



Wildfire Management: Federal Funding and Related Statistics

Kelsi Bracmort

Specialist in Agricultural Conservation and Natural Resources Policy

May 21, 2013

Congressional Research Service

7-5700

www.crs.gov

R43077

CRS Report for Congress

Prepared for Members and Committees of Congress

Summary

Wildfires can have beneficial and harmful impacts on ecosystems (e.g., by reducing fuel loads, or by damaging communities and timber resources). These impacts are generally measured and discussed based on the priorities of humans in these ecosystems. Federal resources are typically deployed during wildfire season—an annual occurrence of intense wildfire activity—to help manage wildfires and potentially minimize some of the impacts, including the loss of life and property. The primary agencies for federal wildfire response are the Forest Service and the Department of the Interior. Federal wildfire response activities involve preparedness, suppression, fuel reduction, site rehabilitation, and more.

More than 9.3 million acres burned during the 2012 wildfire season, which was the third-largest acreage burned annually since 1960. The total amount of wildfire management (WFM) appropriations for 2012 was approximately \$2.7 billion, not including an additional \$407.5 million appropriated in 2013 to repay 2012 WFM wildfire suppression accounts. Over the last five years, WFM appropriations on average have steadily increased relative to earlier years. This leads some to question whether federal resources for wildfire management are being used efficiently.

This report provides wildfire management statistics (e.g., number of wildfires, acres burned, select state wildfire activity, firefighter personnel), presents WFM appropriations from fiscal years 2008 to the present, and discusses two related issues—wildfire suppression funding estimation and air tanker readiness.

Contents

Introduction.....	1
What Is Wildfire Management (WFM)?.....	1
WFM Statistics	2
WFM Appropriations by Account (FY2008-Present).....	5
Preparedness.....	7
Suppression.....	8
Hazardous Fuels	9
Emergency Funding.....	9
Related Issues	10
Wildfire 10-Year Suppression Average and FLAME Suppression Estimate.....	10
WFM Large Air Tankers.....	13

Figures

Figure 1. Total Number of Wildfires and Acres Burned (1983-2012).....	3
Figure 2. WFM Appropriations, FY1994-FY2013	5
Figure 3. Forest Service Suppression Costs Comparison—Observed and Predicted	12
Figure 4. DOI Suppression Cost Comparison—Observed and Predicted	13
Figure 5. Wildfire Aircraft	14

Tables

Table 1. Total Number of Wildfires, Acres Burned, and WFM Appropriations, 2008-2012	4
Table 2. Top Three States for Wildfire Acres Burned, 2008-2012.....	4
Table 3. Total Hazardous Fuels Acres Treated by FS and DOI, FY2008-FY2012	4
Table 4. FS and DOI Firefighting Personnel, Fatalities, and Structures Burned, FY2008- FY2012	4
Table 5. WFM Appropriations FY2008-Present	6
Table 6. WFM Emergency Funds FY2008-Present	10

Contacts

Author Contact Information.....	14
---------------------------------	----

Introduction

The 2012 wildfire season was notable because about 9.3 million acres burned across the United States—the third-largest annual acreage burned, based on the reporting of fire statistics from 1960 to the present.¹ Some predict conditions that could lead to similar wildfire activity in 2013 in certain regions, and possibly an earlier start for the 2013 wildfire season in certain regions due to ongoing drought conditions in the western half of the nation.² Wildfire (or wildland fire),³ an unplanned and an unwanted fire, is a concern to some because it can lead to loss of human life, damage communities and timber resources,⁴ and impact soils, watersheds, water quality, and wildlife.⁵ On the other hand, wildfire can also reduce fuel loads, increase ecosystem health, and restore fire-adapted ecosystems.

There are several ongoing concerns regarding wildfire management (WFM). These include the total federal costs of wildfire, the impact of wildfire on both the quality of life and the economy of communities surrounding wildfire activity, and the strategies and resources used to manage wildfire. Many of these issues are deliberated by Congress, with annual WFM appropriations being a good indicator of how Congress prioritizes and addresses certain WFM concerns. More than \$2.7 billion was appropriated for WFM in FY2012.

This report briefly describes WFM statistics and appropriations for 2008 to the present.⁶ The report also briefly discusses two related issues: wildfire suppression funding estimation and air tanker readiness.

What Is Wildfire Management (WFM)?

WFM is a series of coordinated activities undertaken by federal, state, and local authorities to resolve wildfire events when they occur. Resolution may involve immediate and aggressive measures to quickly suppress a wildfire (e.g., large air tanker response for a wildfire moving quickly toward a populated area), or may involve immediate but less intense measures (e.g.,

¹ The largest fire year on record for acres burned is 2006 (9.8 million). The second- and third-largest fire years are 2007 and 2012, and the acres burned are relatively equivalent. National Interagency Fire Center, *Current Year-to-Date by State (2012)*, December 20, 2012; http://www.nifc.gov/fireInfo/fireInfo_stats_YTD2012.html, National Interagency Fire Center, *Total Wildland Fires and Acres (1960-2009)*.

² National Weather Service, *U.S. Seasonal Drought Outlook May 2-July 31, 2013*, May 2, 2013; National Interagency Fire Center, *National Significant Wildland Fire Potential Outlook Period—May, June and July through August*, May 1, 2013.

³ The terms wildfire and wildland fire are often used interchangeably. However, each term has a distinct definition. The National Wildfire Coordinating Group (NWCG) defines wildland fire as any non-structure fire that occurs in the wildland, defined as an area in which development is essentially nonexistent, except for roads, railroads, power lines, and similar transportation facilities, and where structures, if any, are widely scattered. NWCG defines wildfire as an unplanned, unwanted wildland fire including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fires where the objective is to put the fire out. National Wildfire Coordinating Group, *Glossary of Wildland Fire Terminology*, July 2012. This report will use the term wildfire for both.

⁴ For more information on wildfire damages to homes and resources, see CRS Report RL34517, *Wildfire Damages to Homes and Resources: Understanding Causes and Reducing Losses*.

⁵ For more information, see CRS Report RL30755, *Forest Fire/Wildfire Protection*.

⁶ Appropriations data and statistics prior to 2008 are available in CRS Report RL33990, *Federal Funding for Wildfire Control and Management*.

monitoring a grassland wildfire where there is no immediate threat to humans and weather conditions are favorable for natural suppression of the fire within a short time period).

WFM activities are generally categorized as relating to preparedness, suppression, fuel reduction, or site rehabilitation. Preparedness is any activity that leads to a safe, efficient, and cost-effective fire management program, and includes the range of tasks necessary to build, sustain, and improve the capability to protect against, respond to, and recover from domestic incidents.⁷ Suppression is all of the work associated with extinguishing or confining a fire.⁸ Fuel reduction is manipulation (including combustion) or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control.⁹ Site rehabilitation includes efforts undertaken, generally within three years of a wildfire, to repair or improve fire-damaged lands unlikely to recover to a management-approved condition, or actions taken to repair or replace minor facilities damaged by fire.¹⁰

A number of federal, state, and local agencies can and do respond to wildfire.¹¹ It is sometimes necessary for more than one agency to respond, depending on where the fire occurs, the potential threats, and the expertise required. In these instances, the National Interagency Fire Center (NIFC) coordinates the national mobilization of resources for wildfire and other incidents throughout the United States.¹² NIFC is comprised of eight agencies and organizations.¹³

WFM Statistics

Wildfire statistics help to illustrate past U.S. wildfire activity. Most of the statistics provided in this section are national in scope. The number of wildfires reported and acres burned for 1983 to 2012 is shown in **Figure 1**. The data indicate that the number of wildfires reported has stayed about the same over time. The amount of acres burned has increased steadily over time. **Table 1** gives total WFM appropriations for 2008 through 2012, along with the corresponding number of wildfires and acres burned. **Table 2** lists the three states with the largest number of wildfire acres burned for 2008 to 2012.

NIFC reports that in 2012 there were 67,774 wildfires and 9.3 million acres burned (data compiled for federal and state agencies).¹⁴ Approximately 2% of the wildfires reported in 2012 were classified as large or significant wildfires.¹⁵ Approximately 75% of the wildfires reported

⁷ National Wildfire Coordinating Group, *Glossary of Wildland Fire Terminology*, July 2012.

⁸ Ibid.

⁹ Ibid.

¹⁰ U.S. Department of the Interior, *Interagency Burned Area Emergency Response Guidebook*, February 2006.

¹¹ For more information on federal assistance, see CRS Report R41858, *Federal Assistance for Wildfire Response and Recovery*.

¹² The National Interagency Mobilization Guide identifies standard procedures that guide the operations of multi-agency logistical support activity.

¹³ The agencies and organizations are the Bureau of Land Management, the Bureau of Indian Affairs, the U.S. Fish and Wildlife Service, the National Park Service, the U.S. Forest Service, the National Oceanic and Atmospheric Administration, the National Business Center, and the U.S. Fire Administration. Also, a National Association of State Foresters representative is located at NIFC. Additional information about the role of each agency is available in the NWCG *Communicator's Guide for Wildland Fire Management: Fire Education, Prevention, and Mitigation Practices*.

¹⁴ NIFC, *Wildland Fire Summary and Statistics Annual Report 2012*.

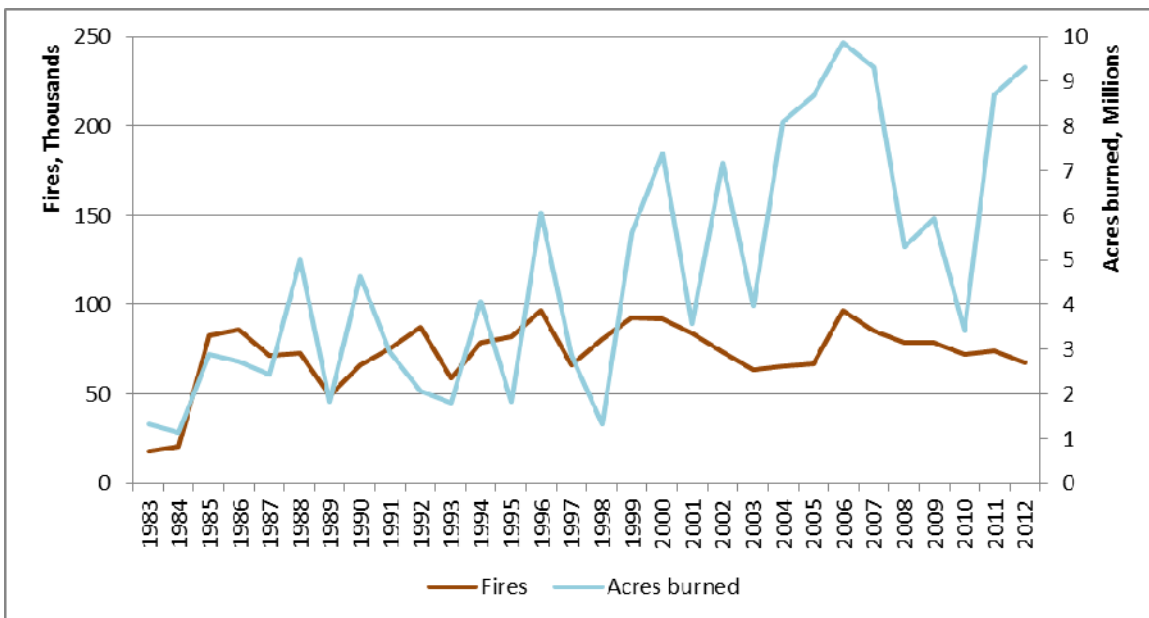
¹⁵ Significant fires are defined as fires that are a minimum of 100 acres in timber fuel types, or 300 acres in grass and (continued...)

occurred on state or other land, but approximately 75% of the acres burned were on federal land. Of all the land management agencies, the FS had the largest percentage (10%) of wildfires, in terms of number of fires occurring on federal land. The BLM and FS had the largest percentage of acres burned on federal land, at 36% and 29%, respectively.

Both the FS and Department of the Interior (DOI) keep statistics on hazardous fuels treated: a measure that may help to prevent wildfire activity.¹⁶ Hazardous fuel treatment includes prescribed burning, thinning, and more.¹⁷ Acres treated for FS and DOI lands are provided in **Table 3**.

Wildfires can have a devastating impact. Therefore, statistics showing the level of destruction a wildfire can cause can be useful. Some more easily quantifiable measures include acres burned, lives lost (firefighters and civilians), structures destroyed, and suppression costs for a specific wildfire. There is no clearinghouse for this type of “destructive” data. Multiple federal and state organizations collect different data. Therefore, the data can usually be found, but in a piecemeal fashion. Firefighter personnel data for the FS and DOI, firefighter fatalities, and structures burned are provided in **Table 4**.

Figure 1. Total Number of Wildfires and Acres Burned (1983-2012)



Source: NIFC.

(...continued)

brush fuel types, or are managed by a Type 1 or 2 Incident Management Team. An incident management team consists of the incident commander and appropriate general and command staff personnel assigned to an incident. Type refers to resource capability. A Type 1 resource provides a greater overall capability due to power, size, capacity, etc., than would be found in a Type 2 resource.

¹⁶ Additional information on hazardous fuels removal is available in the “WFM Appropriations” section of this report.

Table 1. Total Number of Wildfires, Acres Burned, and WFM Appropriations, 2008-2012

	2008	2009	2010	2011	2012
No. of Fires	78,979	78,792	71,971	74,126	67,774
Acres Burned	5,292,468	5,921,786	3,422,724	8,711,367	9,326,238
Total WFM Appropriations (FS & DOI) (\$ in millions) ^a	\$4,461.5	\$3,751.1	\$3,357.7	\$2,812.6	\$2,620.5

Source: NIFC, Agency Budget Justifications, and Appropriations Committee legislation.

Notes: Includes appropriations from the FS WFM account, the DOI Department-Wide Programs WFM account, and emergency funds. Does not include state fire assistance or volunteer fire assistance funding under the FS State and Private Forestry account. Appropriations for state fire assistance under the FS State and Private Forestry (S&PF) account had an annual average of \$33.9 million from 2008-2012. Appropriations for volunteer fire assistance under the FS S&PF account had an annual average of \$6.5 million from 2008-2012.

a. Corresponds to the fiscal year.

Table 2. Top Three States for Wildfire Acres Burned, 2008-2012

2008	2009	2010	2011	2012
TX – 1,570,586	AK – 2,951,597	AK – 1,129,421	TX – 2,722,623	ID – 1,667,654
CA – 1,339,839	TX – 753,261	ID – 613,868	NM – 1,286,487	OR – 1,256,049
NM – 487,652	NM – 421,481	NM – 231,403	AZ – 1,016,428	MT – 1,220,655

Source: NIFC, Historical yearend fire statistics by state.

Table 3. Total Hazardous Fuels Acres Treated by FS and DOI, FY2008-FY2012
(in millions)

	FY2008	FY2009	FY2010	FY2011	FY2012
FS	3.04	3.56	3.26	2.77	2.62
DOI	1.26	1.50	1.30	0.99	1.00

Source: Email from FS on April 25, 2013. Email from DOI on April 19, 2013. DOI reports data are from the National Fire Plan Operations Reporting System.

Table 4. FS and DOI Firefighting Personnel, Fatalities, and Structures Burned, FY2008-FY2012

	FY2008	FY2009	FY2010	FY2011	FY2012
FS firefighters ^a	10,480	10,480	10,480	10,480	10,480
DOI firefighters ^b	3,666	3,664	3,664	3,664	3,447
Firefighter fatalities ^c	25	15	8	12	15
Structures burned ^d	3,956	1,899	788	5,246	4,244

Source: Agency budget justifications. Firefighter fatalities for FY2008 through FY2011 from NIFC, Historical Wildland Firefighter Fatality Reports; Firefighter fatalities for FY2012 from NWCG, Fatalities, Entrapments and Serious Accident Summary for 2012 Safety Gram; Structures burned year-end totals provided by NIFC in an email on May 7, 2013.

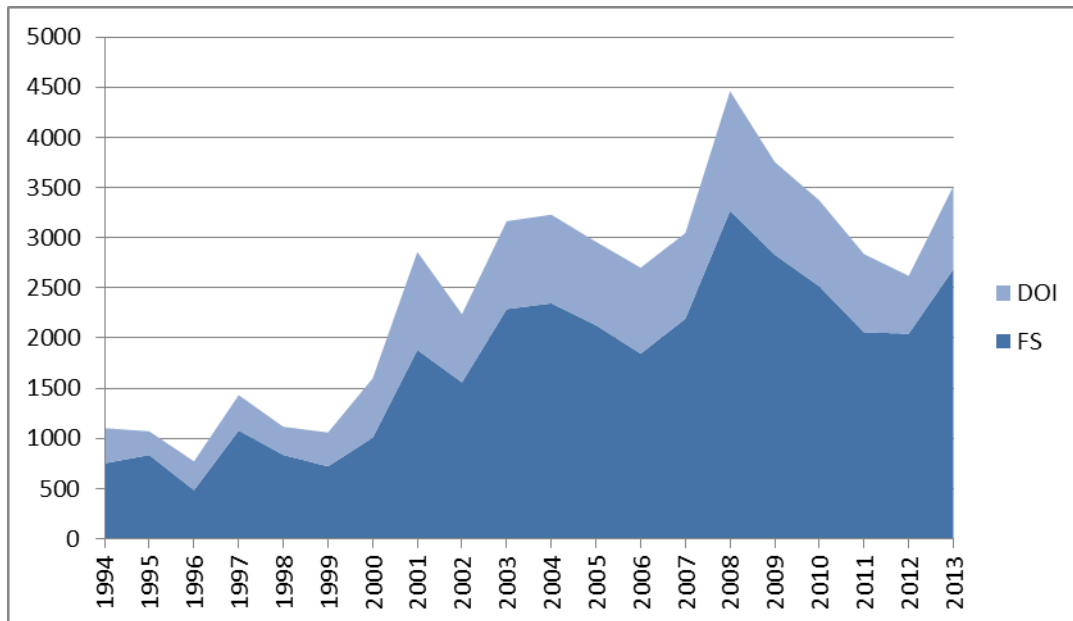
a. FS firefighter data include personnel for hot shot crews, other firefighters, smoke jumpers, and prevention technicians.

- b. DOI firefighter data include firefighters, smoke jumpers, and Type I crews. Although provided in the DOI justification, CRS omitted fire program and support staff from the DOI firefighter total. DOI reports that the personnel data do not include administratively determined (AD) emergency firefighters that are hired for short durations, often for a single incident. AD firefighter data can fluctuate significantly based on need. Source: E-mail from DOI on May 2, 2013.
- c. Corresponds with calendar year.
- d. Structures include primary residences, commercial buildings, outbuildings, and seasonal dwellings. Corresponds with calendar year.

WFM Appropriations by Account (FY2008-Present)

WFM has been a responsibility of the federal government for over a century. WFM appropriations are funded in the annual Interior, Environment, and Related Agencies appropriations bill. FS and DOI are the primary supervisory agencies receiving WFM appropriations.¹⁷ WFM appropriations for both agencies combined has averaged \$3.5 billion from FY2008 to present, with a peak of \$4.5 billion in FY2008 (**Figure 2**).¹⁸ A dramatic increase in WFM appropriations occurred after 2000, partly in response to the severe 2000 fire season.¹⁹

Figure 2. WFM Appropriations, FY1994-FY2013
(millions of dollars)



Source: Agency budget justifications and CRS Report RL33990, Federal Funding for Wildfire Control and Management.

Notes: **Figure 2** includes for FY2013 the additional sum of \$407.5 million appropriated in 2013 to repay 2012 FS and DOI WFM wildfire suppression accounts.

¹⁷ FS traditionally carries out wildfire response in national forests and national grasslands. DOI traditionally carries out wildfire response in national parks, wildlife refuges and preserves, and Indian reservations, and on public lands.

¹⁸ This includes emergency funds (e.g., supplemental appropriations, FLAME).

¹⁹ For more information, see CRS Report RL33990, Federal Funding for Wildfire Control and Management.

A majority of WFM appropriations goes to the FS. From FY2008-FY2012, the FS received on average 75% of the total WFM appropriations. In addition, FS WFM appropriations constitute a large portion of the FS overall discretionary funding total. For example, in FY2012 FS WFM appropriations were nearly 41% of the total discretionary funds appropriated to the FS.²⁰

Each agency's WFM appropriations are distributed into several subaccounts. Three major subaccounts receive the bulk of the appropriations: preparedness, suppression, and hazardous fuels reduction. Additionally, emergency funds are an aspect of WFM appropriations that gain attention, as they can have a dramatic impact on the total WFM appropriations spent in one year. A breakdown of the WFM appropriation subaccounts and emergency funds is provided in **Table 5**.

Table 5. WFM Appropriations FY2008-Present
(\$ in millions)

	FY2008	FY2009 ^a	FY2010	FY2011 ^b	FY2012 ^c	FY2013 ^d
FS	3,269.5	2,826.6	2,501.8	2,033.6	2,285.1	2,688.9
Preparedness	665.8	675.0	675	673.7	1,004.4	1,004.4
Suppression	845.6	993.9	997.5	995.5	537.9 ^e	534.8
Hazardous fuels ^f	310.1	323.1	335.3 ^g	324.6	312.1	317.1
Emergency funds ^h	1,326.0 ⁱ	700.0 ⁱ	—	—	—	400.0 ^k
FLAME ^l	—	—	413	290.4	315.4	317.3
Other	122	134.6	156	149.4	115.3	115.3
Rescission	—	—	—	-400.0	—	—
Use of prior year funds	—	—	-75.0	—	—	—
DOI	1,192.0	924.5	855.9	779.0	575.4	826.3
Preparedness	276.5	281.8	290.5	290.5	276.5	279.5
Suppression	289.8	335.2	383.8	399.0	270.5	276.5
Hazardous fuel reduction	199.6	203.1	206.2	183.3	183.0	145.3
Emergency funds ^h	384	65.0 ^m	—	—	—	7.5 ^k
FLAME ^l	—	—	61	60.9	91.9	92.4
Other	42.1	39.4	39.4	45.3	25.1	25.1
Rescission of unobligated balances	—	—	—	-200.0	-82.0	—
Use of emergency funds	—	—	—	—	-189.6	—
Use of prior year funds ^m	—	—	-125.0	—	—	—
Total	4,461.5	3,751.1	3,357.7	2,812.6	2,860.5	3,515.2

²⁰ Calculation does not include FLAME funds or supplemental funds. FLAME funds and supplemental funds are to be used in select circumstances. While FLAME funds and supplemental funds were used in FY2012, it is not a given that the circumstances requiring their use will happen each year. FLAME funds are to be used to cover the costs of large or complex fires, when amounts provided in the FS and DOI WFM accounts for suppression and emergency response are exhausted.

Source: Annual agency budget justifications and conference reports on P.L. 110-116, P.L. 110-161, P.L. 110-329, P.L. 111-5, P.L. 111-8, P.L. 111-32, P.L. 111-88, P.L. 112-10, P.L. 112-74, P.L. 112-175, and P.L. 113-6.

Notes: Does not include state fire assistance or volunteer fire assistance funding under the FS State and Private Forestry account. Appropriations for state fire assistance under the FS S&PF account had an annual average of \$33.9 million from 2008-2012. Appropriations for volunteer fire assistance under the FS S&PF account had an annual average of \$6.5 million from 2008-2012.

- a. Includes funding in P.L. 111-8 and P.L. 111-32 as well as in P.L. 111-5, the American Recovery and Reinvestment Act of 2009 (ARRA). ARRA funds were available for use in FY2009 or FY2010.
- b. Reflects across-the-board 0.2% reduction.
- c. Data provided do not reflect the across-the-board rescission of 0.16% for FY2012.
- d. Data provided do not take into account the Joint Committee Sequester for FY2013. Data obtained from FS and DOI budget justifications.
- e. Includes \$240 million in carryover emergency fire suppression.
- f. Excludes funds used for biomass grants (\$5.0 million annually, FY2009-FY2012), Community Wood Energy Program (\$5.0 million in FY2011), and Forest Biomass for Energy Program (\$15.0 million in FY2011). These funds could be used for energy from federal land biomass, but could also be used for energy from non-federal land biomass.
- g. Does not include \$10.0 million moved to the Integrated Resources Restoration line item.
- h. Excludes emergency funds provided for other specified activities, such as site rehabilitation, fuel reduction, or state assistance.
- i. Includes funding of \$329.0 million from P.L. 110-116, of which \$110.0 million was for emergency wildfire suppression, \$100.0 million was to repay accounts in FY2007 for wildfire suppression, \$80.0 million was for hazardous fuels reduction and hazard mitigation activities (\$30.0 million for work on state and private lands, \$25.0 million was for rehabilitation and restoration of federal lands, and \$14.0 million was for reconstruction and construction of federal facilities. Also includes funding of \$222.0 million from P.L. 110-161 for urgent wildfire suppression activities and funding of \$775.0 million from P.L. 110-329 for emergency wildfire suppression and related activities.
- j. Includes funding of \$200.0 million appropriated in P.L. 111-32 to cover necessary expenses for wildfire suppression and emergency rehabilitation activities. Also includes funding of \$500.0 million appropriated in P.L. 111-5 of which \$250.0 million is for hazardous fuels reduction, forest health protection, rehabilitation, and hazard mitigation activities on federal lands, and \$250.0 million is for state and private forestry activities including hazardous fuels reduction, forest health and ecosystem improvement activities on state and private lands.
- k. Funding appropriated to the FS and DOI in FY2013 to repay accounts in FY2012 for wildfire suppression in P.L. 112-175. Includes \$400.0 million appropriated to the FS in FY2013 to repay accounts in FY2012 for wildfire suppression in P.L. 112-175. Includes \$23.0 million appropriated to DOI to repay accounts in FY2012 for wildfire suppression in P.L. 112-175; P.L. 113-6 rescinded \$7.5 million of the \$23.0 million made available to DOI in P.L. 112-175.
- l. Since FY2010, reflects appropriations to the FLAME wildfire suppression reserve account.
- m. Includes funding of \$50.0 million appropriated in P.L. 111-32 to cover necessary expenses for wildfire suppression and emergency rehabilitation activities, and funding of \$15.0 million provided in the American Recovery and Reinvestment Act of 2009 (P.L. 111-5) for hazardous fuels reduction.
- n. Applied to DOI WFM suppression account.

Preparedness

Appropriations for preparedness are used to support efforts that assist with fire prevention and detection, equipment, training, and baseline personnel. The FS reports that the preparedness program “ensures agency capability to protect life, property, and natural resources while assuring an appropriate, risk informed and effective response to wildfires that is consistent with land and

resource management objectives.”²¹ Examples of items funded under the FS preparedness subaccount include Web-based decision support tools, central management of aviation assets, and predictive service analysis.

Over the last five years, both the FS and DOI preparedness subaccounts have received the largest or second- largest share of their total WFM appropriations during the annual appropriations process. There was an increase of close to 50% in the FS preparedness funding amount from FY2011 (\$673.7 million) to FY2012 (\$1,004.4 million). This was mostly due to a restructuring of the preparedness and suppression subaccounts which included shifting aviation charges and other charges to the preparedness subaccount. The funding level for the DOI preparedness subaccount has seen little deviation over the last five years.

Suppression

There are three tiers of WFM suppression funding: appropriations to the suppression subaccount (annual appropriations process), appropriations to the FLAME wildfire suppression reserve subaccount (annual appropriations), and emergency suppression (emergency appropriations legislation). This section of the report focuses on appropriations to the suppression subaccount. FLAME and emergency suppression appropriations are discussed in the emergency funding section. Annual suppression estimates contained in the President’s budget consider the 10-year suppression average. The 10-year suppression average is more fully explored in the “Related Issues” section.

Suppression subaccount appropriations are used primarily for wildfire response. The FS reports that funding from this subaccount is used to “efficiently suppress wildland fires on or threatening National Forest System lands and other Federal and non-Federal lands under fire protection agreements.”²² DOI reports that wildfire response activities range from “intensive suppression when wildfires on public lands threaten communities, high value resources, or critical ecosystems, to monitoring wildfires in areas where burning accomplishes resource benefits or where it is too dangerous to place firefighters.”²³

From FY2008 to FY2011, the suppression subaccount received the greatest level of funding compared to all other FS subaccounts. However, the amount of FS suppression appropriations is now second to preparedness appropriations, due to the budget restructuring that occurred in FY2012.²⁴ Some items covered by the FS suppression subaccount are firefighter salaries, aviation asset operations, incident support function, and suppression resources for DOI incidents on a reciprocal non-reimbursement basis. The FS suppression subaccount also covers personnel and resources for the Burned Area Emergency Response (BAER) program.²⁵ Items covered by the DOI suppression subaccount include select personnel expenses above what is covered by the

²¹ U.S. Forest Service, *Fiscal Year 2014 Budget Justification*, April 2013.

²² Ibid.

²³ U.S. Department of the Interior, *Budget Justifications and Performance Information Fiscal Year 2014 Wildland Fire Management*.

²⁴ A similar budget restructure was not found for DOI.

²⁵ The objective of the BAER program is to determine the need for and to prescribe and implement emergency treatments on Federal Lands to minimize threats to life or property resulting from the effects of a fire or to stabilize and prevent unacceptable degradation to natural and cultural resources.

preparedness subaccount, temporary emergency firefighters, and aircraft flight operations and support.

Hazardous Fuels

Hazardous fuels (FS) or hazardous fuel reduction (DOI) appropriations are used to decrease fuel loads, or alter the arrangement of fuel loads, on federal lands to make fires less intense and more controllable.⁷ Appropriations for this subaccount are used for fuel reduction on federal lands and to treat high-priority areas in the wildland-urban interface (WUI).²⁶ More specifically, DOI reports that the hazardous fuel reduction program “removes or modifies vegetation to restore and maintain healthy, diverse ecosystems; reduces wildfire risks to communities and their values; reduces the risk of severe and potentially dangerous wildfire behavior; lessens post-wildfire damage; and limits the spread and proliferation of invasive species and detrimental pathogens.”²⁷ Since 2008, the hazardous fuels subaccount has received the third-largest share of WFM appropriations for both agencies.

Emergency Funding

Emergency funds for WFM are typically appropriated through legislation that supplements the annual appropriations law. WFM emergency funds have usually been provided at the end of the fiscal year or at a time of severe wildfire activity. In general, bill or report language specifies how the emergency funds are to be used (e.g., for suppression, for state and private forestry activities). WFM emergency funds, including FLAME funds, have at times been at the same level or higher than the top-funded three WFM subaccounts during the regular appropriations bills—preparedness, suppression, and hazardous fuels. A breakdown of emergency funds since 2008 is provided in **Table 6**.

For the purposes of this report, funding appropriated under the Federal Land Assistance, Management, and Enhancement (FLAME) Act of 2009 (P.L. 111-88) of the WFM account is considered a type of emergency funding.²⁸ FLAME is a reserve fund for suppression activities and is not technically listed as an emergency fund line item for WFM appropriations. However, FLAME funds may only be used under certain conditions. DOI reports that the “FLAME fund is used for the most severe, complex, and threatening fires, and as a contingency reserve if the agencies exhaust their regular suppression funding due to an active fire season.”²⁹ The Secretary of the Interior declared that DOI conducted suppression operations on 19 wildfires on Interior

²⁶ For more information on WUI, see CRS Report RS21880, *Wildfire Protection in the Wildland-Urban Interface*.

²⁷ U.S. Department of the Interior, *Budget Justifications and Performance Information Fiscal Year 2014 Wildland Fire Management*.

²⁸ FLAME funds are to be used to cover the costs of large or complex fires, when amounts provided in the FS and DOI WFM accounts for suppression and emergency response are exhausted. The requirements are the same for the two accounts. Each Secretary may transfer funds from the FLAME fund into the respective WFM account, for suppression activities, upon a secretarial declaration. The declaration may be issued if the fire covers at least 300 acres or threatens lives, property, or resources, among other criteria. The conferees on the FY2010 bill stated their intent that the money in the FLAME funds, together with appropriations through the Wildland Fire Management accounts, should fully fund suppression needs and prevent borrowing funds from other programs.

²⁹ U.S. Department of the Interior, *Budget Justifications and Performance Information Fiscal Year 2014 Wildland Fire Management*.

land that were eligible for FLAME funding in FY2012.³⁰ The FS reports the Secretary of Agriculture signed two declarations covering 61 fires that met the criteria required to be eligible for FLAME funds in FY2012.³¹ There are not enough data to determine if FLAME is working as intended because it has only been in existence for a few years.

Table 6. WFM Emergency Funds FY2008-Present
(\$ in millions)

	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013
FS Total	1,326.0	700.0	413.0	290.4	315.4	717.3
Emergency appropriations	1,326.0	700.0	—	—	—	400.0 ^a
FLAME	—	—	413.0	290.4	315.4	317.3
DOI Total	384.0	65.0	61.0	60.9	91.9	107.9
Emergency appropriations	384.0	65.0	—	—	—	15.5 ^a
FLAME	—	—	61.0	60.9	91.9	92.4
Total	1,710.0	765.0	474.0	351.3	407.3	825.2

Source: Annual agency budget justifications and conference agreements for select Interior appropriations laws.

- a. Funding appropriated to the FS and DOI in FY2013 to repay accounts in FY2012 for wildfire suppression in P.L. 112-175. Includes \$400 million appropriated to the FS in FY2013 to repay accounts in FY2012 for wildfire suppression in P.L. 112-175; Includes \$23.0 million appropriated to DOI to repay accounts in FY2012 for wildfire suppression in P.L. 112-175; P.L. 113-6 rescinded \$7.5 million of the \$23.0 million made available to DOI in P.L. 112-175.

Related Issues

Wildfire 10-Year Suppression Average and FLAME Suppression Estimate

The WFM suppression appropriation subaccount receives considerable interest from Congress. This is partly because of the amount of funding allocated for WFM suppression, but also because of scrutiny about the accuracy of annual WFM suppression estimates. When WFM suppression estimates for a fiscal year are provided to Congress by federal land management agencies fall short of what is needed, additional funds may have to be issued via emergency appropriations, or funds may have to be transferred from non-WFM suppression accounts, which could impact the performance outcomes of those non-WFM suppression accounts.

The FS recognizes that “fire suppression costs are skyrocketing and seriously jeopardizing [the FS’s] ability to fund [the FS] natural resource mission.”³² There are at least two ways the FS calculates wildfire suppression costs. A 10-year suppression average is used to estimate the

³⁰ Ibid.

³¹ U.S. Forest Service, *Fiscal Year 2014 Budget Justification*, April 2013.

³² U.S. Forest Service, *The U.S. Forest Service - An Overview*.

outyear budget request for wildfire suppression.³³ The FLAME suppression calculation is used to estimate within fiscal year expenditures.

For at least the last two decades, the FS and DOI have estimated annual wildfire suppression outyear costs by using a 10-year suppression average. The moving 10-year average is based on actual suppression obligations reported at the end of the fiscal year. Each end-of-year obligation is adjusted to constant dollars. Once an average is calculated, \$350.0 million is subtracted to account for a recent budget restructuring where funding was transferred from the suppression subaccount to the preparedness subaccount. This figure is then inflated for the upcoming budget year, resulting in the final 10-year suppression average.³⁴

FLAME (P.L. 111-88) requires the Secretaries of the Interior and Agriculture to submit to Congress a report periodically throughout the year that contains estimates of anticipated wildfire suppression costs. This estimation is made using econometric models which include weather and climate variables.³⁵ The FLAME analysis for March 2013 indicates that from 2000 to 2011 annual observed FS wildfire suppression costs exceeded the FLAME forecasts seven times (2000, 2002, 2003, 2004, 2006, 2008, and 2011) (**Figure 3**).³⁶ The same analysis indicates that from 2000 to 2011 annual observed DOI wildfire suppression costs exceeded the FLAME forecasts five times (2000, 2002, 2003, 2008, and 2011) (**Figure 4**).³⁷

The FS has explored alternatives to the 10-year average for the outyear estimate, including the use of regression models to better estimate WFM suppression costs, and non-biophysical policy remedies that might reduce wildfire suppression expenditures (e.g., guidelines about when it is appropriate not to aggressively suppress wildfires).³⁸ Additionally, it has been suggested that more funding for hazardous fuel reduction could lower suppression costs.³⁹ FLAME already requires the best available climate, weather, and other relevant data, and models and other analytical tools be used to estimate anticipated wildfire suppression costs.

³³ Outyear is the fiscal year following the year covered in a budget.

³⁴ Wildfire 10-year suppression average explanation provided by the FS in an email on April 2, 2013.

³⁵ E-mail from the FS May 14, 2013.

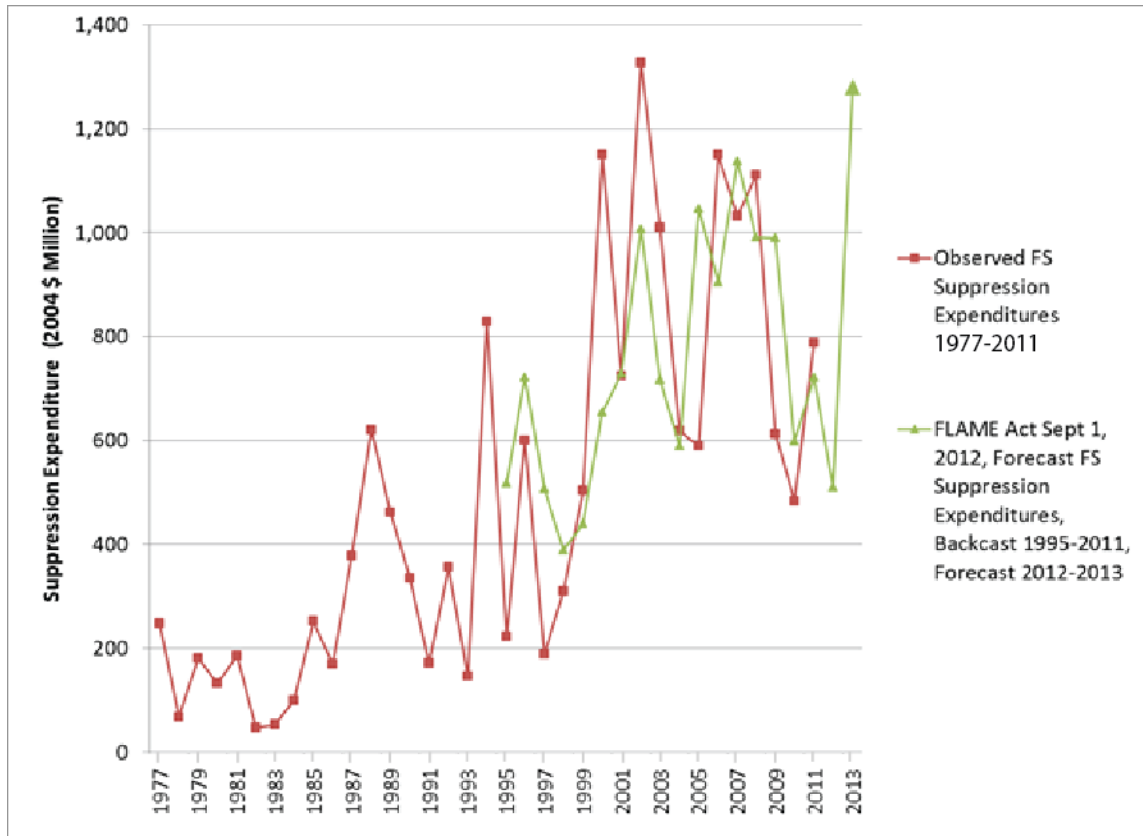
³⁶ DOI. *Federal Land Assistance, Management and Enhancement (FLAME) Act Suppression Expenditures for Interior and Agriculture Agencies: FLAME March 2013 Forecasts for Fiscal Year 2013* (February 7, 2013).

³⁷ Ibid; Email from FS May 15, 2013.

³⁸ Karen L. Abt, Jeffrey P. Prestemon, and Krista M. Gebert, "Wildfire Suppression Cost Forecasts for the US Forest Service," *Journal of Forestry*, June 2009; Geoffrey H. Donovan, Jeffrey P. Prestemon, and Krista Gebert, "The Effect of Newspaper Coverage and Political Pressure on Wildfire Suppression Costs," *Society and Natural Resources*, vol. 24, no. 8 (2011).

³⁹ Gary Snider, P. J. Daugherty, and D. Wood, "Irrationality of Continued Fire Suppression: An Avoided Cost Analysis of Fire Hazard Reduction Treatments Versus No Treatment," *Journal of Forestry*, vol. 104, no. 8 (December 2006).

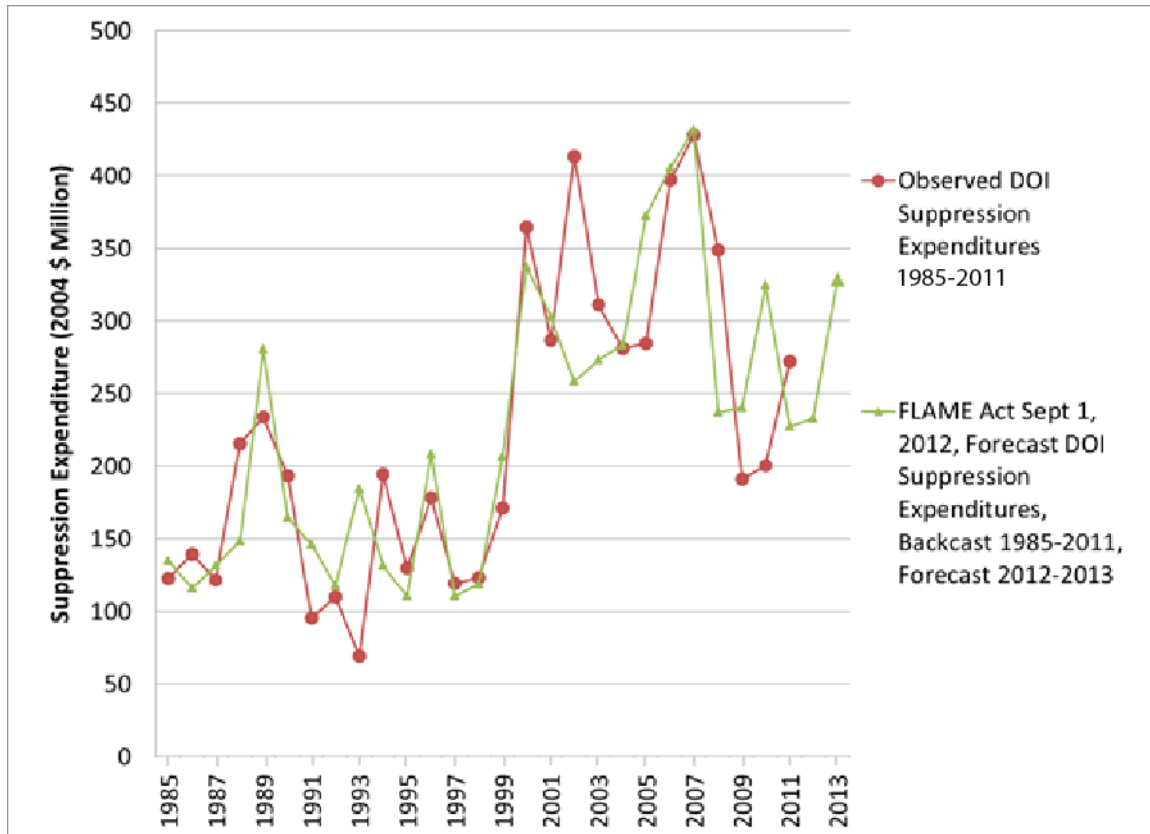
Figure 3. Forest Service Suppression Costs Comparison—Observed and Predicted
(in 2004 dollars)



Source: Email from FS May 15, 2013; DOI. *Federal Land Assistance, Management and Enhancement (FLAME) Act Suppression Expenditures for Interior and Agriculture Agencies: FLAME March 2013 Forecasts for Fiscal Year 2013* (February 7, 2013).

Notes: Values are in constant 2004 dollars and exclude the Wildland Fire Suppression Cost Pool expenditures. Observed historical USDA Forest Service suppression expenditures and the forecasts of these expenditures use the September 2012 FLAME Forecast Model.

Figure 4. DOI Suppression Cost Comparison—Observed and Predicted
(in 2004 dollars)



Source: Email from FS May 15, 2013; DOI. *Federal Land Assistance, Management and Enhancement (FLAME) Act Suppression Expenditures for Interior and Agriculture Agencies: FLAME March 2013 Forecasts for Fiscal Year 2013* (February 7, 2013).

Notes: Values are in constant 2004 dollars. Observed historical Department of the Interior suppression expenditures and the forecasts of these expenditures use the September 2012 version of the DOI FLAME Act Forecast Model.

WFM Large Air Tankers

Aircraft have been used for decades as a part of WFM response. Multiple types of aircraft (e.g., large air tankers, single-engine air tankers, or helicopters) may be used given the wildfire conditions (**Figure 5**). Aircraft are able to be used to, in part, drop fire retardant, ignite prescribed fires, deliver equipment, transport firefighters, and provide reconnaissance of new fires. Additional aviation resources at FS's disposal for WFM are Modular Airborne Firefighting systems (MAFFS)—owned by the Department of Defense—and support available through agreements with state cooperators and Canada.

The size of the fleet of large air tankers has declined over the years; the FS reports a reduction from 43 air tankers in 2000 to 11 air tankers in 2011, and reports that the average age of aircraft still in service is more than 50 years old.⁴⁰ The FS reports that for the 2013 wildfire season, it

⁴⁰ USDA Forest Service, *Large Airtanker Modernization Strategy*, February 2012.

“expects to have available for wildfire suppression up to 26 airtankers, including seven Next Generation airtankers, eight Legacy aircraft, up to three Very Large Airtankers through contracts and eight airtankers through an agreement with the Department of Defense.”⁴¹

FS aviation needs have been studied multiple times, with at least four studies completed since 2000.⁴² The studies generally conclude that additional aviation resources are needed, but conclusions differ on the type, quantity, and costs of the resources needed.

The FS reports that funding for air tankers comes from the preparedness and suppression subaccounts.⁴³ Exclusive use air tanker contract costs (e.g., availability costs) are taken from the preparedness subaccount.⁴⁴ When an air tanker is in use for fire response purposes, funding is drawn from the suppression subaccount. The suppression subaccount also covers additional call-when-needed air tankers. The exclusive use air tanker contract budget had an annual average of \$29.5 million from FY2008-FY2012, ranging from a high of \$33.4 million in FY2010 to a low of \$20.7 million in FY2012.⁴⁵

Figure 5. Wildfire Aircraft

AIR TANKERS		HELICOPTERS			
Type	Heavy (including P2V, CV 580)	Single engine	Type I (including Sikorsky S-64 Skycrane)	Type II and Type III (including Bell 206B JetRanger, Aérospatiale SA 315B Lama)	Military UH-60 Blackhawk
Speed	200 - 340 mph	100 - 200 mph	91 - 140 mph	115 - 161 mph	183 mph
Capacity	2,000 - 2,800 gallons	125 - 800 gallons	700 - 3,000 gallons	120 - 680 gallons per bucket	780 gallons per bucket

Source: Jeremy P. Meyer, “Officials disagree on ability of nation’s old, thin air tanker fleet,” June 17, 2012; U.S. Forest Service Rocky Mountain Area Coordination Center; and CAL FIRE Air Program.

Author Contact Information

Kelsi Bracmort
 Specialist in Agricultural Conservation and Natural Resources Policy
 kbracmort@crs.loc.gov, 7-7283

⁴¹ U.S. Forest Service, “U.S. Forest Service issues notice of intent to award “Next Generation” airtanker contracts,” press release, May 6, 2013.

⁴² Blue Ribbon Panel Report to the Chief, USDA Forest Service and Director, USDI Bureau of Land Management. *Federal Aerial Firefighting: Assessing Safety and Effectiveness*, December 2002; Fire Program Solutions LLC, *Wildland Fire Management Aerial Application Study*, October 2005; National Interagency Aviation Council, *Interagency Aviation Strategy*, 2007 (modified by U.S. Forest Service in 2009); RAND Corporation, *Air Attack Against Wildfires: Understanding U.S. Forest Service Requirements for Large Aircraft*, 2012.

⁴³ Email from FS on May 14, 2013.

⁴⁴ The FS pays two fees for airtankers, an availability rate (fixed) to guarantee the planes are available and a flight use rate (variable). The availability rate is usually charged by the day, while the flight use rate is usually charged by the hour. The 2012 FS Large Airtanker Modernization Strategy reports that, “since 2007, contract costs for daily airtanker availability have more than doubled—from just over \$15 million in 2007 to \$33 million in 2010,” and that “the increase in airtanker availability costs in the last few years is directly attributable to maintaining the airworthiness and safety of 50 year old aircraft for the firefighting mission.”

⁴⁵ Email from FS on May 14, 2013.