioration in the quality of services they provide, such as conducting fewer inspections for compliance with Forest Practices Act requirements that protect water resources and endangered species, or spending less time for planning or completing timber sales that generate revenue for schools and local government services.

Young tree

Apart from increasing fire severity, other factors such as population growth, climate change impacts, and higher forest use are likely to continue to increase the workload for ODF's non-fire programs in the future.

Other work in non-fire programs delayed

Recent seasons have exceeded historical fire seasons and have resulted in work delays for non-fire programs (Private Forests, State Forests, and Agency Administration).

After being deployed to fire incidents for days – sometimes weeks – many employees return to their regular duties to finish work that was delayed while they were away. Examples of work delays include:

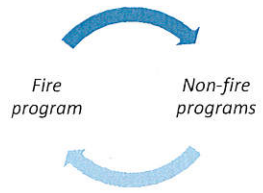
- Modeling for the Alternative Forest Management Plan review process has been disrupted due to State Forest staff being deployed to fires during

the last three fire seasons. The Plan is needed to increase the financial viability of the State Forests Program, which is facing projected deficits in 2020.

- Delays by some field offices in developing annual operations plans needed to implement activities such as timber sales, restoration, fish and wildlife protection, and recreation on state forests.
- The fire season overlaps with the high use season for recreation, education, and interpretation on state forests. This, combined with past staffing reductions, has created difficulty keeping up with maintenance and sanitation operations in campgrounds and day use sites, and has strained education and interpretation services at the Tillamook Forest Center.
- Revision of rules protecting bald eagles after de-listing from Endangered Species Act protection was partly delayed due to a key employee deployed on an IMT in 2015.
- ODF's 2014 annual forest practices compliance report was delayed in 2015 as a key employee was deployed on an IMT.
- Agency Administration projects, such as revising payroll policies and procedures, have been delayed due to staff participation in fire suppression. In 2015, 33 of 62 employees in this division were out on fires.
- A delay in an Information Technology project to enhance ODF's Forestry Activity Electronic Reporting and Notification System (FERNS) was partly due to the length of the 2015 fire season.

Non-fire programs are key to ODF firefighting capacity, but contributions are not fully known

The increasing severity of fire seasons affect non-fire programs, as staff in those programs are called on more and more to help fight fires.



All ODF programs contribute to the fire militia and to maintaining firefighting readiness. Conceptually, the agency's full cost of fire includes special appropriations from the E-board, the budget for the Fire Protection program and portions of the budgets for the State Forests, Private Forests, and Administrative Services programs. Non-monetary costs include the impacts to program work, and the impacts to ODF employees and their families.

But ODF does not know its full fire costs because it is not tracking the contributions non-fire programs make, which are absorbed into the budgets for those programs. Knowing these costs is important for planning and managing both fire and non-fire work now and in the future.

Non-fire programs contribute staff to firefighting

ODF permanent employees billing time to the Fire Protection program during fire season has increased. During the peak month of August between 2013 and 2015, an average of 71% permanent employees devoted

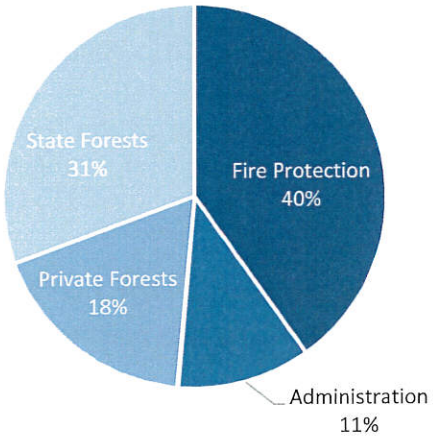
some time to fire protection. This is an increase of 36% over the prior three years.

Non-fire programs also make important contributions to IMTs by providing highly trained, call-when-needed resources used to manage large fire incidents. When they are not on fire assignments, members of these teams perform their regular jobs and are paid by their regular program.

Using Oregon state payroll data, we calculated the contributions of each program to firefighting. Figure 5 shows the regular hours billed to each program by IMT members, which is a proxy for program contributions to ODF's large incident response capacity. By this measure, 60% of ODF's IMT roster came from non-fire programs.

The State Forests Program alone contributed approximately 31% of the IMT roster, or nearly the equivalent of one full team in 2015. During the last three fire seasons, the average number of total hours billed by State Forests program staff for fire protection (including IMT assignments) more than doubled from 7,874 hours to 18,754 hours.

Figure 5: Contributions by Program to 2015 ODF IMTs (Regular Hours)



Non-fire programs contribute other financial resources

In addition to contributing staff time, non-fire programs also pay fire-related expenses. The dollar value of the contributions and the effects on ODF programs, staff, and total firefighting capacity are unclear because these expenses are absorbed into non-fire program budgets. Examples of these non-fire contributions include:

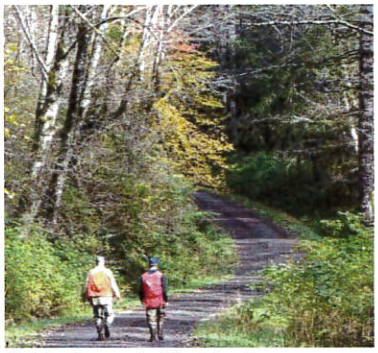
- Staff Training: While the Fire Protection Program pays for some training costs, non-fire programs also pay for specialized fire qualification training. This can include not only the employee's time, but also class fees and travel, lodging, and per diem expenses.
- Staff Fire Equipment and Supplies: These include personal protective equipment (PPE) such as boots, gloves, and protective clothing, and job specific "kit" supplies, including for tracking and recording time spent on

fires. ODF estimates PPE costs to be about $1,800 per employee to work on the line, plus additional costs for maintenance or replacement of gear. Kit supplies can range from $700 to $1,600 per employee.

The State Forests Program also incurs the following expenses:

- Fire Equipment and Supplies: the State Forests Program acquires and maintains both small and large firefighting equipment such as fire engines and tankers. The program also pays for upgrades to vehicle radios.
- Fire Assessment Rates: As a public landowner, the State Forests Program pays full fire protection assessment rates. This is different from private landowners who pay 50% of the assessment rates and receive a 50% General Fund match. The State Forests Program paid over $2.1 million for fiscal year 2016.
- Agency Administrative Overhead: Like other public landowners, the State Forests Program pays for a share of the agency's administrative costs through an additional assessment. The Legislature exempted private landowners from this assessment in recognition of the in-kind contributions they make to the fire protections system.
- Rental Rates: Private landowners receive market rental rates when their equipment is used to fight fires not on their land. The State Forests Program receives less than market rate.

These expenses and foregone revenue add additional financial strain to the State Forests Program, which further jeopardize this component of ODF's firefighting capacity, as well as the State Forests Program's own mission.



Trek in the woods (Photo by Oregon Department of Forestry, CC BY)

Cross-program contributions not tracked, challenges to State Forests Program also threaten firefighting capacity

As discussed above, the militia model for fire operations depends, in part, on contributions from non-fire programs. As a result, changes to staffing, funding, or workload in one of those program can also affect fire operations capacity.

Negative effects can and have occurred from staffing reductions and increased workload in other programs. But, as the following examples illustrate, ODF needs better information on the potential impacts to fire operations from these changes.

- State Forests Program Staff Contributions
  Routine contributions are not tracked and reported. For example, the amount of time State Forest staff contribute to firefighting or readiness is not consistently monitored.
- Fire qualifications within State Forests Program
  Staff fire qualifications are not fully considered in planning efforts. For example, due to the recession, the State Forests Program was required to lay off approximately 40 staff in the 2008-09 biennium, including some with multiple fire qualifications. As a result of layoffs, ODF lost more than

150 fire certifications. Thirty-five of these qualifications were not recovered when ODF was able to rehire staff. With changes in management of the Elliot State Forest, the State Forests Program lost nine positions in 2013-14 and is expected to lose nine additional positions in 2017.

- Non-Fire Program Expenses for Fire
  ODF does not have an accounting of how much non-fire programs contribute to firefighting. For example, ODF does not know how much the State Forests and other non-fire programs pay for fire related staff training, fire equipment, and supplies for staff.

This lack of information makes it difficult to fully assess risks and options, and plan for future firefighting resources and expenses. Threats to the State Forests Program underscore the need for more complete information. The program faces possible staff reductions in the future, including when the Elliot State Forest is sold. Additional reductions could occur if the program fund continues to decline, as is projected in the next several years.

Better reporting of financial and staff contributions would enable ODF management to:

- more accurately report the financial and non-financial cost of fire to the Board of Forestry, the Legislature and stakeholders;
- better assess the financial and non-financial impact of certain actions (e.g., funding or staff reductions); and
- adequately plan for contingencies, including continuing severe fire seasons.

ODF needs agency wide workforce planning to meet current and future challenges

Fire organizations across the country are recognizing the need to conduct workforce planning as resources are constrained by wildfires that are increasing in size and complexity.

The increased work created by recent fire seasons has led ODF to question its long-term ability to support its programs and fulfill firefighting responsibilities with a workforce that has remained at about 870 full-time equivalent staff since 2009. These fire seasons have further exposed the need for ODF to conduct systematic, workforce planning that accounts for multiple program missions and the trade-offs between ODF's fire and non-fire programs created by the firefighting militia model.

Workforce planning, a key element of strategic human capital management, is a systematic process for ensuring an agency has the right staff at the right time to fulfill mission and program objectives. It also helps an organization identify and address the gaps between its current workforce and future needs.

This type of workforce planning can also help ODF communicate with the Legislature and its stakeholders about workforce trends and funding needs.

ODF identified workforce challenges and actions needed to address fire severity and the strains on the agency in its 2004 Fire Program Review, but did not perform comprehensive workforce analysis and planning. Some challenges and actions ODF identified in 2004 include:

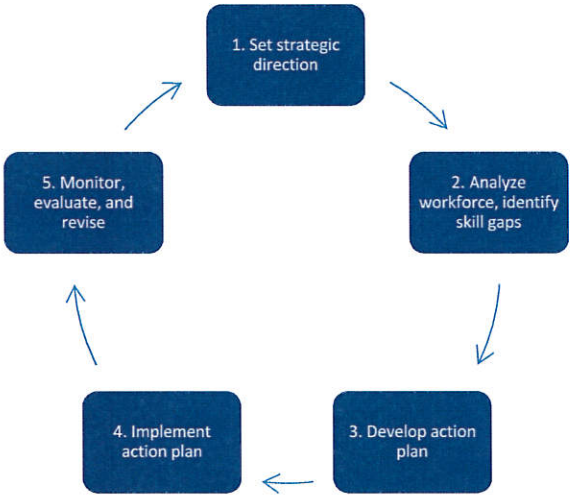
- difficulty maintaining an adequate wildfire workforce;
- increasingly complex fire prevention, detection, and suppression responsibilities as wildfires have become larger and more severe;
- an immediate need to develop a long-term strategy to recruit and fill Incident Command System (ICS) positions;
- a need to identify critical unfilled positions (gap analysis) on a statewide level and develop an action plan to ensure positions are filled within a specified timeframe; and
- a need to set training priorities, use staff from other state agencies for firefighting activities, expand wildfire training and use the National Guard for firefighting.

A systematic and future-oriented workforce planning process can allow ODF to address current or emerging challenges to its programs, workforce, budget, and larger environment.

Workforce planning model

The U.S. Office of Personnel Management's Workforce Planning Model outlines a process that helps identify skills needed for the future, based on facts, that links to the agency's short and long term strategic plans and objectives.

Figure 6: Workforce Planning Model



Source: U.S. Office of Personnel Management

Workforce planning is complex at ODF

As noted below, workforce planning is complex for ODF because it must account for multiple fire and non-fire program missions, the regular duties

and firefighting responsibilities of employees in the militia, long training times for fire qualifications, and inconsistent fire seasons.

Fire Training is a Long-Term Investment

Training staff to manage fires is a long-term investment in permanent employees. Seasonal staff are not with the agency long enough to achieve advanced fire qualifications. Most of ODF's frequently used fire qualifications take a minimum of three years of training to achieve, with only about a quarter taking less than three years. The rest take longer, such as training for Incident Command Team positions (7 to 12 years on average), some of which can take 20 or more years of training.

Trail riding (Photo by Oregon Department of Forestry, CC BY)

Dual Responsibilities Result in Trade-Offs

Trade-offs between fire suppression operations and regular job duties also complicate workforce planning. Employees trained for some advanced fire positions also hold key non-fire positions. For example, the 2015 IMT teams included an Area Director and three District Foresters who are responsible for the full spectrum of agency operations (not just fire) in different regions of the state. Their participation on the IMT teams resulted in them being away from their regular duties for weeks.

Conflicting Priorities for Staff with Fire Qualifications

Key employees in non-fire programs also hold advanced fire qualifications. In 2015, for example, the State Forests Program and Agency Administration Division did not allow two qualified fire staff to participate in fire operations because they were needed on key non-fire projects during the summer months. This meant fewer qualified staff for fire operations during a severe fire season.

Inconsistent Fire Seasons Compounds Planning

Consistent fire seasons would make workforce planning easier, but fire seasons are not consistent. The number of fires and IMT deployments, for example, vary from year to year as temperature, drought and other factors change. ODF uses the militia model to scale up its firefighting for large fires, avoiding the need to pay for a larger full-time "fire department," which results in more complexity for fire planning.

Complete workforce analysis needed

ODF has not conducted a complete analysis of its current and long-term workforce needs. This would allow the agency to identify gaps and to monitor, evaluate, and align the plan to meet the agency's strategic goals. Workforce analysis is a key component of workforce planning and should:

- evaluate workforce trends, such as the number of employees by job classifications, turnover rates, retirement eligibility, and demographic trends;
- establish the kinds, numbers and locations of workers to meet current strategic needs, as well as anticipated future needs; and
- determine the gaps between current and projected needs.

ODF has analyzed and presented some information about its current workforce to the Oregon Board of Forestry. The report included basic information on employment, expected retirements, and demographic trends. For example, the agency knows that 46% of its leadership team can retire in the next five years, further underscoring the need for planning. But the information presented to the Board did not include the kinds, numbers and locations of workers needed to meet current or future needs.

While the agency lacks a complete picture of its workforce needs, ODF has identified areas where additional staffing resources may be needed, such as for fire aviation and finance. ODF is considering these areas for the agency's 2017-19 budget request and estimates the costs to be about $380,000.

Workforce analysis and planning must also evaluate firefighting resources

Firefighter (Photo by Oregon Department of Forestry, CC BY)

ODF has not analyzed its fire militia or formally determined its current or anticipated firefighting needs. In addition to traditional workforce analysis, fire organizations also must study their firefighting militia and expand the analysis to include actual data on:

- Demographics and retirement eligibility of fire-qualified personnel
- Incident Management Team deployments
- Staff participation rates in firefighting efforts
- Numbers of fire qualifications needed
- Unfilled or unmet firefighting resources
- Numbers, demographics, and participation rates in the fire training pipeline

ODF currently maintains some information that could be used to perform this analysis. However, ODF's training qualifications database lacks a way to link individuals in the training database to personnel data.

ODF should identify other metrics to monitor and analyze the sustainability of its fire operations. These could include baseline numbers and targets or ranges to gauge when revisions may be needed. For example, routine monitoring of regular and overtime hours and hours non-fire staff contribute to firefighting could signal the need for short or long term workforce adjustments.

There are other reporting mechanisms that could help inform the workforce analysis and evaluate whether operations are sustainable. Staff input could be collected through surveys or other means to assess the impacts of workload increases. The agency's programs and business units prepare annual operations plans that could be used to report the status of projects delays or disruptions to core services. Also, ODF has procedures to review its operations at the end of each fire and makes recommendations for improvements.

Forward-looking workforce planning needed

Recent fire operations have raised questions about the sustainability of ODF's current staffing model. ODF now has the difficult and uncertain task of planning for future firefighting needs, which can be addressed through forward-looking workforce planning.

Changes in fire severity, the workforce, and non-fire programs may necessitate adjustments to ODF's strategies and resources. Long-term planning for future firefighting needs must happen years in advance to identify anticipated needs, obtain resources, and ensure staff are trained and ready to respond.

Identifying the current and projected future needs allows the agency and leaders to better evaluate possible solutions and make informed decisions based on the size of gaps. Small needs may be better met internally within the agency, whereas large gaps may require going outside the agency.

The 2016 Fire Program Review discussed a broad range of ideas to make the Fire Protection Program sustainable, from adding staff positions to training staff from other state agencies. But without careful workforce analysis and planning, it is difficult for leaders to make informed decisions and decide whether the solutions currently being proposed will actually meet ODF's current and future needs.

ODF needs a systematic method to improve business processes

While ODF has systems in place to collect and assess process improvements suggestions, some systems are fragmented and incomplete. A better system could help ODF address its increased workload by reducing unnecessary costs and inefficiencies, and better direct existing resources to program objectives and priorities.

Financial and administrative workload has increased and is more complex

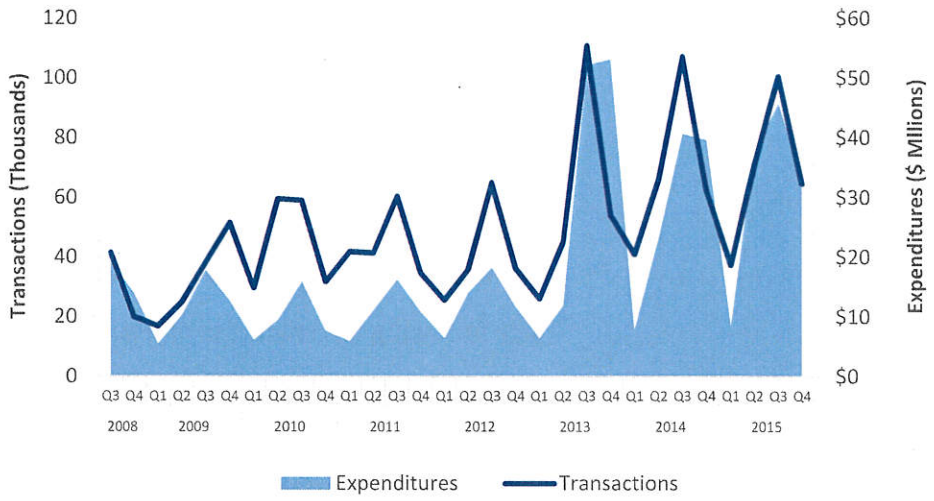
As fires have increased in recent years so has the volume of transactions that ODF staff are processing. This increase occurs on top of other financial and administrative duties of the Fire Protection Business Unit and District offices.

As the average total cost for suppressing large fires increased from $9.7 million in 2006-2012 to $92.4 million in 2013-2015, the number and complexity of related transactions, including FEMA claims, has also significantly increased.

We determined that, on average, the number of transactions for personal services, services and supplies, and capital outlays increased from about 40,000 to over 100,000 at the height of the 2013-2015 fire seasons. This accounts for approximately $50 million in quarterly expenditures, and

provides a measure of fire-related administrative and financial workload (See Figure 7).

Figure 7: Fire Protection Expenditures and Transactions



Note: Excludes Other Expenditures, Special Payments, and Transfers.

In addition to increasing the number of transactions, the financial and administrative aspects of large fires are also more complex to process. For example, fires can occur between multiple fire districts and/or jurisdictions, and involve multiple levels of government. There can also be more employees, contractors, and vendors to pay with different rates, as well as complex aviation bills and cost-sharing agreements between landowners.

Relatively routine tasks, like payroll, become more complex. For example, there were over 90 applicable payroll codes on the 2015 Canyon Creek fire, depending on what a worker did, at what time on which day, at which location, and how many hours they had previously worked. This number of variables makes it easy to make a mistake.

Changes to support new firefighting programs, contract modifications, and new legislation all added high-priority administrative work. The increase and complexity of fire related financial transactions has also expanded the strain on critical business processes, and the increased workload is resulting in payroll errors and corrections and delays in invoicing vendors.

Enhancements to ODF processes for evaluating improvements could help

ODF's increased workload is resulting in delays, financial errors, and time spent making corrections. At the same time, ODF recognizes business process improvements are a way to help address the workload. In 2007, ODF concluded that a successful business process improvement initiative could help address workload requirements by:

- reducing unnecessary costs, errors, and inefficiencies;

- directing existing resources to higher business priorities; and,
- better aligning strategy, goals and objectives.

Today, ODF has systems in place to collect and assess process improvement suggestions made by staff, but some systems are fragmented and incomplete.

ODF managers told us about possible improvements, systems for considering improvements, along with some challenges to moving ideas forward for specific business processes. For the proposed improvements we reviewed, we found that procedures for submitting and addressing process improvements varied and were not documented, and decisions were not always made, communicated, or explained.

The following are examples of improvements suggested:

- Payroll process for large fires: Improving the payroll process for large fires could reduce errors and rework. This was identified as needing improvement as far back as 2010. Current staff cite the process as burdensome and highly prone to errors. As such, it represents one of the biggest administrative pain points for processing fire related bills. Problems have been exacerbated by the increasing number of staff deployments over the past three years. Suggestions have been made, but analysis and decisions have not been finalized and/or communicated.
- Pre-contracting of fire resources (equipment): This change, which involves contracting for services and equipment prior to the fire season, could potentially make more resources (equipment) available to support firefighting, save time at a critical phase of launching a fire response, and reduce liability to the state. The U.S. Forest Service has adopted a variation of this idea, which ODF reportedly first suggested 20 years ago. ODF reported it has been piloting pre-contracting in some districts since 2011. Pre-season contracting is now being adopted by ODF districts, but on a voluntary basis.
- Streamlining payment review processes: Managers, financial staff, and after-fire payment teams are currently required to review all payments for things such as contracted services and supplies, staff time, and fire incidents. Staff reported that parts of the process are cumbersome and excessive given the relatively low level of risk in some areas, and have suggested modifications. Suggestions for improving this process need to be reviewed and assessed in a more effective manner.

Evaluation of wildfire prevention and detection efforts can be improved

Prevention and detection activities are proactive steps that can decrease the need for fire suppression efforts, leading to lower suppression costs and wildfire damages. ODF's fire protection work includes prevention and detection efforts, but the agency's resources are mostly dedicated to suppression operations.

Although ODF has reviewed the work done by some districts in these areas, the agency does not collect enough information to systematically evaluate the costs, benefits and relative effectiveness of the various prevention and detection activities implemented across the state.

Evaluation of these activities could help the agency and decision-makers identify the most cost-effective prevention and detection investments.

ODF needs to find the right balance between suppression and proactive fire management activities. This is particularly important in light of limited state funding, unstable federal prevention and mitigation grants and ODF's goal of keeping landowner protection costs low.

ODF takes proactive steps to prevent and detect wildfires

Hugging Smokey Bear (Photo by Oregon Department of Forestry, CC BY))

It is widely recognized that prevention and early detection efforts are some of the most effective tools for reducing the number of fires that require extensive fire suppression actions. Keeping fires small or preventing them altogether reduces suppression costs, as well as timber losses and damage to homes and habitat.

Oregon law establishes both prevention and suppression as public policy to preserve forests, but most of ODF's Fire Protection resources go to suppression activities. ODF does not track all of the resources dedicated to prevention efforts, but estimates district staff spend around 5-10% of their time doing prevention work. The 2016 Fire Program Review also noted that local prevention efforts represent less than 10% of fire protection budgets. A proper evaluation of ODF's prevention efforts could help determine if these allocations are appropriate. ODF's proactive prevention work includes activities such as:

- Education: Disseminating prevention information through such means as radio and TV ads, blogs, newsletters, social media, Smokey Bear visits to schools, and direct contacts with loggers, campers, hunters, and other forest users.
- Enforcement: Regulating activities in forested areas through campfire bans and other measures, and inspecting forest operations for compliance with industrial fire precaution requirements.

Not all fires are preventable. When fires start, early detection is key to suppressing fires quickly and keeping damages and costs low. ODF employs a variety of fire detection methods, including air and ground patrols, and fire lookouts. Since 2008, the agency has also been employing remote fire detection cameras in some parts of the state. ODF noted that in January 2016, it submitted a request to the Legislature for $290,000 in General Funds for a wildfire detection enhancement package, but it was not approved.

ODF sets fire protection standards and targets, but does not evaluate prevention and detection strategies

To help ensure adequate protection, ODF sets minimum standards to guide districts in planning, budgeting, prioritizing, and implementing fire operations, including prevention and detection activities. The agency also has a process for assessing district performance against these standards and has reviewed four districts in the past three years, using its Protection Standards Review process.

Remote-detection camera monitors

Although ODF has assessed whether some districts are meeting fire protection standards and targets, ODF has not evaluated or compared the costs, benefits and relative effectiveness of the different fire prevention and detection activities implemented across districts.

This type of evaluation could allow ODF to determine, for example, whether districts with more fire detection cameras have shorter response times and lower suppression costs than districts with fewer or no cameras, and whether districts with higher industrial fire inspection and compliance rates have a lower incidence of fires started during forest operations.

ODF has different options for evaluating wildfire prevention and detection activities

In 2004, ODF's Fire Program Review highlighted the importance of evaluating wildfire programs, given that the public, state legislators and the agency expect results. According to the 2004 review, evaluation improves decision-making, helps set and achieve goals and objectives, improves productivity, and can be used to inform planning efforts.

While evaluating the impact of wildfire management activities is difficult due to variables such as temperature and forest use, there are evaluation methods available that range in complexity from individual examples to statistical analysis.

Federal wildfire agencies like the U.S. Forest Service and the Bureau of Land Management evaluate the effectiveness of their programs through performance measures, reviews of their responses to individual wildfires, and studies assessing the effectiveness of specific activities, such as fuel reduction treatments and aerial firefighting.

ODF's 2004 Review also identified forms of evaluation for Oregon's fire prevention activities, including assessing the costs and benefits of specific prevention efforts. One example cited is a 1996 prevention effort launched by states in the U.S. Southwest that was credited with reducing fires within weeks from 20 to 12 fire incidents per week. The effort used 31 individuals who devoted 663 person days at a cost of $180,000. According to the Review, the team was credited with saving millions of dollars.

Statistical analysis is another method that has been used to evaluate the effectiveness of prevention activities. Research in peer-reviewed journals,

although limited, shows evidence of prevention activities reducing the number of human-caused fires, with benefits exceeding prevention costs.

According to a 2015 study, Bureau of Indian Affairs (BIA) tribal units with a longer history of funded wildfire prevention programs and more law enforcement officers saw fewer instances of certain types of human-caused fires. For BIA tribal units in Oregon and Washington, the study's results imply annual savings of $38 in avoided suppression costs for each dollar spent on fire prevention programs.

Fire operations plane

Studies in Florida also present evidence that many of the state's wildfire prevention and mitigation activities have had a significant effect in reducing the number of human-caused wildfires.

In the case of wildfire detection methods, evaluation can be accomplished through testing and comparing different systems in terms of cost, speed and accuracy of detection and other benefits. Studies in Australia and Canada, for example, have compared the relative effectiveness and costs of various wildfire detection technologies, including remote detection cameras and different types of infrared scanners for detecting hotspots of smoldering woody material during post-suppression operations.

Better information can help ODF assess effectiveness and target root causes of fires

Evaluating the effectiveness of prevention and detection activities can help ODF identify and implement the most cost-effective mix of wildfire management strategies. But to evaluate for effectiveness, ODF needs to improve the amount, quality, and consistency of the information it collects.

In the case of fire prevention, ODF does not have a full accounting of the costs of prevention efforts and does not collect consistent information about different prevention activities. For example:

- Some information about staff and funds allocated to prevention can be found in agency documents, including district annual reports and district budgets. However, this information is not enough to differentiate spending among activities that target different groups, such as prevention education campaigns that target the general public or industrial fire inspections aimed at preventing fires caused by forest industry activity.
- Some districts include information on prevention outputs in annual reports, including school visits and the estimated number of contacts with forests users. But not all district annual reports include the same information and some reports have no data on prevention outputs. As a result, a statewide evaluation of the costs and benefits of these activities is not possible.
- Under ODF's industrial fire prevention program, districts are required to inspect forest operations for compliance with fire safety requirements and to maintain inspection records. The effectiveness of this program could be evaluated, for example, by testing whether districts with higher

compliance rates have fewer industry-related fires. But this is not possible because records are not kept consistently. According to ODF, data collection should improve with planned updates to the agency's online Forestry Activity Electronic Reporting and Notification System (FERNS).

According to ODF and federal wildfire agencies, prevention programs are most effective when they target the root causes of fires. But the information ODF currently collects on fire incidents makes it difficult for staff to analyze fire cause statistics and to target activities to specific causes. This limitation was also noted during ODF's Fire Program Reviews in 2004 and 2016.

For example, "Equipment Use" fires in ODF's database may include incidents caused by forest industry activity or members of the public. This is the case of the $34 million Stouts Creek fire near Roseburg in 2015, caused by lawn mowing during high fire danger conditions. To reduce this type of fire, prevention efforts would have to be focused on residents instead of forest industry workers. However, the fire cause data does not allow users to differentiate between the two groups in order to identify the appropriate group to target.

More work needed to mitigate wildfire risks

Proscribed burning (Photo by Oregon Department of Forestry, CC BY)

Experts agree that decades of aggressive fire suppression, land use changes, past land management practices, and other factors have led to an unprecedented accumulation of fuel in forests and rangelands across the United States. To reduce the risk of large wildfires with dramatic effects on forest ecosystems, homes, watersheds and other valuable resources, public agencies and private landowners use a variety of methods such as tree removal and prescribed burning.

Despite these efforts, Oregon has millions of acres of land at high risk of wildfires and in need of restoration, and the resources currently dedicated to mitigation work are unlikely to meet this challenge.

Fuel treatments are conducted on thousands of acres each year

On average, ODF is awarded $1.5-$2 million per year in federal grants to reduce fuel loads on about 3,000-4,000 acres of non-industrial private forest land. With these grants, ODF provides technical assistance to help landowners plan and implement fuels reduction projects on their property. The grants allow ODF to use federal funds to share the costs of these projects with landowners. According to the agency, some of this funding is unstable and is expected to continue declining in coming years. ODF does not receive state funding to implement fuel reduction projects on private forest lands.

Pre-commercial thinning is a forest management activity that can mitigate wildfire risks. It involves removing smaller trees to reduce forest density and allow the remaining trees to increase their growth. This is primarily

done to increase timber volume and revenues, but also mitigates wildfire risks by reducing fuel availability if woody debris is also removed.

According to ODF, industrial private landowners in Oregon regularly conduct pre-commercial thinning operations, although the agency does not currently track the annual number of acres treated using this method. ODF staff told us they may be able to use the agency's Forestry Activity Electronic Reporting and Notification System (FERNS) to track this information.

Federal forest restoration work (Photo by Oregon Department of Forestry, CC BY)

ODF also uses pre-commercial thinning to manage Oregon's state forests. Between 2005 and 2009, ODF treated an average of more than 2,900 acres per year using pre-commercial thinning. In 2009, ODF made reductions to its State Forests Program in response to the economic downturn and lower profitability of state timber sales. However, federal stimulus grants allowed the agency to continue pre-commercial thinning and fuel reduction treatments on over 1,600 acres per year in fiscal years 2010-2013. With the end of federal funds, pre-commercial thinning and fuel reduction treatments on state forests declined to zero acres in fiscal year 2014 and 650 acres in fiscal year 2015. ODF estimates there is now a backlog of at least 2,000 acres each year that should be thinned. Failure to address this backlog may reduce timber revenue and environmental benefits in the long term, and could increase the risk of catastrophic losses due to wildfires.

Federal agencies are responsible for managing 60% of Oregon's forest land. These agencies also conduct wildfire risk mitigation activities in Oregon. In recent years, the U.S. Forest Service, which manages 47% of Oregon's forest land, reports treating over 250,000 acres each year using methods such as forest thinning, prescribed burning, tree pruning, and mowing.

The State of Oregon has limited ability to assist federal agencies in conducting forest management activities on federal forests. However, since 2013, ODF has received funding to directly support activities aimed at increasing the pace, scale, and quality of federal forest restoration efforts, which can include fuel reduction projects. This work is being conducted under ODF's Federal Forest Health Program, which was allocated $7.9 million in lottery funds by the Oregon Legislature for fiscal years 2013 through 2017.

Despite efforts, millions of untreated acres increase wildfire risk

Although fuel treatments are conducted on hundreds of thousands of acres of land each year, Oregon's mitigation needs may be significantly larger.

According to a 2015 study by researchers at the Nature Conservancy, the U.S. Forest Service and Oregon State University titled, "A New Approach to Evaluate Forest Structure Restoration Needs across Oregon and Washington, USA" forest restoration is needed on approximately 7 million acres of forest land in Eastern and Southwestern Oregon. Federal agencies manage most of the lands in these areas and account for around

67% of the land in need of restoration, followed by private lands (30%) and other public and tribal lands (3%).

Forest restoration can be accomplished through various methods, including tree and underbrush thinning and prescribed burning. Restoration treatments may be conducted to reduce wildfire risk, but they can have other objectives such as reducing the risk of insect infestations and/or restoring watershed functions. At the current pace, the study estimates it would take over 50 years to restore U.S. Forest Service lands in the areas of Oregon and Washington included in the analysis.

Another 2015 study by the American Forest Foundation (AFF) titled, "Western Water Threatened by Wildfire: It's Not Just a Public Lands Issue," also found substantial wildfire risks on public and private forest lands across U.S. western states and concluded forest restoration is needed across ownerships.

For Oregon, the study estimated almost 9 million acres of public, tribal and non-industrial private forest land (around 29% of the state's forested areas) are at high risk of experiencing wildfire activity. The study also found that 1.3 million acres of high-risk lands are in important water supply watersheds, with 51% of these lands in non-industrial private forests and 49% in public and tribal forest lands. The study did not include industrial private forest land, which accounts for about 20% of the state's forest land.

Fire outside of an urban area (Photo by Oregon Department of Forestry, CC BY)

Going forward, factors such as climate change and its influences on drought, insect and disease stressors, and the expansion of residential development into forests are anticipated to increase the pace and scale of wildfires and other disturbances. In turn, these are likely to exacerbate Oregon's wildfire risk mitigation needs, signaling a need for state and federal policy makers to take action to reduce hazardous fuel loads across the landscape.

Recommendations

To reduce the impacts of fire operations on personnel and programs, and to sustain or improve operations, we recommend ODF:

- Collect, analyze and communicate the impacts of fire season on programs and personnel, including impacts to core services and annual operations plans.
- Enhance accounting to identify non-fire program contributions to fire protection, to better account for the agency's full cost of protection, and communicate contributions.
- Assess and communicate to decision makers the impact of potential staffing changes on programs and firefighting capacity. Devise mitigation plans to minimize impacts.
- Develop a systematic, future-orientated workforce planning process that incorporates regular job duties, fire militia duties, and future conditions. Communicate with stakeholders about workforce trends and needs.
- Regularly analyze and monitor the overall and fire militia workforces. Identify strategies to fill gaps and ensure the agency has the right staff to fulfill its mission now and in the future.
- In the short term, assess staffing levels and other resources needed to address the backlog of finance and administrative work associated with the last three fire seasons. For the long term, assess the resources needed for these activities as part of the agency's workforce planning process.
- Define and implement a complete process to collect, review, and implement business improvement ideas that address challenges and increase efficiencies.

To reduce the threat of wildfire through prevention and to detect fires early before they become large, as well as to minimize the financial and environmental losses fires cause, we recommend ODF:

- Evaluate the resources allocated to suppression activities versus proactive fire management activities, such as prevention, detection, and mitigation, and communicate findings.
- Evaluate the cost-effectiveness of different fire prevention and detection strategies. Also, consider methods being implemented or developed by other fire organizations and states.
- Communicate with stakeholders about the importance of investing in strategies that can reduce the number and severity of large wildfires.
- Based on an evaluation of strategies and available resources, focus resources on the strategies that will be more likely to succeed in reducing the number, severity and suppression costs of wildfires.
- Increase its proactive wildfire mitigation efforts on both public and private lands.

Objectives, Scope and Methodology

Our audit objectives were to determine (1) the impacts of more intense and longer fire seasons in recent years on the Oregon Department of Forestry's (ODF) personnel, programs, and mission; and (2) whether there are opportunities for ODF to sustain or improve the agency's wildfire operations without compromising other programs.

To address our audit objectives, we interviewed key personnel from each of ODF's five operating program, including each program Chief and Deputy Chief. We also interviewed the Chief of the Administrative Services program and the agency's Human Resource Director and Internal Auditor. We also obtained input from the Oregon Board of Forestry Chair and the Agency Director.

Among the personnel we interviewed were ODF staff with specialized knowledge of ODF fire operations and administration, such as District Foresters, field staff, financial staff, and organizational and policy analysts. Interviews addressed current practices and best practices.

We interviewed ODF stakeholders, including commercial landowners, representation for small landowners, environmental and conservation groups, and county representatives. We also spoke with representatives from the Governor's Office, Legislative Fiscal Office, the U.S. Forest Service, Natural Resources Conservation Service, and Bureau of Land Management.

We reviewed laws and rules related to all ODF operating programs, including those directly related to fire protection. With respect to fire protection operations, we reviewed planning and training documentation, fire standards, agency fire and fire suppression data, key performance measures related to fire operations and ODF programs supporting fire suppression activities.

We also reviewed reports and literature related to fire suppression, prevention, mitigation, and detection in Oregon and other states and jurisdictions; workforce planning literature; and past ODF program audits.

We analyzed payroll data to determine increases in time spent on fire protection activities. Specifically, we sought to determine the hours worked and billed to the Fire Protection Program by ODF staff, the opportunity cost of this work to ODF's non-fire programs, and increases in financial transactions and complexity.

We obtained ODF personnel data from the Oregon State Payroll Application covering the period from July 2009 to November 2015 and assessed the data for reliability. We concluded the data were sufficiently reliable for our audit purposes.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to

provide a reasonable basis for our findings and conclusions based on our audit objective. We believe that the evidence obtained and reported provides a reasonable basis to achieve our audit objective.

Auditors from our office, who were not involved with the audit, reviewed our report for accuracy, checking facts and conclusions against our supporting evidence.

Oregon
Kate Brown, Governor

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"STEWARDSHIP IN FORESTRY"

August 18, 2016

Mary Wenger, Interim Director
Oregon Audits Division
255 Capitol Street NE, Suite 500
Salem, OR 97310

RE: Oregon Department of Forestry's Response to the audit report *Oregon Department of Forestry: Actions Needed to Address Strain on Workforce and Programs from Wildfires*

Dear Ms. Wenger:

Thank you for the opportunity to respond to the audit, titled *Oregon Department of Forestry: Actions Needed to Address Strain on Workforce and Programs from Wildfires*. It has been a pleasure to work with your staff on this audit. Their professionalism and dedication are a credit to your Division. Your team experienced first-hand and quickly comprehended the complexity of our agency's fire business and its relationship to all other functions of our agency and the dramatic increase in fire activity in recent years. I also appreciated that they spent significant time with our agency customers, cooperators and stakeholders, who expressed confidence in and support for our fire operations. Because we do operate in a complete and coordinated system with many landowners and fire agencies, this level of trust, ongoing strength and open communication is crucial.

The culture here at the Oregon Department of Forestry (ODF) is one that encourages continuous improvement and critical examination of all we do. The Department utilizes annual operation planning and budgeting tools to identify and prioritize work to assure alignment with biennial budgets, strategic initiatives, and the Board of Forestry's work plan. We welcome and have embraced the audit process as yet another opportunity to review and improve our practices and processes, and we are committed to incorporating these recommendations into planning processes where the real work forward will be implemented. We support and agree with the audit's conclusions and recommendations. The Department is addressing the recommendations in the ways described below.

I. Recommendation - To reduce the impacts of fire operations on personnel and programs, and to sustain or improve operations, we recommend ODF:

1. Collect, analyze and communicate the impacts of fire season on programs and personnel, including impacts to core services and annual operations plans.

ODF agrees with this recommendation. By law, the Department is required to report to the Legislature the nature and severity of a fire season, the suppression costs, and the budget balance for suppression funds. Recent legislation (HB 2501) requires the Department to also report to the Legislature on the impacts of fire to private landowner's resource losses including timber, buildings, fencing, livestock, and of grazing. Each year, and biennially through the Legislative budget process, we do indeed describe impacts, and we appreciate the audit

recommendation to make these impacts more systematic and as quantifiable as possible, including consideration for employee strain, strengthening our workforce capacity, and providing for transparency of the impacts to our core services and annual operating plans. Incorporating and systematically tracking specific data related to core services and operating plans impacted by fire seasons can improve future reporting.

Our actions to address the strain on employees from the past three fire seasons have included revisions to our Incident Management Rest Policy to ensure that adequate rest is provided while an employee is on assignment. In 2014 and 2015, all ODF employees were granted an additional day of leave in recognition of the exceptional performance that comes along with meeting our agency mission. To improve upon our assessment of employee strain, in addition to reviewing the additional overtime hours worked on a comparative basis as the audit report did, our very recently initiated Strategic Workforce Planning effort will incorporate a survey assessment component focused on work/life balance issues, which will allow the agency to better gauge the less-defined impacts on employees and their families.

As we continue to evaluate staffing needs across the agency, realign duties to meet increasing fire season demands, and consider more cost-effective and efficient ways to address workloads, including the use of contracted resources, the agency may face additional challenges through budget reductions in non-fire programs. Translating these impacts into subsequent legislative requests for additional work force capacity will be critical to sustaining our fire organization and reducing the strain on ODF employees.

2. ***Enhance accounting to identify non-fire program contributions to fire protection, to better account for the agency's full cost of protection, and communicate contributions.***

   ODF agrees with this recommendation. The Department seeks continual improvement to its complex accounting systems and practices. We will work on developing better tracking and reporting mechanisms that identify non-fire program contributions to fire protection including ways to collect, summarize, and communicate non-fire program contributions to fire protection. For example, the Department has recently initiated an intra-agency project that will begin to identify non-fire program contributions.

3. ***Assess and communicate to decision makers the impact of potential staffing changes on programs and firefighting capacity. Devise mitigation plans to minimize impacts.***

   ODF agrees with this recommendation. The Strategic Workforce Planning effort (see below) will include a talent inventory that will be analyzed in terms of future workforce requirements to help reduce the uncertainty of staffing changes. This process will enable the agency to devise intentional, purposeful, data-driven action plans to determine priorities and allocation of resources on programs and firefighting capacity.

4. ***Develop a systematic, future-orientated workforce planning process that incorporates regular job duties, fire militia duties, and future conditions. Communicate with stakeholders about workforce trends and needs.***

   ODF agrees with this recommendation. The Agency plans to initiate a Strategic Workforce Planning process to systematically determine current and emerging workforce trends and needs. This process includes but is not limited to, documenting current and future-oriented job requirements and conditions for fire and non-fire programs. Further, this process incorporates a closed-loop feedback mechanism to monitor attainment of goals and objectives, and to

disseminate this information to stakeholders. Utilizing these strategies will enable the agency to better manage organizational change aimed at augmenting organizational performance.

5. ***Regularly analyze and monitor the overall and fire militia workforces. Identify strategies to fill gaps and ensure the agency has the right staff to fulfill its mission now and in the future.***

   ODF agrees with this recommendation. The agency will address this recommendation via its Strategic Workforce Planning (SWP) effort. By regularly analyzing, monitoring and refining SWP efforts, ODF can more effectively identify gaps and formulate action plans to enlarge the pool of qualified individuals (both fire and non-fire workforces) through a variety of workforce practices (e.g., recruitment, selection, training, development, transfer, promotion, etc.). Doing so will enable the agency to anticipate future staffing requirements, determine priorities and allocate resources where they can do the most good, both now and in the future.

6. ***In the short term, assess staffing levels and other resources needed to address the backlog of finance and administrative work associated with the last three fire seasons. For the long term, assess the resources needed for these activities as part of the agency's workforce planning process.***

   ODF agrees with this recommendation. The Department will explore contracted resources to assist with the FEMA processing and will continue to hire the necessary limited duration positions on a full-time basis to maintain core workloads. These full-time, limited duration positions provide the continuity and expertise necessary to help the Department maintain greater alignment with existing workloads. In the short term, the Department will maintain these positions and consider other alternatives to sustain peak capacity needs.

   In the long term, permanent solutions to address this challenge are underway through the agency's 2017-2019 biennial budget process, which includes a request in Policy Option Package 313 for one full-time permanent "Incident Business Coordinator" position. This position will support additional sustained financial workloads in severity resource management and incident support which have become a permanent part of the Department's workload. A full review of the agency's workforce planning process will provide a complete review necessary to consider all facets of ODF business and administrative needs.

7. ***Define and implement a complete process to collect, review, and implement business improvement ideas that address pain points and increase efficiencies.***

   ODF agrees with this recommendation. Evaluating the current feedback systems and improving their systematic nature can indeed add value to the continuous improvement process. Capacity to conduct and focus improvements on this area of business is being proposed through a full-time permanent "Incident Business Coordinator" position (See Policy Option Package above). If approved through the biennial budgeting process, this position will serve on the Fire Finance Committee, which is a state-wide decision making committee of ODF business managers who coordinate to establish fire business processes and policies to ensure efficient financial management. The comprehensive review of workforce planning will also help to evaluate how the Department may implement such a review if this capacity request is granted.

II. ***Recommendation - To reduce the threat of wildfire through prevention and to detect fires, and detect lightning-caused fires early before they become large, as well as to minimize the financial and environmental losses fires cause, we recommend ODF:***

1. ***Evaluate the resources allocated to suppression activities versus proactive fire management activities, such as prevention, detection, and mitigation and communicate findings.***

ODF agrees with this recommendation. Although there is no national standard or Oregon policy that directs a certain distribution of investments among these activities, the Department feels there would be benefits to such a study. Knowing this information will be helpful to evaluate if funding is in alignment with the Department's priorities to provide for a complete and coordinated fire protection system. The Protection Division conducts "Standards Reviews" of its 12 protection districts with minimum standards to be met in the areas of suppression, prevention, and detection; this effort will help to support this evaluation. Capacity to conduct this review will be a limiting factor, and the comprehensive review of workforce planning will help to evaluate how the Department may implement such a review.

2. ***Evaluate the cost-effectiveness of different fire prevention and detection strategies. Also, consider methods being implemented or developed by other fire organizations and states.***

   ODF agrees with this recommendation. Investing in prevention and early detection is the foundation of every wildfire protection system. The Department is proud of its effort in this area, specifically the proactive approach to initiating a nationally recognized detection system, and the network of fire prevention working relationships we have locally, regionally and nationally. Evaluating the effectiveness of these prevention and detection systems to target future investments will be critical to progressing Oregon's protection system. Capacity to conduct this review will be a limiting factor, and the comprehensive review of workforce planning will help to evaluate how the Department may implement such a review.

3. ***Communicate with stakeholders about the importance of investing in strategies that can reduce the number and severity of large wildfires.***

   ODF agrees with this recommendation. Working with cooperators and fire agency partners, the Department has developed prioritized lists of strategic investments to reduce the number and severity of large wildfires. These priorities are ready for implementation if/when funding is available from the Oregon Forestland Protection Fund (OFLPF) and/or the Legislature and other partners. With the passage of the Wildfire Protection Act in 2013, the concept of a strategic investment from the OFLPF into the protection system was established with the full support of a diverse coalition of stakeholders. A strategic investment is targeted towards improving the protection system to reduce the number and severity of large wildfires. The limiting factor for the past three years has been available funding through the OFLPF. For the past three years the OFLPF has been fully expended on large fire costs, severity and insurance premiums, limiting its ability to invest in strategic investments. The Department presented a prioritized list of strategic investments to its stakeholders at both the Emergency Fire Cost Committee and Forest Protection Associations.

4. ***Based on an evaluation of strategies and available resources, focus resources on the strategies that will be more likely to succeed in reducing the number, severity and suppression costs of wildfires.***

   ODF agrees with this recommendation. As highlighted in recommendation 9 and 10, both prevention and detection strategies along with strategic investments are focused on reducing the number, severity and suppression costs of wildfires. The timing for implementation of strategic investment is detailed in the previous response. The timing for implementation of new prevention and detection strategies will primarily be contingent upon funding available. As a part of the agency's planning processes, all division-wide strategies are aligned with planning cycles for the biennial budget, fiscal budget, fiscal Board of Forestry work plans and divisional annual operating plans.

5. *Increase* its proactive wildfire mitigation efforts on both public and private land.

ODF agrees with this recommendation. ODF frequently hears from stakeholders regarding the need for increased forest management actions to increase the resilience of the state's vast acreage of federal forests to wildfire. ODF shares the urgency to reverse ecological trends at the landscape level and economic trends in our rural communities. To this end, ODF has pioneered the Federal Forest Restoration program using investments by the state legislature to increase the pace, scale and quality of restoration on lands managed by the US Forest Service and BLM. ODF has proposed to transition this biennial program into the Agency's base budget. Given the combination of the recent economic recession and the low density of forest products manufacturing facilities, particularly in eastern and southwestern Oregon, private landowners are challenged to find market outlets for small-diameter trees and biomass removed during forest fuel reduction operations. ODF currently competes for federal funds to help offset the costs of these treatments on non-industrial private lands.

In closing, I offer my sincere personal thanks to the audit team for their careful, detailed and thoughtful exploration of our agency's top priority program. As always, we are happy to answer any questions or provide further clarification to our comments. Please don't hesitate to call me directly at 503-945-7211.

Sincerely,

Doug Decker
Oregon State Forester

c: Tom Imeson, Chair, Oregon Board of Forestry

About the Secretary of State Audits Division

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The courtesies and cooperation extended by officials and employees of the Oregon Department of Forestry during the course of this audit were commendable and sincerely appreciated.