

VEGETATION

Key Points

- Preliminary results indicate that vegetation conditions at the Forest level are generally moving towards the desired Forest Plan objectives. Possible exceptions include:
 - Within the Mesic Birch/Aspen/Spruce-fir Landscape Ecosystem, the young (zero to nine years old) age class shows a trend away from the objectives for the first decade, but upcoming vegetation management projects will increase the acres in this class.
- Patch size and number continue to surpass Plan direction in the mature and older red and white pine forest for both 100+ and 300+ acres patch sizes.
- Five 1,000 acre patches were reported in Zone 1 (mature and older upland forests) in 2008 which continues to be less than the Forest Plan guideline of eight.
- Harvesting in the 50-79 years old age class would create young forest (zero to nine years old) that would then mature into the 10-49 years old age class.
- Opportunities exist for timber harvest within the 50-79 years old and 80-109 years old age classes to achieve the young age class objectives in this LE.
- Regeneration harvest in the 50-79 years old and 80-99 years old age classes would increase the percentage of acres in the zero to nine years old group which will lead to an increase in the 10-49 years old age classes.
- In the sugar maple forest types in this LE, there could be some harvesting that creates opportunities for healthy regeneration of sugar maple (with the associated yellow birch, northern white cedar, and other species).
- Opportunities could also be sought to recruit healthy stands for the 160+ years old age class, which is also currently below the desired condition.

A. MONITORING AND EVALUATION

Forest Plan Direction

This monitoring was conducted to address Forest Plan Objective: O-VG-1 Move vegetation conditions from Year 2003 conditions toward the long-term desired composition, structure, age, spatial patterns, and within-stand diversity, Forest Plan Objective: O-VG-13 Maintain a full range of age classes from young to old, including old growth and multi-aged growth stages, for the variety of forested vegetation communities within each landscape ecosystem, and Forest Plan Objective: O-VG-8 Restore structural diversity and ecosystem processes within stands when harvesting or burning by retaining a diverse mix of trees, shrubs, and herbs; live and dead standing trees; earth and tree root mounds caused by uprooted trees; coarse or large woody debris from fallen trees; and patches of live trees.

Monitoring Conducted

Forest Vegetation Composition, Structure, and Age and Spatial Distribution

Changes in vegetation composition, age, structure, within-stand diversity, and mature pine and lowland forest patch spatial distribution were monitored using the Combined Data System (CDS) database and associated Geographic Information System (GIS) spatial data. The Forest “froze” the CDS database November, 2008 to display both accomplished, planned (NEPA decisions not yet implemented), and unplanned disturbance activities or events which had occurred since October 1, 2007.

Vegetation treatment accomplishments entered into the CDS database included clearcutting with reserve trees, prescribed burning, timber stand improvement, commercial thinning and reforestation. These activities were identified and approved in National Environmental Policy Act (NEPA) projects approved before the 2004 Revised Forest Plan (FP) (Holmes/Chipmunk Environmental Impact Statement (EIS) and the Red Pine/White Pine Thinning Environmental Assessment (EA) as well as after. In addition, changes to the vegetation from environmental disturbances (i.e., Ham Lake wildfire) were entered into the database.

Monitoring of upland mature and older forest patches within Spatial Management Zones 1, 2 and 3 entailed a review of forest vegetation condition changes documented in CDS during 2008.

Post-fire monitoring involving age-class and compositional changes as a result of the Ham Lake wildfire is still ongoing. Within the affected Landscape Ecosystems (LE), preliminary findings indicate changes within the Jack Pine/Black Spruce (JPB) LE and Mesic Birch-Aspen-Spruce-Fir (MBA) LE remain consistent with Forest Plan objectives.

Evaluation and Conclusions

Forest Vegetation Composition, Structure and Age

Changes in vegetation composition and age class distribution in the JPB, Dry-Mesic Red and White Pine (DRW), Mesic Red and White Pine (MRW), MBA, Sugar Maple (SMA), and Lowland Conifer (LLC) Landscape Ecosystems were evaluated. The evaluations reflect actual accomplishments to date plus activities planned through formal NEPA decisions. The 2008 results indicate that vegetation conditions on a Forest-wide scale are generally moving towards the desired Forest Plan objectives. Composition and age changes for Landscape Ecosystems are included in Appendix A. Some conclusions include the following:

- In the MRW, species composition is close to the desired Forest Plan objectives. Existing age class distribution deviates somewhat from desired conditions. Age class 10-49 years old is under (35% 2008 existing versus 45% desired condition) and age 50-79 years old is over (25% 2008 existing versus 16% desired condition) the desired condition. Harvesting in the 50-79 years old age class would create

young forest (zero to nine years old) that would then mature into the 10-49 years old age class.

- In the JPB LE, the young age class is currently at nine percent and trending upward toward the desired condition of 14 percent. Opportunities exist for timber harvest within the 50-79 years old and 80-109 years old age classes to achieve the young age class objectives in this LE. For example, the Echo Trail Project has proposed regeneration harvests in 2009 and 2010 that would harvest acres of 50+ year old mature jack pine to move towards desired conditions in the zero to nine year age class.
- In the MBA LE, the zero to nine year young age class continues to show a trend below the desired condition in the Forest Plan (five percent 2008 existing versus 10% desired condition). Regeneration harvest in the 50-79 years old and 80-99 years old age classes would increase the percentage of acres in the zero to nine years old group which will lead to an increase in the 10-49 years old age classes.
- In the SMA LE, the 10-49 years old group is under the desired condition (27% 2008 existing versus 34% desired condition) and the 50-99 years old group is over (22% 2008 existing versus 18% desired condition). Regeneration harvesting in the older age group will move the LE toward desired conditions. In the sugar maple forest types in this LE, there could be some harvesting that creates opportunities for healthy regeneration of sugar maple (with the associated yellow birch, northern white cedar, and other species). Regeneration is achieved by creating small openings (disturbances) in the forest that allow gaps in the canopy to provide enough sunlight for young seedlings and saplings.
- In all LLC LEs, the young age class (zero to nine years old) is one to three percent below the desired conditions. To move towards desired conditions in both the young and older age classes in the LLC-A (within JPB and DRW LEs), regeneration harvest could be concentrated in the 40-79 years old age class, while in the LLC-B (within MRW and MBA LE's) and LLC-C (within SMA LE), regeneration harvest should be primarily in the 80-159 years old age class. Opportunities could also be sought to recruit healthy stands for the 160+ years old age class, which is also currently below the desired condition.

Vegetation Spatial Distribution

Changes in forest vegetation spatial distribution in mature and older red and white pine forest, mature and older upland forest, and mature and older lowland conifer forest were also evaluated (Table 8.1). The pine and lowland conifer mature/older forest was reviewed Forest-wide while upland forest was evaluated by the three spatial zones delineated in the Forest Plan (p.2-25). Within the upland mature and older forest (UMOF) Zones 1 through 3, definitive trends are difficult to determine as most values remain essentially steady and continue to exceed Forest Plan direction. Some conclusions include the following:

- Within the red and white pine mature and older forest, patch size and number continue to surpass Forest Plan direction for both 100+ and 300+ acre patch sizes. The trend since 2005 shows continued increases in both categories. This increase

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likely resulted from succession of forest stands into older age classes and updated inventories.

- Within UMOF Zone 1, the number of 1000+ acre patches identified during 2008 was five, which is below the desired Forest Plan number of eight.
- Within UMOF Zone 2 the Forest Plan direction is to maintain one patch at 11,700 acres (which was in existence in 2004). Current condition shows an existing patch of 16,297 acres. Early signs of fragmentation are appearing which may affect the integrity of the patch in the future. This fragmentation appears to be primarily due to wind events which create young forest gaps in the existing patch.
- In UMOF Zone 3, patch size of all categories continues to exceed the existing condition as documented in 2004; however the number of patches (with the exception of those 10,000+ acres) is declining. The decrease in the number of 300+ acre and 1000 + acre patches can be attributed to wildfires, merging of smaller patches due to succession, and management actions such as timber harvest.
- Size and number of all patch categories in the lowland conifer mature and older forest continue to exceed those existing in 2004.

It is premature to discuss long term accomplishments or trends for several reasons including the following:

- Less than 30 percent of the ten vegetation project decisions approved since the 2004 Forest Plan have been fully implemented.
- The “pool” of young forest is continually changing as new areas (reforestation of post timber harvest, fire/wind damaged areas, etc) are added, while at the same time, previous young forest is lost due to succession. Therefore, net changes in a given year are difficult to evaluate. More data will be available later in the decade which will show more meaningful trends, therefore, monitoring will continue through the planning period.
- Project level activities do not occur uniformly across all LE’s. Therefore, opportunities to manage vegetation may be relatively absent in the early life of the Forest Plan while more abundant in the latter years. Trends in the data likely won’t be more meaningful until the midpoint of the decade (planning period).

B. MANAGEMENT CONSIDERATIONS

The SNF needs to strive to create three additional patches of upland forest in Spatial Zone 1 to meet Forest Plan guideline G-VG-5 (Forest Plan pgs 2-24 – 2-26). G-VG-5 states that a minimum of eight patches (greater than 1,000 acres in size) of mature or older upland forest should be maintained in Spatial Zone 1. In FY 2008, five patches greater than 1,000 acres occurred in Spatial Zone 1.

Table 8.1. Changes in vegetation spatial distribution (patch type and size) on the Superior National Forest between 2004 and 2008.

Patch Type/ Size Category	Forest Plan Standards and Guidelines		Existing Condition (ROD – 04/04)		Forest-wide Condition 9/30/08*	
	Acres	#	Acres	#	Acres	#
Red/White Pine Mature and Older Forest (Forest-wide)						
100+ ac	17,300	88	17,300	88	21541	104
300+ ac	4,700	8	4,700	8	7311	13
All Upland Mature and Older Forest by Zone						
Zone 1						
300+ ac	44,700	n/a	51,500	86	44543	77
1,000+ ac	n/a	8	13,200	8	9467	5
Zone 2						
300+ ac	54,400	n/a	60,700	35	63,377	36
1,000+ ac	n/a	14	50,000	14	52,329	15
(5000-9999) 1/	n/a	n/a			32,794	4
10,000+ ac	11,700	1	13,000	1	16,297	1
Zone 3						
300+ ac	O-VG-24 Strive to minimize decrease		185,200	177	195,676	166
1,000+ ac	in acres& numbers		116,500	47	132,687	44
10,000+ ac	of patches of mature or older upland forest in patches ≥300 acres.		10,100	1	31,430	2
Lowland Conifer Mature and Older Forest (Forest-wide)						
100+ ac	O-VG-19 Maintain		72,500	310	101,409	420
300+ ac	representative array		30,300	52	46,386	81
1,000+ ac	of large patches (≥ 300 ac) of mature or older lowland forest		6,600	4	11,100	7
*Values reflect existing condition, decision, and conditions resulting from currently completed project decisions.						