



N.C. DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

NORTH CAROLINA FOREST SERVICE



Old House Bay Fire
Spring 2018, Bladen County (White Lake Community)

ANNUAL LEGISLATIVE REPORT ON WILDFIRES

October 1, 2018

Steve Troxler, Commissioner
Scott Bissette, Assistant Commissioner
David Lane, State Forester

Pursuant to G.S. 106-911, the North Carolina Forest Service, a division of the North Carolina Department of Agriculture and Consumer Services, respectfully submits this annual report on wildfire in North Carolina for Fiscal Year 2018.

Contents

STATUTORY REQUIREMENT	3
§ 106-911. Annual report on wildfires.....	3
OVERVIEW OF FIRE CONTROL.....	3
SUMMARY OF ALL WILDFIRE DATA FOR FY18	5
Effects of weather on the North Carolina wildfire season	6
MAJOR WILDFIRE DATA FOR FY18.....	10
Overtime Data	12
Fiscal Impacts.....	13
Wildfire personnel and equipment.....	14
Type 6 engine	14
Wildland fire tractor plow units	14
Aviation resources	15
CONTACT INFORMATION.....	18

STATUTORY REQUIREMENT

§ 106-911. Annual report on wildfires

No later than October 1 of each year, beginning October 1, 2012, the Commissioner shall submit a written report on wildfires in the State to the Chairs of the House Appropriations Subcommittee on Natural and Economic Resources and the Senate Appropriations Committee on Natural and Economic Resources, the Joint Legislative Commission on Governmental Operations, and the Fiscal Research Division of the General Assembly. The report shall include the following information for all major or project wildfires during the prior fiscal year:

- (1) The date, location and impacts (property damage and any casualties) from the wildfire.
- (2) The following data for firefighters and related support personnel involved in fighting the wildfire:
 - a. Total overtime hours worked.
 - b. Total compensation paid for overtime.
 - c. The portion of compensation paid that was reimbursed to the State.
- (3) The fiscal impact of the wildfire, including total costs, reimbursable costs and costs incurred by the State.

OVERVIEW OF FIRE CONTROL

There are more than 18.8 million acres of forestland in North Carolina. Wildfire is one of the greatest threats to this important and valuable natural resource. The North Carolina Forest Service (NCFS) is responsible for protecting state and privately-owned forestland from forest fires. The NCFS forest fire protection program is managed on a cooperative basis with each of the 100 North Carolina counties. Emphasis in the fire program includes fire prevention efforts, pre-suppression activities (including extensive training of personnel and cooperators), aggressive suppression efforts on all wildfires and law enforcement follow-up.

NCFS, local fire departments and communities across the state are working together to prevent, prepare for and lessen the impact of wildfires. Maintaining a well-trained, proficient forest fire control organization is very similar to maintaining a well-trained army. Fire training occurs year-round. New personnel are constantly being trained to maintain capabilities. Veteran firefighters regularly undergo refresher training in suppression tactics, strategy, organization and management.

A study conducted by the U.S. Forest Service and the University of Wisconsin-Madison indicated that North Carolina leads the nation in the amount of area classified as wildland-urban interface (WUI). The WUI is the area where structures and other human development meet or intermingle with undeveloped wildland, forest or vegetative fuels. While North Carolina has the most WUI acres, it also ranks fifth in most housing units within the WUI. The interface creates great challenges for fire

managers, as nearly every wildfire or its associated smoke may impact homes, roads, farms or other developments.

Table 1 illustrates the need to keep wildfires as small as possible through early detection and rapid response, which are critical to reducing fire size, protecting property and minimizing overall loss.

Table 1. Historical wildfire activity in North Carolina, FY 2009-2018

Fiscal Year	Wildfires	Acres	100+ Acre Wildfires	100+ Acres Burned	Percent of Total Wildfires	Percent of Acreage Burned on 100+ Ac. Wildfires
2009	3,723	14,966	18	5,056	0.5%	33.8%
2010	3,023	10,904	16	3,347	0.5%	30.7%
2011	5,701	85,857	36	70,166	0.6%	81.7%
2012	3,259	11,958	14	2,779	0.4%	23.2%
2013	3,542	11,026	14	3,647	0.4%	33.1%
2014	4,624	13,358	14	4,448	0.3%	33.3%
2015	3,991	9,903	9	2,647	0.2%	26.7%
2016	3,210	18,808	12	11,992	0.4%	63.8%
2017	5,541	79,674	38	69,389	0.7%	87.1%
2018	4,553	13,647	14	5,575	0.3%	40.9%
Total	41,167	270,101	185	179,046	0.4%	66.3%
Average	4,117	27,010	19	17,905	0.4%	40.8%

From fiscal year 09-18, 270,101 acres of woodland burned in North Carolina wildfires. Of these wildfires, 179,046 acres, or 66 percent of the total area burned, were burned in fires larger than 100 acres. However, 100+ acre fires only made up 0.4 percent of the total number of fires for this 10-year period.

The total number of wildfires per fiscal year is shown in Figure 1 while Figure 2 shows the total number acres burned in wildfires per fiscal year from 2009-2018.

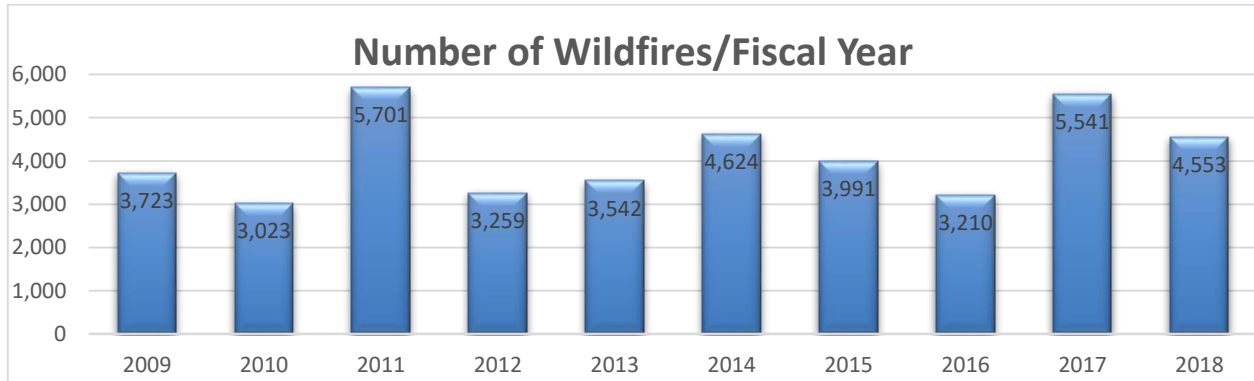


Figure 1. Wildfire activity per fiscal year in North Carolina, FY 2009-2018

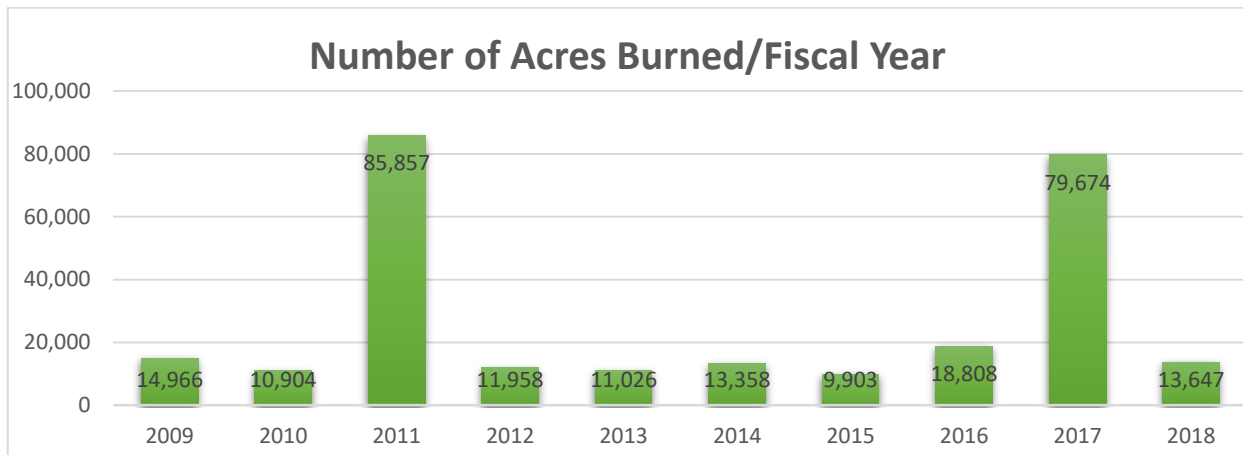


Figure 2. Wildfire acres burned per fiscal year in North Carolina, FY 2009-2018

SUMMARY OF ALL WILDFIRE DATA FOR FISCAL YEAR 2018

From July 1, 2017, through June 30, 2018, 4,553 wildfires¹ burned on 13,647 acres in North Carolina. The average fire size was 3 acres with the largest wildfire being 1,475 acres. Of these 4,553 wildfires, only one percent could be directly linked to a natural ignition source (lightning). That means 99 percent of the wildfires started in fiscal year 2018 were directly related to human activity. As the population of the state increases, the number of wildfires per year are expected to also increase.

¹ NCFS has the statutory (G.S. 106-895) requirement of prevention and control of forest fires in any and all parts of this state with the exception of Federal Government owned property. Through administrative decision, areas within municipal limits are considered beyond the jurisdiction of the N.C. Forest Service.

Effects of weather on the North Carolina wildfire season

Weather plays a very important role in determining wildfire activity and severity in North Carolina. Historically, North Carolina has two distinct wildfire seasons that occur in the fall and in the spring. During these two times of the year, weather and vegetation conditions on the landscape increases the potential for wildfires.

Figure 3 below provides a visualization of the general trend for wildfires throughout the year. Wildfire occurrence was generally low at the beginning of fiscal year 2018. Typically, fuels of concern are at full greenness during the summer months, which reduces the danger of having a wildfire. Moving into the fall of the year, fuels of concern start to become more available with the physiological changes in vegetation as moisture content decreases. Wildfire occurrence in North Carolina normally starts to pick up in October coinciding with leaf shed.

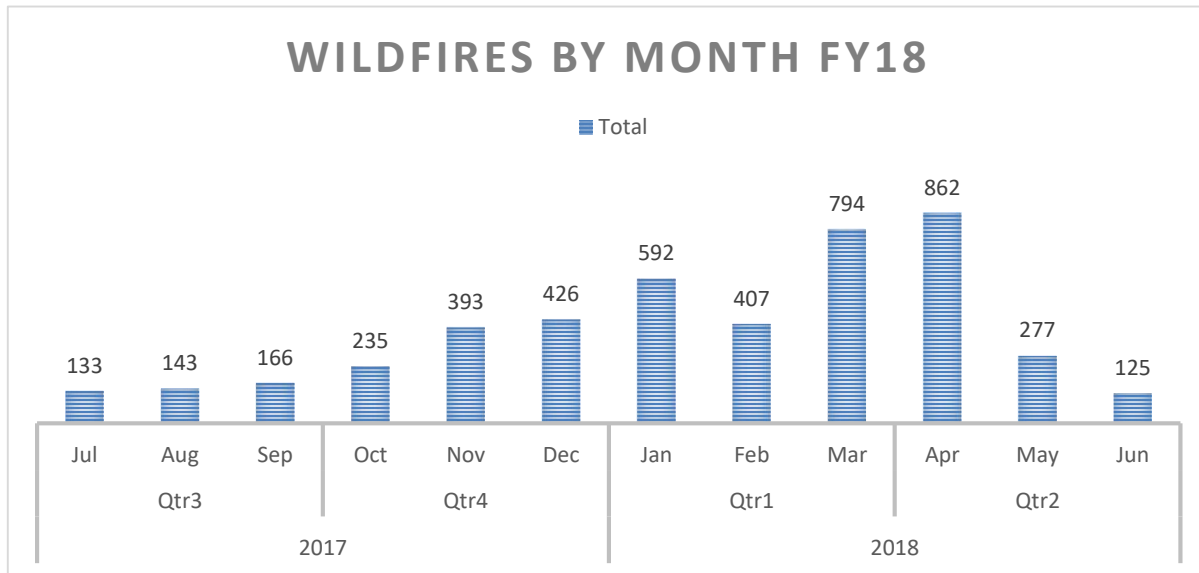


Figure 3. Wildfires in North Carolina by month during FY18

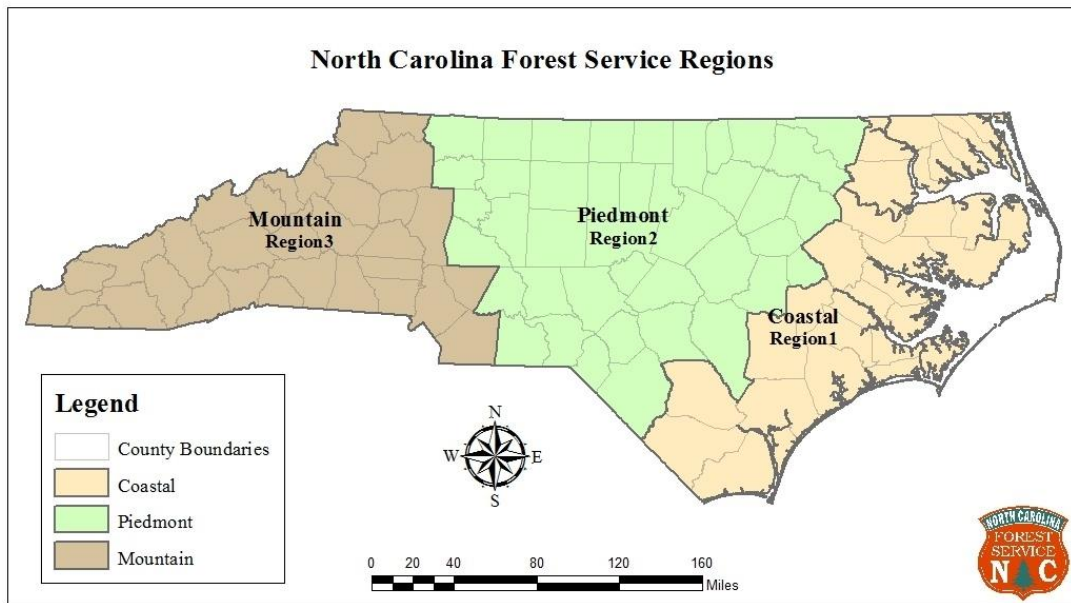
This trend of increasing available fuels continues through the winter months into spring. During winter and spring, it is very common for North Carolina to have periods of weather with low relative humidity and strong wind events. These weather events, along with receptive fuels, combine to create high fire danger that correlates to the increase in the number of wildfires during this period.

Wildfire occurrence normally starts to decrease as vegetation starts new growth in late spring. The wildcard in these trends is drought. North Carolina can experience severe droughts and during these events the wildfire seasons can extend beyond the historical wildfire season. Some of the largest fires that have occurred in the state have been during the summer months as shown in Table 2.

Table 2. Recent examples of large summer wildfires in North Carolina

Fire Name	County	Acres Burned	Start Date
Pains Bay	Dare	45,294	5/5/11
Juniper Road	Pender	31,140	6/19/11
Simmons Road	Cumberland/Bladen	5,438	6/20/11
Evans Road	Hyde/Washington/Tyrrell	41,534	6/1/08

Figures 4 and 5 plus Tables 3-7 outline all FY18 wildfires occurring by region, including estimated damages and causes.



Map created by:
North Carolina Forest Service

Date: 10/1/2012

Data from: North Carolina Forest Service
Data current as of 10/1/2012.

Figure 4. Map of North Carolina Forest Service regions

Table 3. Wildfires by North Carolina Forest Service Region in FY18

NCFS Region	# of Wildfires	% of Wildfires	Wildfire Acres
Coastal	754	16.6%	3,548
Piedmont	2,751	60.4%	8,762
Mountain	1,048	23%	1,338
Total	4,553	100%	13,647

Table 4. Estimated values of property impacted by wildfires per geographic area in North Carolina during FY18

N.C. Forest Service Region	Homes and Structures Protected by NCFS Fire Protection	Est. Value of Homes and Structures Protected	Homes and Structures Damaged or Destroyed by Wildfires	Est. Value of Homes and Structures Damaged or Destroyed	Est. Value of Other Property Damaged (Timber, Livestock, Crops, Vehicles)
Coastal	1,038	\$77,543,115	48	\$311,401	\$867,630
Piedmont	4,366	\$358,006,021	223	\$1,159,450	\$554,885
Mountains	1,230	\$15,2862,359	67	\$765,550	\$114,935
Total	6,634	\$588,411,495	338	\$2,236,401	\$1,537,450

Table 5. Causes of wildfires in North Carolina during FY18

Wildfire Cause	#of Wildfires	Wildfire Acres
Camping	36	93
Children	162	206
Debris Burning	1,977	4,158
Incendiary	235	481
Lightning	44	239
Machine Use	451	520
Miscellaneous	809	2,607
Fireworks	35	16
Railroad	28	16
Smoking	43	61
Undetermined	733	5,250
Total	4,553	13,647

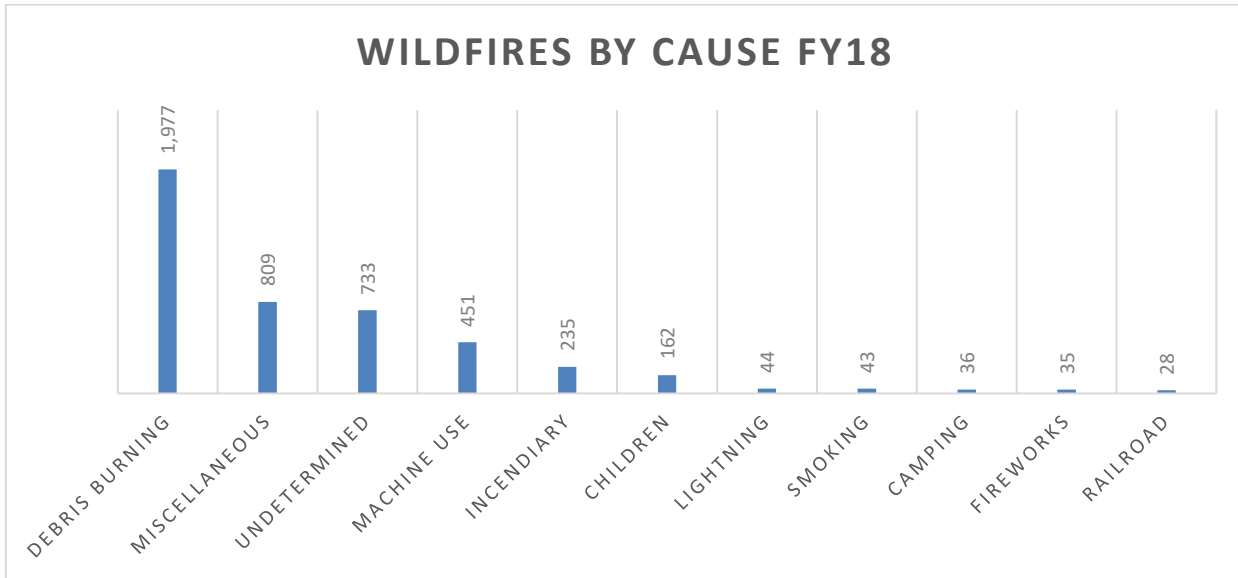


Figure 5. Leading causes of wildfires in North Carolina during FY18

Table 6. Top five counties with the most fire response in North Carolina during FY18

County	NCFS Region	# of Wildfires	Wildfire Acres	Suppression Cost
Robeson	Piedmont	265	2,054	\$167,157
Richmond	Piedmont	172	360	\$55,248
Harnett	Piedmont	147	356	\$91,397
Union	Mountain	140	136	\$36,908
Chatham	Piedmont	134	125	\$38,768
Total for the 5 counties		858	3,031	\$389,479
% of annual total across NC		19%	22%	17%

Table 7. Top five counties with most acres burned by wildfire in North Carolina during FY18

County	NCFS Region	# of Wildfires	Wildfire Acres	Suppression Cost
Scotland	Piedmont	82	2,773	\$64,976.51
Robeson	Piedmont	265	2,054	\$167,157.27
Carteret	Coastal	23	1,780	\$46,957.55
Bladen	Coastal	113	778	\$108,787.41
Sampson	Piedmont	45	437	\$67,921.78
Total for the 5 counties		528	7,822	\$455,800.52
% of annual total across NC		12%	57%	20%

MAJOR WILDFIRE DATA FOR FISCAL YEAR 2018

North Carolina had 23 major wildfires with a start date between July 1, 2017, and June 30, 2018. NCFS classifies a major wildfire when any of the following occurs:

- A wildfire is 100 acres or more in size.
- Any inhabited or inhabitable dwelling has been destroyed regardless of value.
- Structure(s) destroyed with a value greater than \$50,000 (ex. commercial building, detached garage, farm shop).
- A firefighter fatality.
- Any significant firefighter injury that requires an emergency room visit or hospitalization.
- An Incident Management Team (Type 1, 2 or 3) is assigned to the incident.
- Central Office funding is requested.²

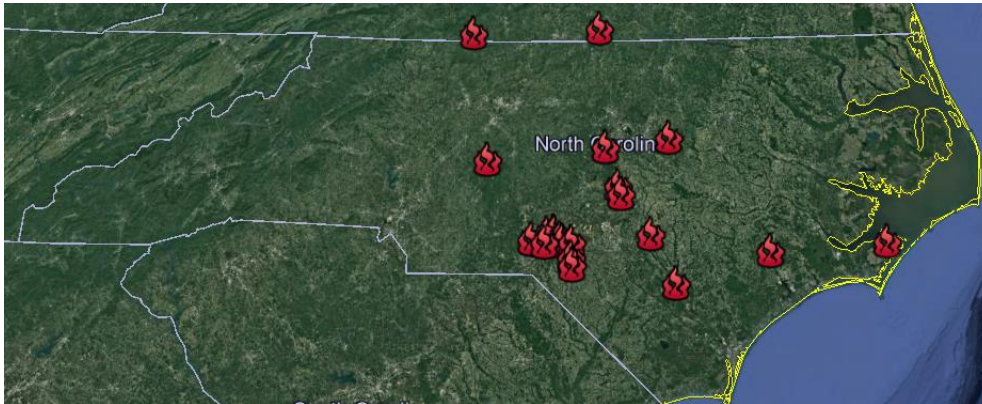


Figure 6. Locations of major wildfires in North Carolina during FY18

Table 8 shows the dates, locations and impacts for each of the 23 major wildfires in fiscal year 2018. It is important to note that while Table 8 shows approximately \$1,727,000 in property damage/loss to homes and structures, 70 homes and structures with an estimated value of \$5,087,000 were protected on those same wildfires. Of the 23 fires, 12 were considered major wildfires due to the fire size and 11 were considered major due to the value of structures lost or damaged.

² When the cost of responding to an incident is projected to be more than the field unit can afford, financial support from the NCFS Raleigh Headquarters (Central Office) budget can be requested. Recently, the NCFS Central Office “fire contingency budget” has been limited to \$200,000. This has proven to be insufficient for multiple major fires, as shown in fiscal year 2018.

Table 8. Dates, locations and impacts of major wildfires in North Carolina FY18

Fire Name	County	Start Date	Days to Control	Acres Burned	Homes And Structures Damaged Or Destroyed	Estimated Value Of Homes And Structures Damaged Or Destroyed	Estimated Value Of Other Property Damaged (Timber, Livestock, Crops, Vehicles)
Ace Drive	Scotland	3/10/2018	1	0.6	1	\$50,000	\$0
Bells Grove	Randolph	1/4/2018	2	101.1	0	\$0	\$0
Big Barn	Person	12/19/2017	1	2.0	1	\$50,000	\$100,000
Castleberry	Johnston	3/29/2018	1	0.0	1	\$6,000	\$0
Christian Chapel	Chatham	4/6/2018	1	14.6	0	\$0	\$0
Clark Rd. #3	Robeson	4/20/2018	1	101.7	0	\$0	\$0
Foliage Court	Onslow	12/14/2017	1	0.6	1	\$150,000	\$0
Gum Swamp Lake Road	Scotland	4/19/2018	2	246.9	0	\$0	\$17,000
House	Hoke	3/2/2018	1	3.3	4	\$85,000	\$0
Jane Shaw Road	Scotland	4/2/2018	1	312.3	0	\$0	\$0
Marshnton Road	Scotland	2/2/2018	1	669.4	0	\$0	\$0
Moorefield	Stokes	12/1/2017	1	0.7	2	\$90,000	\$0
Old Course	Moore	3/3/2018	1	2.0	6	\$1,200,000	\$0
Old House Bay	Bladen	4/2/2018	2	510.0	0	\$0	\$225,000
Open Grounds Farm	Carteret	3/11/2018	1	254.3	0	\$0	\$0
Pine Loop	Sampson	4/3/2018	2	200.1	0	\$0	\$250
Pine Needle	Richmond	6/24/2018	1	1.8	1	\$75,000	\$0
Saddle Club Road	Person	3/4/2018	1	115.1	0	\$0	\$0
Slate Road	Scotland	12/12/2017	1	158.0	0	\$0	\$0
Strausberg Lane	Scotland	5/6/2018	2	1,181.7	0	\$0	\$0
Twenty-Two	Harnett	8/11/2017	1	0.4	2	\$21,000	\$1,200
White Oak	Robeson	11/26/2017	1	123.6	0	\$0	\$0
Will Lucas	Harnett	4/6/2018	1	83.8	0	\$0	\$0
Totals			28	4,084.1	19	\$1,727,000	\$343,450

Overtime Data

Employees record time worked on an incident with timesheet charge objects. Charge objects are assigned for major fires. In fiscal year 2018, NCFS permanent employees earned 30,920 hours of compensatory time related to wildfire suppression in the state. Table 9 shows the overtime hours worked and compensatory time earned for major fires in fiscal year 2018.

Table 9. Overtime/compensatory time for major wildfires in North Carolina during FY18

Wildfire Name	County	Acres Burned	Overtime Hours Worked	Reimbursement	Hours of Earned Comp. Time
Ace Drive	Scotland	0.6	2	\$0	3
Bells Grove	Randolph	101.1	17	\$0	25.5
Big Barn	Person	2.0	0	\$0	0
Castleberry	Johnston	0.0	1	\$0	1
Christian Chapel	Chatham	14.6	35.5	\$0	53.25
Clark Rd. #3	Robeson	101.7	32	\$0	45.01
Foliage Court	Onslow	0.6	4.98	\$0	6.97
Gum Swamp Lake Road	Scotland	246.9	26.25	\$0	37.38
House	Hoke	3.3	10	\$0	15
Jane Shaw Road	Scotland	312.3	38.5	\$0	52.75
Marshton Road	Scotland	669.4	21	\$0	31.5
Moorefield	Stokes	0.7	7	\$0	10.5
Old Course	Moore	2.0	0	\$0	0
Old House Bay	Bladen	510.0	201.3	\$0	275.46
Open Grounds Farm	Carteret	254.3	8.76	\$0	13.15
Pine Loop	Sampson	200.1	33	\$0	48.5
Pine Needle	Richmond	1.8	1.25	\$0	1.88
Saddle Club Road	Person	115.1	49.5	\$0	64.25
Slate Road	Scotland	158.0	16	\$0	24
Strausberg Lane	Scotland	1,181.7	22.5	\$0	31.25
Twenty-Two	Harnett	0.4	2	\$0	2
White Oak	Robeson	123.6	31.25	\$0	46.88
Will Lucas	Harnett	83.8	42.8	\$0	59.95
Totals		4,084.1	603.59	\$0	849.18

Fiscal Impacts

NCFS tracks cost information for reimbursable³ and billable⁴ wildfires. The NCFS Fire Reporting System does track estimated costs. These estimated costs include employee salary (based on an average salary of the position) and standard equipment use rates. Table 10 shows the actual and estimated costs of each of the 23 major fires that started July 1, 2017 through June 30, 2018. The total estimated suppression cost for all wildfires in fiscal year 2018 was \$2,315,647.

Table 10. Estimated fiscal impacts of wildfires in North Carolina during FY18

Wildfire Name	County	Days to Control	Acres Burned	Estimated Cost	Reimbursement	State Cost
Ace Drive	Scotland	1	0.6	\$678	\$0	\$678
Bells Grove	Randolph	2	101.1	\$8,072	\$0	\$8,072
Big Barn	Person	1	2.0	\$2,142	\$0	\$2,142
Castleberry	Johnston	1	0.0	\$542	\$0	\$542
Christian Chapel	Chatham	1	14.6	\$6,116	\$0	\$6,116
Clark Rd. #3	Robeson	1	101.7	\$5,695	\$0	\$5,695
Foliage Court	Onslow	1	0.6	\$1,942	\$0	\$1,942
Gum Swamp Lake Road	Scotland	2	246.9	\$13,304	\$0	\$13,304
House	Hoke	1	3.3	\$1,954	\$0	\$1,954
Jane Shaw Road	Scotland	1	312.3	\$14,832	\$0	\$14,832
Marshton Road	Scotland	1	669.4	\$2,815	\$0	\$2,815
Moorefield	Stokes	1	0.7	\$2,233	\$0	\$2,233
Old Course	Moore	1	2.0	\$46	\$0	\$46
Old House Bay	Bladen	2	510.0	\$25,111	\$0	\$25,111
Open Grounds Farm	Carteret	1	254.3	\$2,577	\$0	\$2,577
Pine Loop	Sampson	2	200.1	\$13,161	\$0	\$13,161
Pine Needle	Richmond	1	1.8	\$1,535	\$0	\$1,535
Saddle Club Road	Person	1	115.1	\$11,728	\$0	\$11,728
Slate Road	Scotland	1	158.0	\$2,876	\$0	\$2,876
Strausberg Lane	Scotland	2	1,181.7	\$2,988	\$0	\$2,988
Twenty-Two	Harnett	1	0.4	\$1,653	\$0	\$1,653
White Oak	Robeson	1	123.6	\$3,440	\$0	\$3,440
Will Lucas	Harnett	1	83.8	\$15,528	\$0	\$15,528
Totals		28	4,084.1	\$140,968	\$0	\$140,968

³ Reimbursable Fires – A wildfire where NCFS may obtain a reimbursement of funds from FEMA, U.S. Forest Service, or other agencies

⁴ Billable Fires – Wildfires where NCFS has a cost share or cooperative agreement or provided suppression services to a federal agency

Wildfire personnel and equipment

The NCFS could not perform its legislative mandate without trained personnel and specialized equipment. The agency puts a considerable emphasis on training our employees in wildfire and all-hazard emergency response. In fiscal year 2018, 46,322 hours were spent by NCFS employees in these trainings. Training for incident response is a career endeavor that is essential for safe incident response.

Along with training comes the need for specialized equipment necessary for wildfire response. This equipment ranges from simple tools like a fire rake to complex tools such as helicopters and single engine air tankers. Each tool has a specific use and it takes all of them for effective wildfire management across the state.

Type 6 engine

The most visible tools include heavy equipment and aviation resources. The most commonly used of these resources is the Type 6 engine. These units are designed for maneuverability to allow for direct attack on wildfires to keep any acres burned as low as possible. Many of the wildfires in the state are controlled by these types of engines, equipped with 150-gallon water tanks, pump and hose along with an assortment of hand tools commonly used in wildland fire fighting.



Figure 7. Type 6 engine

Wildland fire tractor plow units

When wildfires cannot be controlled with these engines, heavier equipment is needed. Wildland fire tractor plow units are the next line of defense (see Figure 8). These units range in size and configurations depending on the terrain in the portion

of the state in which they are located. While configurations vary, the purpose of all these units is to quickly install fire breaks. All of these units are equipped with a plow pulled behind the tractor that allows for the quick construction of a fire break. Currently, the NCFSS has 93 of these tractor plow units across the state that are designated for initial attack of wildland fires.



Figure 8. This John Deere 700J is one of the 93 wildland fire tractor plow units across the state.

Aviation resources

Aviation is a critical tool used in the detection and control of wildfires. In North Carolina, the aviation fleet consists of 11 patrol aircraft, five helicopters and two single engine air tankers (SEATS) along with several support aircraft, as shown in Figures 9-13.



Figure 9. Patrol plane



Figure 10. Astar 350B3 helicopter



Figure 11. Air tractor (AT-802F)



Figure 12. Lead plane (T-34C)



Figure 13. SEAT (single engine air tanker) load crew plane

CONTACT INFORMATION

For further information, please contact:

Greg Hicks
North Carolina Forest Service – Forest Protection Division Director
N.C. Department of Agriculture and Consumer Services
greg.hicks@ncagr.gov
919-857-4838
1616 Mail Service Center, Raleigh, NC 27699-1600

Debbie Robertson
North Carolina Forest Service – Administrative Services Division Director
N.C. Department of Agriculture and Consumer Services
debbie.robertson@ncagr.gov
919-857-4853
1616 Mail Service Center, Raleigh, NC 27699-1600