

Monitoring Question

What level of wild land fire on the landscape is appropriate and desirable and, to what extent is unwanted wild land fire on the landscape suppressed?

Monitoring Conducted

Fuel Reduction Associated with 1999 Blow-down

Objective. O-ID-3. *Treat areas of highest fire risk to minimize effects of unwanted wild land fire. Objective. O-ID-4.* *Reduce fuels and control vegetation in the under-story of stands that had naturally occurring low intensity surface fires* **Objective. O-ID-2.** *Establish, maintain, or improve the condition of vegetation using prescribed fire, mechanical treatments, and other tools.*

In October of 2005, 3,510 acres of blow-down fuels were intentionally treated within the Boundary Waters Canoe Area Wilderness (BWCAW) as part of the 2001 BWCAW Fuel Reduction Environmental Impact Statement (BWEIS). During mid and late summer of 2006, wildfires in the BWCAW reduced the Superior National Forest's (SNF) ability to implement a fall prescribed burn program. However, the 2006 Cavity wildfire burned five units proposed in the BWEIS (13,426 acres), resulting in a total of 43,279 acres burned during 2006.

The 2006 BWCAW wildfires, particularly the Cavity Lake wildfire, provided managers an excellent opportunity to: (1) validate the effectiveness of the previous year's prescribed burning in preventing or minimizing blow-down wildfires from exiting the wilderness and threatening life and property; and (2) validate prescribed burn mitigation measures in protecting wilderness resources. The Cavity fire was ignited by a lightning strike on July 14th, 2006 and occurred with heavy blow-down fuels resulting from the 1999 blow-down windstorm. Thunderstorm downdrafts caused rapid spread and high fire intensities in the blow-down fuels.

The monitoring results clearly show what managers viewed on the ground during the Cavity fire. The prescribed fire units accomplished their intended BWEIS purpose and need: "Improve public safety by reducing the potential for high-intensity wildland fires to spread from the BWCAW into areas of urban interface and across the border into Canada". Moreover, monitoring findings did validate that mitigations outlined in the BWEIS and Burn Plans were successful in protecting the soil organic layer, eagle nests, shoreline old forest, and interior old forest. A complete summary of monitoring fire effects can be found in Appendix H. The following major findings were observed:

- *Fuels reduction within the Cavity fire was over twice that of prescribed burns (45% fuel reduction within prescribed burns vs. 95% for Cavity). See Photos 1 & 2.*
- *Soil organic layer was reduced by an average of 79% in the Cavity fire compared to an average of 43% reduction for prescribed burns. See Photos 3 & 4.*
- *It was apparent that there was significantly less surviving shoreline forest in the Cavity fire than observed with prescribed burns. See Photos 5 & 6.*
- *It was apparent that there was significantly less surviving interior forest in the Cavity fire than observed with prescribed burns.*
- *Within the Cavity fire perimeter, 3 eagle nests were affected by the fire but remained intact, and one was destroyed. No known eagle nests were adversely impacted in any of the prescribed burns*



Photo 1. Prescribed Burn.
Trout Lake BU 66. 9/05.



Photo 2. Cavity Burn. W end of Alpine
Lake 7/06.



Photo 3. Pres Burn. BU 307. 9/05.



Photo 4. Cavity Fire. BU 268. 7/06



Photo 5. Shoreline Forest Survival. 2002.
Majority of shoreline forest survived.
3 Mile Island Burn Unit.



**Photo 6. Cavity Fire Shoreline Forest
Survival.** Majority of old shoreline forest
burned.

Wildfires

Desired Condition D-ID-6. *The presence of wildland fire on the landscape is appropriate and desirable, but unwanted wildland fire is actively suppressed where necessary to protect life, investments, and natural resources. The full range of appropriate management responses are considered for unwanted wildland fires.*

The year 2006 was an active year for wildfires on the SNF. Approximately 42,003 acres burned. During mid July, the Cavity Lake and Turtle Lake wildfires occurred. The Cavity fire occurred within the east side of the BWCAW and burned 31,830 acres while the Turtle fire burned 2,085 acres within the BWCAW just north of Ely. During September, the Red Eye and Famine wildfires occurred in the BWCAW, burning 1,792 and 4,104

acres respectively. Table 1 shows 2006 wildfires, acres burned, and when fires occurred. Table 2 displays wildfire acres burned and causes of fires for years 2002-2006, as well as a 5 year average.

Fire	Acres Burned	Time of Year
Scott Creek	36	Sep
Cavity	31,830	July
Turtle	2,085	July
Redeye	1,792	Sept
Famine	4,104	Sept
Sumpett	58	Sept
Patriot	4	Sept

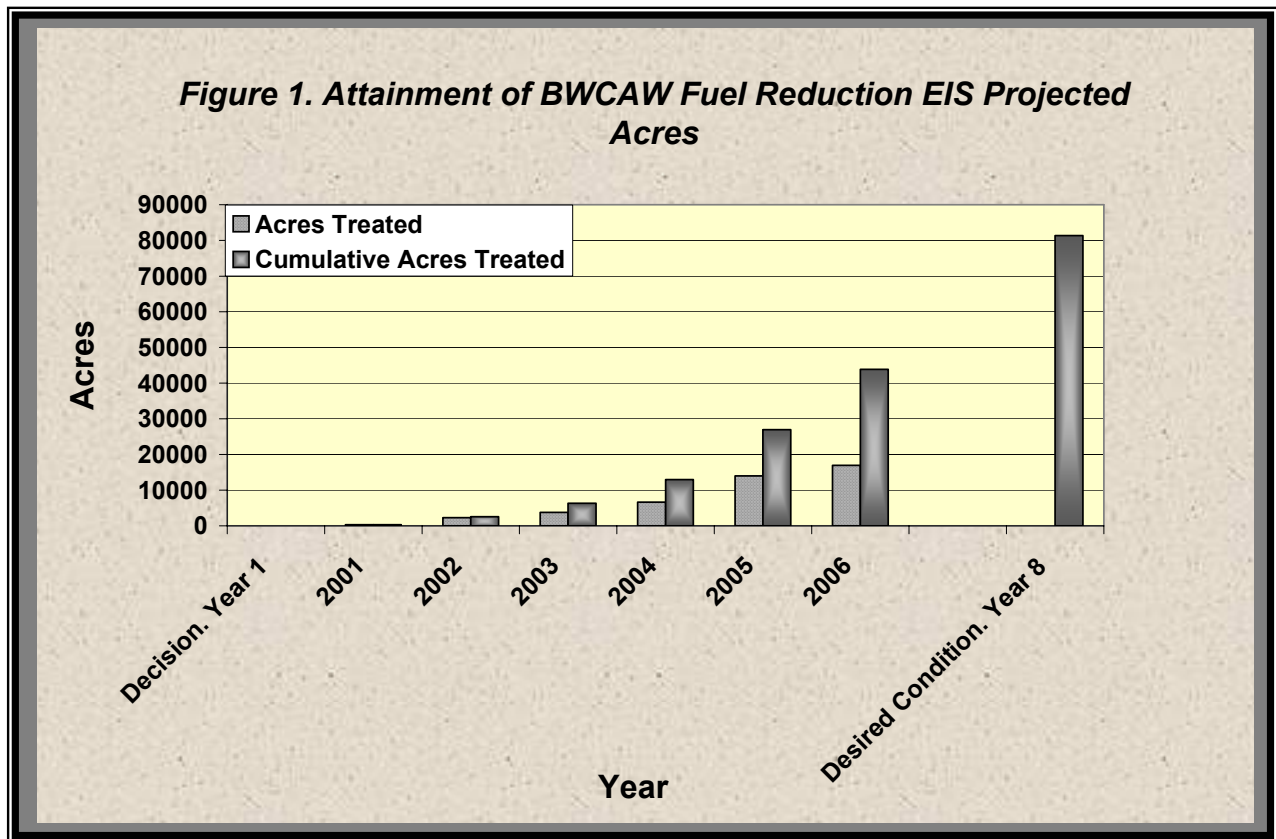
Cause	2002	2003	2004	2005	2006	5-Year Avg.
Lightning	15	10	9	20	39,970	8,005
Equipment	0	4	1	0	7	2
Smoking	0	0	0	3	1	1
Campfire	9	11	7	22	9	12
Debris Burning	10	7	7	6	2	6
Railroad	4	6	6	0	3	4
Arson	0	6	0	3	0	2
Children	0	5	3	4	2	3
Misc.	10	16	9	5	3	9
TOTALS	48	65	42	61	42,003	8,444

Evaluation

Fuel Reduction Associated with 1999 Blow-down

The vast majority of prescribed burning for fuel reduction is planned and has occurred within the BWCAW. Since the 2004 Forest Plan adopts previous BWCAW decisions and management direction including the 2001 BWEIS, the following evaluation focuses on the wilderness fuel reduction program.

Year	Acres Treated	Cumulative Acres Treated	Percent Completion
Decision. Year 1	0	0	
2001	291	291	
2002	2,274	2,565	
2003	3,744	6,309	
2004	6,643	12,952	
2005	13,972	26,924	
2006	16,936	43,860	
Desired Condition. Year 8		81,347	
Status-Total			
Total Project Acres	84,812		
Total Completed	43,279		51%
Dropped	3,465		4%
Incomplete	38,068		49%



The 2001 BWEIS made a decision to treat 84,000 acres of hazardous fuels through prescribed burning by 2008. To date approximately 50% of the 84,000 acres have been treated (see Table 3 and Figure 1). It is unlikely that the remaining untreated acres will be completed within the next 2 years as an average of only 7,300 acres have been treated each year since 2001. Monitoring has shown that fire hazard risk is still high. This was confirmed during the Cavity fire when severe, intense fires occurred within 7 year old blow-down fuels.

Wildfires

There are no Forest Plan objectives or desired projected conditions for wildfire acreage. However, the preponderance of fire in blow-down during 2006 demonstrates the continued high fire risk of blow-down fuels seven years following the 1999 windstorm (see photo 7). This elevated risk is further enhanced by conifer succession, particularly increased balsam fir and spruce budworm infestations (see photo 8).



Photo 7. Cavity Fire. 7/06



Photo 8. Balsam Fir Establishment. Burn Unit 302.

Standards and Guidelines

Four applicable Guidelines (G-ID-1 through G-ID-4, Forest Plan p. 2-19) were monitored during 2006 and all were successfully met and did reduce environmental effects as predicted. Three guidelines address applying minimum tool practices during prescribed burns and wildfires and one guideline addresses hazardous fuel treatments near urban interfaces as a part of Community Wildfire Protection Plans. The successful implementation can be attributed to good communication between field crews and burn planners, and that all the guidelines were discussed during briefings and displayed in daily incident reports.

Necessary Follow-up Actions and Management Recommendations

After reviewing monitoring findings, the Forest Interdisciplinary Team (FIDT) identified one Follow-up Action and two Management Recommendations to carry forward during Fiscal Year 2007. A full list of Follow-up Actions and Management Recommendations are displayed in Appendices A and B.

Follow-up Actions

- ✱ Increase the use of prescribed fire (under burning) in the red and white pine types. Increase mechanical treatments such as thinning where feasible.

Management Recommendations

- ✱ The FIDT should determine the circumstances in which the "where appropriate" statement in Activity Limit Code E listed on Table G-WS-8 (Forest Plan p. 2-16) does and does not apply. It is difficult to retain or return slash following prescribed burning on these ELT's. Furthermore, returning/retaining slash after every harvest increases fire risk near private property, recreation sites, or high use roads. See O-WS-10 (Forest Plan p. 2-12).
- ✱ The FIDT should consider S-VG-4 and G-VG-2 (Forest Plan p. 2-26) and determine if it is acceptable to diverge from 60% canopy closure within patches 100 acres or greater. This standard precludes fuel treatments that may affect the red and white pine over story within stands below 60% canopy closure. Ramifications of this standard include: (1) it is contrary to historic disturbance patterns that were necessary to establish & maintain pine ecosystems, (2) may limit implementation of hazardous fuels reduction projects in areas of heavy under story fuel accumulation, (3) may limit pine regeneration, and (4) may limit under story vegetative diversity.

Collaborative Opportunities To Improve Efficiency And Quality Of Program

Partnerships

The Community Wildfire Protection Plans (CWPP) for Cook, Lake, and St. Louis counties are an efficient way to increase collaboration and cooperation with neighbors and partners. Substantial efforts are ongoing to develop, complete and implement unique CWPPs for each county. These CWPPs describe and define what the local residents and cooperators view as fuel hazards as well as identify priority fuel treatment areas within the Wildland-Urban Interface.

Research

During 2006, one extensive research project pertaining to fire and fuels occurred on the SNF. The project investigated blow-down fuels resulting from the 1999 windstorm and fire effects from prescribed burning and the Cavity wildfire. Anticipated research findings will be valuable in supporting future burn planning across the SNF.

Summary Conclusions

- * Fiscal Year 2006 was an active year for wildfires with seven fires burning approximately 42,003 acres.
- * During Fiscal Year 2006 within the BWCAW, 3,510 acres of blow-down fuels were intentionally treated and five burn units encompassing 13,426 acres were burned by the Cavity wildfire. As of 2006, 43,279 acres identified for burning by the BWEIS have been completed, which is about 50% of the 84,000 acres scheduled in the BWEIS.
- * The completed prescribed fire units did reduce and in some cases prevented the Cavity wildfire from spreading from the BWCAW into areas of urban interface and across the border into Canada.
- * Monitoring findings did validate that mitigations outlined in the BWEIS and Burn Plans were successful in protecting the soil organic layer, eagle nests, shoreline old forest, and interior old forest from impacts by prescribed fire.
- * The preponderance of fire in blow-down demonstrates the continued high fire risk of these fuels 7 years following the 1999 windstorm. This risk is further enhanced by conifer succession, particularly increased balsam fir and spruce budworm infestations.
- * Increase prescribed fire within red & white pine forest to promote seedling establishment
- * Community Wildfire Protection Plans were completed for Cook and Lake counties and initiated for St. Louis county.