

U.S. Department of the Interior

Wildland Fire Management

Fiscal Year 2020 ANNUAL REPORT AND LARGE FIRE REVIEW

December 22, 2020

The Department of the Interior’s Wildland Fire Management Program works collaboratively with federal, state, and tribal partners to ensure firefighter and public safety while reducing wildfire risk across the country. The program includes the Office of Wildland Fire and four bureaus that manage wildland fire—the Bureau of Indian Affairs, the Bureau of Land Management, the National Park Service, and the U.S. Fish and Wildlife Service.

This document addresses reporting requirements for fiscal year 2020, as described in Division O of the Consolidated Appropriations Act, 2018 (Public Law 115-141, 132 STAT. 1061).

www.doi.gov/wildlandfire

Executive Summary

Public Law (P.L.) 115-141, the Consolidated Appropriations Act, 2018, amended the Balanced Budget and Emergency Deficit Control Act to provide additional new budget authority for fiscal years (FY) 2020 through 2027. Under this provision, otherwise known as the Stephen Sepp Wildfire Suppression Funding and Forest Management Activities Act, the Department of the Interior (DOI) and the Department of Agriculture (USDA) were provided \$2.25 billion in additional new budget authority for wildfire suppression operations in FY 2020. As a preliminary split of this cap adjustment funding for FY 2020, the Further Consolidated Appropriations Act, 2020 authorized \$300 million to DOI and \$1.95 billion to USDA Forest Service in the Wildfire Suppression Operations Reserve Fund.

The DOI Wildland Fire Management (WFM) program budget is coordinated by the Office of Wildland Fire, which develops budget guidance and allocates funding to the Bureau of Indian Affairs (BIA), the Bureau of Land Management (BLM), the National Park Service (NPS), and the U.S. Fish and Wildlife Service (FWS). The bureaus use this funding to carry out work in accordance with established WFM policies, program direction and guidance. In FY 2020, the DOI spent a total of \$1.081 billion on all wildland fire management operations. Of this amount, over \$444 million in Suppression Operations funding was obligated and an additional \$67 million of the new budget authority from the Wildfire Suppression Operations Reserve Fund was obligated to meet emergency wildfire suppression needs.

P.L. 115-141 requires the Secretary of the Interior and the Secretary of Agriculture (as applicable) to submit a report to Congress, and made available to the public, within 90 days after the end of the FY if the Secretary uses the additional budget authority provided in that FY. This report addresses the requirements in Section 204 of P.L. 115-141, including a review and analyses of: (1) risk management; (2) suppression management; (3) landscape considerations; (4) fire summaries; (5) financial reporting; (6) lessons learned; and (7) recommended enhancements. To complete the analysis, six representative large wildfires were selected from a wide range of geographic areas with varying incident objectives, strategic courses of action and differing costs. Because wildfires are unique events subject to incident-specific conditions, risks, and management decisions, sampled fire information is supplemented with general program analysis information.

It should be noted that wildfires cannot be managed independently by a single agency. The backbone of wildland fire management in the United States is partnerships, collaboration and assistance across boundaries to include Federal, tribal, state, local and public engagement. Wildfire outcomes vary considerably and are influenced by fire management plans; community and resource preparedness; and on-incident conditions, options and decision-making.

Two primary themes arose from this evaluation:

- The strength of the DOI WFM program resides in the workforce and the partnerships and collaboration that occurs across the fire community. Enhancements would be gained from additional investments in a more permanent workforce to meet the demands of wildland fire in the future.
- The DOI WFM program has a network for gathering, evaluating, synthesizing and sharing information. Enhancement of this network would be gained with additional investments in data management and information integration.

Fiscal Year 2020 Overview

The 2020 fire year was active and notable. The number of wildfires reported for all jurisdictions, as of mid-December was 3 percent below the 10-year annual average. In total, all agencies reported nearly 58,000 wildfires nationally. Across the United States, more than 10.2 million acres burned, representing 153 percent of the national 10-year average.¹ The California and Northwest Geographic Areas experienced historic fire events. The Southwest, Rocky Mountain, and Great Basin Geographic Areas also reported above average fire occurrences in 2020. Alaska experienced relatively average fire activity while the Eastern and Southeastern areas experienced approximately 600,000 acres of wildfire, an 11 percent increase in acres burned over last year.¹ DOI was jurisdictionally responsible for more than 5,900 fires with more than 2.7 million acres burned.² The nation spent 49 days at the highest level of wildfire preparedness and a record 32,727 firefighters were deployed at one time this summer to support firefighting efforts.

Summary of National Fire Activity

The year began with most of the country at relatively average-to-low fire activity. By spring, there was a slight increase in activity as much of the West received significantly less than normal precipitation and above average temperatures.

Fire activity increased markedly in June as fine fuels became critically dry across most of the southern half of the West. Persistent hot and dry conditions, along with periodic wind events, coincided with large fires across the Southwest, Colorado, and southern California. A three-day lightning event led to an increase in fire activity across the Great Basin and California. Fire activity significantly increased in July as fuels continued to dry across much of the West and lightning spread farther north and west into the Great Basin, northern California, Pacific Northwest, and northern Rockies. Fire activity increased in the Rocky Mountain Area, Southwest, and southern Great Basin into mid-July. Monsoonal moisture abated until later in the summer and was not overly persistent which increased the extent and duration of wildfire in multiple geographic areas.

August ushered in a dramatic increase in fire activity across the West as several multi-day lightning events ignited critically dry fuels. Lightning combined with strong winds and high temperatures in California, Oregon, Washington, Colorado and Arizona led to significant wildfire events. The Great Basin remained active as did west Texas. By mid-month, fire activity also increased in the Northern Rockies. Generally, most areas across the West received less than 25 percent of average precipitation in August. The significant increases in large fire activity contributed to the need for the additional funding made available by P.L. 115-141.

A heat wave across the West Coast during the first week of September resulted in hot, dry, and unstable conditions with explosive large fire growth. Multiple wind events ushered in significant large fire activity including a historic wind event off the West Coast that began on Labor Day and continued for several days thereafter. Numerous new and existing large fires in Washington, Oregon, and California reported rapid fire spread and extreme fire behavior. For much of September, air quality and smoke concerns were greatly exacerbated on the West Coast, and eventually most of the West. A series of upper-level troughs produced enough rain across portions of the Pacific Northwest and Northern Rockies to reduce fire activity, however significant wildfire activity continued into October for many areas of the West.

¹ National wildfire data gathered from Incident Management Situation Report from National Interagency Coordination Center.

² DOI data from Integrated Reporting of Wildland Fire Information (IRWIN) system.

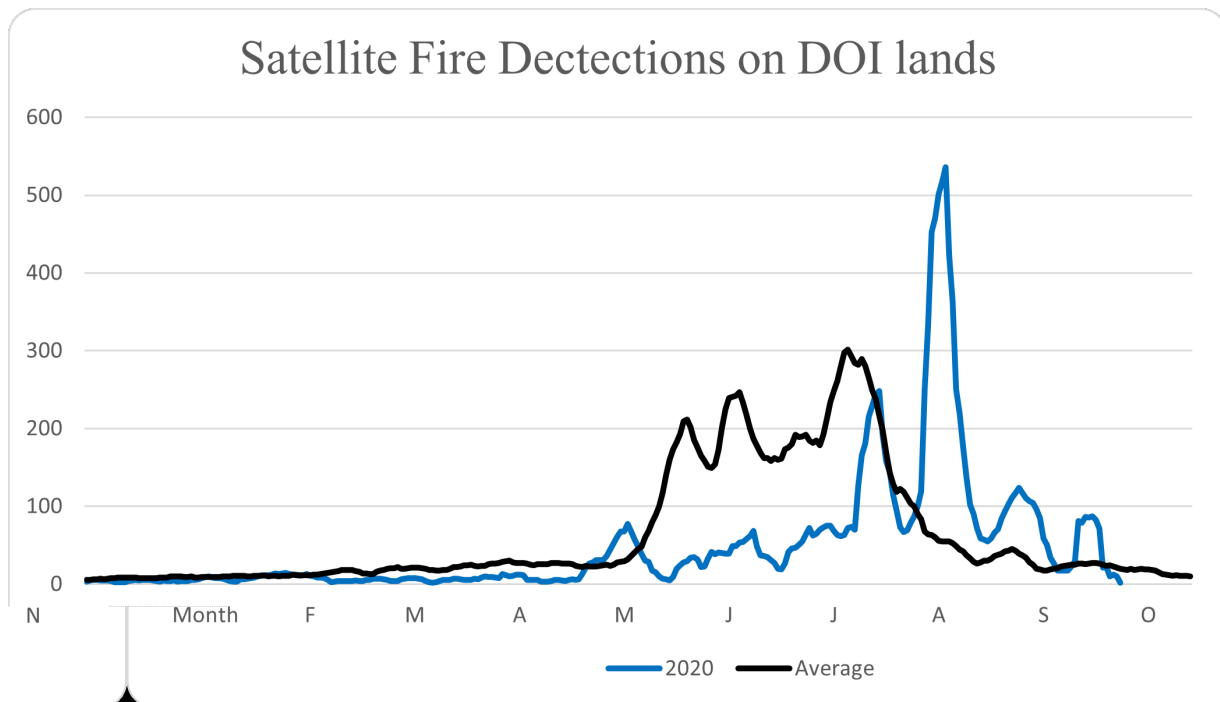


Figure 1 Graph depicting the 7-day running average for satellite heat detection on DOI lands for 2020 illustrating the consequential resulting August-September for DOI lands. Data from Moderate Resolution Imaging Spectroradiometer (MODIS).

This graph shows the 7-day running average of the total number of heat points or fire locations detected by satellite on DOI lands for the past 20 years. The black line is the average and the blue line is 2020. For DOI, the first part of the fire season (except for mid-June) was well below average. In fact, there were 22 days where the 7-day running average was at a 20-year minimum. It wasn't until the end of August that the season went above average. In the first week of September, fires on DOI lands became very active, exceeding the 90th percentile and 20-year maximums. DOI had 24 days where the 7-day running average number of fire locations was higher than the previous 20-year maximum. This exceptional fire activity required a surge in resource response by DOI and its interagency partners.

COVID-19 Pandemic Response

In close coordination with tribal, state and local partners, federal wildland fire agencies developed and maintained geographic area Wildland Fire Response Plans (WFRP) to help sustain fire operations and protect firefighters and the public during the COVID-19 pandemic. The geographic area WFRPs outlined strategies and adaptations to normal fire operations that helped mitigate and manage the impact of COVID-19. The plans were used to inform the development of local level plans and address incident specific issues. Both the geographic and local WFRPs were updated as new information and recommendations were made available. A Wildland Fire Medical and Public Health Advisory Team (MPHAT), consisting of Centers for Disease Control and Prevention (CDC) detailers, interagency Chief Medical Officers and public health subject matter experts, was established to provide multi-agency coordination, consistent review and advice on all medical and public health aspects related to COVID-19. MPHAT regularly advised the Fire Management Board (FMB) and assisted in providing recommendations to national committees, managers and field personnel to enhance the safety and protection of all wildland fire response personnel. Collectively, all efforts to address COVID-19 helped to promote firefighter health, maintain wildland fire response continuity and sustain the highest degree of fire suppression resource availability throughout the season.

The DOI wildland fire agencies continually evaluated and updated COVID-19 guidance to ensure consistency with CDC recommendations. MPHAT provided the wildland fire context to apply recommendations for all levels of wildland firefighting operations. Throughout the fire year, information was continually gathered and shared across the country and at multiple levels of organizations. Incident Management Remote Response Teams weekly meetings and the Wildland Fire Lessons Learned Center were key venues for sharing information quickly.

International Support

The National Interagency Fire Center (NIFC) mobilized wildland firefighting hand crews from Canada and Mexico to assist with wildfire suppression efforts. The National Multi-Agency Coordinating Group (NMAC), which is responsible for prioritizing and allocating firefighting resources, requested international firefighting assistance after determining that the United States needed additional support for numerous large fires. Canada aided with eight 20-person crews, helicopters, engines and leadership personnel. Mexico supplied five 20-person crews. For over 35 years, the United States has maintained reciprocal cooperative agreements for resource sharing during peak fire activity with both Canada and Mexico.

2020 National Preparedness Levels

The NMAC is composed of wildland fire representatives from each wildland fire agency and the U.S. Fire Administration. Based at NIFC, NMAC establishes National Preparedness Levels (PLs) throughout the calendar year to ensure suppression resource availability for emerging incidents across the country. PLs are dictated by fuel and weather conditions, fire activity, and fire suppression resource availability throughout the country.

The five PLs range from the lowest (1) to the highest (5). Each PL includes specific management actions and involves increasing levels of resource commitments. As PLs increase, so does the need for incident management teams and suppression resources, which include wildland fire crews, engines, helicopters, airtankers and other aircraft, and specialized heavy equipment, such as bulldozers. In 2020, 71 days were spent at PL 4 or 5, which indicates substantial wildfire activity and deployment of resources. In 2019, there were zero days at PL 5. In 2018 there were 48 days at PL 5. Most of this year's fire activity occurred in August, September and October.

Methodology

As required by P.L. 115-141, a sample of large fires was analyzed. The sample represents a range of geographic areas as well as size, cost, and suppression strategies. Using sampling to draw broad conclusions related to large wildfires can be challenging because each wildfire has a unique combination of environmental conditions; risks; management objectives; resource availability and application; and incident management options, strategies, and decisions.

Table 1 Fires selected for analysis.

| Agency | Fire Name | FY 2020 Estimated Cost | Size (Acres) | State | Geographic Area |
|--------|--------------------|---------------------------|--------------|-------|---------------------|
| BIA | Lionshead | \$1,738,469 | 204,469 | OR | Northwest |
| BIA | Blue River | \$1,348,165 | 30,408 | AZ | Southwest |
| BLM | Pine Gulch | \$10,847,121 | 139,007 | CO | Rocky Mountain |
| FWS | Ingakslugwat Hills | \$43,590 | 54,099 | AK | Alaska |
| NPS | Caldwell | \$238,317 | 80,859 | CA | Northern California |
| NPS | Dome | \$799,892 | 43,273 | CA | Southern California |

Risk Management

Foundational wildland fire management documents such as the “Review and Update of the 1995 Federal Wildland Fire Management Policy (2001)” and the “Guidance for Implementation of Federal Wildland Fire Management Policy (2009)” highlight the concepts of risk and fire consequences by noting that: 1) risk management underlies all fire management activities; 2) those risks must be thoroughly understood; and 3) the consequences of a wildland fire dictate the approach to fire response.

All wildfire presents inherent risks. The Wildland Fire Decision Support System (WFDSS)--an information technology-based decision support system—assists fire managers and agency administrators in making strategic and tactical risk-based decisions for wildfire incidents. WFDSS uses a deliberative risk analysis process to make informed risk-based decisions. Three risk components are analyzed: values, hazard, and probability.

- Values are the things of concern (e.g. social, culture, economic, ecological resources) that could be lost or damaged because of a fire.
- Hazard is measured by intensity, severity and spatial extent of the fire and is influenced by the physical conditions of the fire environment.
- Probability refers to the likelihood of the fire affecting values.

The wildfires analyzed for this report demonstrate several common risk factors that influenced management decisions. Those factors are firefighter and public safety, including COVID-19 mitigation; the presence of Federal or private infrastructure; stakeholder involvement at the federal, tribal, state/local and private levels; socio-political and economic considerations in relation to neighboring communities; and the existence of natural resources.

In addition to the common risk factors, the analysis included several other incident-specific risk factors that also influenced risk management decisions such as geographic location and access (wilderness vs. urban interface); time of year (early season or late season); availability of firefighting resources; condition

of the fuels; land ownership; presence of threatened & endangered species; smoke emissions and impacts to local communities and public health; and presence of cultural sites.

The overall suppression strategy of each incident informed the suppression tactics that were employed and aligned with the principles outlined in the federal fire policy to maximize firefighter and public safety and protect values-at-risk. The location, number of firefighting resources, and daily work assignments minimized the exposure to firefighters by using indirect and point protection tactics, natural and man-made barriers, monitoring the fire perimeter where there was no threat to values, and working to ensure that the appropriate resources were being used in the right place at the right time to ensure the highest probability of success.

The 2020 fire season brought many challenges. Some of these challenges were familiar (e.g., prioritizing limited resources), while others such as COVID-19 presented a new set of risk management challenges both before and during the fire season. The dramatic late season increase in wildfire activity across several states required an exceptional volume of resource engagement, both people and equipment, simultaneously across multiple geographic areas. Regardless of the challenges, the interagency wildland fire community has worked hard over the years developing and refining processes and tools, based on lessons learned, to help guide and inform risk management decisions.

Suppression Management

The six fires analyzed for this report burned more than 552,000 acres. There were 14 reportable injuries, approximately 300 structures lost, and more than 400 additional structures threatened. Response costs in FY 2020 for these fires totaled more than \$14 million. Extreme fire behavior was exhibited in some fires. In certain areas, the fire damaged natural and cultural resources or community infrastructure. In other areas, fire assumed the natural disturbance role resulting in landscape benefits. In 2020, fires on DOI lands threatened a total of 7,785 structures resulting in the loss of 684 structures. Overall, 93 percent of residences and 88 percent of all other structures were protected.³

Table 2 Depicts residences and other structures threatened and lost in 2020 DOI Wildfires.

| Type | Threatened | Lost | Protection Rate |
|------------------|------------|------|-----------------|
| Residences | 5,660 | 400 | 93% |
| Other Structures | 2,125 | 284 | 88% |
| Total | 7,785 | 684 | 92% |

DOI relies on analytical techniques (e.g. fire weather forecasting, fire danger/fuels analysis, and intelligence/resource status information) to help predict what areas might have conditions that support an above-normal occurrence of wildfires. Each geographic area experiences significant variations in the number of acres burned from year to year without a consistent pattern. The Preparedness program provides the resources to manage the complexity and uncertainty of wildfire occurrence by ensuring that a flexible, capable, qualified and mobile workforce is available to quickly respond whenever and wherever wildfires occur. In an average year, significant fire activity occurs in only a couple of geographic areas and typically not at the same time. This normally enables the shifting of resources based on fire response needs. As drought conditions persist across the West and fire seasons become longer⁴ with more extreme fire behavior and increased complexity (urban interface) there is increasing strain on the national availability of firefighting resources. This was particularly true in 2020, with five different geographic

³ Data derived from Integrated Reporting of Wildland-Fire Information (IRWIN) as reported by SIT-209 Program.

⁴ W. Matt Jolly, M. A. (2015). Climate-induced variations in global wildfire danger from 1979 to 2013. Nature communications.

areas in PL 4 or 5 at once, resulting in a demand for resources that significantly outpaced the availability. An extremely busy fire season only compounds other challenges, including the scarcity of personnel and resources. Since 2009, the DOI has experienced a reduction of 451 Full Time Equivalent (FTE) employees in the Preparedness program and 484 FTEs in the Fuels Management program, a loss of personnel that directly translated to the effectiveness of the DOI's suppression efforts. This equates to a smaller workforce, fewer personnel available, and reduced response capacity. For instance, DOI is staffing 70 fewer wildland fire engines than in 2009. Preparedness investments are actualized during fire response.

Overall, while roughly 98 percent of initial response strategies for wildfires succeed on DOI-managed lands, reduced capacity coupled with increasing and prolonged wildfire workload is likely to erode mission performance over time and have significant impacts on response capabilities. Increasing and maintaining an adequate firefighting workforce would provide the capacity at critical moments throughout the year for DOI and the interagency wildland fire community to address extremely busy and challenging fire seasons, as was the case in 2020.

Learning and adapting to challenges (even new and novel) was greatly aided through the existing collaborative framework, such as operational sharing of COVID-19 mitigation information and recommendation through the WFLC, NMAC, NWCG and FMB and new recommendations from MPHAT. DOI adapted to challenges by leveraging previous investments (e.g. remote sensing capability, IT applications and other technology) and modifying processes or approaches (e.g. traditional on-incident administration fire support from other virtual locations, increased availability of decision support groups assisting multiple incidents and modifying response strategies). This additional support produced efficiencies in many cases; for example, leveraging automated and integrated applications to share data or reduce personnel travel costs.

Landscape Considerations

Fire behavior is determined by three primary factors: weather, vegetation (fuels) and topography; however, numerous variables influence the outcome of a wildfire's effects at broader, landscape scales. Vegetation treatment history and frequency play a vital role in a fire's broad scale impact. The 2020 fire season witnessed most of the western United States in severe to extreme drought conditions according to the National Integrated Drought Information System. The intensity of drought conditions created dangerously dry fuels that contributed to extremely active and uncontrollable wildfires.

The DOI has committed to significant investments in fuels management and the Fuels Treatment Effectiveness Monitoring (FTEM) application. From 2015 to 2020, the DOI's Fuels Management program budget increased \$30 million, from \$164 million to \$194 million, or a nearly 20 percent increase in funding. The DOI has made substantial investments in FTEM, which assesses the effectiveness of fuels treatments with wildfire interaction. Thorough monitoring takes time to complete, especially during a busy or prolonged fire year, such as the circumstance in 2020. Monitoring assessments are on-going for 2020 fires. Currently, 534 assessments are complete out of the 1,036 identified possible interactions with wildfire and treatments. Completed assessments indicate that in approximately 80 percent of the interactions fuels treatments changed the fire behavior, and in 85 percent of the interactions fuel treatments helped control the wildfire. Nearly 90 percent of the treatments were identified as strategically located to facilitate control of the fire.

Frequently, the ecological outcomes are dependent upon complex interactions, response factors and subsequent conditions that may not be readily apparent. In FY 2020, the DOI managed approximately 585,000 acres of wildfire that achieved land management objectives.

Sampled Fire Summaries

Six large wildfires were selected representing wildfires from a wide range of geographic areas with varying incident objectives, strategic course of actions and differing costs. Additional information is provided from general program data analysis. Wildfires are unique events and their outcomes are highly situationally dependent; thus, looking at individual events and general program information helps to determine common themes from which to enhance programs.

Blue River Fire was started by lightning on June 5, 2020, on the San Carlos Apache Reservation in Arizona. The wildfire was managed under a full suppression strategy due to the threat to commercial timber and historic structures. The fire was contained on June 25, 2020, at 30,408 acres at an estimated cost of \$1.43 million. No structures were reported lost and no significant injuries reported. Values-at-risk were cultural sites, threatened and endangered (T&E) fish species, and livestock and range improvements. The wildfire's benefit to the landscape was the reduction of encroaching woody species and improving grassland conditions by restoring native plant communities for both livestock and wildlife. The Blue River fire had minimal impacts to important riparian zones along the Blue River with locations where the fire encroached benefitted by the cooler backing fire. Grazing practices within the fire footprint prior to the incident also provided an effective fuels treatment in the grassland areas to reduce fire behavior.

Caldwell Fire was started by lightning on July 22, 2020, in Lava Beds National Monument (NM) in California. The wildfire was managed under a full suppression strategy due to the immediate threat to the NM headquarters and housing. The fire was contained on September 1, 2020, at 80,890 acres with a total cost of \$255,000. Values-at-risk were private residences and businesses, commercial timberland, agricultural lands, cultural sites and infrastructure for communications and electricity as well as habitat for sage-grouse, northern spotted owl and short-nose sucker and lost river sucker on the Modoc National Wildlife Refuge. Management objectives supported the reintroduction of fire so that it could assume its natural role and minimize resource damage on the land. Ponderosa pine forests in the NM that were previously treated with prescribed burns had positive impacts on fire severity. Mechanical thinning of juniper coupled with prescribed fire provided for firefighter safety and allowed operational options that would not have been available if previous work had not occurred. To protect cultural and natural resources from erosion and sedimentation resulting from suppression activities, NM staff are working on site stabilization over nine acres. A total of 313 acres where a planned fuels treatment was scheduled was partially burned helping to meet management objectives. Six structures were lost with no reported significant injuries or fatalities.

Dome Fire was started by lightning on August 15, 2020, in Mojave National Preserve in California. Due to the remoteness of the fire it was originally managed under a confine and contain strategy. However, due to extreme fire conditions, threat to residential and commercial properties, transportation and infrastructure, and tortoise habitat a full suppression strategy was adopted. The fire was contained on August 24, 2020, at 42,515 acres at a total estimated cost of \$746,000. Ten structures were reported lost of approximately 30 that were threatened. No significant injuries were reported. Values-at-risk were the unique Joshua tree forest (one of the largest in the world), critical habitat for the desert tortoise and a main power line providing electricity to Los Angeles operated by Southern Edison California. Fire severity fluctuated on this wind driven fire depending on fire position (i.e., head or flank), and in most instances causing occasional torching of individual or dense clusters of Joshua trees (including increased fire severity impacting half of the Mojave National Preserve's wilderness area). Approximately 1,000 acres may require nursery stock planting to promote vegetation regeneration.

Ingakslugwat Hills Fire was started by lightning on May 30, 2020, on the Yukon Delta National Wildlife Refuge in Alaska. Due to the location of the fire and no immediate threat to values-at-risk the fire was managed under a point protection and monitor strategy. The fire was contained on July 15, 2020, at

54,099 acres with an estimated total cost of \$43,600. No structure loss or injuries were reported. Values-at-risk were sensitive tundra vegetation. The fire burned in a limited management area where no structures or other significant resources were threatened; therefore, no suppression actions were taken. The low intensity fire provided opportunities to reduce some brush and rejuvenate grasses and forbs within the fire area for wildlife benefits. The lower fire intensity exhibited during this event provided good fire effects on 54,025 acres and is not expected to cause significantly long-lasting damage to sensitive tundra vegetation.

Lionshead Fire was started by lightning on August 16, 2020, on the Warm Springs Agency in Oregon. Due to the time of the year; topography; extreme fire behavior; values-at-risk, including private residences, commercial timberlands, natural and cultural resources of the Confederated Tribes of Warm Springs, state highways, and powerlines, the fire was managed under a full suppression strategy using indirect tactics to minimize risk to firefighters. Two hundred eighty structures were reported lost during this incident with 400 more threatened. Ten injuries were reported. The fire was contained on November 13, 2020, at 204,588 acres at an estimated cost of \$11.6 million. High value commercial timber and carbon sequestrations stores, hydro-electric facilities, and T&E species across multiple watersheds were in the fire footprint. The Lionshead Fire's intensity increased when topography and winds were aligned to create extreme fire behavior conditions enhanced by 97th percentile dry fuel conditions. When situations such as this generational event occur in steep, remote terrain there is very limited incident management suppression strategies available to reduce burn severity. However, pre-fire fuels treatments in the form of commercial thinning on the Warm Springs Indian Reservation helped mitigate some of the fire severity effects on the landscape. Also, mosaic burning—a practice that creates burnt and unburnt areas intended to mimic natural ecological conditions across a landscape that changes over time—occurred along the flanks of the fire and areas where the fire backed down mountain slopes from ridgelines acting similarly to a prescribed fire.

Pine Gulch Fire was started by lightning on July 31, 2020, on public lands managed by the BLM Grand Junction Field Office in western Colorado. Due to rugged terrain, limited access, and hot and windy conditions the fire was managed under a full suppression strategy. Direct and indirect tactics minimized risk to firefighters and protected values-at-risk including private structures, oil and gas infrastructure, sage-grouse habitat, and pre-historic and historic sites. Six structures were reported lost and 4 injuries reported. The fire was contained on September 22, 2020, at 139,007 acres at an estimated cost of \$13.7 million. The fire grew to 250 acres within three hours of detection and on its highest spread day grew 37,000 acres overnight. High fuel loadings, low fuel moisture, steep slopes, and fire indices above the 97th percentile⁵ aligned to create undesirable fire effects on the landscape, prompting quick action to seed ~22,000 acres for ecosystem restoration⁶. There were 247 acres of the wildfire footprint that had ecosystem benefits from the fire.

⁵ ERC-G Fire Danger Rating Graph for the Boulder RAWS Station, auto-generated by the Wildland Fire Decision Support System.

⁶ Findings and implications from a course-scale global assessment of recent selected mega-fires. Jerry Williams, 2011 5th International Wilden Fire Conference.

Table 3 Suppression costs for incidents by cost driver as a percentage. As previously mentioned, the driving factors for each incident are unique.

| Fires | Labor, Benefits, Travel | Contract Services | Aviation Contract | Supplies, Materials, Goods | Rent, Communication, Utilities, Equipment Rental | Other, Grants, and Cooperative Agreements |
|---------------------------------|-------------------------|--------------------|-------------------|----------------------------|--|---|
| Blue River | 21.7% | 1.5% | 7.2% | 0.3% | 50.4% ² | 18.8% |
| Caldwell | 87.2% | 2.2% | 0.0% | 10.3% | 0.0% | 0.2% |
| Dome | 48.3% | 45.7% ¹ | 1.7% | 3.9% | 0.3% | 0.2% |
| Ingakslugwat Hills ³ | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Lionshead | 30.7% | 9.8% | 0.0% | 2.8% | 56.6% ² | 0.1% |
| Pine Gulch | 31.3% | 54.1% ¹ | 0.4% | 11.6% | 2.5% | 0.1% |

1 Includes firefighting contractors, base camp services, excavation services

2 Includes heavy and excavation equipment rental

3 Fire costs only reflect DOI direct expenditure, fire was managed under agreement with Alaska Division of Forestry.

Financial Reporting

The complex and dynamic nature of wildland fire management is reflected in the DOI's WFM program structure. The DOI WFM appropriation is comprised of budget line items for Fuels Management, Preparedness, Suppression, Burned Area Rehabilitation, Facilities Construction and Maintenance and Joint Fire Science. Additionally, in FY 2020 the DOI had access to \$300 million in the Wildfire Suppression Operations Reserve Fund that was authorized in the Further Consolidated Appropriations Act, 2020. Total fiscal year 2020 wildland fire management costs for the DOI were \$1.081 billion.

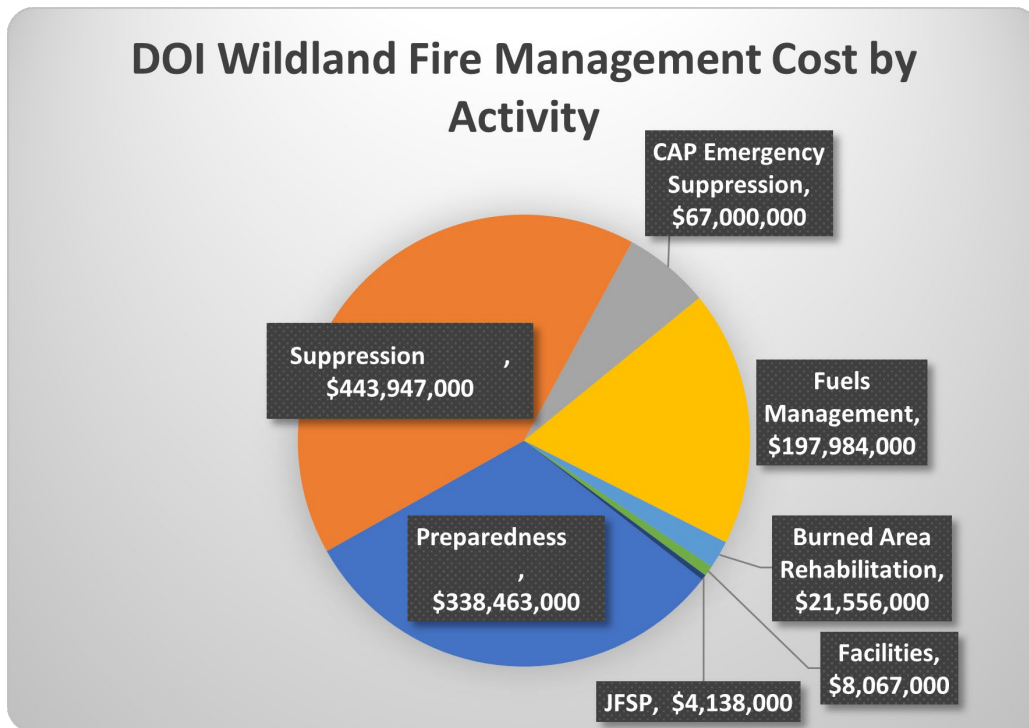


Figure 2 Total Wildland Fire Management program costs for FY 2020.

Total suppression activity costs were approximately \$511 million, which consists of \$444 million funded from DOI's WFM appropriation and an additional \$67 million of new budget authority that was transferred from the Wildfire Suppression Operations Reserve Fund to the DOI for emergency wildfire suppression operations. Wildfire outlays include direct wildfire incident accounts as well as non-incident-specific wildfire support accounts (e.g. an aviation contract servicing multiple fires). Note that fires not only span FYs, but also costs associated with a wildfire incident may take multiple FYs to resolve as items like cost-share agreements, cost-recovery efforts, and invoice submissions are reconciled.

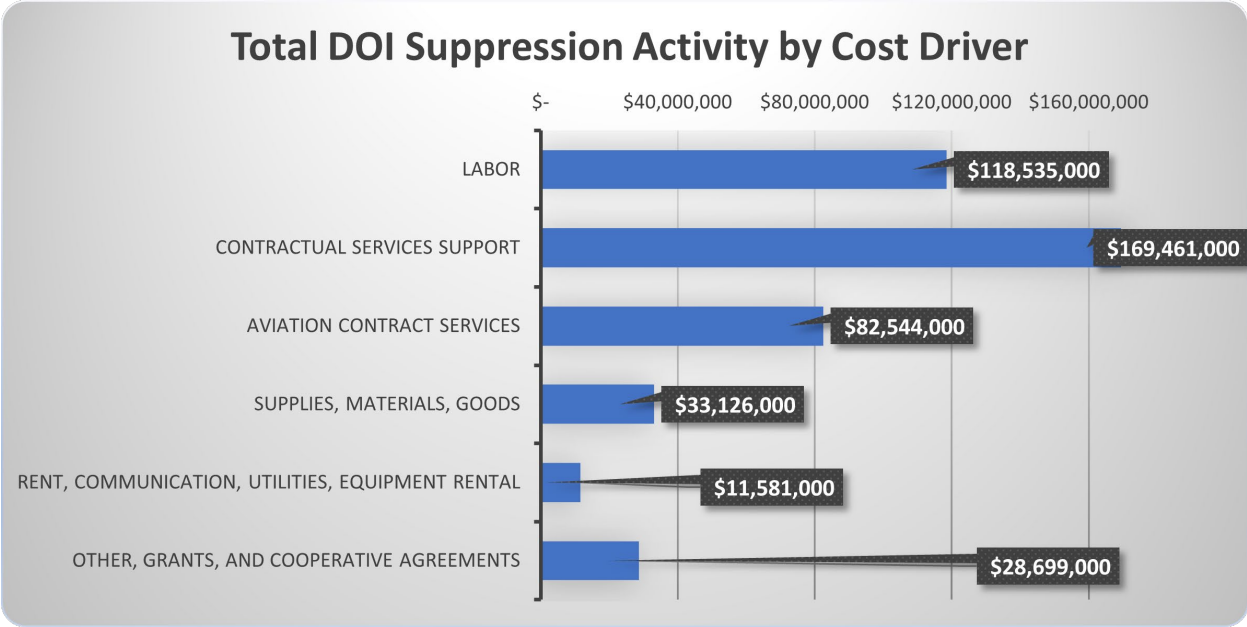


Figure 3 Suppression activity costs by cost driver for FY 2020. Labor expenses including personnel compensation, benefits and transportation of people. This represents a national perspective as cost drivers vary by incident specific situations.

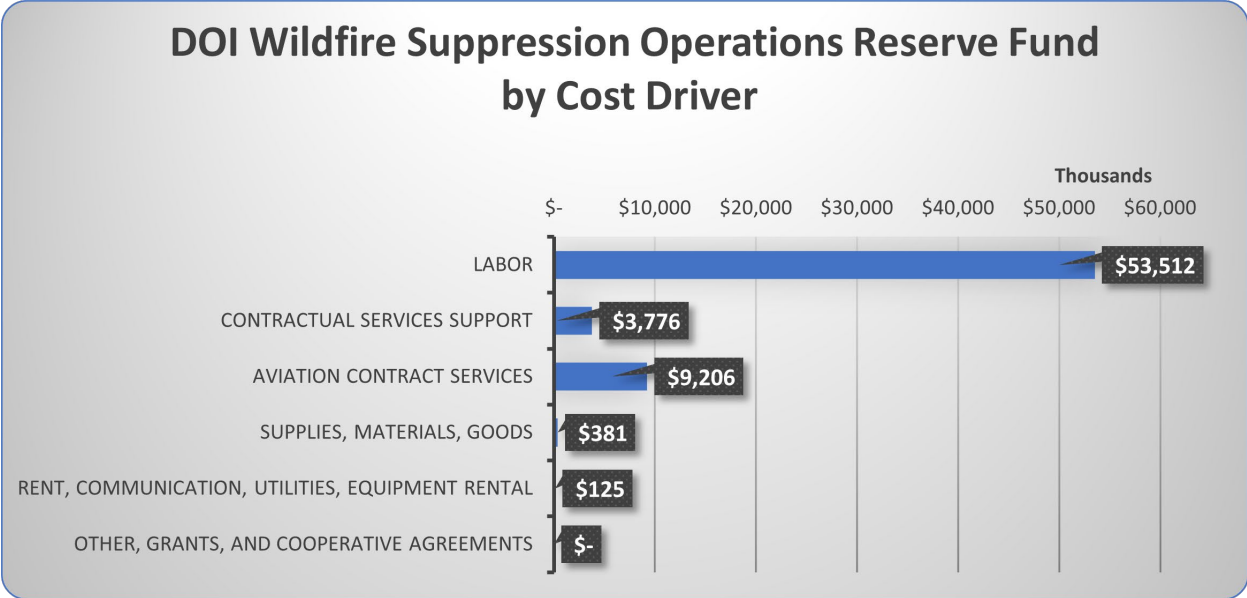


Figure 4 DOI CAP Emergency Suppression shown by Cost Driver showing labor by far as the most significant

Two funding transfers from the Wildfire Suppression Operations Reserve Fund were necessary late in the FY as suppression funds were exhausted. The transfers were needed primarily for labor costs in order to provide the necessary resources for DOI fires and to assist wildland fire partners. As previously mentioned, DOI provides a significant amount of support in wildfire response to our federal, tribal, state, and local partners for fires that occur outside DOI-administered lands, and the DOI receives similar reciprocal support for DOI jurisdictional fires. As demonstrated in the graph below, funding transferred to the DOI from the Wildfire Suppression Operations Reserve Fund supported wildfire response activity on

various jurisdictions. While \$29.2 million of the funding supported wildfires on DOI-administered lands, the funding also supported wildfire response on USDA Forest Service fires (\$26.7 million) and state and local fires (\$9.7 million).

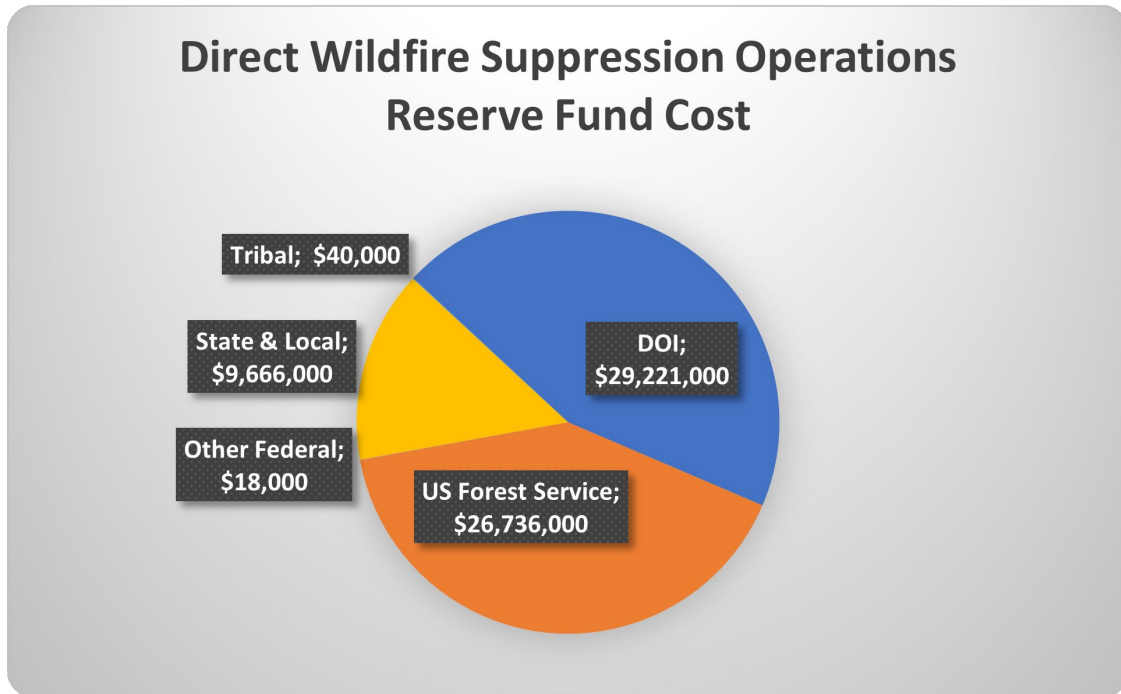


Figure 5 DOI 2020 CAP Emergency Suppression cost shown by partner. DOI contributed significant effort to partners.

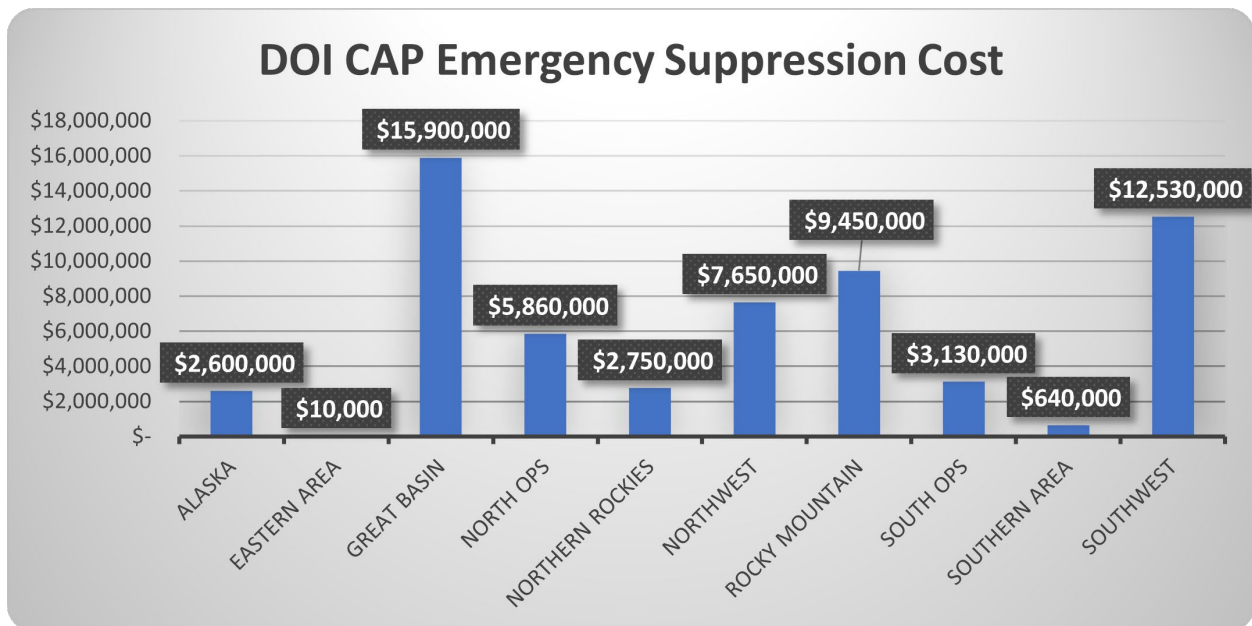


Figure 6 DOI CAP Emergency Suppression cost shown by geographic area. These correlates well with incident activity and DOI lands in the West.

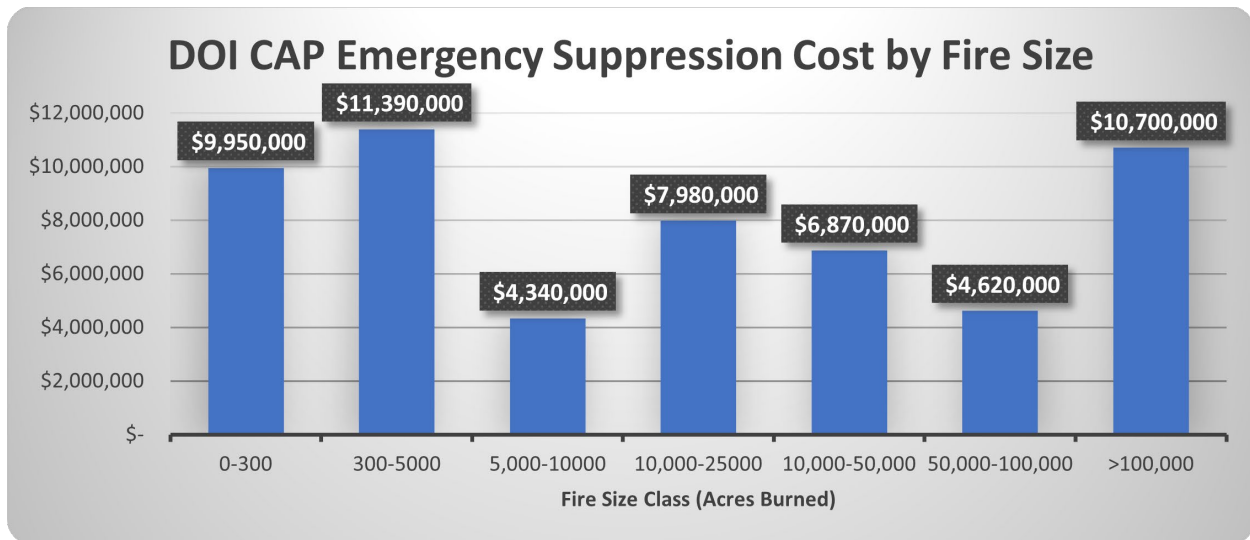


Figure 7 DOI CAP Emergency Suppression cost demonstrated by fire size. No size-range of fires accounted for a significantly disproportionate amount of cost.

Lessons Learned

Throughout this analysis several themes emerged:

- DOI wildland fire management can adapt quickly to challenging situations. As 2020 brought numerous challenges, adaptive solutions were implemented.
- Timely collection of accurate and useful data that is integrated from multiple sources acts as significant leverage in decision making, knowledge building, and accountability. Integration of applications and improved data management could bring more connection, utility and efficiency.
- Efficiencies can be gained in many areas, but a reliably available, highly skilled workforce is the solid foundation of wildland fire management and necessary to achieve desired outcomes.

Recommended Enhancements

Additional investment in the DOI wildland fire workforce would provide more capability to meet critical mission functions and provide improved service to partners, stakeholders, and the public on a year-round basis. A more permanent workforce would better sustain wildfire response during peak periods while addressing vegetation management during times of lower wildfire activity. It would also provide additional recruitment and retention opportunities to ensure a highly skilled and professional workforce into the future. This would help DOI meet the increasing demands of wildland fire management and improve the effective and efficient management of the WFM program.

DOI wildland fire management has made advancements in information technology investments. However, benefits would be gained from the enhancement of systems integration and data management for rapid information exchange and increased knowledge and shared perspective.