

**Monitoring Conducted**

(1) Forest Vegetation Composition, Structure, and Age and (2) Vegetation Spatial Distribution

Changes in vegetation composition, age, structure, within-stand diversity, and mature pine and lowland forest patch spatial distribution were monitored through the Combined Data System (CDS) database and associated Geographic Information System (GIS) spatial data. The Forest “froze” the CDS database in November, 2007 to display both accomplished, planned (NEPA decisions not yet implemented), and unplanned disturbance activities or events which had occurred since October 2006.

Vegetation treatment accomplishments entered in the CDS database included clear cutting with reserve trees, prescribed burning, timber stand improvement, commercial thinning and reforestation. These activities were identified and approved in NEPA projects approved before the 2004 Forest Plan Revision (FP) (Holmes/Chipmunk EIS and the Red Pine/White Pine Thinning EA) and projects approved after the FP (Tomahawk, Dunka and Eastside Thinning, Virginia). In addition, impacts from environmental disturbances (Ham Lake wildfire etc) were entered into the database.

Monitoring of upland mature and older forest patches within Spatial Management Zones 1, 2 and 3 entailed review of changes documented in CDS during 2007.

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

Within the Mesic Red White Pine (MRW) LE, the young age class (0-9 years) appears to be more seriously impacted. The extent to which this has occurred is still being analyzed.

**Vegetation Summary Points**

- \* Preliminary results indicate that vegetation conditions on a Forest-wide scale are generally moving towards the desired Forest Plan objectives. Possible exceptions pertaining to vegetative composition include:
  1. Within the Mesic Red and White Pine LE, the northern hardwoods forest type may exceed Decade 1, 2 and Long-term (100 yr) objectives. The forest type would be 3% instead of the 2% objective at this time.
  2. Within the Jack-Pine Black Spruce (JPB) LE, the white pine forest type is likely to exceed Decade 1, 2 and Long-term (100 yr) objectives. The forest type would be 4% instead of 3%.
  3. Within the Mesic Birch/Aspen/Spruce-fir (MBA) LE, the young (0-9 years) age class shows a trend away from Decade 1 objectives.
- \* Within the Red/White Pine Mature and Older Forest, acres and number of patches continue to surpass Plan direction for both 100+ and 300+ acre patch sizes. The trend since 2005 shows continued increases in both categories.
- \* Within Zone 1 (Upland Mature and Older forests), the number of 1,000 acre patches reported in 2007 was 5 and continues to be less than the Forest Plan guideline of 8 patches.
- \* Within Zone 2 (Upland Mature and Older forests), the Forest Plan standard is to maintain 1 patch at 11,700 acres. Current condition shows this currently existing patch has been fragmented to less than 10,000 acres.
- \* Continue to integrate the Native Plant Community Classification concept into inventory efforts on the Forest. In 2006, this classification option was integrated into the Field Sampled Vegetation (FSVeg) database, a Forest Service-wide application and is now routinely collected in forest inventory work.

## Evaluation and Conclusions

### Forest Vegetation Composition, Structure, and Age

Changes in vegetation composition and age class distribution in the Jack Pine/Black Spruce, Dry-Mesic Red and White Pine, Mesic Red and White Pine, Mesic Birch/Aspen/Spruce-Fir, Sugar Maple, and Lowland Conifer Landscape Ecosystems (LE) were evaluated. The evaluations reflect actual accomplishments to date plus activities planned through formal NEPA decisions. These preliminary (third year) 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 F. Possible exceptions include the following:

- \* Mesic Red and White Pine LE: Within the Mesic Red and White Pine LE, the proportion of northern hardwoods forest type may exceed Decade 1, 2 and long term (100 yr) objectives. Although the forest type would be 3% instead of the long term 2% objective at this time, this forest type may warrant management to decrease the percent down to the 2% objective. This is because the northern hardwood tree diversity objective (FP, Table MRW-3, p. 2-68) is to decrease the percentage of northern hardwoods. Site-specific analysis of management opportunities will be important in making this decision since the difference in the observed long-term trend and the objective may be the result of improved inventory.
- \* Jack Pine/Black Spruce (JPB) LE: The proportion of white pine forest type has the potential to exceed Decade 1, 2 and long term (100 yr) objectives (3%, 3%, and 2% respectively). Because the white pine tree diversity objective is to increase percent of white pines, any additional recruitment of white pine trees will move the Landscape Ecosystem towards the tree species objective of increasing white pine across the landscape.  
The young age class (0-9) shows a persistent trend downward from the Management Direction for the first decade (14%). Opportunities may exist in harvesting within the 50-79 and 80-109 age classes (which indicate a likely surplus at the end of Decade 1) to “create” the desired young age class conditions.
- \* Mesic Birch/Aspen/Spruce-Fir (MBA) LE: The young age class (0-9) shows a trend downward from the Management Direction for the first decade (10%). Opportunities may exist in harvesting within the 50-79 age class (which indicates a likely surplus at the end of Decade 1) to “create” the desired young age class conditions.
- \* Lowland Conifer Landscape (LLC) LE: While less pronounced as shown for the JPB and MBA LE’s, the young age classes (0-9) in all categories show a trend away from meeting the Decade 1 Management Direction. In LLC-A and LLC-B, opportunities may exist to harvest in the 40-79 age classes so as to “create” desired young age class conditions. Within LLC-C, those opportunities would likely occur in the 80-159 age class.

### Vegetation Spatial Distribution

Changes in Forest Vegetation spatial distribution in the Red/White Pine, Upland, and Lowland Conifer Mature and Older forest were also evaluated. The pine and lowland conifer mature/older forest was reviewed Forest wide while Upland Forest was evaluated by zones.

Within the Red/White Pine Mature and Older Forest, acres and number of patches continue to surpass Plan direction for both 100+ and 300+ acre patch sizes. The trend since 2005 shows continued increases in both categories. This increase likely resulted from succession of forest stands into older age classes and updated inventories.

Within the Upland Mature and Older Forest (Zones 1 through 3), definitive trends are difficult to determine as most values remain essentially steady and continue to exceed Plan direction. An exception is the number of 1000+ acre patches in Zone 1 which remains three patches below the desired Forest Plan number of eight. A second situation occurs within Zone 2 where Forest Plan direction is to maintain 1 patch at 11,700 acres (which was in existence in 2004). Current condition shows an existing patch of 16,126 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 Zone 3, while acreages of all patch sizes continue to exceed the existing condition as documented in 2004, the actual numbers of patches (with the exception of those 10,000+ acres) show declines. The reason for this is undetermined.

Within all patch sizes in the Lowland Conifer Mature/Older Forest, acreages and numbers continue to exceed those existing in 2004.

Changes in spatial distribution (patch types and sizes) between 2004 and 2007 are shown in Table 1 and Figures 1 through 3.

It is premature to meaningfully discuss long term accomplishments or trends for several reasons. These reasons include:

- \* With a very limited number of vegetation management decisions since Forest Plan approval in 2004, only a small portion of the Forest has had project (site-specific) level implementation.
- \* The “pool” of young forest is continually changing as newly created areas (reforestation of post timber harvest, fire/wind damaged areas etc) are added, while at the same time, previously young forest is lost due to succession. For this reason, net changes in a given year are not meaningful until the Forest is 5 to 6 years into implementation of the Forest Plan and trends can be meaningfully discussed.
- \* Project level activities do not necessarily uniformly occur across all LE’s. For this reason, opportunities to manage vegetation may be relatively absent in the early life of the Forest Plan while abundant in the latter years of implementation. It is likely to be closer to years 4 through 6 (the midpoint of the decade) before trends can be meaningfully determined

<b>Table 1. PATCH SPATIAL DISTRIBUTION. ACHIEVEMENT OF FOREST PLAN DIRECTION</b>										
Patch Type and Size Category	Forest Plan Standards and Guidelines		Existing Condition (ROD – 04/04)		Forest-wide Condition 9/30/05*		Forest-wide Condition 9/30/06*		Forest-wide Condition 9/30/07*	
	Acres	#	Acres	#	Acres	#	Acres	#	Acres	#
<b>Red/White Pine Mature and Older Forest (Forest-wide)</b>										
100+ ac	17,300	88	17,300	88	20,400	100	20,485	97	21,573	103
300+ ac	4,700	8	4,700	8	6,000	9	7,061	11	6,981	12
<b>All Upland Mature and Older Forest (Zones 1, 2 and 3)</b>										
<b>Zone 1</b>										
300+ ac	44,700	n/a	51,500	86	45,500	79	43,948	76	45,286	79
1,000+ ac	n/a	8	13,200	8	9,200	5	9,397	5	9,406	5
<b>Zone 2</b>										
300+ ac	54,400	n/a	60,700	35	63,000	37	62,814	38	63,400	38
1,000+ ac	n/a	14	50,000	14	52,700	16	51,588	15	51,780	15
(5000-9999) 1/	n/a	n/a			33,600	5	16,525	3	16,547	3
10,000+ ac	11,700	1	13,000	1	0	0	16,063	1	16,126	1
<b>Zone 3</b>										
300+ ac	O-VG-24 Strive to minimize decrease in acres & numbers of patches of mature or older upland forest in patches ≥300 acres.		185,200	177	207,400	179	201,845	173	198,843	168
1,000+ ac			116,500	47	139,400	49	134,775	46	132,231	42
10,000+ ac			10,100	1	29,800	2	30,320	2	30,980	2
<b>Lowland Conifer Mature and Older Forest (Forest-wide)</b>										
100+ ac	O-VG-19 Maintain representative array of large patches (≥ 300 ac) of mature or older lowland forest		72,500	310	99,400	415	98,314	412	100,579	419
300+ ac			30,300	52	44,838	77	43,763	77	45,283	79
1,000+ ac			6,600	4	11,299	7	10,854	7	11,100	7

\*Values reflect existing plus decision plus conditions resulting from currently completed project decisions.

