THE IMPACTS OF THE 2017 WILDFIRES ON OREGON'S TRAVEL AND TOURISM INDUSTRY

16 July 2018

Prepared for

Oregon Tourism Commission (Travel Oregon)
319 SW Washington St. #700
Portland, Oregon 97204

Project Manager

Ladan Ghahramani

Dean Runyan Associates, Inc.
833 SW 11th Avenue, Suite 920
Portland OR 97205
503.226.2973
www.deanrunyan.com

Destination Analysts, Inc.
1728 Union Street, Suite 310
San Francisco CA 94123
415.662.0732
www.destinationanalysts.com

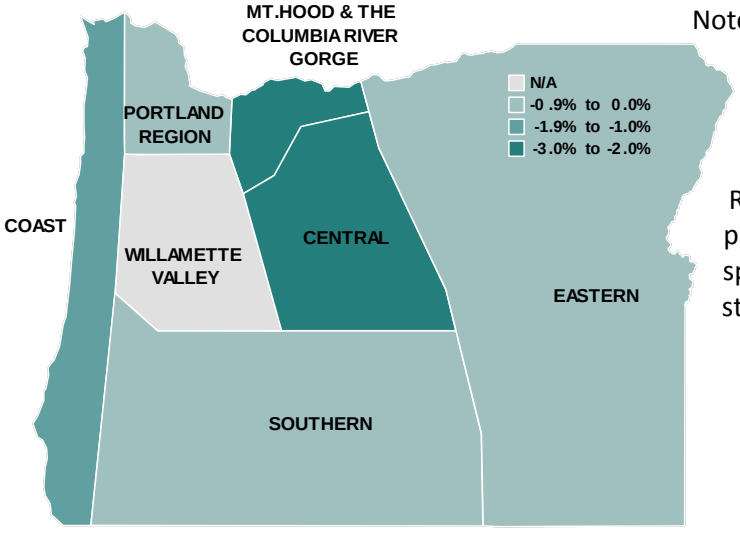
Executive Summary

2017 Fire Season

- 1.2 million acres burned during Oregon's 2017 wildfire season, with some fire activity in every county.
- Smoke from these fires was particularly widespread, causing 451 unique unhealthy air quality readings across the state, a 65% increase over the previous high number of readings between 2000and 2016.
- Compared to previous years, smoke intruded more into populated areas, including the Portland Metro Area
- According to respondents to the business and organization survey conducted as part of the study, the Eagle Creek Fire (Columbia River Gorge) and Chetco Bar Fire (Curry County on the Southern Oregon Coast) had the most impact, followed by several fires and fire complexes in the Central Oregon Cascades.
- Businesses reported that smoke was the most prominent problem, followed by customer perceptions regarding fire-related discomfort; road closures and evacuations were also notable concerns.

Economic Impacts

- There was a $51.5 million loss in visitor spending attributable to Oregon wildfires in 2017.
- $16 million in earnings for employees and working proprietors was lost, as was $368,000 and $1.5 million in local and state tax receipts, respectively.
- In terms of absolute sales lost, impacts were largest in Deschutes and Multnomah Counties, followed by Curry and Jackson Counties.
- In terms of proportional sales lost, impacts were greatest in Central Oregon and the Columbia River Gorge.



Note: The loss in visitor spending was calculated by comparing baseline monthly spending estimates, prepared in part from existing visitor spending measurements from Dean Runyan Associates research, with projections based on typical monthly spending patterns for each region of the state.

Impacts by Fire and Type of Business

- Impacts were greatest on lodging and food and beverage service businesses, followed by retail businesses.
- Respondents to the business survey indicated that impacts were greatest from the Eagle Creek Fire, followed by the Chetco Bar Fire, then the Milli Fire and a constellation of fires in the Central Oregon Cascades.

Future Impacts

- About half of business or organization survey respondents indicated that the 2017 fire season will have an adverse effect on their business in 2018, primarily because consumers will have a diminished perception of their area due to the fires, and that their area has a diminished appeal due to fire damage.

Table of Contents

I. Introduction

Oregon's forest and rangeland assets form a vital part of the state's tourism branding and marketing efforts and host a significant portion of Oregon's visitors. Each year these areas of the state are subject to wildfires, often during summer – the most active months of the recreation season. Disruptions to visitors and the businesses that serve them can be substantial, particularly in the rural locations where fires occur.

The wildfire season of 2017 was notable for its effects on some of the state's most significant visitor destinations, including the Portland Metropolitan Area. Economic consequences of these fires are important to consider, in particular for the state's travel and tourism industry.

Objectives

This study describes the economic impacts of wildfires during 2017 on Oregon's travel and tourism industry, providing in particular an estimate of the economic impact the fires had on businesses and organizations that serve visitors throughout the state. Specific objectives include:

- Describe the geographic scale of wildfires during 2017 with respect to locations in the state that rely most on travel and tourism expenditures
- Profile the types of travel industry businesses that were most affected by wildfires
- Assess business and organization operator perceptions about wildfire impacts
- Provide county- and region-level estimates of the economic impacts resulting from wildfires

Wildfires during 2017 caused hardship well beyond that affecting the travel industry. Containment costs alone were more than $454 million, and many local businesses and residents suffered from dislocations, traffic disruptions and health effects associated with smoke. This study recognizes that these broader impacts occurred, but retains a focus on fire-related effects on Oregon's tourism industry. A thorough review of the 2017 wildfire season appears in the Northwest Interagency Coordination Center's 2018 report, *Northwest Annual Fire Report 2017*.[1]

Wildfire Impacts

Wildfires can have a disproportionate impact on the travel industry because travel – leisure travel in particular – results from a discretionary expenditure by households, one that can be redirected to alternative locations and/or rescheduled in response to undesirable conditions brought on by a fire. Examples of how wildfires can change behavior include:

- Closures and other limitations on access, such as road closures, caused by a fire and/or the efforts to suppress it

1. Northwest Interagency Coordination Center. *Northwest Annual Fire Report 2017* (2018). https://gacc.nifc.gov/nwcc/content/pdfs/archives/2017_NWCC_Annual_Fire_Report_FINAL.pdf.

- Limitations on travel-related services as businesses close or cut back availability; business limitations can be due to staff inability to travel to the business location, difficulty obtaining supplies, power outages, and unhealthy conditions due to smoke
- Undesirable conditions due to smoke, ranging from unsightly haze and visibility limitations to smoke concentrations that are dangerous to health
- Visitor perceptions of smoke- and fire-related adverse conditions, whether or not these conditions actually prevail in destination locations

Oregon has a wildfire season every year, with most fires typically occurring between July and November. Accordingly most economic and other effects occur during this period of time. One of those short term effects is the costs required to suppress each year's fires: in 2017, that cost for Oregon was $454 million. Longer-term impacts can occur, however, such as when potential or actual visitors develop adverse perceptions regarding the desirability, or even safety, of the state, affecting future decisions to visit.

Economic impacts, as considered in this report, include the spending by travelers at a travel destination plus the earnings and employment that this spending supports. Travel includes overnight trips plus day trips that are more than 50 miles and which are not recurring, such as for commuting. Wildfire-related losses of travel employment are not estimated in this study due to limitations on accurately gauging this particular impact. Research methodology is described in more detail in Section VI.

Data Collection

This research makes use of data from a variety of sources, including original data collected from Oregon's travel and tourism businesses and organizations. Baseline travel economic conditions are from the 2017 travel economic impact analysis prepared by Dean Runyan Associates for the Oregon Tourism Commission (Travel Oregon), which describes the spending, earnings, employment and tax receipts that travel generated during 2017 for each county and region of the state. Seasonal variations in travel spending and other impacts are estimated using data from STR, Inc., that describes commercial lodging sales by month for selected locations in the state.

The survey of travel-related businesses and organizations was conducted by Destination Analysts in order to gather location- and business-specific information on wildfire impacts, and was made possible by using contacts provided by Travel Oregon. The contacts included:

- Hotel, motel, B&B, resort or other lodging
- Casino / casino hotel
- Commercial campground or RV park
- Campground on public land (e.g., local, state, or national park / forest)
- Restaurant/Bar
- Retail store or shopping venue
- Event organizer (concert, play, sports, etc.)
- Guide or tour operator
- Cultural, recreation, historic or education visitor attraction
- Transportation provider (taxi, bus, rental car)

The survey made use of an online questionnaire, the link for which was distributed to all businesses on the contact list maintained by Travel Oregon, augmented by a survey completion request distributed by the Oregon Restaurant and Lodging Association. Selected telephone contacts were used to facilitate completions in some locations. A copy of the questionnaire used for this survey appears in Appendix B.

Report Contents

After the Introduction, Section II reviews the 2017 wildfire season, comparing 2017 with previous years and identifying the fires that were most significant in terms of size, cost, and reported impact on local tourism-related businesses.

Business and organization responses toward the 2017 fire season appear in Section III, based on results of the survey conducted as part of this study.

Section IV focuses on the predominant fires and their impact on travel and recreation conditions in the locations where each occurred. A review of primary effects of each fire, such as road closures and evacuation orders, is detailed here.

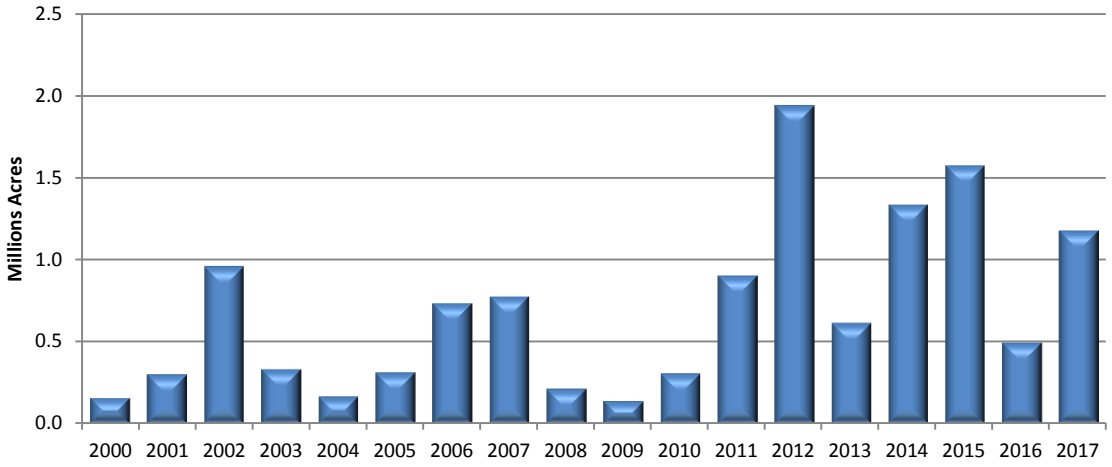
Further discussion of the smoke impacts prevailing during the 2017 fire season appears in Section V. The discussion of smoke impacts is organized by location in the state, rather than by fire, since smoke for a particular fire often traveled to multiple locations during the time the fire burned.

Section VI describes the economic impacts of the 2017 fire season, broken out by geographic area of the state and by fire.

II. The 2017 Wildfire Season

Wildfires occur throughout Oregon each year with the summer onset of warm and dry conditions, thunderstorms, and increased human activity related to outdoor recreation. The acreage burned by wildfires in Oregon during each of the fire seasons since 2000 appears in Figure II-1. It indicates that 2017 was a year of substantial wildfire-related losses, although not the largest in this period of time. However, acres burned is only one measure of wildfire activity, and is not always directly related to the impacts of fires on human settlements and activity. Specific location and timing are also significant factors.

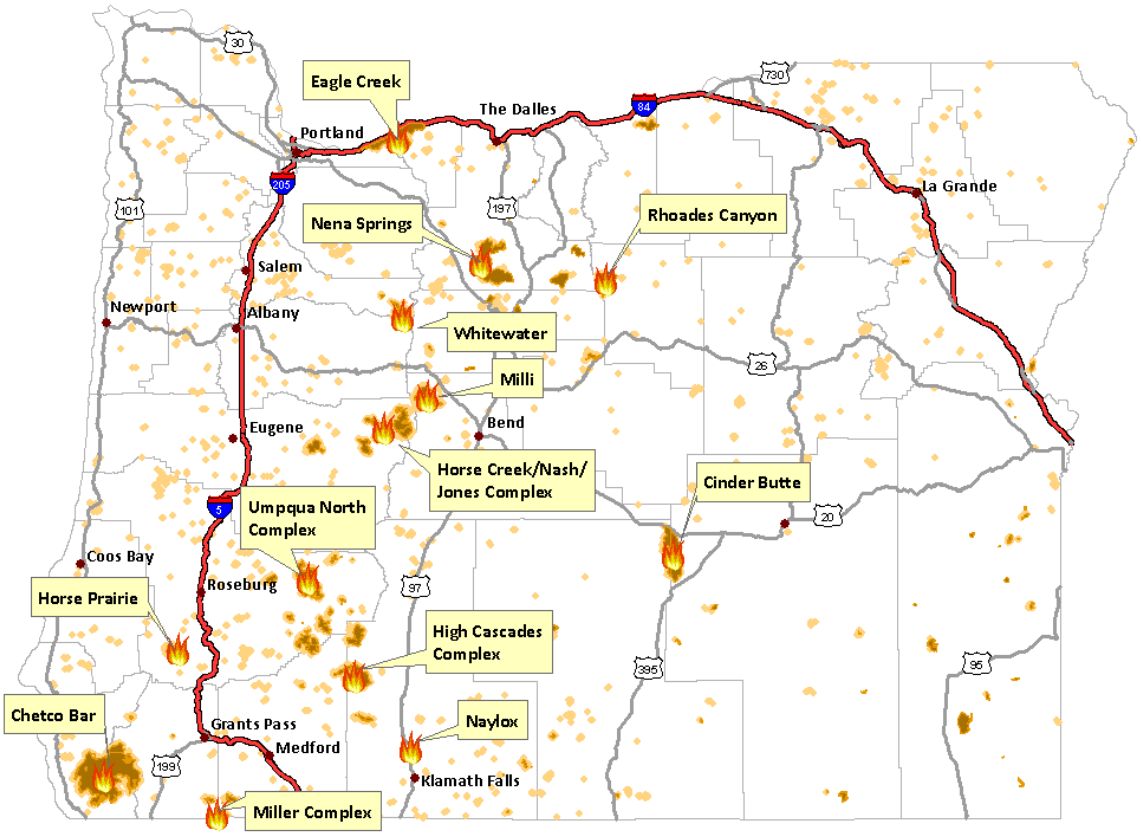
Figure II-1
Oregon Wildfire Acres Burned 2000 - 2017



Source: Northwest Interagency Coordination Center

A total of 113 wildfires are listed by the Northwest Interagency Coordination Center for Oregon during 2017, the second highest number in the period since 2000, surpassed only by 2014 with 115 fires. While many of these fires occurred in areas with relatively dry conditions, others occurred throughout the state, and each county had at least one listing. See the summary in Figure II-2. A list of 2017 Oregon wildfires appears in Appendix A.

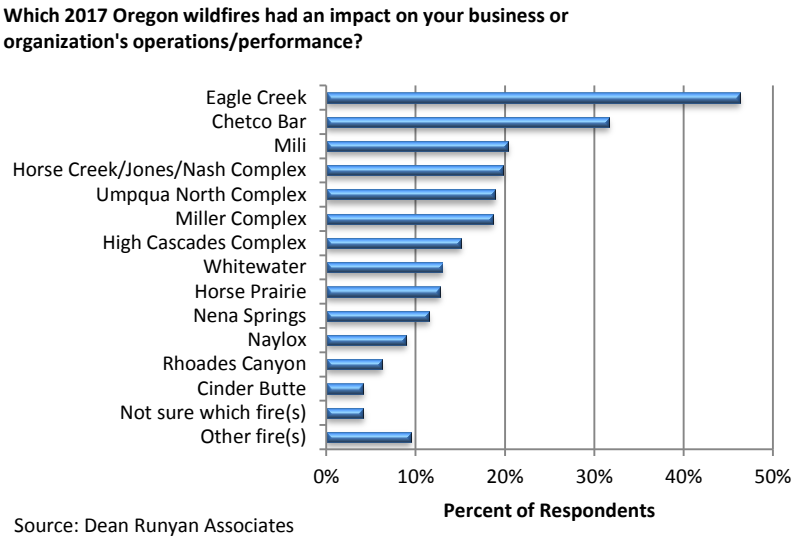
Figure II-2
Primary Oregon Wildfires 2017



Source: Northwest Interagency Coordination Center

The most significant of the fires, according to the respondents to the business and organization survey, were those in the Columbia River Gorge, Central Cascades and on the South Coast. Respondent reports of fire effects are summarized in Figure II-3.

Figure II-3



Source: Dean Runyan Associates

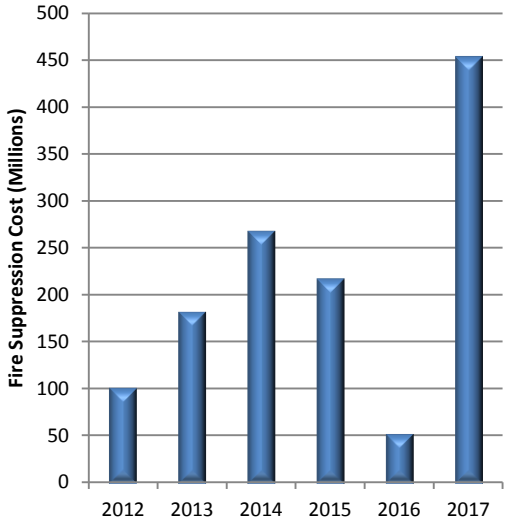
The most common fire identified by respondents is the Eagle Creek Fire in the Columbia River Gorge, a persistent fire that was located near major population areas in a busy transportation corridor.

The Chetco Bar Fire, located in the coast range in southern Curry County, was the second most frequent mention. This fire was also particularly large and persistent and reached the outskirts of Brookings, producing smoke that spread throughout the southwestern part of the state.

Fires in the central Cascades – the Milli Fire and the Jones/Nash/Horse Creek Complex – were next, a set of fires that extended over a substantial period of time, disrupted traffic and sent smoke into Deschutes County and elsewhere in Central Oregon. The fires that appear in Figure II-3 represent the primary focus for the economic impact analysis that appears in Section VI.

Figure II-4

Oregon Wildfire Suppression Costs 2012—2017

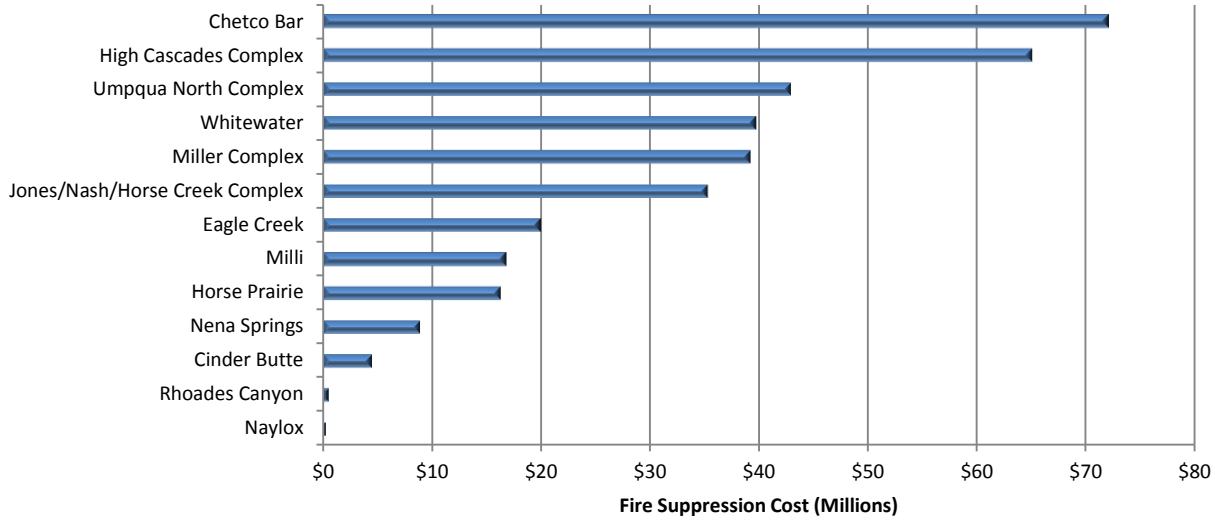


Source: Northwest Interagency Coordination Center

Each year Oregon spends millions of dollars working to suppress these fires before they endanger lives or property. Like with economic impact, the suppression costs are not always directly linked with the size of the fires (compare Figure II-4 to Figure II-1, particularly 2012 and 2017).

Fuel type, terrain, fire duration, and location relative to residents or infrastructure are a few factors that can affect the cost of suppressing each year's wildfires. Figure II-5 shows the costs to suppress each of the wildfires selected for study in this report.

Figure II-5
Oregon Wildfire Suppression Costs
2017 by Fire



Source: Northwest Interagency Coordination Center

Wildfires can have a particularly severe impact on small visitor and recreation businesses located in the rural areas where fires often occur. The season when fires are most prominent – August and September – is often peak period for these businesses, and demand cannot be easily shifted to another point in time. Examples include backcountry or fishing guides with scheduled trips that often cannot be rescheduled, or small lodging operators for whom road closures, smoke and even the fire itself can be very immediate and cause shutdowns and sales that cannot be recovered. Larger businesses in the areas most affected by wildfires, such as larger hotels or restaurants, are typically located in urban areas and can be more flexible in how they respond, although in some cases they certainly lose unrecoverable business as well.

III. Business and Organization Reactions to the 2017 Wildfires

The survey of businesses and organizations in Oregon was conducted in order to gather first-hand information on reactions to the 2017 wildfire season, including data on the distribution of the most significant impacts, the relative impacts on the various type of businesses in the travel and recreation industry, and perceptions of potential future impacts stemming from the 2017 fire season.

The survey made use on an online questionnaire, the link to which was distributed by Travel Oregon to its list of travel-related businesses and organizations. The list includes:

- Hotel, motel, B&B, resort or other lodging
- Restaurant/bar
- Guide or tour operator
- Cultural, recreation, historic or education visitor attraction
- Retail store or shopping venue
- Event Organizer
- Campground on public land
- Commercial campground or RV park
- Transportation provider
- Casino / casino hotel

Respondents were allowed to identify other, additional categories if they wished.

The questionnaire link was also provided to the Oregon Restaurant & Lodging Association, and distributed to their members.

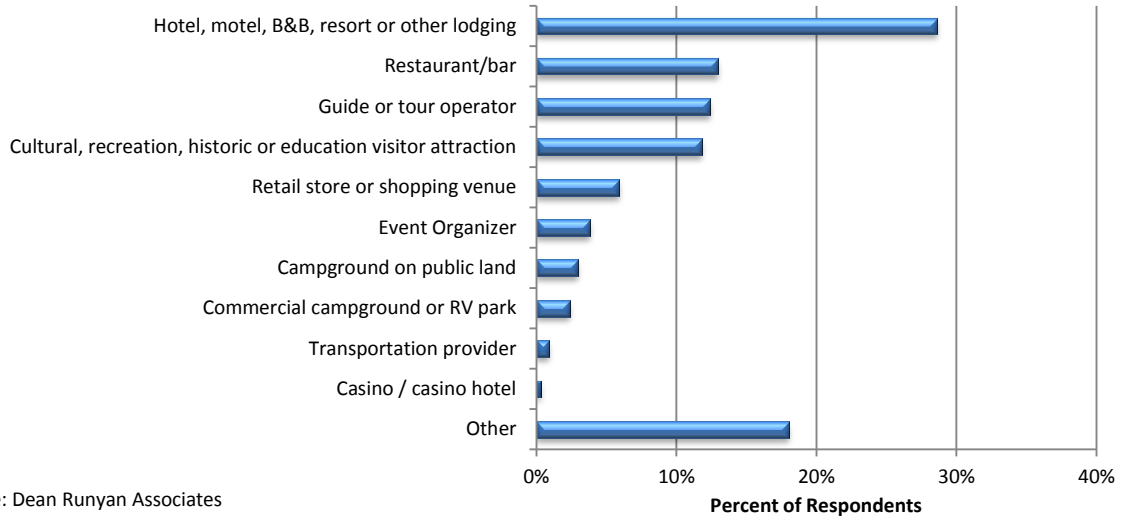
Telephone contacts were also used in order to solicit survey participation in certain locations where additional respondents were desirable, particularly in the Portland Region, Central Oregon and Southern Oregon. Of the 4,200 businesses and organizations contacted, 412 completed the survey for an overall response rate of 9.8%. See appendix B for a full copy of the Questionnaire used in this survey.

Business Type

The most common business type among the respondents is hotels, motels, resorts or other forms of commercial lodging. See Figure III-1.

Figure III-1

Which best describes the business or organization for which you are reporting?



Source: Dean Runyan Associates

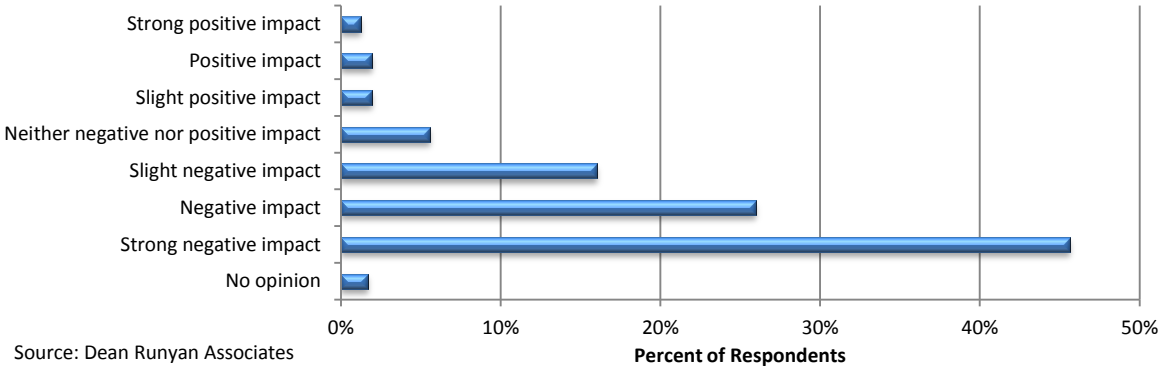
Other types of businesses that are well represented include food and beverage service (restaurants and bars), guides or tour operators, and cultural, recreation or education visitor service organizations. Many of the latter are nonprofit entities such as museums.

Fire Impacts

Most businesses and organizations reported that fire impacts were negative, as might be expected. See Figure III-2. Some businesses reported positive impacts, which are reviewed further below.

Figure III-2

Which best describes how one or more of the 2017 Oregon wildfires have affected the overall performance of your business or organization?

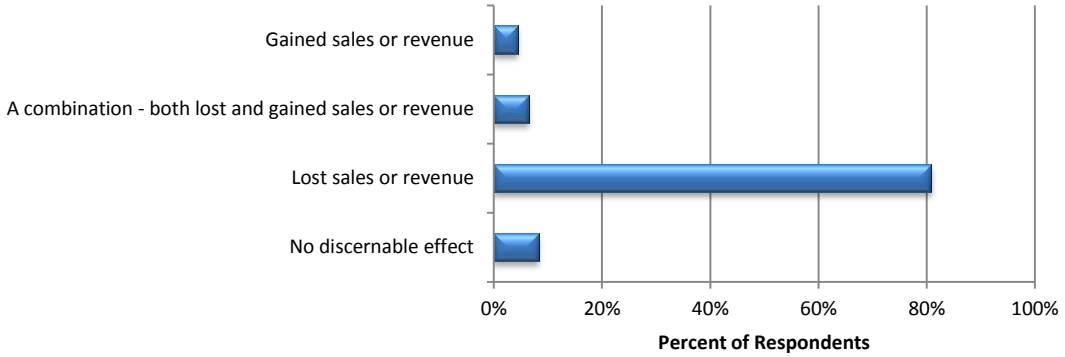


Source: Dean Runyan Associates

Looking specifically at revenue, most businesses reported losses associated with the fires, although some (4%) reported gains, and another 8% reported no effect. See Figure III-3.

Figure III-3

Thinking specifically about the seven-month period from June 1, 2017 through December 31, 2017, did your business/organization lose or gain sales or revenue due to Oregon's wildfires?



Source: Dean Runyan Associates

Reasons for Loss

When asked specifically why the wildfires had a negative impact, businesses and organizations most often responded it was smoke that disrupted the business, its staff and/or its customers, followed by perceptions on the basis of customers regarding discomfort or safety associated with the fires. See Figure III-4.

Figure III-4

Perceived cause of fire period revenue loss

Source: Dean Runyan Associates

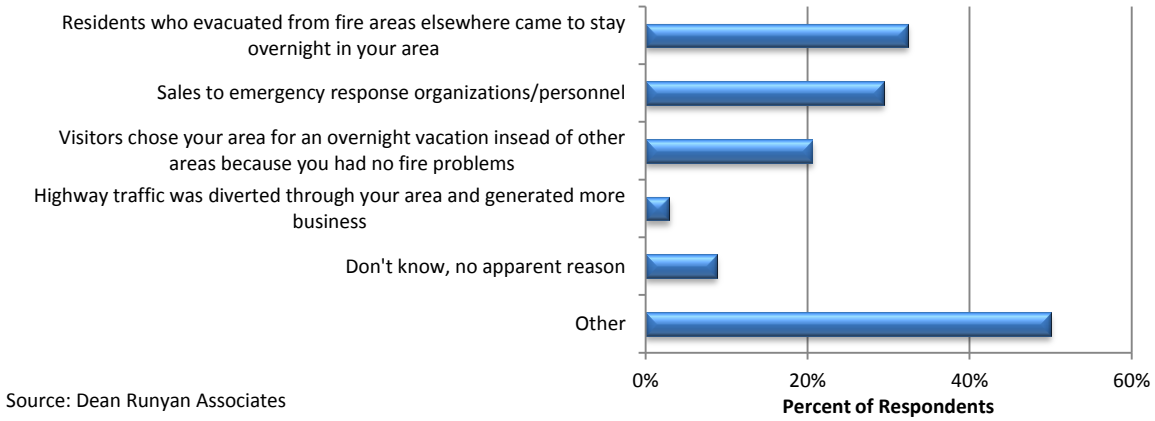
Road closures and other access limitations, and actual evacuations, were the next most common reasons. A number of other reasons were mentioned as well, illustrating the wide range of adverse impacts that fires can have on communities and their businesses.

Revenue Gain

Of those businesses that reported a revenue gain from the fires, most reported additional business due to visitors who were displaced or otherwise chose not to stay in fire-affected areas, or first responders who stayed in their area while working on one or more fires. See Figure III-5.

Figure III-5

Perceived cause of fire period revenue gain

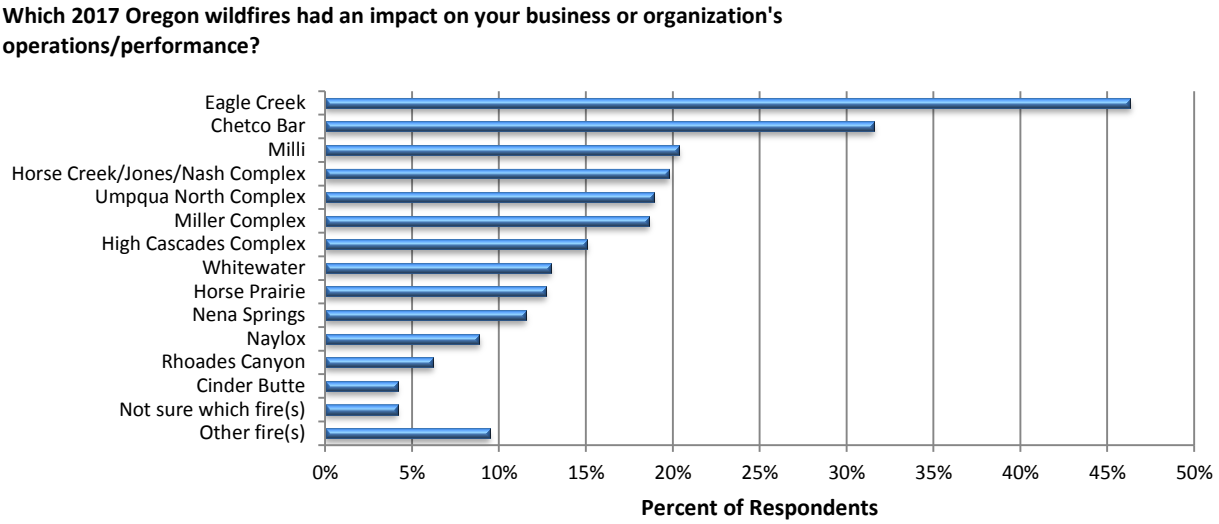


Source: Dean Runyan Associates

Important Fires

When asked to specify which fires were most impactful in terms of effects on businesses and organization, the Eagle Creek and Chetco Bar fires were mentioned most, followed by several fires and fire complexes in the Oregon Cascades. See Figure III-6.

Figure III-6
Fire Impacts

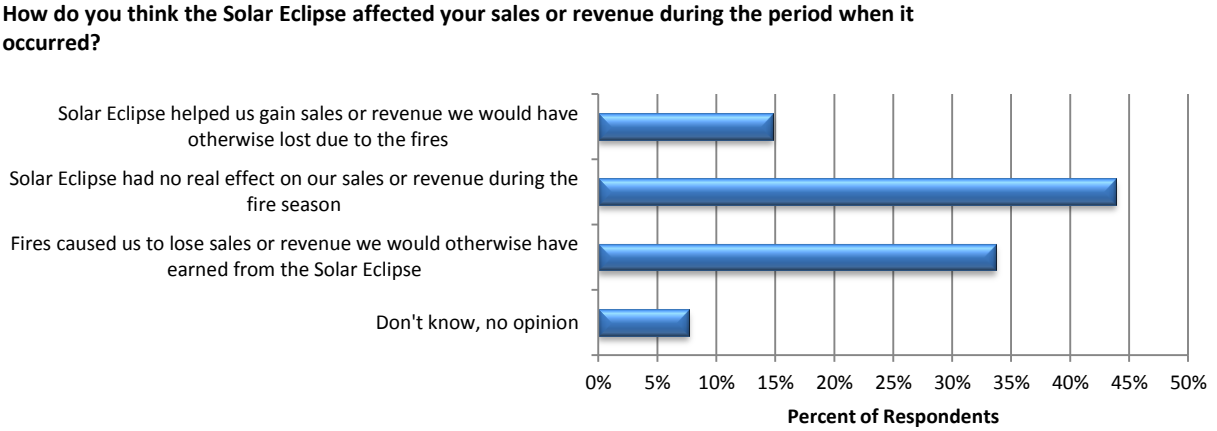


Source: Dean Runyan Associates

Solar Eclipse

The solar eclipse that occurred on Aug. 21 was a contributing factor to travel and tourism during that time period. Some locations in the state reported substantial traffic associated with increased visitation to their area during the time of the eclipse – generally a few days before and immediately after. See Figure III-6.

Figure III-6



Source: Dean Runyan Associates

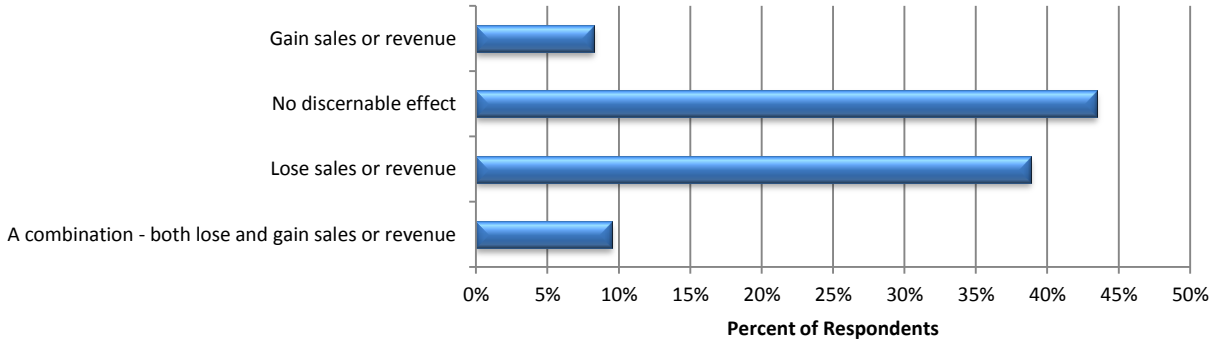
Approximately 15% of respondents indicated that the eclipse helped their business by enhancing visitation that would otherwise have been lost due to fires in the area. The largest portion said that the eclipse had no effect on their business during the fire season. About a third (34%) said that the fires diminished business they would otherwise have had due to the eclipse.

Long-Term Impacts

A number of businesses or organizations were concerned about the long-term adverse effect of the 2017 fire season. See Figure III-7. A few businesses (8%) said they expect to gain revenue in 2018, and another 47% said the 2017 fires will have no discernable effect on their revenues. However, 38% said the 2017 fires will have an adverse effect in 2018, which is consistent with the findings presented in Figure III-8. This figure shows that businesses are most concerned about the perceptions of their customers regarding discomfort or danger associated with fires.

Figure III-7

Thinking specifically about 2018, do you think your business / organization will lose or gain sales or revenue due to the effects of one or more Oregon fires in 2017?

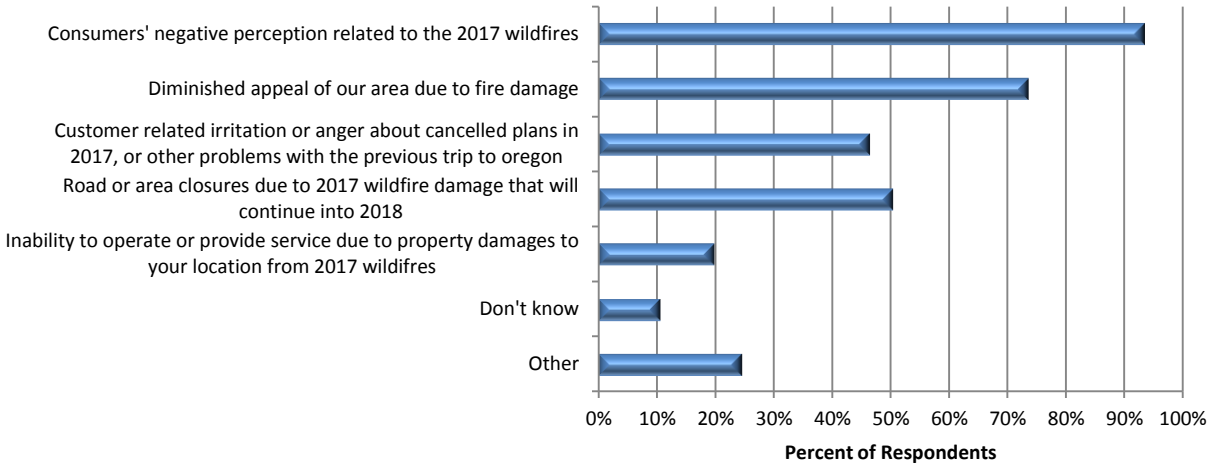


Source: Dean Runyan Associates

Diminished appearance of their area is the second most common concern, which represents trail and recreation closures, fire damage and perhaps damage to campgrounds and other visitor-oriented infrastructure.

Figure III-8

Perceived cause of 2018 revenue loss

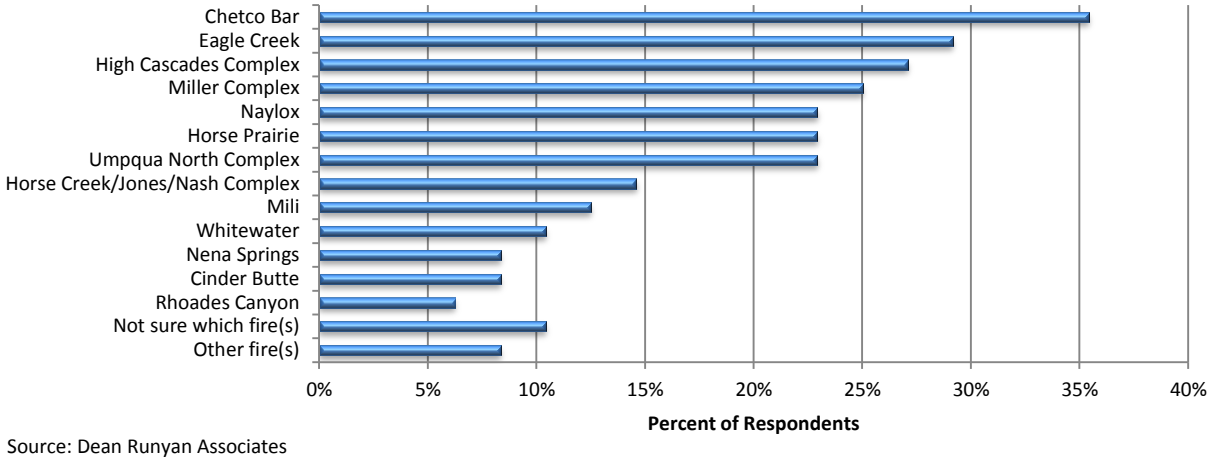


Source: Dean Runyan Associates

When asked which fires during 2017 would have the most impact on business in 2018 the results closely parallel responses about which fires were most influential in 2017. See Figure III-9. The Chetco Bar and Eagle Creek fires were considered the most likely cause of negative impacts in 2018, followed by the various fires in the Cascades.

Figure III-9

Which of these 2017 Oregon wildfires do you believe will have an impact on your 2018 sales and revenue?

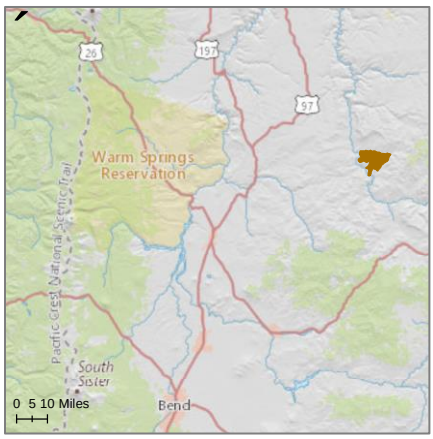


Source: Dean Runyan Associates

IV. Primary Fires of the 2017 Season

As described above, there were a total of 113 named wildfires, of varying sizes and across different parts of the state during the 2017 wildfire season. While many of the smaller fires had some local impact on travel and recreation during this period, the most severe impacts were associated with the larger fires and fire complexes, particularly those located in areas with established recreation and travel industry infrastructure. The following are descriptions of the most severe of these fires, providing a chronology of how the fire season evolved and the locations where fire-related impacts were most severe.

Rhoades Canyon Fire

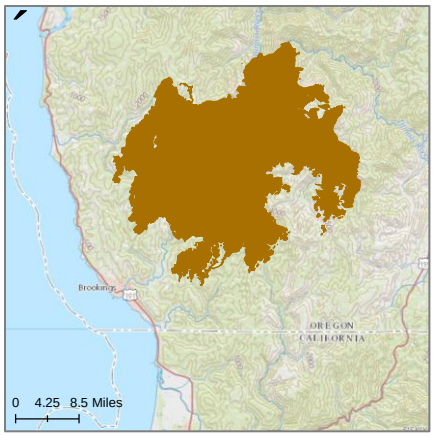


First reported late in the morning on June 20, the Rhoades Canyon Fire was the first of the 2017 fire season's large blazes. From its ignition point along OR 218 just east of Clarno it spread to roughly 15,000 acres thanks to dry fuels and high winds in the area.

Despite its size and an especially aggressive first day of growth, the impacts on local infrastructure were minimal. The John Day River and associated boat launches remained open for the four days it took to bring the fire to 100% containment. OR 218 remained open as well, despite its proximity to the fire line. A pilot car was in use along OR 218 for June 22—24, but delays were reportedly no more than 20 minutes.

Firefighters were able to totally contain the fire on June 24, bringing a quick end to the first major fire of the season.

Chetco Bar Fire



The Chetco Bar Fire was first reported on July 12 in the mountainous Kalmiopsis Wilderness Area to the northeast of Brookings in Curry County. The area's steep topography and dense underbrush obstructed firefighting efforts, making it impossible to directly contain the fire in a safe manner.

Fire growth remained moderate through the first weeks of August, with only a few closures on trails and forest roads within the Kalmiopsis Wilderness Area. The first closure order was issued on July 20 and expanded slightly on Aug. 8, but neither directly affected the Brookings community.

Fire crews' luck ran out on Aug. 17, as the locally-known Brookings Effect (sometimes call the Chetco Effect) drove hot, dry wind from the Great Basin down through the fire area. Within two days the fire area had nearly doubled, and a large swath of the Rogue

River-Siskiyou National Forest to the northeast of Brookings was closed off – including the vast majority of the Kalmiopsis Wilderness Area.

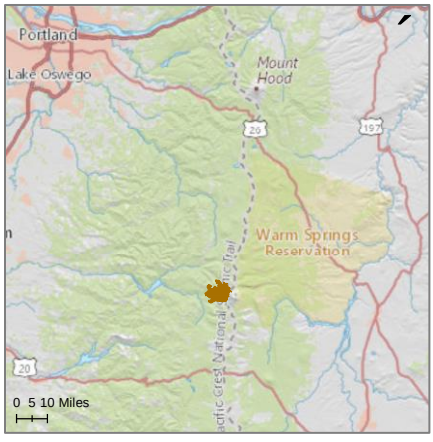
Residents were told to leave their homes as evacuation notices were issued. The initial level 3 (GO!) evacuation area – which covered almost everything near the Chetco River upstream from Brookings – was expanded on Aug. 20 west to the Pacific Ocean and north to the mouth of the Pistol River. Roughly 3,000 people were urged to evacuate immediately and the Carpenterville Highway was closed to all but local traffic. Despite visibility issues due to smoke and its proximity to the fire line, U.S. 101 remained open for the duration of the fire.

The three-week period from Aug. 20 to Sept. 9 saw the most fire activity. During this period, evacuation levels varied with wind direction; Brookings remained under a level 1 (Ready) evacuation notice, while areas to its north and east were evacuated. On Sept. 4 the fire also made a few moves to the northeast that caused officials to issue a level 3 (GO!) evacuation for communities along the Illinois River in Josephine County. The cities of Selma, Cave Junction, and O'Brien were all issued a level 1 (Ready) evacuation notice, but nothing more drastic was required.

On Sept. 8, Curry County reduced the area of its evacuation level 3 (GO!) notice for all areas outside the established fire perimeter. By Sept. 13 only a small area to the northeast of Brookings remained under a level 2 (Set) evacuation order, and on Sept. 18 all Curry County evacuation orders were withdrawn. On the other side of the fire, evacuation orders remained in place until Sept. 15 when the level 1 order was removed from the Illinois River Valley communities; National Forest land along Illinois River Road were lowered to a level 2 (Set) evacuation order until all evacuation notices were dropped on Sept. 19.

Late September saw the fire crews in the area transition from suppression to repair work. U.S. Forest Service lands from the California border north to Gold Beach remained closed, and portions remained closed at the time of writing. Though the Kalmiopsis Wilderness Area was initially included in the closures, it was reopened on Oct. 18. The final closure revision of the year came on Nov. 21, which opened up a number of recreation areas along the banks of the Chetco River just outside of where it enters U.S. Forest Service land.

Whitewater Fire



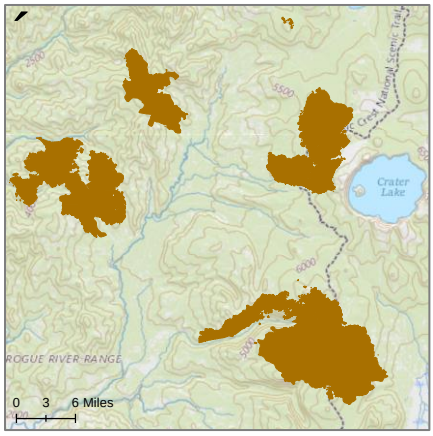
The Whitewater Fire was first reported on July 23 on a ridgeline directly across from Mt. Jefferson, along the Whitewater Trail leading to Jefferson Park. Though its location was remote, it was near enough to the Marion County communities of Breitenbush, Detroit, and Marion Forks to cause those communities worry.

Through the end of July and most of August, the fire burned slowly. This allowed firefighters to focus their protection on the vulnerable alpine meadows in Jefferson Park, a popular recreation destination just a few miles from the fire's ignition point. Most trails into the park were closed on July 25, and all access was shut off on July 31 – just 21 days before the 2017 solar eclipse passed directly over the area. Access to the park was not opened again until spring of 2018.

Like with most fires in the 2017 season, the most dangerous weeks of the Whitewater Fire came in late August and early September. Heightened fire activity due to wind and high temperatures caused the Whitewater Fire and nearby-but-smaller Little Devil and Scorpion Fires to encroach on the Breitenbush community in the final week of August. Nearby trails and campgrounds were closed off, and on Aug. 30 the community was issued a level 1 (Ready) evacuation notice. The next week this notice was increased to a level 2 (Set), and on Sept. 14 there was imminent danger to the community that led to a level 3 (GO!) evacuation order that lasted for five days.

Although it wasn't the largest fire, the Whitewater Fire and nearby fires may have had the highest impact on eclipse-related travel in the state. The Jefferson Wilderness Area lay directly in the path of totality, and was perfectly situated to provide a wilderness viewing location without sacrificing proximity to the Willamette Valley. Local communities will continue to see less traffic until the trails and campgrounds reopen in 2018.

High Cascades Complex



The first fires in what would become the High Cascades Complex were reported in late July to the west of Crater Lake National Park. Two fires in particular – Blanket and Spruce Lake – were a high priority for containment, since they were burning within the park boundaries.

On Aug. 5, dry and hot conditions fueled both fires, and necessitated the first major closures of the Complex. West Rim Drive and a portion of the Rim Trail were both closed, and a level 1 (Ready) evacuation notice was issued for Rim Village at Crater Lake. The majority of the Pacific Crest Trail through the park was also closed, along with a number of trails in the area. The Rim Drive and Trail were opened again on Aug. 11 when the evacuation notice was lifted, but the hiking trails were not reopened for the remainder of the season.

As with other fires in the state, the worst weeks for the High Cascades Complex came in late August and early September. It began on Aug. 25 when high fire activity by the Broken Lookout Fire – located west of Union Creek – and Blanket Fire caused forestry staff to close down large swaths of the area to the south and west of Crater Lake. Included in these closures were at least 20 camping and recreation sites and 33 hiking trails in the Rogue River-Siskiyou and Fremont-Winema National Forests.

The hot, windy days didn't stop, and on Aug. 27 the Mazama Village campground on the southern slope of the volcano was issued a level 1 (Ready) evacuation notice. Union Creek to the west in Jackson County was issued its own level 1 (Ready) notice on Aug. 31. The following days also saw closure area expansions in both the Rogue River-Siskiyou and Fremont-Winema National Forests, including the entire Rogue-Umpqua Divide Wilderness Area. The Sky Lakes Wilderness Area was also closed in its entirety, with the last portion closing on Sept. 8.

Through all this, the staff at Crater Lake National Park prepared for one of their premier summer events: Ride the Rim on Sept. 9 and 16. Smoke was their main concern, but reports say that luck was with them and smoke levels over the park were minimal on the event days. They had closed down the north

entrance and West Rim Drive on Sept. 5, but were able to temporarily open it on Sept. 6 for the ride, and reopen it for good on Sept. 15.

Mid to late September saw the closure areas reduced, and evacuation notices for Mazama Village and Union Creek lifted after 25 and 21 days, respectively. The fires in this area burned during the last days of the prime summer season, but lasting damage to park infrastructure or nearby communities was avoided.

Cinder Butte Fire

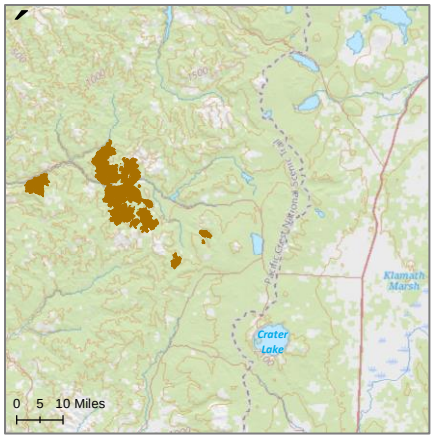
Compared with other fires from the 2017 season, the Cinder Butte Fire was short. From its beginning on Aug. 2, it spread quickly across the dry, flat grasslands on the border of Lake and Harney Counties just south of U.S. 20. Since there were no lightning strikes in the area to set it off, officials reported it as human-caused. On that first day it spread to 10,000 acres, and then overnight to 50,000 acres.

Factors that contributed to its quick growth also allowed firefighters to quickly get a handle on the blaze. Though there were some rough hills to the west, the landscape was mostly flat, and nothing at all like the high relief landscapes in the Cascade or Siskiyou mountains. These conditions meant firefighters could bring their full toolkit to bear in suppressing the fire.

Impacts from the fire were minimal. On Aug. 2, a two-mile stretch of U.S. 20 was closed for an hour, at which point a pilot car was used to shuttle passenger cars through. Expected delays were around 20 minutes. The nearby community of Wagontire (population: 2) was protected – though the fire came within a few miles – and no evacuation order was given.

By Aug. 10 the fire was declared 100% contained, and its crews were released to help other areas of the state.

Umpqua North Complex



The first fires of the Umpqua North Complex were reported on Aug. 10, 50 miles north of Roseburg along OR 138. Flames spread quickly, and on the Aug. 12 the communities of Dry Creek and Horseshoe Bend were issued a level 3 (GO!) evacuation order. Nearby Moore Hill Lane in the community of Glide was given a level 2 (Set) order. At the same time the Umpqua National Forest closed off areas surrounding the fire, including three campgrounds and numerous trails. The North Umpqua River was closed for a 25 mile stretch, excluding a small area on the north bank in the community of Steamboat.

By Aug. 16 fires were threatening OR 138, and it was closed from mile 39 to mile 54. Dry Creek's evacuation order was lowered to a

level 2 (Set) for a matter of hours, before it was raised again to level 3 (GO!); this time the nearby area of Illahee was included in the order as well. Portions of the Umpqua National Forest were closed, adding at least 15 new trails to the closure area.

Wind and dry weather didn't let up despite a brief respite due to trapped smoke, and on Aug. 18 a new level 1 (Ready) evacuation notice was issued to the community of Susan Creek and the Susan Creek Campground. Secured fire lines did allow firefighters to open up the portion of OR 138 from mile 39 to mile 43, but the remainder of the stretch to mile 54 remained closed at that time.
The next day saw further fire spread, with further closures and evacuations. Eleven area campgrounds and recreation sites shut down along the North Umpqua River, along with four more trails. The community of Clearwater on the eastern side of the fires was also issued a level 1 (Ready) evacuation notice.

More trapped smoke kept fire activity dampened over the weekend of the eclipse, though the air cleared up on Aug. 23 around the Devil's Lake Fire burning a few miles west of Diamond Lake. The increased fire activity on that side of the complex caused the Umpqua National Forest to close seven more trails in the area. Further closures were released on Aug. 25 as the fires around the North Umpqua River continued to push outward: this included just one trail, but five campgrounds and recreation areas.

By this time the fires were spreading eastward – particularly to the north and south of OR 138 at roughly mile 50 – and the danger to local communities was moving along that same route. On Aug. 29 the Dry Creek and Illahee communities were brought down to a level 2 (Set) evacuation notice, and residents were allowed to return to their homes. OR 138 from miles 43 to 47 was reopened to facilitate their return. On the other side of the highway closure and just two days later, a level 2 (Set) evacuation notice was issued for the Slide Creek community.

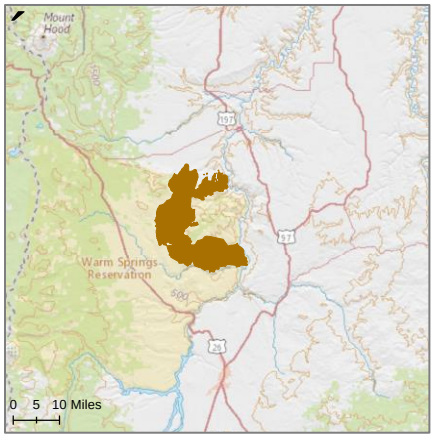
By this point, the worst was over. In the first week of September the evacuation notices on Moore Hill and Susan Creek were lifted, while Dry Creek and Slide Creek – the communities on either side of the OR 138 closure – were reduced to level 1 (Ready). On Sept. 7 a pilot car reopened OR 138 between miles 47 and 54, and on Sept. 11 five campgrounds were opened on the western edge of the closure area. By Sept. 19 all evacuation notices in the area were lifted, and OR 138 was fully reopened the next day.

Falling debris will continue to be a challenge for the area, due to the steep now-burned slopes above both the North Umpqua River and OR 138. The river was mostly reopened in November, but a portion will remain closed until early summer 2018. The same can be said for trails within the fire perimeters. This beautiful area will recover, but it may take some time.

Nena Springs Fire

One of the shorter fires of the season, the Nena Springs Fire began on Aug. 8 just south of the community of Wapinitia in Wasco County, on the northern border of the Warm Springs Reservation. Since there were no reported lightning strikes in the area, the cause is assumed to be human.

The fire spread south, and evacuation notices were immediately put in place for nearby communities. The Kah-Nee-Ta Resort, Charlie Canyon Subdivision, and Wolf Point all received level 1 (Ready) notices; Fish Hatchery Grade got a level 2 (Set) notice; and Schoolie Flat, Simnasho, and the S-300 subdivision got

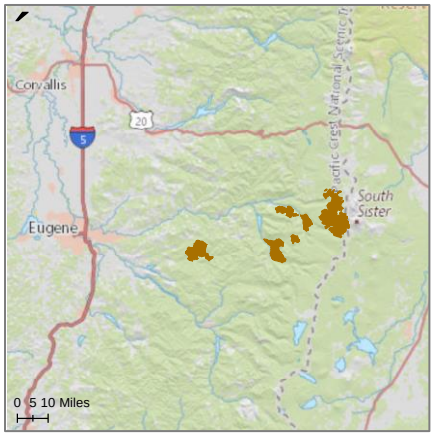


immediate level 3 (GO!) orders. Highway 3 was also closed down. By Aug. 11, several non-primary homes and historic outbuildings were destroyed, along with one unoccupied primary residence.

By Aug. 13 the fire was moving toward containment. All level 3 (GO!) evacuation orders were reduced, and residents were allowed to return home. All evacuation notices were lifted on Aug. 15, and the roads were reopened as the community planned to transition to recovery.

An ember blown over the containment line on Aug. 17, however, reignited the fire. Kah-Nee-Ta Resort saw a level 3 (GO!) evacuation order immediately, though it was reduced to level 2 (Set) after a few hours. The level 3 (GO!) orders for Charlie Canyon, Webster Flat Road, South Junction, Culpus Bridge, and Wolf Point Subdivision lasted two days, until they were also reduced to level 2 (Set) on Aug. 19. After an active week and weekend, all evacuation notices and road closures were lifted on Aug. 22.

Jones/Nash/Horse Creek Complex



What would eventually become the Horse Creek Complex started on Aug. 8 as the Rebel Fire, which was ignited by lightning roughly 50 miles east of Eugene – but less than 10 miles south of OR 126 – in the Willamette National Forest in Lane County. The steep, inaccessible terrain meant that this and other fires in the complex would be difficult to suppress before the end of the fire season.

The initial closure of three trails that first day was followed up with a widespread area closure on Aug. 11 that included 24 trails, 12 campground/recreation areas, and the Terwilliger Hot Springs. Fires continued to spring up in the area, including the Jones Fire just northeast of Lowell and the Nash Fire on the southwestern slope of South Sister, and by Aug. 14 fire management was combined into the Horse Creek Complex. Three days later, as the now-multiple fires in the area continued to grow, 52 more trails and five more campground/recreation areas were closed – including every trail in the Sisters Wilderness Area south of OR 242.

Meanwhile to the west, two trails and eight campground/recreation areas were closed surrounding the Jones Fire, which was now rounded up into the Horse Creek Complex. Though it would continue to burn near Lowell and grew to more than 10,000 acres, the Jones Fire never threatened more than trails, forest roads, and campgrounds. On Aug. 19 and 20 nine more trails were added to the closure list as the fire was blown down Fall Creek; though the fire had only reached half its final size by this point, its growth stayed within established control lines and didn't threaten any more recreational infrastructure.

Back on the eastern side of the forest in the Sisters Wilderness Area, the Nash and Separation Fires were uncontrolled and pushing south toward Elk Lake on Aug. 29. All areas around Elk and nearby Hosmer Lakes were issued a level 2 (Set) evacuation warning, and Lava and Little Lava Lakes to the south were issued a level 1 (Ready) notice. New fires and increased activity continued, causing a level 1 (Ready)

evacuation notice along OR 242 and OR 126 from just west of Rainbow all the way to Clear Lake, 15 miles south of U.S. 20.

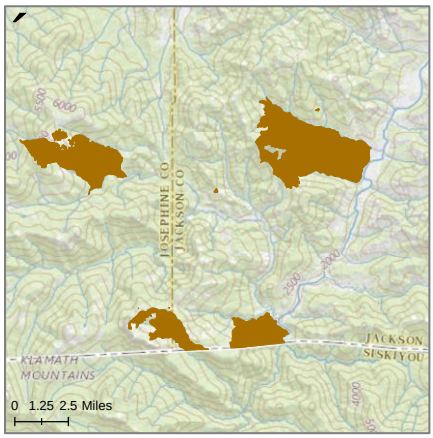
The hot and dry first weeks of September were difficult for suppression efforts, similar to other fires in the state. The Willamette National Forest closure area was expanded to encompass Mt. Washington on Sept. 4 as the fire spread northward.

The next day, fire activity around the highways caused evacuation levels to increase. OR 242 was issued a level 3 (GO!) evacuation order and closed – it did not open again before its normal winter closure. OR 126 north of 242 was issued its own level 3 (GO!) order and closed down, and the stretch west from OR 242 to the McKenzie Bridge community was issued a level 2 (Ready) warning and also closed down.

Sept. 5 was the peak closure day for the Horse Creek Complex. On Sept. 6, after just a day, OR 126 was reopened and the level 3 (GO!) evacuation orders were downgraded to level 2 (Set). Two days later the areas under level 2 (Set) warnings were downgraded to level 1 (Ready).

Through September the fire danger receded. On Sept. 14 Elk Lake's evacuation warning was reduced to level 1 (Ready), and the Lava Lakes were released from their warnings entirely. Four days later all evacuation notices in the area were lifted. The last days of September and first week of October saw the reopening of numerous forest roads and trails, though the majority of the Sisters Wilderness Area remained closed until the spring of 2018.

Miller Complex



The Miller Complex was first reported on Aug. 14 after a lightning storm over the area ignited 24 separate fires around Applegate Lake, located in the southwest corner of Jackson County against the border with California to the south and Josephine County to the west. The Abney Fire at the southern end of the Complex burned almost entirely in California.

For the first two weeks the fires stuck to the ridges and valleys in the area, and only the surrounding National Forest land was closed down. By Aug. 26 things were heating up to the north and west of Applegate Lake, and communities in those areas were issued a level 1 (Ready) evacuation notice. South across the California border the small community of Joe Bar was given its own level 1 (Ready) notice, and then issued a full level 3 (GO!) order three days later as the Abney Fire continued to expand in its direction.

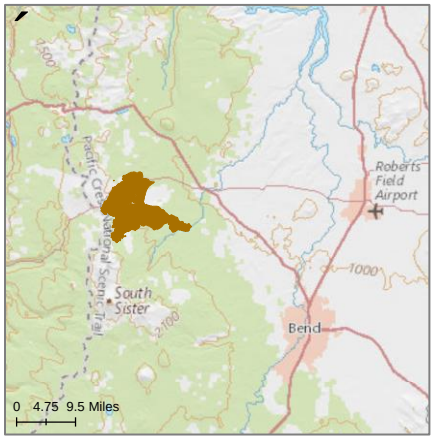
On Aug. 30 and 31, the evacuation orders west and north of Applegate Lake increased as level 1 (Ready) and level 2 (Set) notices were issued for the area around the lake itself. On Sept. 2, as fires pressed eastward toward Upper Applegate Road, the area north of Applegate Lake was evacuated at level 3 (GO!) for a day before returning to level 2 (Set), which allowed residents back into their homes.

Unlike other fires in the region, the fires of the Miller Complex did not threaten a lot of infrastructure in the first weeks of September. By Sept. 8, all evacuation notices around Applegate Lake were lifted, which left only the full evacuation order for the Joe Bar area in affect – likely because the fire

containment line bisected the community. The fires were still very active during this time – they were just burning primarily in the surrounding National Forests and not approaching inhabited land.

No further closure or evacuation orders were issued, and even the Joe Bar area residents were allowed to return to their homes on Sept. 18. October and November brought season-ending precipitation, and the fires of the Miller Complex were brought to a close.

Milli Fire



The Milli Fire was first reported on Aug. 11 less than 10 miles west-southwest of Sisters in Deschutes County. Though its spread was limited in the first days of activity, the Sisters Ranger District closed 11 trails and five campground/recreational areas nearby on Aug. 14.

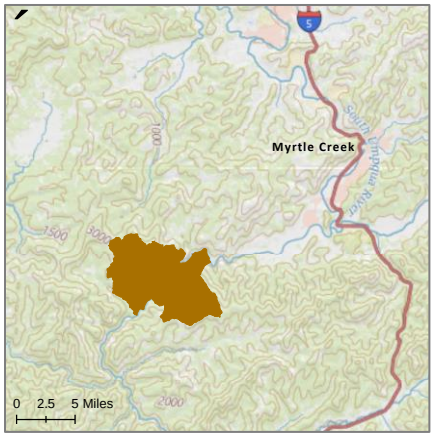
After a slow start, the fire expanded west on Aug. 17, growing to more than 6,000 acres. Local authorities issued evacuation warnings in response: a level 1 (Ready) notice north of OR 242, and a level 2 (Set) warning for the Crossroads subdivision, Edington Road, and Remuda Road – small communities to the west of Sisters along OR 242. By this time OR 242 was already closed down due to the Horse Creek Complex fires, except the portion needed to reach these communities.

Due to a spot fire that started up just that day less than a quarter mile from 242 and the Crossroads subdivision, and with forecasts promising hot and dry conditions, evacuations were upgraded and expanded on Aug. 18. All communities previously at level 2 (Set) were issued a level 3 (GO!) evacuation order, as was a stretch of the Three Creeks Lake Road beginning less than a mile south of Sisters on the eastern side of the fire. The incident commander estimated at this point that 600 people had been told to leave their homes.

Luckily for the communities outside of Sisters, winds shifted back west at that point. The spot fire just south of OR 242 began threatening Black Butte Ranch, and the Ranch was issued its own Level 1 (Ready) evacuation notice on Aug. 21. The winds would remain easterly, and on Aug. 24 the closure area was expanded to the southern boundary of Black Butte Ranch.

By Aug. 25 the Three Creeks Lake area was able to reopen. With the eastern edge contained, evacuation notices began to decline throughout the area. The communities to the west of Sisters were reduced to a level 1 (Ready) evacuation notice on the Sept. 3, and all evacuation notices were lifted three days later. Closure areas would continue to be trimmed closer to the fire perimeter as the danger passed, and the fire was declared 100% contained on Sept. 24.

Horse Prairie Fire



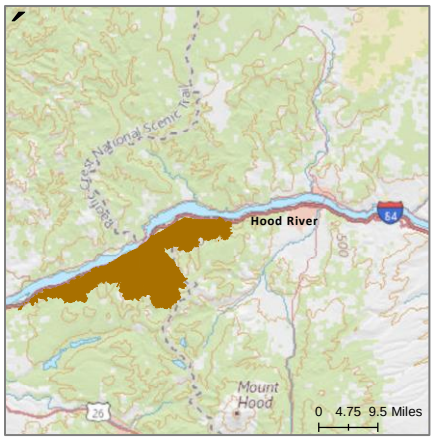
A latecomer to the 2017 fire season, the Horse Prairie Fire was first reported on Aug. 26, burning on a mix of Bureau of Land Management (BLM) and private land a little more than 20 miles south-southwest of Roseburg in Douglas County, near the community of Riddle. Since no lightning storms had passed over the area the fire was likely caused by human action.

The communities most in danger from the fire were situated along Cow Creek Road as it headed west out of Riddle. By Aug. 28 the fire had blown far enough east that a level 2 (Set) evacuation warning was issued for an eight mile stretch of the road; the eastern end of the warning area was still a few miles outside of Riddle. By Aug. 30 the fire had crossed Cow Creek and continued its eastward push, causing local authorities to issue a level 3 (GO!) evacuation order along the road right up to the edge of Riddle. The Cow Creek Road was also closed at this time, as was the Central Oregon Railroad line that runs parallel to it.

Through the first week of September, firefighters worked hard to establish control lines around the fire as it crept southeast in a tangent to Riddle. By Sept. 6 they were confident enough in their work that they were able to lower the evacuation level to 2 (Set) along Cow Creek Road, though the road remained closed to all but residents. As controlled burns along the eastern edge of the fire helped consolidate their position, authorities reduced that evacuation level down to 1 (Ready) the next day.

With fire lines established and containment increasing by the day, the worst danger from the Horse Prairie Fire had passed. By Sept. 11 the railroad line was reopened, and on Sept. 15 all local evacuation orders were lifted.

Eagle Creek Fire



The Eagle Creek Fire was ignited by fireworks on Sept. 2 along the Eagle Creek Trail two to three miles southwest of Cascade Locks on the border of Hood River and Multnomah Counties. Once again hot and dry conditions combined with steep terrain and dense foliage to create the potential for an out of control blaze.

The Hood River County Sheriff's Office quickly issued a range of evacuation orders for Cascade Locks – Level 1 (Ready) for the northeastern portion, Level 2 (Set) for the northwest, and a level 3 (GO!) order for the area south of Interstate 84 and Wa Na Pa street. The U.S. Forest Service also closed off five trailheads to the east and west of the fire. Officials used this time while the fire was still small to protect nearby structures and prepare for a shutdown of I-84 in case the fire spread in that direction.

As feared, gorge winds drove the fire west along the I-84 corridor on Sept. 4, prompting a slew of closure and evacuation notices. Dodson, Warrendale, and East Corbett were issued level 3 (GO!) evacuation orders; the northeastern portion of Cascade Locks was upgraded to level 2 (Set) along with Latourell and Bridal Veil, and the remainder of Corbett was given a level 1 (Ready) notice. The danger was such that the Hood River County School District canceled classes for the day.

I-84 was closed down from Exit 17 in Troutdale to Exit 62, roughly two miles west of Hood River. The portions of U.S. 30 within that stretch were closed down as well, along with southbound traffic on the Bridge of the Gods. Essentially the entire Gorge Scenic Area was closed down along I-84, and as far south as Lost Lake in the foothills of Mt. Hood. The historic lodge at Multnomah Falls became a high priority for fire protection, as did the Vista House – though it was never directly threatened by the fire.

Sept. 4 also saw the fire spot across the Columbia River to Archer Mountain in Washington. Though this fire could have threatened SR 14 if it were allowed to burn out of control, quick containment by firefighters kept it to 260 acres and it was fully contained within a week.

Back on the Oregon side, evacuation levels were raised and expanded on the western edge of the fire. Bridal Veil and Latourell were added to the level 3 (GO!) evacuation order area, Troutdale east of the Sandy River and Springdale were issued a level 2 (Set) warning, and Troutdale between 257th and the Sandy River was issued a level 1 (Ready) notice. SR 14 on the Washington side of the gorge was closed to truck traffic in order to help deal with the increased car traffic due to I-84's closure. I-84 itself was closed to commercial traffic all the way from Hood River to The Dalles. The Union Pacific Railroad also closed down operations through the Columbia Gorge on Sept. 4.

By Sept. 6 winds had shifted and the fire pushed south and east to within a quarter mile of Cascade Locks. At this point every trail, road, and campground on U.S. Forest Service land in Hood River County was closed down as a precaution. Since the I-84 corridor was less threatened, the Union Pacific Railroad was able to restart operations.

Over the next few days cloud cover and lower temperatures allowed firefighters to establish fire lines to the east and west of the fire. The fire continued to threaten in those directions – especially to the east – and evacuation notices were expanded and upgraded on that side of the fire. To the west of Hood River, Dee was issued a level 1 (Ready) evacuation notice, and Cascade Locks' level 2 (Set) evacuation zone was extended eastward to cover Wyeth State Park.

On Sept. 13 the fire made another sizable run eastward. As the fire danger changed around, so did the evacuation levels. Cascade Locks itself was reduced from level 3 (GO!) to level 2 (Set) while the area between its east side and Viento State Park was issued a level 3 (GO!) order. Rural areas west of Hood River that had previously been at level 1 (Ready) were issued a level 2 (Set) warning as well. On the western side of the fire, Multnomah County was reducing its evacuation orders. Residents of Latourell were able to return to their homes under a level 2 (Set) order, and the level 1 (Ready) notice for western Troutdale was lifted entirely.

Weeks of work focused on I-84 paid off the next day, and the westbound lane was reopened – it had been closed for 11 days. That same day evacuation levels continued to creep eastward, pacing the fire. Dee was issued a level 2 (Set) warning, and the areas surrounding Hood River to the west and south were issued a level 1 (Ready) notice. The continued eastward advance of the fire allowed firefighters to strengthen lines on its western edge in Multnomah County, and on Sept. 15 evacuation levels were

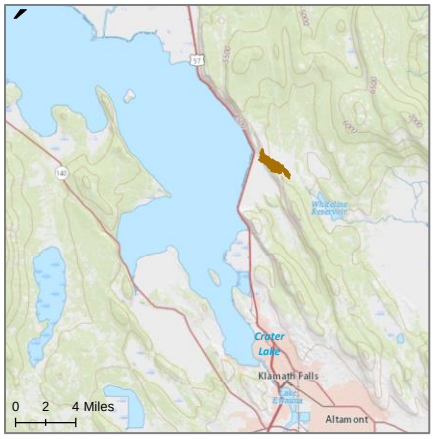
lowered across the board. People were able to return to their homes as the communities from Dodson westward were brought down from level 3 (GO!) to a level 2 (Set) evacuation warning.

The eastward activity from Sept. 13 through 15 was the last major expansion of the fire, as mid-September brought cooler weather and eventually rain to the area. By Sept. 18 evacuation notices were drastically reduced, and only a level 1 (Ready) notice from Cascade Locks eastward to Viento State Park was left in place due to flash flood risk.

Scattered reopenings continued throughout the fall. First, eastbound I-84 was reopened on Sept. 23, 19 days after it had initially closed. Exits from Bridal Veil to Warrendale were still closed. Two days later, National Forest areas to the south of the fire were reopened along with state parks along and north of I-84. In late November, Vista House, Multnomah Falls, and even a stretch of U.S. 30 from Troutdale to Bridal Veil were reopened.

The damage done by the Eagle Creek Fire will take a long time to repair. Trails on the Oregon side of the Gorge from the Sandy River to Viento State Park will stay closed until early summer 2018, and some may stay closed into 2019 and beyond. It will take longer than that for the forest – a major tourism draw for the region – to regrow.

Naylox Fire



The Naylox Fire, which initially ignited near hay barns just 10 miles north of Klamath Falls on Aug. 29, was one of the shortest major fires of the season. It quickly spread eastward from its ignition point, growing to 400 acres by Aug. 30.

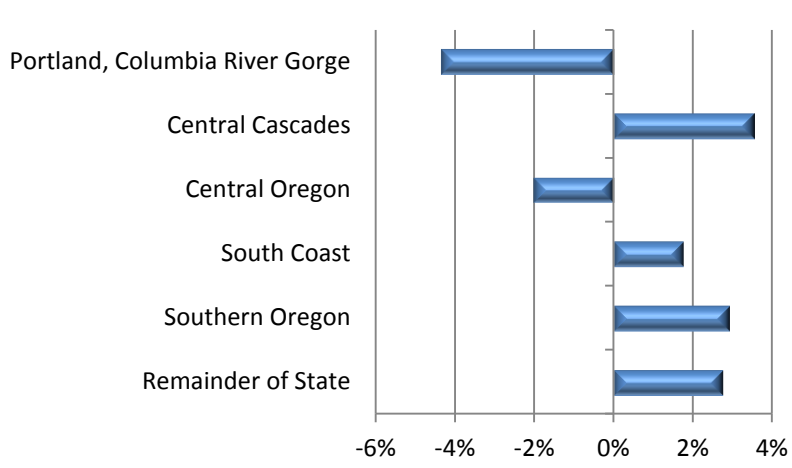
The rapid spread of the fire caused local authorities to issue a level 3 (GO!) evacuation order for Algoma Road off of U.S. 97 until it intersected with Old Fort Road, along with five residences and the campground at Hagelstein Park. A level 2 (Set) warning was also issued for another nearby residence.

Containment lines were completed on Sept. 1, and residents previously at level 3 (GO!) evacuation levels were allowed to return to their homes under a level 1 (Ready) notice. The fire did not spread any further than the 400 acres it had already burned.

State Parks

Oregon state parks are typically located in rural areas and can be particularly affected by wildfires. During the 2017 wildfire season, attendance data show reduced overnight visitor use for several parks located near wildfires and/or where significant smoke impacts occurred. In Figure IV-1 parks have been organized into five regions which are situated near the primary wildfire locations, and separate measures of visitation change between 2016 and 2017 are shown for each region. See Appendix C for a table showing individual parks in each region and overnight visitation per park in 2016 and 2017, as well as statewide numbers.

Figure IV-1
Change in State Park Visitation, 2016—2017 by Region



Overall Oregon state park overnight use increased 1.6% between 2016 and 2017. In Portland and the Columbia River Gorge, however, the effects of the fires is clearly evident, with substantial reductions in visitation at Ainsworth, Memaloose and Viento State Parks, all located within the Gorge. Overall the region saw a 4.3% reduction in visitation between 2016 and 2017.

In the Central Cascades, Cascadia State Park saw a substantial decrease in visitation, which is consistent with its location on Highway 20 near the Horse Creek Complex.

Central Oregon saw an overall 2% reduction in its state park visitation, with relatively more loss shown for Smith Rock and Lapine State Parks.

On the South Coast, state parks saw an overall growth of 1.8%, but a substantial decline for Alfred A. Loeb State Park, which is located near Brookings and the site of the Chetco Bar Fire.

Finally, Southern Oregon saw an overall 2.9% increase in state parks use. Although there was a 14.8% reduction for the Collier Memorial State Park and 44.4% reduction for the Jackson F. Kimball State Recreation Site, these parks represent very low visitor volume.

In the areas not listed as primarily impacted by fires, state park use increased by 2.7%. It appears that, at least for some state park users, visits were shifted from parks that were impacted by smoke and fires to parks that were less affected. The result was a shift in regional patterns of park use as much as it was a decline in parks situated in areas impacted by fires.

V. Smoke Impacts

Smoke had a disproportionately large impact on Oregon during the 2017 fire season. Though it was not the worst recent fire season by acres burned, the 2017 season had the worst smoke coverage of any year in the period from 2000 to 2017.

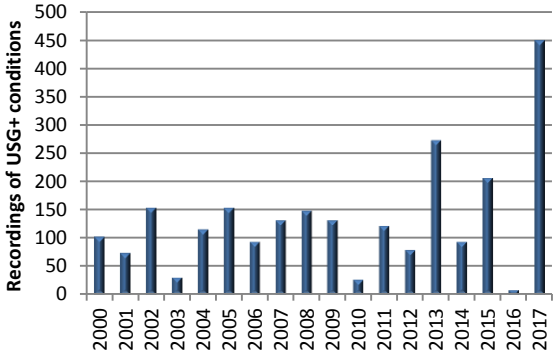
The Environmental Protection Agency's Air Quality Index (AQI) converts measurements of airborne particulates into an easy-to-understand six-tiered chart, ranking the air quality from good to hazardous. At an AQI value of 101 and above, they begin recommending reduced outside activity for the young, the old, and the infirmed – this level of smoke concentration is labeled Unhealthy for Sensitive Groups (USG). At 151 and above (Unhealthy) the smoke is more likely to be affecting the general population and everyone is advised to reduce their exposure to the smoke. At higher levels (Very Unhealthy or Hazardous), people are advised to stay inside entirely.

Figure V-1
Air Quality Index Definitions

Air Quality Index Levels of Health Concern	Numerical Value	Meaning
Good	0 to 50	Air quality is considered satisfactory, and air pollution poses little or no risk.
Moderate	51 to 100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151 to 200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201 to 300	Health alert: everyone may experience more serious health effects.
Hazardous	301 to 500	Health warnings of emergency conditions. The entire population is more likely to be affected.

Source: Environmental Protection Agency

Figure V-2
Oregon USG Air Quality Index Readings

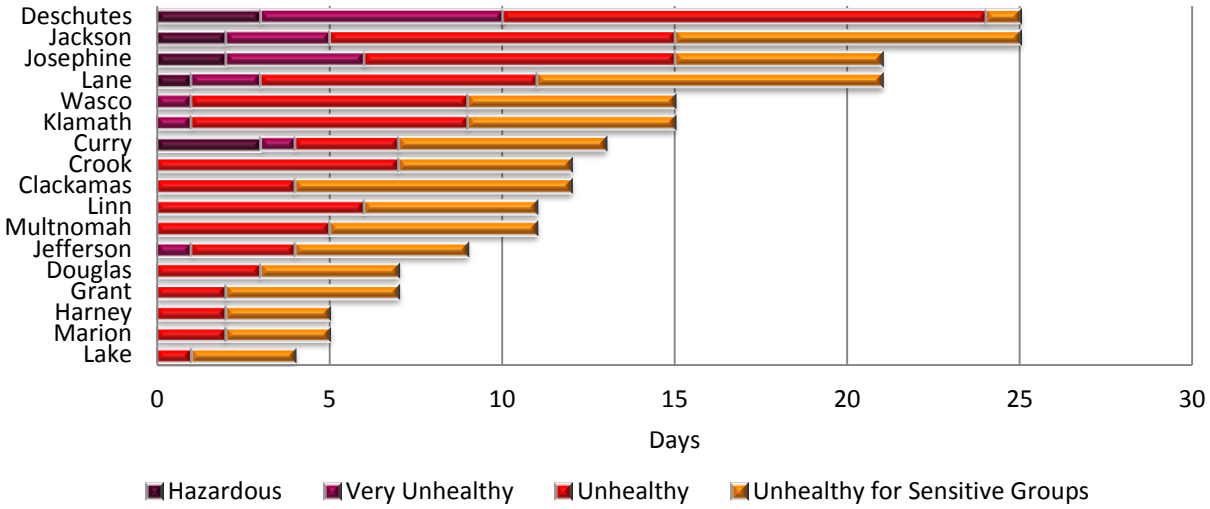


Source: Environmental Protection Agency and U.S. Forest Service

The year 2017 was Oregon's fourth worst fire season by acres burned since 2000 and it was its worst smoke year since 2000 due to the breadth of smoke coverage. Across the state, permanent air monitors reported a daily AQI value of at least USG (100 or above) 451 times. See Figure V-2. The next closest year was 2013, when air monitors reported the same measure only 274 times. These measurements indicate that unhealthy levels of smoke reached large population centers more often than in previous years. Smoke measures draw a useful picture of Oregon's 2017 fire season that complements measures of acres burned.

Though every area recorded some smoke, a few places were more affected than others. Figure V-3 has a summary of county level air quality measurements between Aug. 17 and Sept. 17.

Figure V-3
Air Quality Measures, Oregon Counties

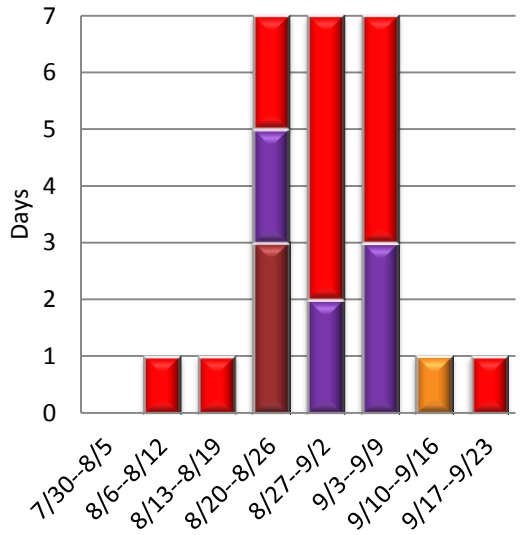


Source: Environmental Protection Agency, U.S. Forest Service

Deschutes County

In Sisters, the air quality was dangerous enough that the Sisters Folk Festival was completely canceled.

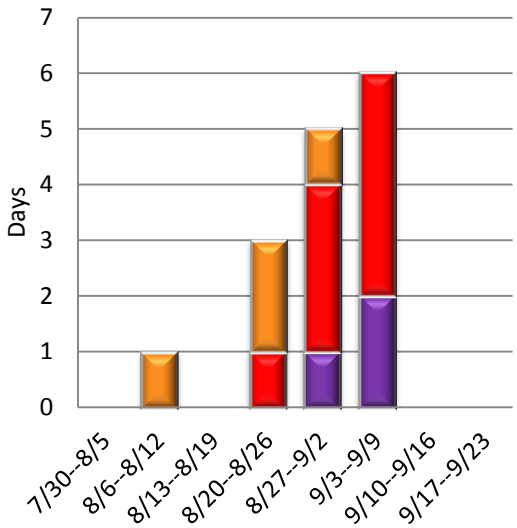
Figure V-4
Sisters Air Quality



Source: Environmental Protection Agency

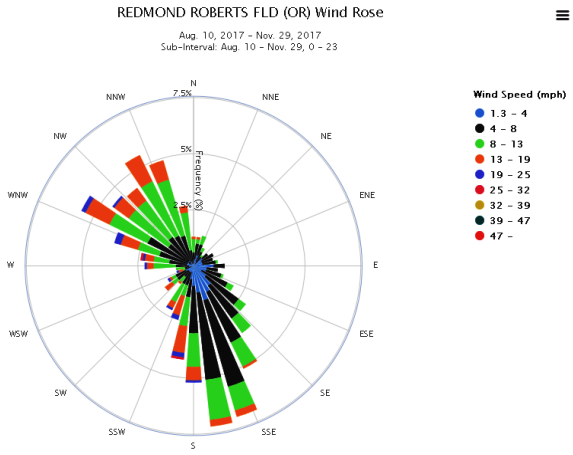
Figure V-4 shows local smoke readings for Sisters, Oregon from July 30 to Sept. 23. This represents the worst recorded air quality conditions anywhere in Oregon during 2017.

Figure V-5
Bend Air Quality



Source: Environmental Protection Agency

Figure V-6
Bend Area Wind Patterns

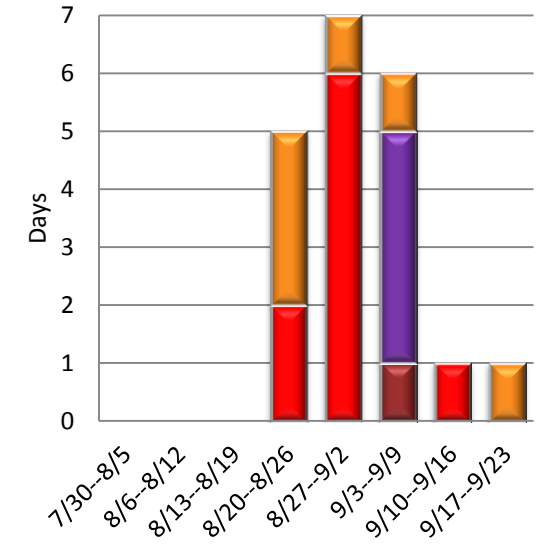


Bend, just 20 miles Southwest of Sisters, recorded much better air during the main smoke period, but still had some bad periods of unhealthy smoke levels. See Figure V-5. During that period the wind was mostly from the North-Northwest in Bend, so it's possible that the smoke from Sisters passed to the west of Bend. See Figure V-6 for the prevailing winds in Bend/Redmond during the smoke period. This figure, called a wind rose, shows the direction of wind at a location for a particular period of time– represented by the location of each bar relative to north, at the head of the figure – and the frequency of wind from a particular direction by the length of each bar. Colors indicate average wind strength.

Jackson County

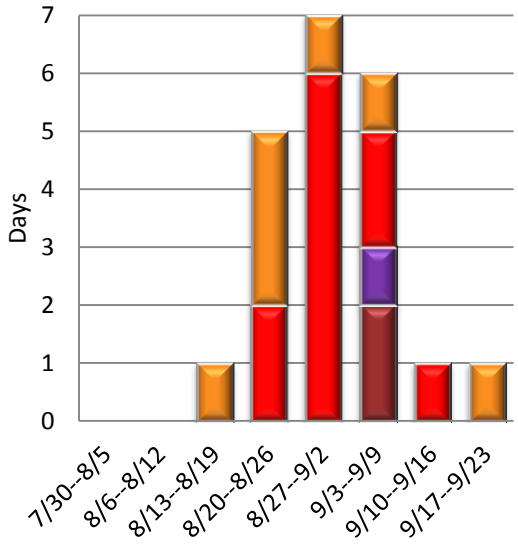
Medford and Ashland, which were located between multiple large fires in Oregon and northern California, could not depend on prevailing winds to clear away smoke.

Figure V-7
Medford Air Quality



Source: Environmental Protection Agency

Figure V-8
Ashland Air Quality



Source: Environmental Protection Agency

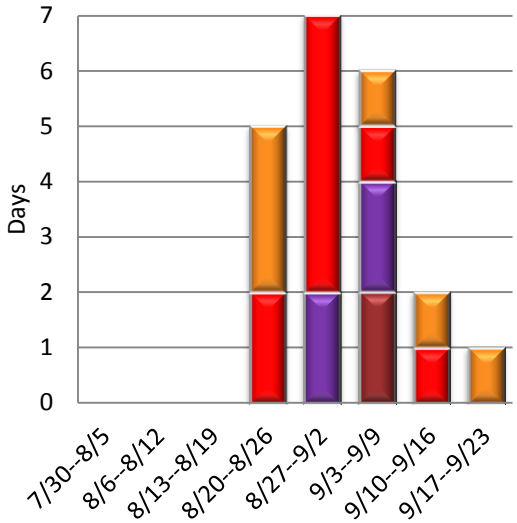
Figure V-7 shows the air quality in Medford, which had almost three continuous weeks of dangerous smoke levels. The smoke caused the local U.S. Tennis Association branch to move two of their Section Championships – tournaments that draw athletes from all over Oregon, Alaska, Washington, and northern Idaho –to Tacoma, Washington.

Ashland's air quality over the smoke period (Figure V-8) was roughly the same as Medford's. During this time, the Shakespeare Festival performances were on-going outdoors. In total, nine performances were canceled to protect customer and staff health – including one that was canceled mid-play.

Josephine County

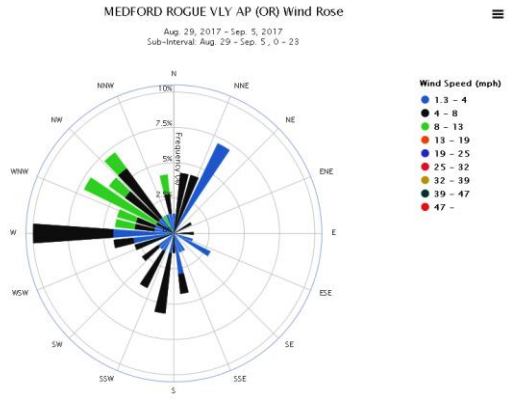
In Josephine County, Grants Pass was similarly surrounded by wildfires, and inundated with smoke as a result.

Figure V-9
Grants Pass Air Quality



Source: Environmental Protection Agency

Figure V-10
Medford Area Wind Patterns



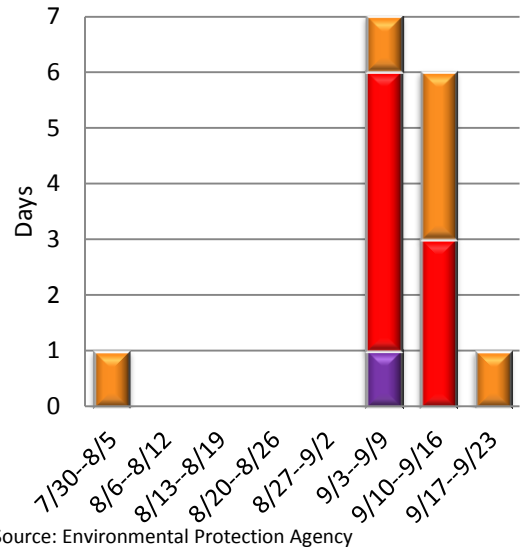
Air quality measurements in Grants Pass over the smoke period (Figure V-9) match those in nearby Medford and Ashland.

Wind measurements in nearby Medford (Figure V-10) indicate that the Chetco Bar and Horse Prairie Fires, along with the High Cascades Complex – to the west, northwest and northeast respectively – were likely causes for smoke in the area. Smoke from the Miller Complex to the south is also indicated to a lesser extent.

Columbia River Gorge

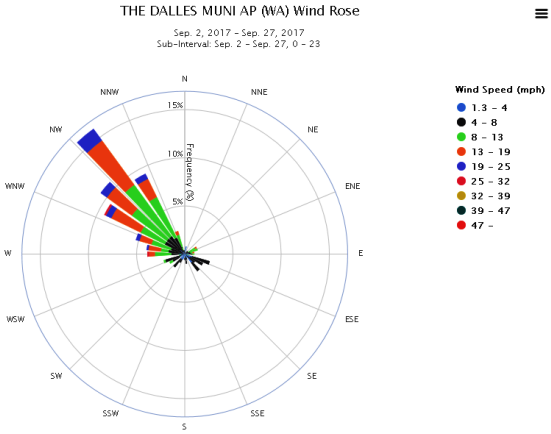
Unfortunately no air quality data are available for Hood River County; the closest source for air quality in this area is The Dalles.

Figure V-11
The Dalles Air Quality



Source: Environmental Protection Agency

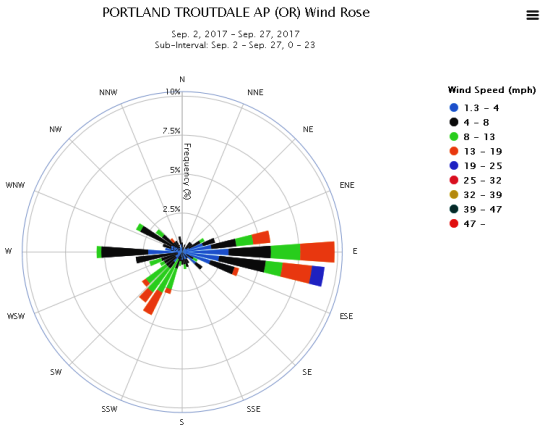
Figure V-12
The Dalles Area Wind Conditions



Looking at air quality measurements from The Dalles (Figure V-11) and the wind conditions measured from the same weather station (Figure V-12), we can see that prevailing winds along the alignment of the Gorge would bring smoke into Hood River and The Dalles from the Eagle Creek Fire to the west.

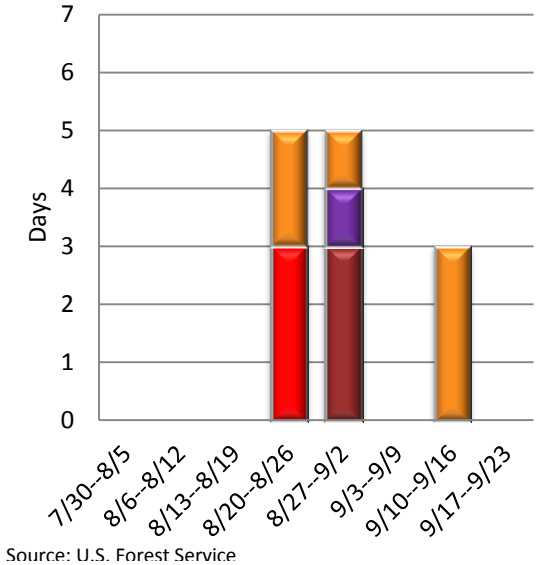
In addition, winds during the fire period in Troutdale, at the west end of the Gorge, were often from the east, bringing Eagle Creek smoke into the Portland metro area. See Figure V-3.

Figure V-13
Troutdale Area Wind Patterns



Curry County

Figure V-14
Air Quality, Chetco Bar Fire Area



Source: U.S. Forest Service

There are no permanent air quality monitors set up in Curry County, but the U.S. Forest Service had three set up temporarily to measure the air quality effects of the Chetco Bar Fire in 2017.

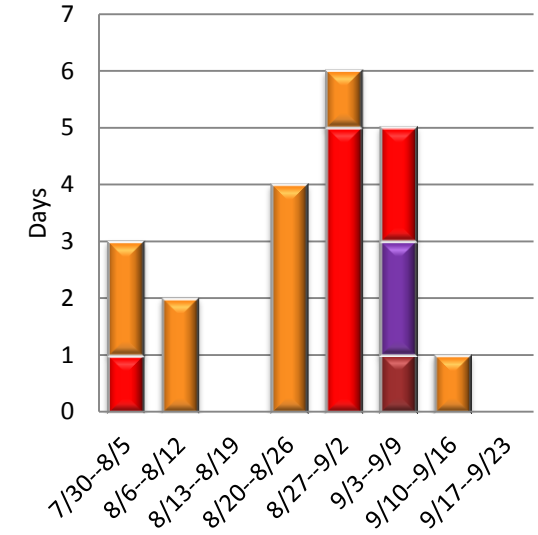
Figure V-14 shows the results of that data collection. Curry County was equal to Deschutes County in regards to which county had the most days with hazardous air quality, despite having fewer days of poor air quality overall.

Lane County

Like Southern Oregon, Lane County had a number of fires surrounding it in late August and early September. Lane County saw three weeks of unhealthy air in 2017. The fires most likely to have caused this were the Jones/Nash/Horse Creek Complex to the west and the Umpqua North Complex to the south.

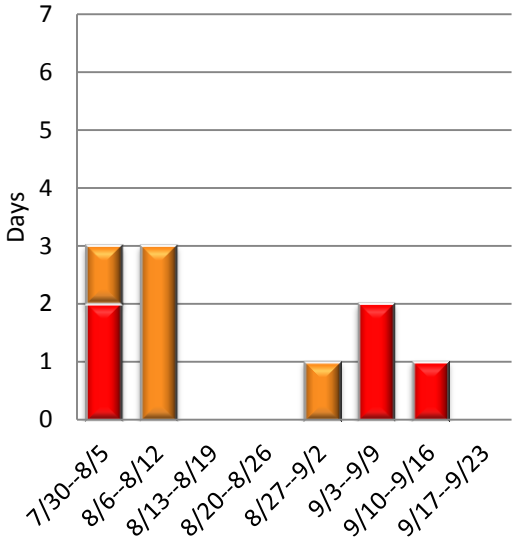
Figure V-15 shows the air quality readings across Lane County. Though we were unable to find direct evidence of economic impact in the county from the fires, air quality measurements indicate that they were impacted.

Figure V-15
Eugene Area Air Quality



Source: Environmental Protection Agency

Figure V-16
Portland Area Air Quality



Source: Environmental Protection Agency

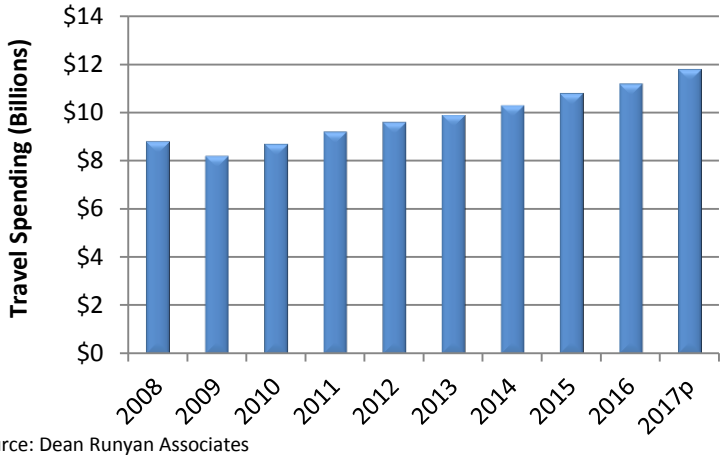
Portland Area

By comparison, Portland (as seen in Figure V-16) had only minor air quality problems. Winds brought smoke south from Washington and Canada initially, and from the Eagle Creek Fire later in the season, but the smoke cleared up after a few days each time. The wind rose in Figure V-13 shows how Eagle Creek fire smoke was blown into the metro area.

VI. Economic Impacts

Economic impacts, as reported in this study, include travel-related sales, the associated employment and earnings, and state and local tax receipts on sales and earnings. Travelers are those who stay overnight in a destination location away from their home or who travel during the day on a non-routine basis to a destination at least 50 miles from their home. For purposes of this research all types of travel are included – leisure, business and personal – as is travel by both domestic and international visitors.

Figure VI-1
Oregon Travel Spending, 2000–2017p



Source: Dean Runyan Associates

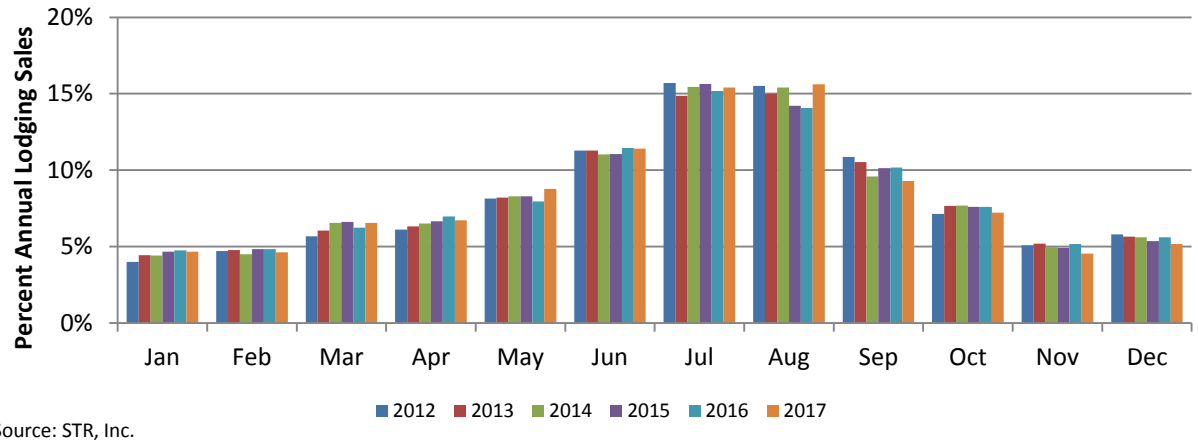
Travel impacts are measured annually by Dean Runyan Associates for Travel Oregon, with reporting at the county, region and state level. Travel spending for 2017 was more than $11.8 billion statewide, up 5.3% from 2016. See Figure VI-1. These figures for 2017 include any wildfire impacts that occurred. Baseline 2017 economic figures for each Oregon county appear in Appendix D.

Fire-Related Spending Impacts

Estimating the portion of each region's spending and other impacts that are affected by fires during 2017 makes use of annual and seasonal spending findings, represented by the county-level travel spending impacts from the 2017 impact study combined with other data by which this spending can be allocated across each month during the year. The expected spending for each region is estimated first for all months without fire impact. Then for fire affected months, actual spending estimates are compared to projected monthly spending from historical monthly spending distribution for that region. The difference between projected monthly spending during fire-impacted months and actual spending as represented by the baseline 2017 impact findings is considered the spending impact associated with fires during the fire-impacted months.

Projecting the monthly distribution of travel spending makes use of lodging sales data as available from STR, Inc. for a selection of Oregon regions. These data are based on monthly surveys of a selection of commercial lodging properties and are the best available measures of monthly variations in travel industry spending. An example of data for Central Oregon appears in Figure VI-2, showing the proportion of lodging sales in each month for the period from 2012 through 2017. It is apparent that monthly variations are very regular in most years; accordingly the average monthly sales distribution for 2012 through 2016 is used for projection purposes.

Figure VI-2
Lodging Sales, Central Oregon, by Month, 2012-2017



Source: STR, Inc.

This procedure provides suitable results for nearly all counties or regions in the state except for the southern Oregon Coast and Southern Oregon - Curry, Jackson and Josephine Counties in particular. No STR data are available specifically for those counties, and no other data for nearby areas, such as Coos County, appear to be suitably representative. Accordingly an alternative approach is used for Curry, Jackson and Josephine Counties that is based on survey data obtained from lodging businesses in the county, as explained in a section further below.

Continuing with the example of Deschutes County, the travel spending proportion for Central Oregon for the nine months that were not affected by fires, based on historic STR monthly lodging sales data for Central Oregon, appears in the first line of Table VI-1 (77.1%). Actual sales for this same period for 2017, from STR data, appear in the second line (about $137 million). Dividing the first figure into the second yields the expected annual Central Oregon lodging sales that would be expected based on the nine months of actual sales data and the amount, historically, that this represents annually, amounting to about $177 million. Actual STR Central Oregon lodging sales for 2017 amounted to about $173 million, 2.3% less that the estimate based on historical patterns. This 2.3% figure is interpreted as the percent of actual sales that was not realized due to conditions during the 2017 fire season.

Table VI-1
Fire-Related Spending Loss
2017 Deschutes County

Fire affected months	Sept, Oct, Nov
Historical proportion of lodging sales during non-fire affected months	77.1%
2017 lodging sales during non-fire affected months (STR, $M)	$136,921,831
Expected total 2017 lodging sales based on historical patterns	$177,495,303
Actual total 2017 lodging sales	$173,444,044
Percent sales loss	2.3%

Using the same technique for the remaining counties, with the exception of Curry, Jackson and Josephine Counties, provides the wildfire-related sales losses that appear in Table VI-2. In each case the STR data for the region in which the county is located is used for the analysis.

Table VI-2
Wildfire-Related Spending Percent Loss, 2017, Affected Oregon Counties

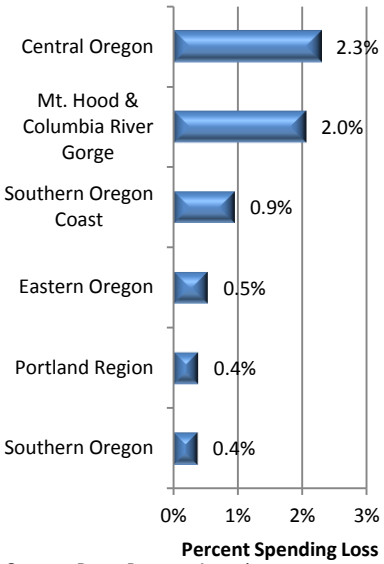
County	Fire affected months	Lodging sales during non-fire affected months		Expected total 2017 lodging sales ($M)	Actual total 2017 lodging sales ($M)	Percent sales loss (annual)
		Historical proportion (STR)	2017 Amount (STR, $M)			
Baker	-0.53%	76.2%	$34.6	$45.4	$45.2	-0.53%
East Clackamas	-2.09%	74.8%	$100.4	$134.3	$131.5	-2.05%
West Clackamas	-0.38%	90.5%	$300.6	$332.2	$330.9	-0.38%
Columbia	-0.38%	90.5%	$29.7	$32.8	$32.7	-0.38%
Crook	-2.34%	77.1%	$33.9	$44.0	$43.0	-2.28%
Curry	-3.19%	76.2%	$102.0	$133.8	$129.7	-3.09%
Deschutes	-2.34%	77.1%	$536.0	$694.8	$679.0	-2.28%
Gilliam	-0.53%	76.2%	$3.3	$4.3	$4.3	-0.53%
Grant	-0.53%	76.2%	$7.9	$10.4	$10.3	-0.53%
Harney	-0.53%	76.2%	$13.7	$17.9	$17.8	-0.53%
Hood River	-2.09%	74.8%	$82.6	$110.4	$108.2	-2.05%
Jackson	-0.58%	74.5%	$368.7	$494.8	$492.0	-0.57%
Jefferson	-2.34%	77.1%	$39.0	$50.6	$49.4	-2.28%
Josephine	-0.58%	74.5%	$88.6	$118.9	$118.3	-0.57%
Malheur	-0.53%	76.2%	$31.9	$41.9	$41.7	-0.53%
Morrow	-0.53%	76.2%	$11.0	$14.5	$14.4	-0.53%
East Multnomah	-2.09%	74.8%	$64.9	$86.8	$85.0	-2.05%
West Multnomah	-0.38%	90.5%	$2,418.3	$2,672.3	$2,662.1	-0.38%
Sherman	-0.53%	76.2%	$3.9	$5.2	$5.1	-0.53%
Umatilla	-0.53%	76.2%	$114.6	$150.4	$149.6	-0.53%

Union	-0.53%	76.2%	$24.4	$32.0	$31.9	-0.53%
Wallowa	-0.53%	76.2%	$23.0	$30.1	$30.0	-0.53%
North Wasco	-2.09%	74.8%	$57.2	$76.5	$75.0	-2.05%
South Wasco	-2.34%	77.1%	$34.7	$45.0	$44.0	-2.28%
Washington	-0.38%	90.5%	$633.2	$699.7	$697.1	-0.38%
Wheeler	-0.53%	76.2%	$2.1	$2.8	$2.8	-0.53%

Note: Includes only counties showing at least some wildfire-related losses

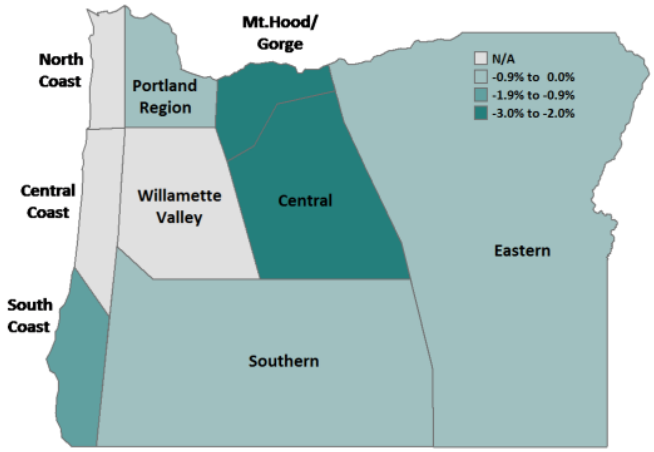
These loss percentages are summarized by tourism region in Figures VI-3 and VI-4.

Figure VI-3
Wildfire-Related Spending Loss
2017 by Region



Source: Dean Runyan Associates

Figure VI-4
Wildfire-Related Spending Loss
2017 by Region



Source: Dean Runyan Associates

Those counties for which no loss in sales can be identified—that is, the projection is zero or positive – are not shown in the table. It is important to consider that some spending impacts could have occurred in these other counties, but not enough to be recognized by the methodology employed for this study. Treatment of these counties is discussed further below.

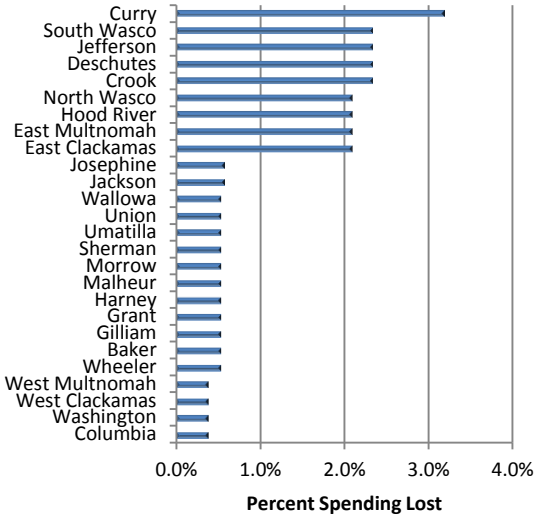
In Curry, Jackson and Josephine Counties no monthly lodging data breakouts are available by which annual lodging sales figures can be converted to monthly data. For these locations the fire impacts are calculated using survey data from businesses in these locations, adjusted to be as consistent as possible with the analysis method used for other Oregon counties.

As part of the business and organization survey conducted for this research, businesses were asked to report the proportion of their sales that were gained or lost due to fire-related conditions. In order to correct for likely response bias in the survey data, the reported percentage of business loss is adjusted using comparable data from Deschutes County. In Deschutes County the annual loss attributable to fire impacts is 2.3%, as calculated on the basis of monthly lodging sales data applied to the fire impact period. Survey findings from lodging businesses in Deschutes County report an average loss of 16.3%, which represents only a portion of the year. This is higher than the Deschutes County lodging distribution figure, which represents the entire year, by a factor of 7.1. This factor is used to adjust the Curry County survey-based loss figure so as to correct for likely response bias. The resulting loss figure is 3.1%, as appears in Table VI-2.

The proportion of spending lost in each county is shown in Figure VI-5. All counties for which a quantitative estimate is available are so labeled. Total statewide loss in visitor spending amounts to about $51 million, as appears in Table VI-3.

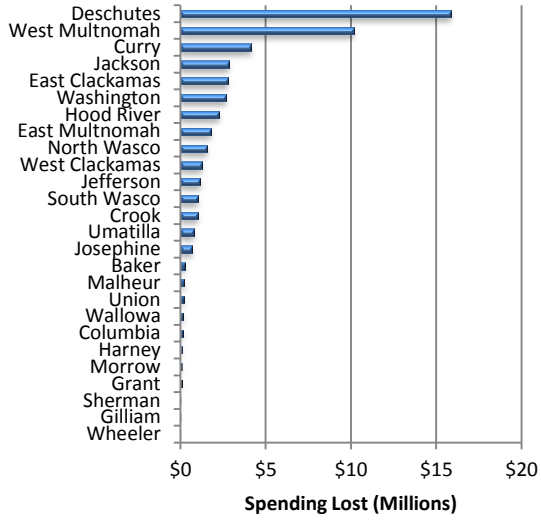
Figures are included for those counties for which a loss can be calculated. The loss amounts also appear in Figures VI-6 and VI-7. Those counties for which no impacts are identified are label N/A, Not Ascertained, and appear gray. Three counties where information or data exists that fire impacts were present but which were not measured by the methodology employed in this study -- consisting of Douglas, Klamath and Lane – are shown in the lightest shade of blue.

Figure VI-5
Percent Wildfire-Related Spending Loss
2017 Affected Oregon Counties



Source: Dean Runyan Associates

Figure VI-6
Wildfire-Related Spending Loss
2017 Affected Oregon Counties (Millions)

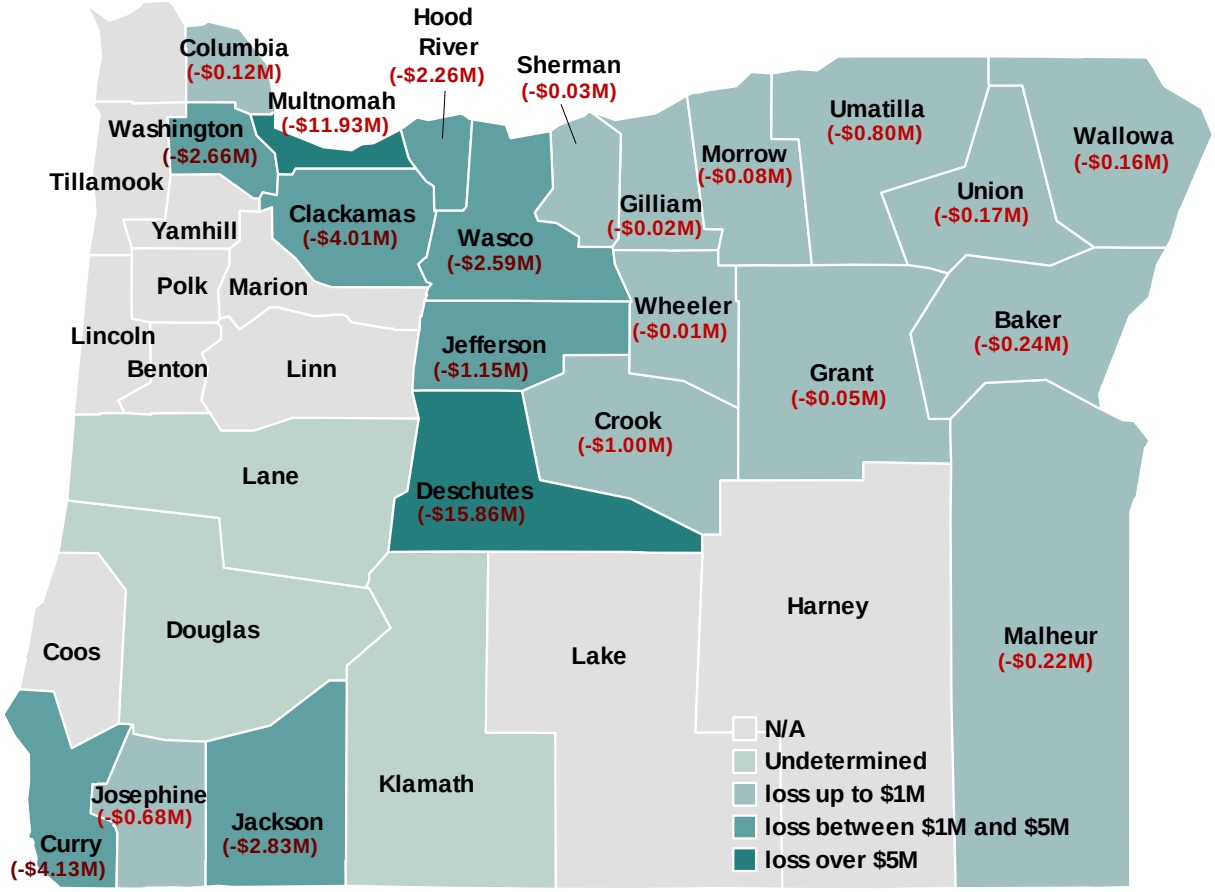


Source: Dean Runyan Associates

Table VI-3
Wildfire-Related Spending Loss
2017 Affected Oregon Counties

Oregon Counties	Spending ($000)	Spending Loss Percent	Spending Loss Amount ($000)
Baker	$45,185	0.53%	$241
Columbia	$32,674	0.38%	$125
Crook	$42,959	2.34%	$1,003
Curry	$129,688	3.19%	$4,131
Deschutes	$678,950	2.34%	$15,859
East Clackamas	$131,506	2.09%	$2,746
East Multnomah	$85,017	2.09%	$1,775
Gilliam	$4,311	0.53%	$23
Grant	$10,328	0.53%	$55
Harney	$17,825	0.53%	$95
Hood River	$108,155	2.09%	$2,258
Jackson	$491,966	0.58%	$2,834
Jefferson	$49,447	2.34%	$1,155
Josephine	$118,268	0.58%	$681
Malheur	$41,699	0.53%	$222
Morrow	$14,390	0.53%	$77
North Wasco	$74,965	2.09%	$1,565
Sherman	$5,125	0.53%	$27
South Wasco	$43,986	2.34%	$1,027
Umatilla	$149,597	0.53%	$797
Union	$31,857	0.53%	$170
Wallowa	$29,978	0.53%	$160
Washington	$697,063	0.38%	$2,658
West Clackamas	$330,949	0.38%	$1,262
West Multnomah	$2,662,141	0.38%	$10,150
Wheeler	$2,796	0.53%	$15
Total Oregon Counties			$51,111

Figure VI-7
Wildfire-Related Spending Loss
2017 Affected Oregon Counties



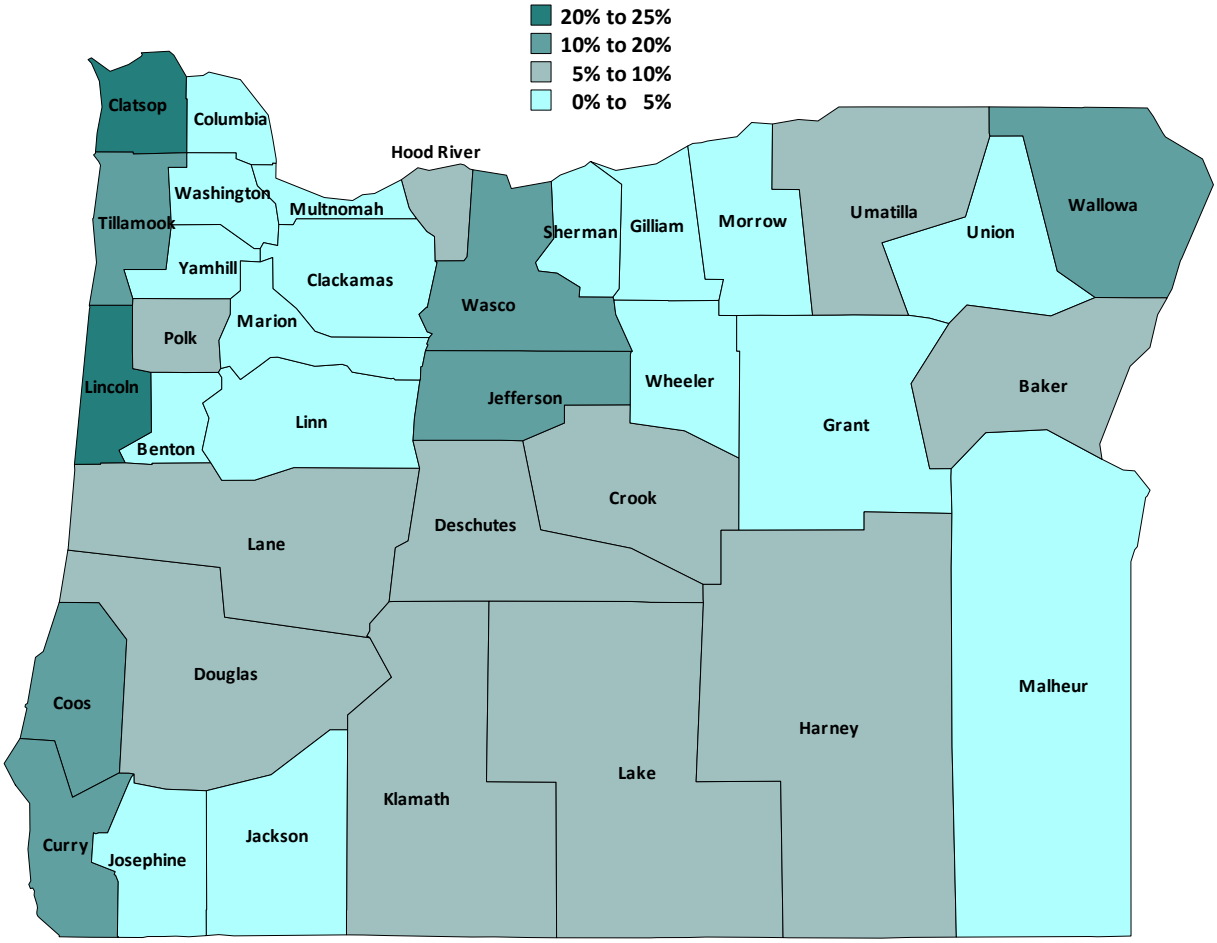
Source: Dean Runyan Associates

Reliance on Tourism Employment

Spending losses due to the 2017 wildfire season will affect locations differently according to how much each relies on the tourism industry. Counties with a high proportion of employment in the tourism industry will see negative effects from a smaller loss than counties that are less economically reliant on tourism.

Of the counties affected by wildfire-related loss in 2017, Jefferson (11.1%), Wasco (12.4%), and Curry (19.2%) Counties have the highest proportion of employment in the tourism industry compared to overall employment. See Figure VI-8.

Figure VI-8
Tourism Industry Employment as Proportion of Total Employment
2016 Oregon Counties



Source: Dean Runyan Associates

Earnings and Tax Receipts

Earnings losses associated with the 2017 wildfire season stem from employee furloughs or other reductions in income, including tips and commissions that are common in the industry. Earnings losses by working proprietors are also included. The total statewide earnings associated with the fire-related loss in spending amount to $16 million, as appears in Table VI-4. Earnings losses for each county are shown as well. These figures are calculated from the overall relationship between destination sales and earnings, which are assumed to prevail through the fire season as well as the remainder of the year.

Table VI-4
Wildfire-Related Earnings Loss
2017 Selected Oregon Counties

County	Earnings ($000)
Baker	$76
East Clackamas	$894
West Clackamas	$381
Columbia	$39
Crook	$305
Curry	$1,282
Deschutes	$4,820
Gilliam	$9
Grant	$16
Harney	$32
Hood River	$784
Jackson	$1,033
Jefferson	$403
Josephine	$169
Malheur	$62
Morrow	$37
East Multnomah	$534
West Multnomah	$2,961
Sherman	$10
Umatilla	$355
Union	$60
Wallowa	$58
North Wasco	$587
South Wasco	$228
Washington	$842
Yamhill	$0
Total Oregon Counties	$15,975

Some qualification to the listed earnings losses is in order. While reduced business sales can be expected to result in employee schedule reductions, furloughs, loss of commissions and other reductions in income, in some cases businesses and organizations may have paid their employees in a typical manner irrespective of reductions in their sales. To the extent this is the case, the estimate of reduced earnings is too high. It is also possible that employers paid their workers more in order to clean up or otherwise mitigate the effects of a wildfire, or to engage in additional marketing and other activity to compensate for lost business. No data are available however to measure how wages may have been affected specifically by fire-related changes in sales, so the typical relationship between business sales and earnings is assumed to prevail.

State and Local Tax Receipts

State and local tax receipt losses are calculated in a similar manner to spending and earnings losses, using regional and statewide tax rates. State and local tax receipt losses totaled $368 thousand and $1.5 million, respectively, over the course of 2017. Figures for individual counties appear in Table VI-5.

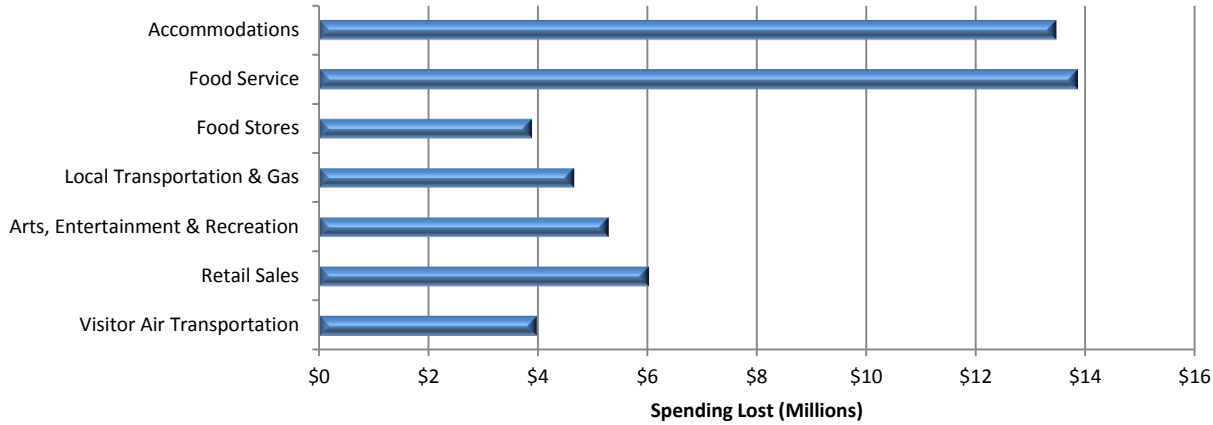
Table VI-5
Wildfire-Related Loss of State and Local Tax Receipts

	Tax Receipts ($000)	
County	Local	State
Baker	$2.7	$7.2
East Clackamas	$31.6	$97.5
West Clackamas	$24.8	$33.0
Columbia	$0.8	$3.7
Crook	$21.6	$30.6
Curry	$29.4	$133.8
Deschutes	$61.9	$401.2
Gilliam	$0.4	$0.7
Grant	$1.2	$1.6
Harney	$2.0	$3.2
Hood River	$30.2	$79.4
Jackson	$31.7	$104.5
Jefferson	$15.5	$39.4
Josephine	$6.3	$21.1
Malheur	$0.2	$7.7
Morrow	$4.6	$3.0
East Multnomah	$0.0	$45.2
West Multnomah	$42.3	$296.1
Sherman	$0.3	$1.0
Umatilla	$9.8	$23.8
Union	$2.8	$5.2
Wallowa	$0.0	$3.7
North Wasco	$30.3	$63.0
South Wasco	$0.0	$30.4
Washington	$17.9	$101.4
Total Oregon Counties	$368.4	$1,537.2

Impacts by Type of Business

Breaking up unrealized spending by industry, as in Figure VI-9, shows the most sizable losses in the food services industry, which fell short $13.9 million, and in the accommodations industry, which fell short $13.5 million.

Figure VI-9
Wildfire-Related Spending Loss
2017 by Industry

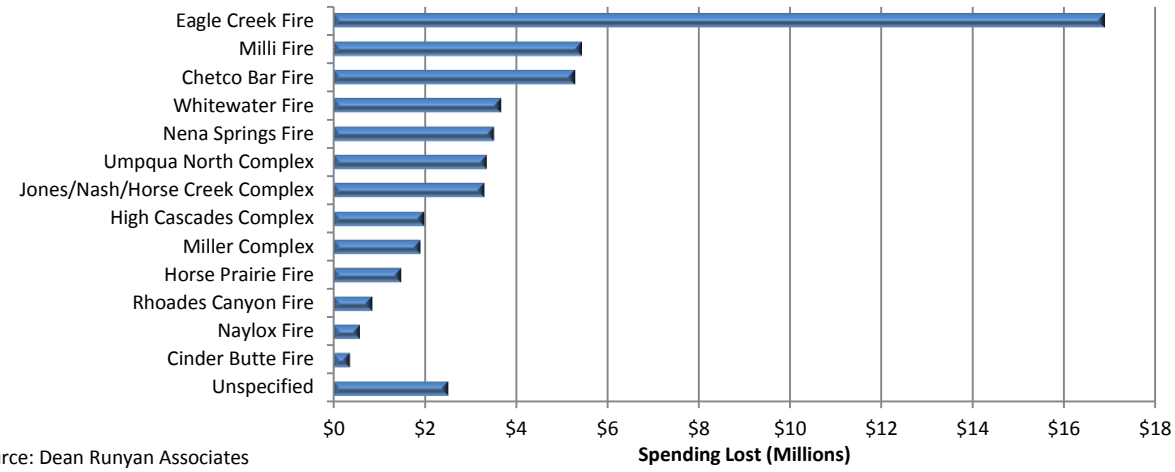


Source: Dean Runyan Associates

Impact Summary by Fire

A summary of sales reductions by fire, which appears in Figure VI-10, indicates the significance of the Eagle Creek Fire. These estimates were prepared by allocating the county-level fire impact figures to each of the fires on the basis of the survey findings for residents of each county. Those fires that respondents thought were most significant in each county were allocated the largest portion of the lost sales estimates. While these findings are useful, they should be considered approximations.

Figure VI-10
Wildfire-Related Spending Loss
2017 by Fire



Source: Dean Runyan Associates

Acknowledgements

Travel Oregon would like to thank the following organizations for their generous support of the "The Impacts of the 2017 Wildfires on Oregon's Travel and Tourism Industry" study:

Appendix A

Oregon Fires, 2017 Season

Name	Start Date	Cont. Date	Acres	Days
Chetco Bar	07/12/2017	11/02/2017	191,125	114
Nena Springs	08/08/2017	08/18/2017	68,007	11
Cinder Butte	08/02/2017	08/17/2017	52,531	16
Eagle Creek	09/02/2017	09/27/2017	48,831	26
Blanket Creek	07/25/2017	11/28/2017	33,322	127
Abney	08/10/2017	10/19/2017	32,745	71
Happy Dog	08/12/2017	09/27/2017	31,141	47
Milli	08/11/2017	09/24/2017	24,025	45
Broken Lookout	08/08/2017	10/27/2017	19,181	81
Separation	08/10/2017	10/19/2017	17,747	71
Bowden	07/24/2017	07/25/2017	16,773	2
Horse Prairie	08/26/2017	09/29/2017	16,436	35
Rhoades Canyon	06/20/2017	06/24/2017	15,200	5
Spruce Lake	07/29/2017	10/30/2017	14,515	94
0821 RN	08/10/2017	08/11/2017	12,447	2
Whitewater	07/23/2017	11/21/2017	11,493	122
Emerson	07/25/2017	07/30/2017	10,527	6
Jones	08/10/2017	11/29/2017	10,114	112
Horn Butte	07/21/2017	07/23/2017	9,300	3
Rebel	08/04/2017	09/28/2017	8,709	56
Pup	08/09/2017	11/30/2017	8,282	114
Horse Cross	06/26/2017	06/27/2017	6,650	2
Nash	08/10/2017	10/19/2017	6,359	71
Ana	07/08/2017	07/14/2017	5,874	7
North Pole	08/13/2017	08/16/2017	5,075	4
Fall Creek	08/10/2017	09/09/2017	4,827	31
Desolation	09/09/2017	10/30/2017	4,512	52
Burnt Peak	08/11/2017	11/02/2017	4,215	84
Upper Mine	07/24/2017	08/01/2017	4,135	9
Brokentooth	08/10/2017	10/23/2017	3,941	75

Avenue	08/11/2017	10/19/2017	3,857	70
Roney	08/10/2017	10/19/2017	3,548	71
North Pelican	08/10/2017	10/15/2017	3,427	67
Dry Creek Buttes	07/28/2017	07/30/2017	3,000	3
Mecca Fire	06/25/2017	07/08/2017	2,400	14
Staley	08/10/2017	10/31/2017	2,300	83
Morgan Creek	08/03/2017	08/05/2017	2,206	3
Little Devil	08/10/2017	11/21/2017	2,125	104
Creedence	08/11/2017	09/30/2017	2,093	51
Indian Ridge	09/08/2017	09/27/2017	2,053	20
Whychus 0814 CS	08/10/2017	08/21/2017	2,012	12
Upper Ash Flat	08/09/2017	10/23/2017	1,983	76
Devils Lake	07/31/2017	08/10/2017	1,702	11
Little	08/28/2017	08/28/2017	1,614	1
Olallie Lookout	08/10/2017	10/19/2017	1,572	71
Oxbow	07/28/2017	07/31/2017	1,454	4
Hawk	07/27/2017	07/28/2017	1,412	2
Rattlesnake	08/17/2017	10/23/2017	1,373	68
Diamond Butte	07/08/2017	07/09/2017	1,369	2
Coyote	07/12/2017	07/14/2017	1,314	3
Blevins	08/19/2017	08/19/2017	1,314	1
Hard Rock	09/08/2017	09/10/2017	1,280	3
McKay	08/29/2017	09/07/2017	1,221	10
Overlook	08/30/2017	08/31/2017	1,020	2
Buck	07/10/2017	07/25/2017	1,015	16
Devil	08/08/2017	10/23/2017	874	77
McCarty	07/11/2017	07/15/2017	848	5
Jade Creek	08/29/2017	09/07/2017	782	10
Double Buck	08/07/2017	09/21/2017	762	46
Copeland	08/22/2017	09/15/2017	699	25
Sheep Springs	06/26/2017	08/23/2017	696	59
Scorpion	08/28/2017	11/21/2017	695	86
Powerline	07/08/2017	07/10/2017	688	3
Indigo	09/11/2017	09/17/2017	615	7
Crane	07/24/2017	07/29/2017	602	6

Flounce	08/07/2017	09/20/2017	587	45
Haystack Rock	07/28/2017	07/30/2017	511	3
Frog Creek	10/18/2017	10/18/2017	500	1
Ferry Canyon	08/12/2017	08/13/2017	500	2
Stone Springs	06/27/2017	06/27/2017	500	1
Bear Butte	08/04/2017	08/23/2017	499	20
Hart	07/11/2017	07/12/2017	466	2
Bernard	08/24/2017	09/27/2017	450	35
Kelsey Creek	09/09/2017	11/06/2017	441	59
Un-named	08/07/2017	08/15/2017	425	9
Freeze	08/09/2017	08/22/2017	425	14
Naylox	08/29/2017	09/05/2017	423	8
Duck	07/24/2017	07/25/2017	420	2
Oak Springs	06/24/2017	06/29/2017	375	6
Willow	07/06/2017	07/10/2017	346	5
Dry Diggins	08/14/2017	09/10/2017	345	28
Wagner 0422 RN	07/03/2017	07/06/2017	256	4
Rim	09/03/2017	09/16/2017	237	14
Cow Creek	06/26/2017	06/28/2017	230	3
Rigdon Point	09/11/2017	10/31/2017	206	51
Potato Hill	08/29/2017	09/18/2017	199	21
Gerber Flat	06/26/2017	06/27/2017	194	2
Goat	07/26/2017	07/26/2017	174	1
Cougar Butte NW	05/26/2017	05/29/2017	170	4
Shan Creek	08/10/2017	08/26/2017	156	17
Iron	06/23/2017	06/24/2017	152	2
Dry Gulch	06/26/2017	06/26/2017	150	1
Sadu	08/29/2017	08/31/2017	134	3
Wildcat 0284	06/13/2017	06/20/2017	130	8
Belknap	08/11/2017	08/22/2017	125	12
Dog Prairie	08/09/2017	09/10/2017	115	33
SRZ 284	09/10/2017	10/31/2017	100	52
Hammond Hill	07/29/2017	07/30/2017	97	2
Tallow	08/07/2017	08/22/2017	89	16
Tumblebug 2	08/10/2017	11/07/2017	87	90
Sherwood	08/14/2017	08/21/2017	77	8
Fish	07/23/2017	07/24/2017	70	2
Bigelow	08/10/2017	09/30/2017	63	52
Oak Nob	08/10/2017	09/13/2017	59	35
Box Canyon	08/09/2017	08/13/2017	27	5
Twin #4	08/11/2017	11/21/2017	6	103
Lime Gulch	08/11/2017	11/02/2017	4	84
292	08/08/2017	08/22/2017	3	15
Tom	08/15/2017	08/17/2017	2	3
Imagination Peak	09/14/2017	09/28/2017	1	15
Buckskin	08/09/2017	08/22/2017	1	14
Jerry	08/15/2017	08/19/2017	1	5
Steamboat	08/11/2017	08/14/2017	-	4

Appendix B

Oregon Wildfires Travel Impacts Survey Questionnaire

Dear Travel Industry Partner:

Your input is critical in this study as it will assist us in assessing how wildfires affected Oregon's tourism.

In responding, please keep the following in mind:

- Your responses will be entirely confidential and will not be available to anyone outside our immediate research team.
- Some questions may be difficult to answer. You may not have specific data for providing exact responses. In these cases, please use your best professional judgment in providing answers. We are looking to gain perspective from those working on the ground in the area.
- If you have more than one business unit with a physical location, please fill out a questionnaire for each separately. You may fill out the questionnaire as many times as necessary.

If you should have any questions, please feel free to contact Travel Oregon's Research Manager, Ladan Ghahramani (ladan@traveloregon.com).

Thank you,

TRAVEL OREGON

Questionnaire prepared collaboratively with Destination Analysts. The survey was conducted online, and the copy shown here includes formatting necessary for online application.

1. Do you operate any tourism related businesses/organizations in Oregon that were affected (either positively or negatively) by last year's wildfire season (June 1, 2017 through December 31, 2017)

❍ Yes

❍ No

2. How many tourism related businesses/organizations do you operate in Oregon that were affected (both positively and negatively) by wildfires (June 1, 2017 through December 31, 2017)?

❍ One location *

❍ More than one location * (Please specify how many): _____

*Note: If you have more than one business unit with a physical location please fill out a questionnaire for each separately

Conditional: You have indicated that **more than one** of your locations was affected by the 2017 Oregon wildfire season.

Please fill out **a separate questionnaire <u>for each location</u>** (a link to another questionnaire will be provided at the end of this survey)

49. Please provide the following information on your business or organization:

(Your contact information will only be used if Travel Oregon needs to clarify any of your responses and to email the final results of the study to you.)

Name: _____

Title: _____

Email address: _____

Name of primary business or organization: _____

Location (city, county): _____

Zip code: _____

4. Which best describes the business or organization for which you are reporting? (check one only)

❍ Hotel, motel, B&B, resort or other lodging

❍ Campground on public land (e.g., local, state, or national park / forest)

❍ Commercial campground or RV park

❍ Restaurant or beverage service establishment

❍ Retail store or shopping venue

❍ Cultural, recreation, historic or education visitor attraction

❍ Event organizer (concert, play, sports, etc.)

❍ Casino / casino hotel

❍ Guide or tour operator

❍ Transportation provider (taxi, bus, rental car)

❍ Other (please specify): _____

27. Conditional: How many rental units are in your establishment?

_____

29. Conditional**:** How many campsites do you have available?

_____

30. Conditional**:** How many seats are there in your establishment?

_____

31. Conditional**:** How many square feet does your establishment have?

_____

32. Conditional**:** What is your annual visitation / attendance / number of customers?

_____

35. Conditional**:** What is your annual visitation / attendance / number of customers?

_____

33. Conditional**:** How many tour customers do you serve each year?

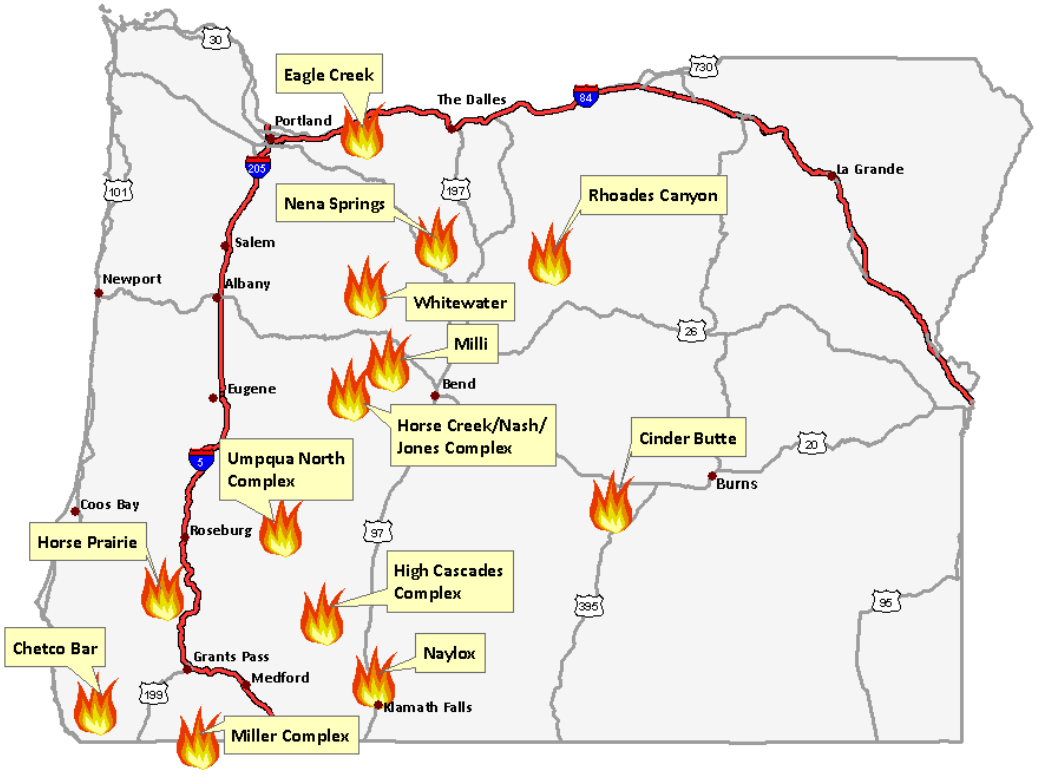
_____

34. Conditional**:** How many customers do you serve each year?

_____

(**In the following two questions, please share your perspective regarding the impact of the 2017 Oregon wildfires on tourism in your immediate region and on your business or organization specifically.**

5. Please consider the map below showing the approximate location of thirteen of the biggest wildfires or wildfire complexes.



Which best describes how one or more of the 2017 Oregon wildfires have affected the overall performance of **your business or organization?**

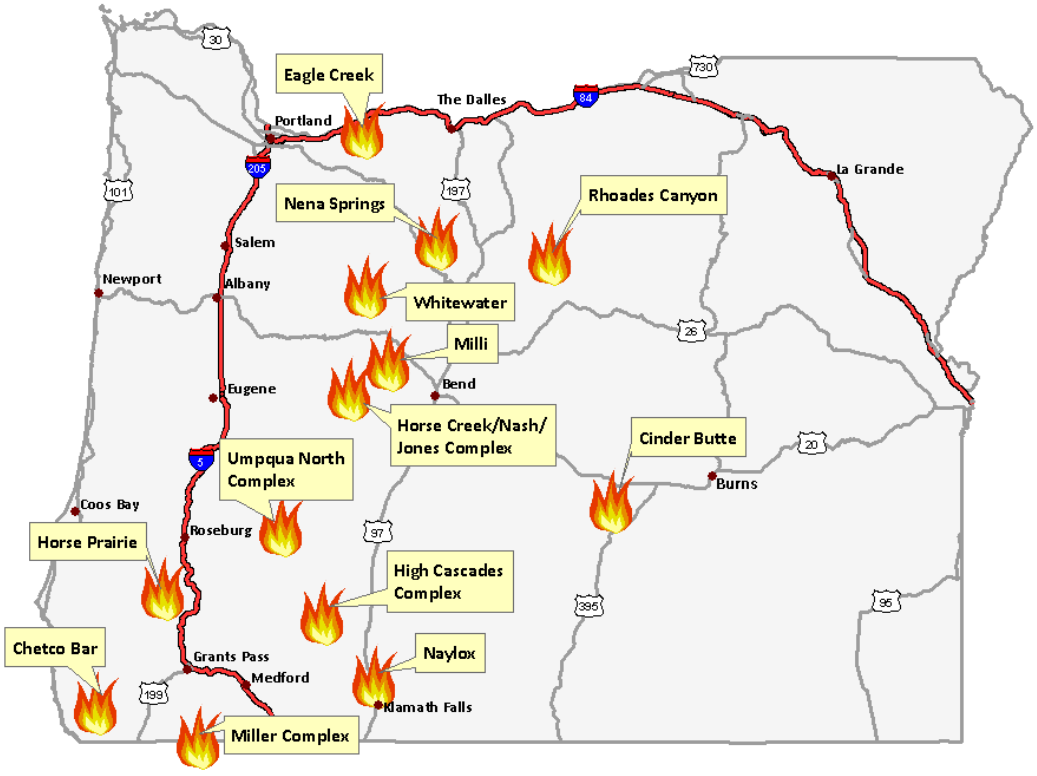
- ❍ Strong negative impact
- ❍ Negative impact
- ❍ Slight negative impact
- ❍ Neither negative nor positive impact
- ❍ Slight positive impact
- ❍ Positive impact
- ❍ Strong positive impact
- ❍ No opinion

6. Which best describes how the 2017 Oregon wildfires affected the overall performance of **the tourism industry in your region?**

- ❍ Strong negative impact
- ❍ Negative impact
- ❍ Slight negative impact
- ❍ Neither negative nor positive impact
- ❍ Slight positive impact
- ❍ Positive impact
- ❍ Strong positive impact
- ❍ No opinion

In the following questions, please share your assessment of the impact the 2017 Oregon wildfires have had specifically on your business or organization's operations / performance.

The map below is included for reference:



Fire Name	Time Frame of Fire	Area of Fire
o Rhoades Canyon	June 20 – June 24	Wheeler
o Chetco Bar	July 12 – November 2	Curry/Josephine
o Whitewater	July 23 – November 21	Marion/Linn
o High Cascades Complex	July 25 – November 30	Douglas/Jackson/Klamath
o Cinder Butte	August 2 – August 17	Lake/Harney
o Umpqua North Complex	August 8 – November 21	Douglas
o Nena Springs	August 8 – August 18	Wasco
o Horse Creek/Jones/Nash Complex	August 10 – November 29	Lane
o Miller Complex	August 10 – November 2	Josephine/Jackson
o Milli	August 11 – September 24	Deschutes
o Horse Prairie	August 26 – September 29	Douglas
o Naylox	August 29 –September 5	Klamath
o Eagle Creek	September 2 – September 27	Hood River/Multnomah

40. Which of these 2017 Oregon wildfires **had an impact on your business or organization's** operations / performance? (check all that apply)

- ❑ Rhoades Canyon
- ❑ Chetco Bar
- ❑ Whitewater
- ❑ High Cascades Complex
- ❑ Cinder Butte
- ❑ Umpqua North Complex
- ❑ Nena Springs
- ❑ Horse Creek/Jones/Nash Complex
- ❑ Miller Complex
- ❑ Milli
- ❑ Horse Prairie
- ❑ Naylox
- ❑ Eagle Creek
- ❑ Other fire or fires
- ❑ Not sure which fire(s)

50. Conditional**:** Please specify what other fire or fires had an impact in your business or organization's operations / performance?

_____

41. Thinking specifically about the 2017 Oregon wildfires you selected that **had an impact on your business or organization's** operations / performance,

For each fire, please select the extent of that impact below.

	Minor Impact	Moderate Impact	Major Impact
Rhoades Canyon	❑	❑	❑
Chetco Bar	❑	❑	❑
Whitewater	❑	❑	❑
High Cascades Complex	❑	❑	❑
Cinder Butte	❑	❑	❑
Umpqua North Complex	❑	❑	❑
Nena Springs	❑	❑	❑
Horse Creek/Jones/Nash Complex	❑	❑	❑
Miller Complex	❑	❑	❑
Milli	❑	❑	❑
Horse Prairie	❑	❑	❑
Naylox	❑	❑	❑
Eagle Creek	❑	❑	❑
Other fire or fires	❑	❑	❑
Not sure which fire(s)	❑	❑	❑

8. Thinking specifically about the seven-month period from June 1, 2017 through December 31, 2017, did your business / organization **lose or gain** sales or revenue **due to Oregon's wildfires**?

❍ Lost sales or revenue

❍ Gained sales or revenue

❍ A combination – both lost and gained sales or revenue

❍ No discernable effect

9. Please think specifically about the seven month period from June 1, 2017 through December 31, 2017.

Relative to the sales or income that you expected for your business or organization, what is your **best estimate of the percent of sales or revenue that you lost** during these seven months due to Oregon's wildfires?

Lost percentage of your sales for this period _____

42. Why do you think these losses occurred? (check all that apply)

❑ Road closures or other problems with customer access to your location

❑ Road closures or other problems with staff access to your location

❑ Evacuation of the area, fire danger at or near your location

❑ Smoke in your area that kept you, your staff and/or customers away

❑ Problems obtaining supplies necessary to operate

❑ You needed to cancel an event or activity

❑ Perceptions of your customers regarding discomfort or danger

❑ Fire damage reduced attractiveness of the area

❑ Don't know, no apparent reason

❑ Other (please explain) _____

11. Please think specifically about the seven month period from June 1, 2017 through December 31, 2017.

Relative to the sales or income that you expected for your business or organization, what is your **best estimate of the percent of sales or revenue that you gained** during these seven months due to Oregon's wildfires?

Gained (fill in blank) percentage of our sales for this period _____

12. Why do you think these gains occurred? (check all that apply)

❑ Residents who evacuated from fire areas elsewhere came to stay overnight in your area

❑ Visitors chose your area for an overnight vacation instead of other areas because you had no fire problems

❑ Sales to emergency response organizations / personnel

❑ Highway traffic was diverted through your area and generated more business

❑ Don't know, no apparent reason

❑ Other (please explain) _____

13. Did the 2017 Solar Eclipse (which was between August 19th and 22nd) occur during the same time you experienced fire impacts?

❍ Yes

❍ No

14. Conditional**:** How do you think the Solar Eclipse affected your sales or revenue **during the period when it occurred?**

❍ Fires caused us to lose sales or revenue we would otherwise have earned from the Solar Eclipse

❍ Solar Eclipse helped us gain sales or revenue we would have otherwise lost due to the fires

❍ Solar Eclipse had no real effect on our sales or revenue during the fire season

❍ Don't know, no opinion

43. Thinking specifically about 2018, do you think your business / organization **will lose or gain** sales or revenue **due to the effects of one or more Oregon fires in 2017?**

❍ Lose sales or revenue

❍ Gain sales or revenue

❍ A combination – both lose and gain sales or revenue

❍ No discernable effect

37. Conditional**:** Why not?

_____

16. What is your best estimate of what your business or organization expects to lose **during all of 2018** due to the effects of **one or more fires in 2017**? (Please leave blank if you have no estimate)

Expect to lose (fill-in-the-blank) percentage of our sales for 2018 _____

47. Why do you think these losses will occur? (check all that apply)

❑ Consumers' negative perception related to the 2017 wildfires (example: safety concerns, access issues, cancellations, closures)

❑ Inability to operate or provide service due to property damages to your location from 2017 wildfires

❑ Road or area closures due to 2017 wildfire damage that will continue into 2018

❑ Customer related Irritation or anger about cancelled plans in 2017, or other problems with a previous trip to Oregon

❑ Diminished appeal of our area due to fire damage

❑ Don't know

❑ Other (please explain) _____

44. What is your best estimate of what your business or organization expects to gain **during all of 2018** due to the effects of **one or more fires in 2017**? (Please leave blank if you have no estimate)

Expect to gain (fill-in-the-blank) percentage of our sales for 2018 _____

48. Conditional**:** Why do you think these gains will occur?

_____

_____

_____

38. Conditional**:** Due to the Oregon wildfires (from June 1, 2017 through December 31, 2017) were any incremental room nights at your lodging property sold to Oregon residents and/or visitors who were displaced by any of the Oregon wildfires?

❍ Yes

❍ No

❍ Unsure

18. Conditional**:** What is your best estimate of the percent of your total room nights sold during this seven month period that were purchased by Oregon residents and/or visitors who were displaced by any of the Oregon wildfires (from June 1, 2017 through December 31, 2017)?

Percentage of total room nights _____

23. How many total room nights does this represent?

Total room nights _____

26. If you have any additional comments, we would appreciate hearing them.

_____

_____

_____

Thank you very much for your help

Appendix C

Oregon State Parks Overnight Visitor Volume, 2016--2017

State Park	Overnight Visitors 2016	2017	Change
Portland, Columbia River Gorge			
Ainsworth State Park	26,041	23,341	-10.4%
Deschutes River State Recreation Area	37,648	36,537	-3.0%
L.L. "Stub" Stewart Memorial State Park	62,271	61,017	-2.0%
Memaloose State Park	42,210	36,696	-13.1%
Milo Mciver State Park	34,399	36,782	6.9%
Viento State Park	18,731	17,332	-7.5%
Subtotal	221,300	211,704	-4.3%
Central Cascades			
Cascadia State Park	8,510	6,596	-22.5%
Detroit Lake State Recreation Area	84,721	89,697	5.9%
North Santiam State Recreation Area	2,277	2,591	13.8%
Subtotal	95,507	98,883	3.5%
Central Oregon			
Cottonwood Canyon State Park	10,290	10,536	2.4%
Cove Palisades State Park	83,603	82,731	-1.0%
Lapine State Park	63,070	60,205	-4.5%
Prineville Reservoir State Park	33,337	34,139	2.4%
Smith Rock State Park	25,676	23,816	-7.2%
Tumalo State Park	54,774	53,849	-1.7%
Subtotal	270,750	265,275	-2.0%
South Coast			
Alfred A. Loeb State Park	26,456	21,325	-19.4%
Bullards Beach State Park	104,022	103,458	-0.5%
Cape Blanco State Park	36,807	37,750	2.6%
Harris Beach State Park	97,075	98,858	1.8%
Humbug Mountain State Park	35,148	42,251	20.2%
Sunset Bay State Park	75,153	75,729	0.8%
William M. Tugman State Park	43,851	46,511	6.1%
Subtotal	418,511	425,881	1.8%
Southern Oregon			
Collier Memorial State Park	21,457	18,272	-14.8%
Goose Lake State Recreation Area	4,633	6,095	31.6%

Jackson F. Kimball State Recreation Site	1,551	865	-44.3%
Joseph H. Stewart State Recreation Area	66,330	64,787	-2.3%
Valley of The Rogue State Park	103,022	112,724	9.4%
Subtotal	196,993	202,742	2.9%
Remainder of State	1,541,580	1,583,867	2.7%
Total State	2,744,642	2,788,352	1.6%

Appendix D

2017p County Travel Impacts

	Spending ($Million)				Tax Revenue ($000)		
	All Travel	Destination	Earnings ($Million)	Employment	Local	State	Total
Baker	47.2	45.2	15.1	740	530	1,430	1,960
Benton	122.0	107.5	35.9	1,790	1,770	4,260	6,030
Clackamas	613.2	530.5	175.9	6,420	6,160	19,700	25,870
Clatsop	561.1	556.1	177.9	6,220	11,150	15,350	26,500
Columbia	39.3	32.7	12.9	680	0	1,680	1,680
Coos	271.1	261.1	79.0	3,300	1,470	8,020	9,500
Crook	45.9	43.0	13.8	580	300	1,340	1,640
Curry	132.6	129.7	51.3	2,040	660	3,800	4,460
Deschutes	760.3	679.0	202.4	7,110	14,000	20,500	34,510
Douglas	237.5	223.6	70.5	3,170	1,400	7,170	8,570
East Douglas	177.3	164.3	52.0	2,350	1,170	5,610	6,780
West Douglas	60.2	59.3	18.4	820	230	1,560	1,790
Gilliam	4.5	4.3	1.1	50	0	130	130
Grant	11.2	10.3	3.0	180	90	350	440
Harney	18.8	17.8	6.5	330	310	560	870
Hood River	111.4	108.2	29.6	1,160	2,360	3,260	5,620
Jackson	582.3	492.0	153.2	5,630	9,630	15,730	25,360
Jefferson	52.5	49.4	17.5	1,010	670	1,820	2,490
Josephine	130.9	118.3	46.2	1,820	1,340	4,670	6,000
Klamath	153.9	143.1	51.9	2,080	1,960	5,110	7,070
Lake	14.3	13.3	3.3	220	130	420	560
Lane	954.6	725.4	274.7	10,790	12,990	25,710	38,710
East Lane	817.7	608.3	227.7	8,880	12,140	22,360	34,510
West Lane	136.9	117.2	46.9	1,910	850	3,350	4,200
Lincoln	590.8	578.7	162.0	6,130	13,600	15,850	29,450
Linn	143.6	127.7	37.0	1,800	1,220	5,100	6,320
Malheur	45.6	41.7	13.1	620	940	1,460	2,400
Marion	415.3	363.0	111.9	4,720	4,490	14,500	18,990
Morrow	15.8	14.4	4.1	190	10	520	530
Multnomah	3,956.8	2,747.2	972.0	23,020	113,990	81,840	195,830
East Multnomah	90.2	85.0	26.5	1,080	1,810	2,490	4,300
West Multnomah	3,866.5	2,662.1	945.5	21,950	112,180	79,350	191,540
Polk	177.8	167.2	51.3	2,190	0	4,460	4,460
Sherman	5.3	5.1	1.4	60	20	160	180
Tillamook	232.7	229.3	77.3	2,210	1,600	5,910	7,510

Umatilla	165.5	149.6	52.4	2,480	1,750	5,340	7,090
Union	35.2	31.9	12.3	620	610	1,160	1,770
Wallowa	30.9	30.0	12.8	630	390	900	1,290
Wasco	122.3	119.0	42.7	1,880	1,270	3,410	4,680
North Wasco	78.1	75.0	26.8	1,180	1,270	2,380	3,650
South Wasco	44.2	44.0	15.9	700	0	1,040	1,040
Washington	832.8	697.1	257.5	8,620	16,780	28,350	45,130
Wheeler	3.0	2.8	0.7	30	0	90	90
Yamhill	126.1	111.5	36.0	1,680	770	4,450	5,220

Note: The sum of destination spending for the counties will be less than statewide destination spending because of the treatment of transportation expenditures (airfares and a portion of ground transportation expenditures are not included in county destination spending).