Fire Management

OBJECTIVE: Track trends in wildland fire and fire management actions.

DATA SOURCES: Fire management records (KCFAST, Firefamily Plus, FACTS (Forest Service Activity Tracking System)

FREQUENCY: Annually.

REPORTING PERIOD: 2014-2016

VARIABILITY: Deviation from historic ranges of wildland fire and desired conditions.

EVALUATION:

The Forest incorporates a comprehensive ecosystem management type model into Forest Plan revision, the two concepts that are utilized are:

> ***Fire Regime*** – a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning. Five such fire regimes have been defined, based on fire frequency and fire intensity, and there is a need to evaluate the Forest in terms of these five regimes.
>
> ***Fire Regime Condition Class*** – a classification of the amount of departure from the natural regime – possibly resulting in alterations of key ecosystem components such as species composition, structural stage, stand age, canopy closure, and fuel loadings. Three condition classes have been identified and there is also a need to evaluate the Forest, based on these three condition classes.

At present, fire regime condition class is being evaluated at the project level to determine the departure from natural regimes so that needed treatments can be identified and implemented as funding and conditions allow. While there has been no forest-wide determination, preliminary indications are that in general, lower elevation areas of ponderosa pine and Douglas-fir types have the most departure and are in greatest need of treatment, followed by mid-elevation mixed conifer types. Upper elevation lodgepole and sub-alpine fir types have the least departure from natural regimes.

MONITORING RESULTS:

Wildland Fire Situation

Overall the 2014 and 2015 fires seasons on the Bitterroot National Forest were pretty much an average season in terms of number of fire starts, and below average in acres burned. The 2016 fire season on the Bitterroot National Forest was one of the mildest with only 35 fires for the year. This fire total is less than half of the average fire load for the past 10 years of 82 fires per year. There was less lightning activity with the thunderstorms and precipitation was present with most storms. There were 10,214 acres burned during the 2016 season, again under the average for the past 10 seasons. Of this total 8,577 acres were on Forest Service ownership lands and 1,637 acres were on State & Private lands within the Bitterroot National Forest fire protection boundary.

Two indices that are tracked each year to determine fire severity are 1000-hr fuel moisture content and the energy release component (ERC). The 1000-hr fuel moisture content represents the fuel moisture content in dead fuels in the 3- to 8-inch diameter class and can range from 1 to 40%. As large dead fuels dry, this number decreases and large fuel moistures below 10% signify the potential for high fire severity.

The energy release component (ERC) is used to provide a relative indication of drought conditions. It relates to the potential heat release per unit area in the flaming zone of a fire front, and as live fuels cure and dead fuels dry, the ERC values get higher. As an example, conditions producing as ERC value of 24 represent a potential heat release twice that of conditions resulting in an ERC value of 12. From 2014-2016, ERC's for 2014-2016

remained around the average range. Periodic rain events never really allowed ERCs to get much above the 90th percentile during the peak of fire season (Figure 1).

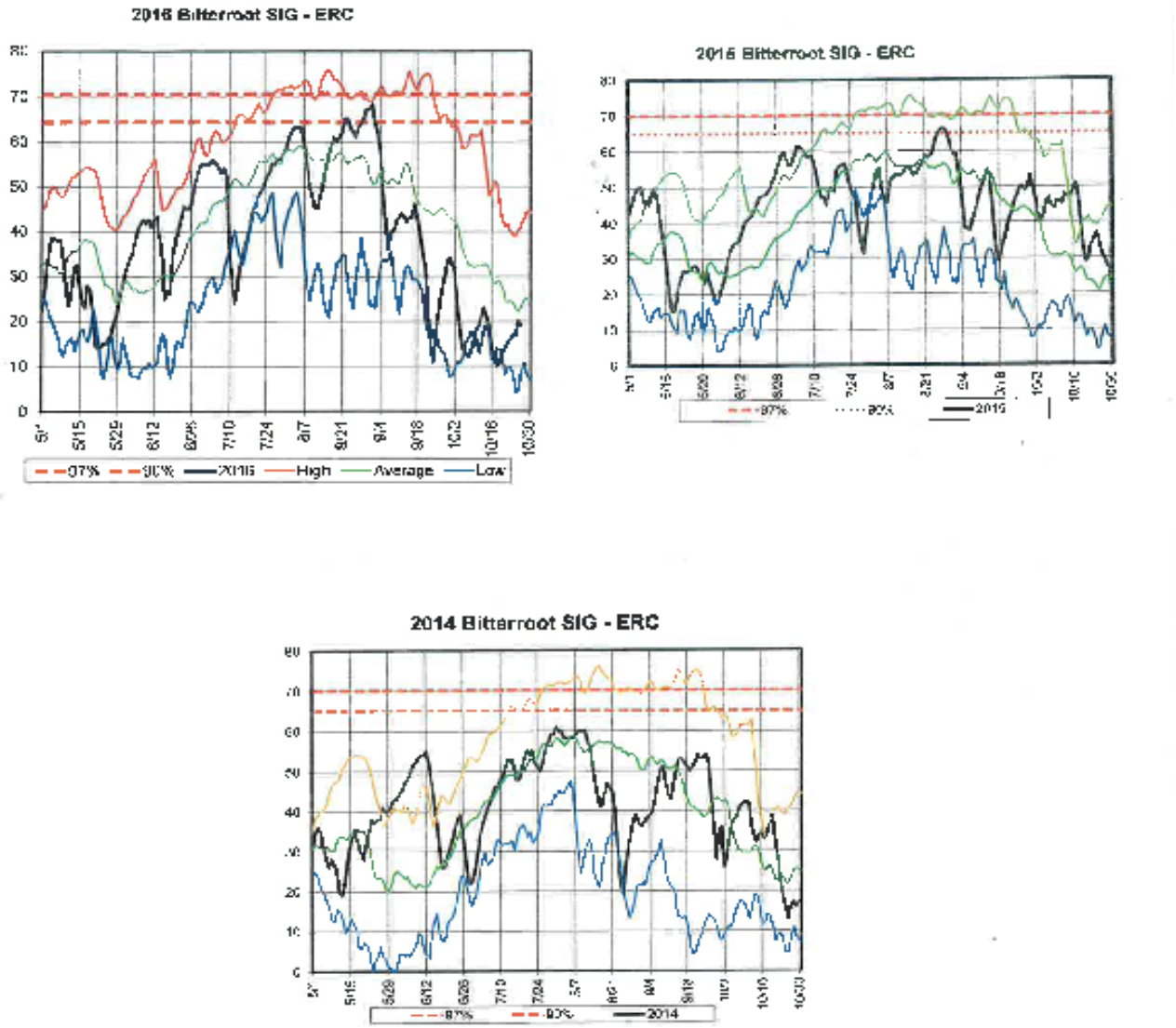

Figure 1 – ERC Chart 2016

The 2016 season's first fire was human-cause and recorded on April 28th, and the first lightning fire was recorded on May 31st. The last lightning fire occurred on September 1st, and the last human-caused fire occurred on September 16th. Two fires, Observation (1,429 acres) and Roaring Lion (8,684 acres), escaped initial attack and were managed by Type 1 Incident Management Teams. The Observation fire started by lightning on June 29th and was managed my Doug Turman's Type I Incident Management Team. The Roaring Lion Fire was human caused and was reported on July 31st and was managed by Greg Poncin's Type 1 Incident Management Team. This fire destroyed 64 structures, of which 16 were residences. On average from 1989 to 2016, the forest averaged 104 fire starts annually. From 2007 through 2016, the average is only 75 fires/year – probably a result of having so many acres now in standing snags and thus less fire starts from lightning (Chart 1).

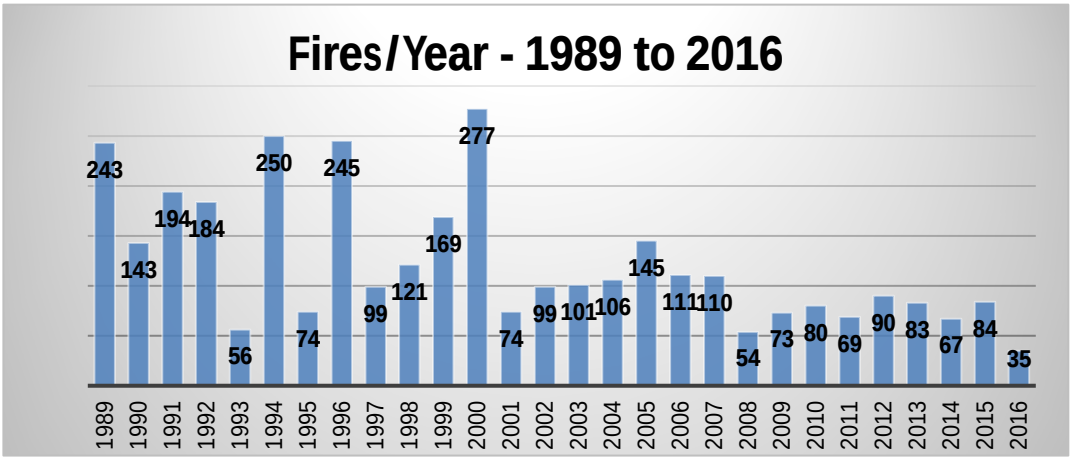

Chart 1 – Fires/Year from 1989 – 2016

Table 1 – Number of Fires by Year within Forest Protection Boundary and by Fire Cause

Type of Fire	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Lightning	229	125	159	154	37	200	49	203	71	112
Human-Caused	14	17	20	30	17	15	25	45	28	9
TOTAL	**243**	**142**	**179**	**184**	**54**	**215**	**74**	**248**	**99**	**121**
Type of Fire	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Lightning	137	249	50	76	96	90	126	74	95	33
Human-Caused	32	28	23	23	5	17	19	28	13	16
TOTAL	**169**	**277**	**73**	**99**	**101**	**107**	**145**	**102**	**108**	**49**
Type of Fire	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**AVERAGE**	
Lightning	55	68	58	78	60	45	68	22	**104**	
Human-Caused	18	12	11	12	23	22	16	13	**20**	

Table 2 – Number of Wildfire Acres Burned By Year within Forest Protection Boundary

Human-Caused	580	3,167	1,891	160	11	773	407	435	25	3,955
TOTAL	**782**	**6,338**	**4,850**	**598**	**464**	**8,364**	**735**	**45,569**	**231**	**26,763**
Type of Fire	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Lightning	3,092	353,199	282	1,153	11,769	1,510	52,902	7,179	50,651	8,092
Human-Caused	340	10,779	6	205	1,374	12	15	8,912	530	6
TOTAL	**3,432**	**363,978**	**288**	**1,358**	**13,143**	**1,522**	**52,917**	**16,091**	**51,181**	**8,098**
Type of Fire	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**AVERAGE**	
Lightning	11,294	1,426	17,407	41,598	43,848	3,962	952	1,502	**25,689**	
Human-Caused	28	25	14	10	3	59	31	8,712	**1,517**	
TOTAL	**11,322**	**1,451**	**17,421**	**41,608**	**43,851**	**4,021**	**983**	**10,214**	**27,206**	

Table 3 – Wildfire Acres Burned By Management Area (MA)

Year	MA 1,2,3a,3b,3c,8b,9,(5/9),(6/9)		MA 5 & 8a	MA 6 & 7	Total
	Roaded Acres	Inventoried Roadless Acres	Acres	Acres	Acres
1996	278	0	163	47,059	47,500
Percent of MA	0.0007	0.0000	0.0006	0.0567	
1997	0	0	0	0	0
Percent of MA	0.0000	0.0000	0.0000	0.0000	
1998	3,794	0	145	20,242	24,181
Percent of MA	0.0094	0.0000	0.0006	0.0244	
1999	0	0	0	3,815	3,815
Percent of MA	0.0000	0.0000	0.0000	0.0046	
2000	121,851	35,455	55,824	96,607	309,737
Percent of MA	0.3019	0.3593	0.2197	0.1164	
2001	0	0	16	2,245	2,261
Percent of MA	0.0000	0.0000	0.0001	0.0027	
2002	17	0	0	1,245	1,262
Percent of MA	0.0000	0.0000	0.0000	0.0015	
2003	2,365	2,630	5,893	44	10,932
Percent of MA	0.0059	0.0267	0.0232	0.0001	
2004	43	0	171	1,096	1,310
Percent of MA	0.0001	0.0000	0.0007	0.0013	
2005	0	952	1,484	38,637	41,073
Percent of MA	0.0000	0.0096	0.0058	0.0466	
2006	2,434	733	889	14,858	18,914
Percent of MA	0.0060	0.0074	0.0035	0.0179	
2007	6,503	5,134	19,175	21,023	51,835
Percent of MA	0.0161	0.0520	0.0755	0.0253	
2008	0	0	26	7,973	7,999
Percent of MA	0.0000	0.0000	0.0001	0.0096	
2009	119	255	4,868	6,734	11,976
Percent of MA	0.0003	0.0026	0.0192	0.0081	
2010	35	169	877	30	1,111
Percent of MA	0.0001	0.0017	0.0035	0.0000	
2011	15,623	2,634	12,749	2,608	33,614
Percent of MA	0.0387	0.0267	0.0502	0.0031	
2012	2,678	2,076	10,989	133,819	149,562
Percent of MA	0.0066	0.0210	0.0432	0.1613	
2013	2	0	0	43,443	43,445
Percent of MA	0.0000	0.0000	0.0000	0.0524	
2014	0	0	54	5,346	5,400
Percent of MA	0.0000	0.0000	0.0002	0.0064	
2015	73	0	0	608	681
Percent of MA	0.0002	0.0000	0.0000	0.0007	
2016	1,117	1,726	4,088	1,575	8,506
Percent of MA	0.0028	0.0175	0.0161	0.0019	

The Bitterroot NF Fire Management Plan identifies the following four Fire Management Units (FMUs): FMU1 includes the wildland urban interface areas; FMU2 includes the active roaded areas; FMU3 includes roadless and unroaded areas outside of wilderness; and FMU4 includes wilderness areas. As the Forest begins the latest Forest Plan revision (Tentatively slated for 2018), these areas will begin to have more significance in monitoring and Table 4 tracks acres burned in each FMU since 1996.

Table 4 – Acres Burned per FMU per Year

Fire Mgt Unit	1996	1997	1998	1999	2000	2001	2002
FMU 1	2,250	0	4,560	430	79,998	16	0
FMU 2	43,907	0	18,058	3,385	88,148	473	1,131
FMU 3	1,218	0	146		64,656	1,772	96
FMU 4	125	0	1,518		128,057	0	129
Total Acres	47,500	0	24,282	3,815	360,859	2,261	1,356
Fire Mgt Unit	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
FMU 1	546	83	2,554	1,839	11,410	1,449	1,724
FMU 2	44	1,077	35,949	14,774	18,816	6,524	4,987
FMU 3	7,594	149	2,574	356	21,046	26	4,077
FMU 4	2,387	0	0	1,985	811	0	1,190
Total Acres	10,571	1,309	41,077	18,954	52,083	7,999	11,978
Fire Mgt Unit	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
FMU 1	501	21,156	6,995	9,344	1,417	53	1,371
FMU 2	18	2,202	128,926	30,620	3,924	604	866
FMU 3	305	7,665	10,839	3,480	59	4	1,715
FMU 4	342	2,599	3,272	16	48	23	6,182
Total Acres	1,166	33,622	150,032	43,460	5,448	684	10,134

	FMU 1	FMU 2	FMU3	FMU4
1996-2016 Average	4,317	17,809	4,278	1,347

*1997 data does not show any acres burned in any MA's or FMU's. This data could not be verified at the time of this report.

Hazardous Fuel Reduction Accomplishments

The Forest's hazardous fuels management program plays an important role in sustaining ecosystems by reducing heavy fuel loadings, reducing fire risk to homes along the wildland urban interface of the Forest, and by restoring vegetation composition and structure to a condition that allows ecosystems to function within their historical range.

The warm, dry ponderosa pine and Douglas-fir vegetation types characterize much of the interface area. Thickets of Douglas-fir in the understory have become established in many of these previously open stands, which puts them at risk for higher intensity wildfires. Under natural conditions, low intensity wildland fires frequently underburned these drier sites and maintained them in a more open condition. Forest managers will continue to reduce fuels in these priority areas and coordinate their efforts with Ravalli County, homeowners, and research scientists.

Table 5, shows acres of hazardous fuels reduced of the Bitterroot National Forest since 1994.

Hazardous Fuels Treatments include broadcast burning, hand piling, slashing/leave tree protection, thinning (commercial/noncommercial), tree removal and pile burning. The majority of this work was done in the WUI. The Forest will continue to work to reestablish its prescribed fire program, but limits on funding and weather conditions may not allow it to reach its annual goal of approximately 4,600 acres.

Table 5 – Hazardous Fuels Program Acres Accomplished Per Year

Year	1994	1995	1996	1997	1998	1999	2000
Acres	2,100	2,000	2,005	5,234	5,700	5,100	2,982
Year	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Acres	755	349	2,191	5,171	2,100	2,090	7,814
Year	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Acres	3,710	4,602	9,167	7,360	9,428	4,514	4,189
Year	**2015**	**2016**	**Total**				
Acres	5,413	5,669	99,643				

In addition to the above acres, wildfire acres also contribute to the reduction of hazardous fuels. Although fire in the ecosystem is a natural and revitalizing process, it does have other consequences. There may be hazy skies, temporary smoke pooling in the valley, and some visible burn patches on the landscape. However, prescribed burns can be timed to allow control of the prescribed burn length, smoke dispersal, and fire intensity. In contrast, wildland fires often create more long-lasting smoke. The Forest has been monitoring air quality in relation to smoke from wildland fires and prescribed fires for several years.

Expanded Cooperative Efforts

As more people continue to build homes in forested settings in the Bitterroot Valley, the complexity of wildland fire suppression in these areas continues to increase. The Bitterroot National Forest, State and Private Forestry program is working cooperatively with the Bitterroot Resource Conservation and Development Area, Inc. (RC&D), State of Montana Department of Natural Resource Conservation, and private landowners in the treatment of hazardous fuels on private lands and National Forest lands immediately adjacent to private lands. Bitterroot National Forest fire management personnel have been providing expertise to the RC&D community forester when working with the private landowners to improve understanding of fire risk in areas that need fuels treatment. They have also been assisting Rural Fire Departments in updating a Community Fire Plan that identifies priority areas for fuels treatment in conjunction with work being planned on adjacent public lands (http://www.bitterrootfireplan.org/).

The State and Private Forestry program provides grant monies and fuels treatment expertise to private landowners to assist them in reducing fire risk on their lands. This increases the chance of successfully suppressing a fire during initial attack and correspondingly reduces risks to lives, homes, and property from a catastrophic large fire. From 2007 to 2016, 117 landowners treated 4,037 acres of their private lands in Ravalli County using $1,490,303 of grant money.

Table 6 – State and Private Forestry Accomplishments

Year	2004	2005	2006	2007	2008	2009	2010
Acres	518	799	146	320	405	425	393
Year	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
Acres	435	635	479	483	222	239	**5,499**