

VEGETATION MANAGEMENT (VEG)

(1) Overview

(A) Summary of Assessment of Need for Change in Forest Plan

No need for change in the Forest Plan for vegetation management objectives is identified. Since desired conditions are long-term and not easily measured (FP, Page 1-7), detecting overall vegetative trends is difficult during a first year of Forest Plan implementation. Overall, during this first year of implementation, projects generally are promoting conditions that should trend the Forest toward desired conditions. For example, Landscape Ecosystem (LE) vegetation conditions are generally trending toward objectives, and associated standards and guidelines are being met. Where LE vegetation conditions are not trending toward objectives, no obvious factor or problem with implementability has been singled out in this first year that would drive either a Forest Plan amendment or reanalysis. It will continue to be important to annually measure and evaluate vegetation and LE objectives (FP, p. 2-55).

(B) Landscape Ecosystems and Forest Stand Data: Changes in data and GIS layer from Planning to Implementation

NRRI map to Implementation Map

During Forest Plan revision, existing and desired future vegetation conditions (forest type and age) of Landscape Ecosystems (LE) were modeled based on a GIS layer called "NRRI LE map". The NRRI LEs were mapped at a relatively coarse scale by NRRI (Natural Resources Research Institute) for the Minnesota Forest Resource Council project of describing range of natural variability of ecosystems and species at appropriate landscape scales. This project is described in the Forest Plan Environmental Impact Statement, Vol II, Appendix G, p. G-2.

During the first year of Forest Plan implementation the NRRI LE map was replaced with a refined GIS map now called "LE Implementation map". Refinements to the NRRI map were necessary to correct a variety of technical errors, omissions, or other "glitches" that would have made implementation of LE forest vegetation problematic. The likelihood that changes such as these would occur over the course of the plan implementation period was both acknowledged and predicted in the Forest Plan (p. 2-55 in the *Vegetation Objectives Overview* section). Changes made to the map resulted in some changes to acres of "existing conditions" (as shown in FP, tables 1 and 2 for each Landscape Ecosystem, pp. 2-61 to 2-77 and below in Section 3 LE tables). Changes to the documented existing condition were not significant, and would not affect long-term objectives for forest vegetation.

Some of the key changes included:

- Upland forest types that were incorrectly mapped in the NRRI map as Lowland Conifer LE were remapped to upland forest LEs. This was done using a combination of methods, including: "Nearest neighbor" mapping: for example, an aspen stand in Lowland Conifer that was contiguous with another aspen stand in the Mesic Aspen/Birch/Spruce Fir LE (MBA), was changed to MBA.
 - Lowland forest types were remapped to appropriate Lowland Conifer LEs.
 - White cedar and black ash, forest types previously mapped within Lowland Conifer LEs were placed in separate layers so that their Forest-wide type and age trends can be tracked: although there are no quantified objectives for black ash and cedar forest type ages, O-VG-13 provides Forest-wide direction to "Maintain a full range of age classes from young to old, including old growth and multi-aged growth stages..,"; and O-VG-3 provides Forest-wide direction to maintain white cedar and black ash types.
 - Rich Swamp LE was dissolved and incorporated into appropriate LEs – or, into the white cedar or black ash layers, if they were one of these forest types.
 - Non-forest stands, such as, grasslands, fens, open bogs, or lowland brush, were removed from the LEs and are now in a separate non-forest layer where their Forest-wide successional stage trends can be tracked..
 - Unmapped stands and stand fragments, including those that were not suitable for timber production or those that were outside the Northern Superior Uplands, were assigned to appropriate LEs.
- Other changes to forest type vegetation:
Some changes in acres of forest types and ages within the LEs also resulted from updated field inventory.

(C) New Tools for Inventorying and Monitoring Vegetation: Native Plant Communities

Individual Tree Crown (ITC) is a new technology for inventorying forest vegetation with helicopter-captured stereographic photographs and high resolution high elevation images of the Northeast Minnesota landscape. Trees on the helicopter photographs can be measured at accuracy levels parallel to field plot examinations. This plot level data is used as training information in a process that classifies trees and stands across the high resolution image. Acquiring accurate stand level forest inventory data at affordable costs is one of the largest challenges facing the Superior National Forest and other Northeast Minnesota land managers. This information is vital in the inventory, monitoring, and subsequent management of vegetation, fuels, and wildlife habitat.

During FY04 and FY05 the Superior National Forest, in conjunction with other partners, conducted an ITC pilot test. The test demonstrated that ITC inventory has the potential to replace traditional methods such as SilvExam for large scale vegetation inventories. The cost of using this technology is much less than conventional technology. The information resulting from successful implementation of this method would provide enhanced data to analyze vegetation conditions and treatments, wildlife habitat, and hazardous fuels. This information is expected to be improved and more comprehensive than what is currently available using existing technologies. Stand level data can include: tree and forest canopy height; average tree crown

diameter; diameter of tree at breast high; basal area of trees; and percent of forest canopy closure for up to two age cohorts of a maximum of ten tree species. Measurements are also recorded for standing dead trees (snags) and down large woody debris.

Although this project is promising, further information is needed and the Superior will continue to pilot and test the methodology in 2006 and 2007.

(2) Monitoring Activities

Monitoring Question

To what extent are Forest management, natural disturbances, and subsequent recovery processes changing vegetation composition and structure? To what extent are conditions moving toward short-term (1-20 years) and long-term (100 years) objectives at Landscape Ecosystem, Management Area, and other appropriate landscape scales?

NOTE: This monitoring question is addressed in two groups of monitoring drivers and activities:

- A) Forest Vegetation Composition/Structure and Forest Vegetation Age
- B) Within-stand Structural Diversity.

A. Monitoring Drivers:

Forest Vegetation Composition and Structure

Objective.O-VG-1. Move vegetation conditions from Year 2003 conditions toward the long-term desired composition, age, spatial distribution, and within stand diversity.

Objective. O-VG-2. Increase acres of red, white, and jack pine, spruce/fir, and northern hardwood vegetation communities. Decrease acres of aspen vegetation communities.

Objective.O-VG-3. Maintain acres of lowland conifer and lowland hardwood vegetation communities.

Objective.O-VG-9. Increase the amount of multi-aged forest communities in a variety of vegetative growth stages, including stages dominated by young, mature, old, and old growth trees. To successfully achieve a diversity of healthy multi-aged stands, a variety of vegetation management practices that are ecologically appropriate to the forest community will be used. This will include an increase in the percentage of uneven-aged timber harvest practices used to manipulate vegetation, with a decrease in percentage of clearcutting.

Forest Vegetation Age

Objective. FWD. 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.

Objective. FWD. O-VG-14. Increase acres of old forest, old-growth forest, and multi-aged upland forest vegetation communities.

Objective. FWD. O-VG-16. Increase acres of young lowland black spruce and tamarack forest communities. Increase acres of old-growth lowland black spruce and tamarack forest communities.

Applicable Monitoring Activity, Practice, Or Effect Measured	Methods	When Monitored	Location or Project Area
<u>Forest Vegetation Composition (Forest Type) by Landscape Ecosystem</u> Jack Pine-Black Spruce (JPB) Dry-mesic Red and White Pine (DRW) Mesic Red and White Pine (MRW) Mesic Birch-Aspen-spruce-Fir (MBA) Sugar Maple (SM) Lowland Conifer (LLC-A, -B, and -C combined)	Compartment Stand Data (CDS) for forest type/age intersected with GIS LE polygons; calculated using LE age and composition models documented in Forest Plan (Chapter 2). (Current technology requires use of CDS since as of FY06 FACTS does not yet have a spatial component.)	End of Fiscal Year 05 (frozen database 11/2005)	Forest-wide by Landscape Ecosystem
<u>Composition of Lowland Hardwood Vegetation Communities</u> Black Ash forest type	Compartment Stand Data (CDS) for black ash forest type.	End of Fiscal Year 05 (frozen database 11/2005)	Forest-wide
<u>Forest Vegetation Age by Landscape Ecosystem</u> Jack Pine-Black Spruce (JPB) Dry-mesic Red and White Pine (DRW) Mesic Red and White Pine (MRW) Mesic Birch-Aspen-spruce-Fir (MBA) Sugar Maple (SM) Lowland Conifer-A (LLC-A in JPB, DRW) Lowland Conifer B (LLC-B in MRW, MBA) Lowland Conifer-C (LLC-C in SMA)	Compartment Stand Data (CDS) for forest type/age intersected with GIS LE polygons; calculated using LE age and composition models documented in Forest Plan (Chapter 2). (Current technology requires use of CDS since as of FY06 FACTS does not yet have a spatial component.)	End of Fiscal Year 05 (frozen database 11/2005)	Forest-wide by Landscape Ecosystem

B. Monitoring drivers:

Within-stand Structural Diversity

Objective. FWD. O-VG-6. Restore the diversity of tree species within stands to conditions more representative of native vegetation communities by increasing the component of white pine, red pine, paper birch, yellow birch, upland tamarack, and in some areas, white spruce and black spruce.

Objective. FWD. 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.

Objective. FWD. O-VG-15. In forest managed to meet desired conditions and objectives for the old growth and multi-aged old growth forest vegetative growth stages, manage forest to promote old growth characteristics.

Applicable Monitoring Activity, Practice, Or Effect Measured	Methods	When Monitored	Location or Project Area
<u>Within-stand tree species diversity by Landscape Ecosystem:</u> Jack Pine-Black Spruce (JPB) Dry-mesic Red and White Pine (DRW) Mesic Red and White Pine (MRW) Mesic Birch-Aspen-spruce-Fir (MBA) Sugar Maple (SM)	Forest Inventory Assessment (FIA) plot data estimates of stem density by species, by Landscape Ecosystem. All land ownerships.	Monitoring occurred in 2005 as part of multiple year contract through MN DNR and North Central Research Station	Northern Minnesota FIA areas, all ownerships
Retention of diverse mix of trees. Shrubs, and herbs; live and dead standing trees; earth and tree root mounds, coarse or large woody debris; and patches of live trees.	<u>Site level:</u> vegetation management projects: tree planting; harvest method; timber sale unit design features; prescribed fire	End of Fiscal Year 05	Tomahawk EA Dunka EA Virginia EIS

Monitoring Question

To what extent are Forest management, natural disturbances, and subsequent recovery restoring vegetation spatial landscape patterns and moving conditions toward both short-term (1-20 years) and long-term (100 years) objectives at Landscape Ecosystem, Spatial Zone, Management Area, and other appropriate landscape scales?

Monitoring Drivers:

Objective. O-VG-1. Move vegetation conditions from Year 2003 conditions toward the long-term desired composition, age, spatial distribution, and within stand diversity.

Objective. O-VG-17. In mature or older upland forest types managed to maintain large patches (>300 acres of all types) manage patches to maintain the characteristics of mature or older native upland forest vegetation communities and promote the maintenance or development of interior forest habitat conditions.

Objective O-VG-18. In mature or older red and white pine forest types managed to maintain large patches (100 acres or greater), manage patches to maintain the characteristics of mature or older native upland forest vegetation communities and promote the maintenance or development of interior forest habitat conditions.

Objective O-VG-19. Maintain a representative array of large patches (>300 acres) of mature or older lowland forest.

Objective O-VG-20. Create large patch temporary openings up to 1000 acres through management activities.

Objective O-VG-21. Increase average size of temporary openings. Reduce amount of forest edge created through vegetation management activities, while still retaining a range of small patches and edge habitat.

G-VG-1: The number of patches >300 acres that are older red & white pine forest types will generally not be reduced below 8.

S-VG-2: Maintain a minimum of 4,700 acres of mature and older red and white pine forest types in patches >300 acres.

G-VG-2: Maintain a minimum of 88 patches of mature and older red & white pine forest types in patches >100 acres in size.

S-VG-3: Maintain a minimum of 17,300 acres of mature and older red and white pine forest types in patches >100 acres.

G-VG-4: In Spatial Zone 2 maintain a minimum of one patches of mature and older upland forest in patches of >10,000.

S-VG-5: In Spatial Zone 2 maintain a minimum 11,700 acres of mature and older upland forest in patches of >10,000 acres.

G-VG-5: In Spatial Zone 1 maintain a minimum of 8 patches of mature or older upland forest in patches of >1,000 acres.

G-VG-6: In Spatial Zone 2 maintain a minimum of 14 patches of mature and older upland forest in patches of >1,000 acres.

S-VG-6: In Spatial Zone 1 maintain a minimum 44,700 acres of mature and older upland forest in patches of >300 acres.

S-VG-7: In Spatial Zone 2 maintain a minimum 54,400 acres of mature and older upland forest in patches of >300 acres.

Applicable Monitoring Activity, Practice, Or Effect Measured	Methods	When Monitored	Location or Project Area
Mature and older red and white pine forest type in patches 100 acres or greater	Compartment Stand Data (CDS) (Current technology requires use of CDS since as of FY06 FACTS does not yet have a spatial component.)	End of Fiscal Year 05 (frozen database 11/2005)	Forest-wide
Mature or older lowland forest in patches >300 acres.	Compartment Stand Data (CDS) (Current technology requires use of CDS since as of FY06 FACTS does not yet have a spatial component.)	End of Fiscal Year 05 (frozen database 11/2005)	Forest-wide
Mature and older red and white pine forest type in patches 300 acres or greater	Compartment Stand Data (CDS) (Current technology requires use of CDS since as of FY06 FACTS does not yet have a spatial component.)	End of Fiscal Year 05 (frozen database 11/2005)	Forest-wide
Mature or older upland forest patches >300 acres	Compartment Stand Data (CDS) intersected with GIS Zones 1, 2, 3 polygons.	End of Fiscal Year 05 (frozen database 11/2005)	Zones 1, 2, 3
Mature or older upland forest patches >10,000 acres	Compartment Stand Data (CDS) intersected with GIS Zone 2 (1 and 3 also measured)	End of Fiscal Year 05 (frozen database 11/2005)	Zone 2
Mature or older upland forest patches >1000 acres	Compartment Stand Data (CDS) intersected with GIS Zones 1 and 2 (Zone 3 also measured)	End of Fiscal Year 05 (frozen database 11/2005)	Zone 1 and 2
Created temporary openings: size	See O-VG-20 and O-VG-21 in Timber Section of this report	End of Fiscal Year 05	Forest-wide

(3) Evaluation and Conclusions: Achievement of Desired Conditions & Objectives

Desired Conditions/Objectives

A. Forest Vegetation Composition and Structure

Objective. O-VG-1. Move vegetation conditions from Year 2003 conditions toward the long-term desired composition, age, spatial distribution, and within stand diversity.

Objective. O-VG-2. Increase acres of red, white, and jack pine, spruce/fir, and northern hardwood vegetation communities. Decrease acres of aspen vegetation communities.

Objective. O-VG-3. Maintain acres of lowland conifer and lowland hardwood vegetation communities.

Objective. O-VG-9. Increase the amount of multi-aged forest communities in a variety of vegetative growth stages, including stages dominated by young, mature, old, and old growth trees. To successfully achieve a diversity of healthy multi-aged stands, a variety of vegetation management practices that are ecologically appropriate to the forest community will be used. This will include an increase in the percentage of uneven-aged timber harvest practices used to manipulate vegetation, with a decrease in percentage of clearcutting.

B. Forest Vegetation Age

Objective. FWD. 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.

Objective. FWD. O-VG-14. Increase acres of old forest, old-growth forest, & multi-aged upland forest vegetation.

Objective. FWD. O-VG-16. Increase acres of young lowland black spruce and tamarack forest communities. Increase acres of old-growth lowland black spruce and tamarack forest communities.

2005 Accomplishment 2004 and 2005 Accomplishments

- Ongoing implementation of vegetation management projects that were decided under the 1986 Forest Plan (such as, Rocky Road EA, Holmes-Chipmunk EIS) is continuing to contribute to some of the current Forest Plan vegetation objectives, such as mature and older forest, spruce/fir forest. (Young forest, in general, will result from projects with decisions made before and after the Forest Plan ROD was signed in July 2004).
- Site-specific decisions made to implement F. Plan veg mgt projects: Tomahawk EA, Dunka EA, Virginia EIS, Eastside Thinning EA, Compartment 63/64 Salvage CE, and Kadunce EA. For example, timber harvest in these projects will increase young forest, multi-aged forest, jack pine forest, white pine forest, & other objectives using tools such as clearcutting with reserve trees, partial overstory removal, prescribed fire, and planting. Refer to Timber and Fire sections for more details.
- When implemented, vegetation management projects will generally move Forest-wide Landscape Ecosystems toward forest composition and age objectives (FP, pp. 2-61 to 2-78).

Data Source. Data sources for all following tables are: 1. *Existing Condition:* CDS/GIS forest stand data in DualPlan (Forest Plan/FEIS revision vegetation model) based Natural Resources Research Institute Landscape Ecosystem Map. 2. *Management Direction – Decade 1: Objectives & FEIS Projected*

Condition: Forest Plan, p. 2-61 to 2-78, tables 1 & 2 for each LE. 3. *Forest-wide Existing Condition in 2005*: CDS/GIS forest stand data frozen on Sept 30, 2005 to reflect actual condition of vegetation at end of Fiscal Year 2005 based on Landscape Ecosystem Implementation Map. 4. *Forest-wide Condition in 2005 plus NEPA Decisions (DN) for vegetation mgt*: CDS/GIS forest stand data frozen on Sept 30, 2005 PLUS the expected condition of vegetation after implementation of vegetation management projects with NEPA Decisions as of end of FY05. Decisions include those made for Dunka EA, Virginia EIS, Holmes/Chipmunk EIS, Kadunce 2 EA, Tomahawk EA, and other decisions made prior to Forest Plan ROD, but not yet implemented.

MANAGEMENT DIRECTION & ACHIEVEMENT OF FOREST PLAN DIRECTION				
Jack Pine-Black Spruce Landscape Ecosystem (JPB)-Composition				
JPB Vegetation Composition	Existing Condition (ROD date- July 2004)¹	Mgt Direction (DECADE 1)²: Objectives & FEIS Projected Condition	Forest-wide Existing Condition in 2005³. (EC)	Forest-wide Condition in 2005 plus NEPA Decisions (DN) for vegetation mgt.⁴
Forest Types	Percent	Percent	Percent	Percent
Jack pine	24	28	23.2	23.2
Red pine	10	10	9.5	9.5
White pine	3	3	3.6	3.6
Spruce-fir	13	15	13.2	13.2
Oak	<1	0	0.1	0.1
Northern hardwoods	1	<1	0.7	0.7
Aspen	45	40	44.7	44.7
Paper birch	5	5	5.1	5.1
Totals (rounded up)	101	101	100	100

MANAGEMENT DIRECTION & ACHIEVEMENT OF FOREST PLAN DIRECTION				
Jack Pine-Black Spruce Landscape Ecosystem (JPB)-Age Class				
JPB Age Class	Existing Condition (ROD date- July 2004)¹	Mgt Direction (DECADE 1)²: Objectives & FEIS Projected Condition	Forest-wide Existing Condition in 2005³. (EC)	Forest-wide Condition in 2005 plus NEPA Decisions (DN) for vegetation mgt.⁴
	Percent	Percent	Percent	Percent
0-9	10	14	7.9%	10.1%
10-49	38	42	38.9%	38.6%
50-79	24	18	24.0%	22.7%
80-109	25	22	24.9%	24.3%
110-179	4	5	4.2%	4.2%
180+	0	0	0.2%	0.2%
Totals	101	100	100.0%	100.0%

MANAGEMENT DIRECTION & ACHIEVEMENT OF FOREST PLAN DIRECTION				
Dry-Mesic Red and White Pine Landscape Ecosystem (DRW)-Composition				
DRW Vegetation Composition	Existing Condition (ROD date- July 2004)¹	Mgt Direction (DECADE 1)²: Objectives & FEIS Projected Condition	Forest-wide Existing Condition in 2005³. (EC)	Forest-wide Condition in 2005 plus NEPA Decisions (DN) for vegetation mgt.⁴
Forest Types	Percent	Percent	Percent	Percent
Jack pine	9	10	8.7	8.9
Red pine	13	13	12.5	12.5
White pine	7	9	8.0	8.3
Spruce-fir	8	11	8.0	8.1
Oak	<1	0	0.2	0.2
Northern hardwoods	1	1	1.0	1.0
Aspen	52	47	52.5	51.9
Paper birch	10	9	9.1	9.1
Totals	100	100	100	100

MANAGEMENT DIRECTION & ACHIEVEMENT OF FOREST PLAN DIRECTION				
Dry-Mesic Red and White Pine Landscape Ecosystem (DRW)-Age Class				
DRW Age Class	Existing Condition (ROD date- July 2004)¹	Mgt Direction (DECADE 1)²: Objectives & FEIS Projected Condition	Forest-wide Existing Condition in 2005³. (EC)	Forest-wide Condition in 2005 plus NEPA Decisions (DN) for vegetation mgt.⁴
	Percent	Percent	Percent	Percent
0-9	10	10	8.3	10.2
10-49	33	44	34.8	34.6
50-99	45	32	44.9	43.4
100-139	12	14	11.7	11.5
140+	0	0	0.3	0.3
Totals	101	100	100.0%	100.0%

MANAGEMENT DIRECTION & ACHIEVEMENT OF FOREST PLAN DIRECTION				
Mesic Red and White Pine Landscape Ecosystem (MRW)-Composition				
MRW Vegetation Composition	Existing Condition (ROD date- July 2004)¹.	Mgt Direction (DECADE 1)²: Objectives & FEIS Projected Condition	Forest-wide Existing Condition in 2005³. (EC)	Forest-wide Condition in 2005 plus NEPA Decisions (DN) for vegetation mgt.⁴
Forest Types	Percent	Percent	Percent	Percent
Jack pine	5	6	4.9	4.9
Red pine	6	7	6.2	6.2
White pine	3	5	3.6	3.9
Spruce-fir	16	18	15.9	15.9
Oak	<1	0	0.1	0.1
Northern hardwoods	2	2	2.6	2.6
Aspen	51	47	51.8	51.5
Paper birch	15	15	14.9	14.9
Totals	98	100	100	100

MANAGEMENT DIRECTION & ACHIEVEMENT OF FOREST PLAN DIRECTION				
Mesic Red and White Pine Landscape Ecosystem (MRW)-Age Class				
MRW Age Class	Existing Condition (ROD date- July 2004)¹.	Mgt Direction (DECADE 1)²: Objectives & FEIS Projected Condition	Forest-wide Existing Condition in 2005³. (EC)	Forest-wide Condition in 2005 plus NEPA Decisions (DN) for vegetation mgt.⁴
	Percent	Percent	Percent	Percent
0-9	15	10	10.8	11.7
10-49	30	45	30.9	30.7
50-79	29	16	29.9	29.3
80-99	17	21	18.9	18.8
100-119	6	6	7.0	7.0
120+	2	2	2.5	2.5
Totals	99	100	100	100

MANAGEMENT DIRECTION & ACHIEVEMENT OF FOREST PLAN DIRECTION				
Mesic Birch/Aspen/Spruce-Fir Landscape Ecosystem (MBA)-Composition				
MBA Vegetation Composition	Existing Condition (ROD date- July 2004)¹	Mgt Direction (DECADE 1)²: Objectives & FEIS Projected Condition	Forest-wide Existing Condition in 2005³. (EC)	Forest-wide Condition in 2005 plus NEPA Decisions (DN) for vegetation mgt.⁴
Forest Types	Percent	Percent	Percent	Percent
Jack pine	3	4	3.5	3.5
Red pine	5	5	5	5.1
White pine	2	3	2.5	2.6
Spruce-fir	25	26	25.2	25.2
Oak	<1	0	0.1	0.1
Northern hardwoods	4	4	4.4	4.4
Aspen	45	43	44.3	44.2
Paper birch	15	14	15	15
Totals	99	99	100	100

MANAGEMENT DIRECTION & ACHIEVEMENT OF FOREST PLAN DIRECTION				
Mesic Birch/Aspen/Spruce-Fir Landscape Ecosystem (MBA)-Age Class				
MBA Age Class	Existing Condition (ROD date- July 2004)¹	Mgt Direction (DECADE 1)²: Objectives & FEIS Projected Condition	Forest-wide Existing Condition in 2005³. (EC)	Forest-wide Condition in 2005 plus NEPA Decisions (DN) for vegetation mgt.⁴
	Percent	Percent	Percent	Percent
0-9	13	10	7.1	7.6
10-49	33	45	34.6	34.5
50-79	28	15	29.8	29.6
80-99	19	21	20.1	20.0
100+	8	9	8.3	8.3
Totals	101	100	100	100

MANAGEMENT DIRECTION & ACHIEVEMENT OF FOREST PLAN DIRECTION				
Sugar Maple Landscape Ecosystem (SMA)-Composition				
SMA Vegetation Composition	Existing Condition (ROD date- July 2004)¹.	Mgt Direction (DECADE 1)²: Objectives & FEIS Projected Condition	Forest-wide Existing Condition in 2005³. (EC)	Forest-wide Condition in 2005 plus NEPA Decisions (DN) for vegetation mgt.⁴
Forest Types	Percent	Percent	Percent	Percent
Jack pine	<1	0	0	0
Red pine	5	5	4.7	4.7
White pine	1	2	1.1	1.1
Spruce-fir	15	15	13.7	13.7
Oak	0	0	0.1	0.1
Northern hardwoods	36	37	37.5	37.6
Aspen	27	25	26.5	26.2
Paper birch	17	17	16.5	16.6
Totals	101	101	100	100

MANAGEMENT DIRECTION & ACHIEVEMENT OF FOREST PLAN DIRECTION				
Sugar Maple Landscape Ecosystem (SMA)-Age Class				
SMA Age Class	Existing Condition (ROD date- July 2004)¹.	Mgt Direction (DECADE 1)²: Objectives & FEIS Projected Condition	Forest-wide Existing Condition in 2005³. (EC)	Forest-wide Condition in 2005 plus NEPA Decisions (DN) for vegetation mgt.⁴
	Percent	Percent	Percent	Percent
0-9	6	4	3.7	3.3
10-49	27	34	27.3	27.4
50-99	45	38	45.6	45.8
100-149	21	23	22.9	23.0
150+	1	2	0.6	0.6
total	100	101	100	100.0

MANAGEMENT DIRECTION & ACHIEVEMENT OF FOREST PLAN DIRECTION				
Lowland Conifer Landscape Ecosystem (LLC)-Age Class				
LLC-A In JPB and DRW Vegetation Age Class	Existing Condition (ROD date- July 2004)¹.	Mgt Direction (DECADE 1)²: Objectives & FEIS Projected Condition	Forest-wide Existing Condition in 2005³. (EC)	Forest-wide Condition in 2005 plus NEPA Decisions (DN) for vegetation mgt.⁴
	Percent	Percent	Percent	Percent
0-9	<1	3	0.2	1.1
10-39	7	5	7.3	7.2
40-79	24	18	25.1	24.9
80-159	65	69	65.1	64.5
160+	3	4	2.3	2.3
Total	99	99	100	100
LLC-B In MRW and MBA Vegetation Age Class	Existing Condition (ROD date- July 2004)¹.	Mgt Direction (DECADE 1)²: Objectives & FEIS Projected Condition	Forest-wide Existing Condition in 2005³. (EC)	Forest-wide Condition in 2005 plus NEPA Decisions (DN) for vegetation mgt.⁴
	Percent	Percent	Percent	Percent
0-9	1	2	0.6	0.7
10-39	4	4	4.8	4.8
40-79	25	14	27.7	27.6
80-159	62	70	61.0	61.0
160+	8	10	5.8	5.9
Total	100	100	100	100
LLC-C In SMA Vegetation Age Class	Existing Condition (ROD date- July 2004)¹.	Mgt Direction (DECADE 1)²: Objectives & FEIS Projected Condition	Forest-wide Existing Condition in 2005³. (EC)	Forest-wide Condition in 2005 plus NEPA Decisions (DN) for vegetation mgt.⁴
	Percent	Percent	Percent	Percent
0-9	0	1	0.0	0.0
10-39	2	2	2.7	2.7
40-79	25	19	18.0	18.0
80-159	49	45	55.6	55.6
160+	24	33	23.6	23.6
Total	100	100	100.0	100.0

Lowland Conifer Landscape Ecosystem Composition: During the reporting period, management actions (and natural succession) in Lowland Conifer LE have resulted in maintenance of existing forest type vegetation composition, meeting Forest Plan direction for maintaining existing acres of lowland black spruce, tamarack, and cedar forest types. (No table is included).

ACHIEVEMENT OF FOREST PLAN DIRECTION

Forest Vegetation Composition and Age Class

"Existing condition in 2005 (EC)" and "Forest-wide condition in 2005 plus NEPA Decisions (DN)" can be interpreted to show a general trend toward desired conditions & objectives for LE forest composition & age. These conditions result, in part, from vegetation treatments (or decisions to treat). Management activities in the Virginia, Dunka, Tomahawk, and other vegetation management projects, such as timber harvest, prescribed burning, and tree planting, were developed specifically to move conditions toward the LE objectives. Additionally, trend toward objectives results from natural vegetative succession.

The forest vegetation composition and age class tables by Landscape Ecosystem (LE) displayed above, show wide variation in achievement of Forest Plan objectives for acres of each forest type & age class – from substantially under to substantially over the % desired in Decade 1. These variations, however, are expected and appear acceptable for a number of reasons:

- With only a few major vegetation management decisions in FY2005, only a small portion of the Forest has had site-specific Plan implementation planning: it is too early to detect any concern about whether or not vegetation objectives may be fully achieved in Decade 1. Possible exceptions include forest types:
 - Jack-Pine Black Spruce LE: *White pine forest* is likely to exceed Decade 1, 2 and Long-term (100 yr) objectives. However, "over-achievement" is minor (4% in stead of 3% objective). Because white pine tree diversity objective (FP, Table JPB-3, p. 2-62) is to increase percent of white pines, this additional 1% of white pine forest type is likely consistent with overall objectives.
 - Mesic Red and White Pine LE: *Northern hardwoods forest type* may exceed Decade 1, 2 and Long-term (100 yr) objectives. Although the "over-achievement" is minor (3% instead of 2% objective), this forest type may warrant management to decrease percent down to 2%. This is because northern hardwood tree diversity objective (FP, Table MRW-3, p. 2-68) is to decrease percent of northern hardwoods. Site-specific analysis of management opportunities will be important in making this decision, since "over-achievement" may also be the result of improved inventory.
- For young forest age classes, "percent of achievement" is somewhat misrepresentative of achievement of objectives (more so than for mature and older age classes). This is because all acres in 0-9 class in the "existing condition 2004" will grow out of this age class into the sapling stage by end of the decade. Thus objectives for all acres in the 0-9 age class must be met by establishment of new replacement young forest during the next 10 years. For example, though it may appear that greater than 100% of young forest has been achieved for some LEs, that % includes acres that will not be in the 0-9 age class by the end of the first decade. Vegetation management projects address this through modeling succession to the end of Decade 1.
- Vegetation management decisions are not likely to result in evenly distributed patterns of all forest types and ages across each LE. For example, some parts of LEs may have more young or old forest than other parts of the LE. Any given vegetation management project may not strive to achieve LE objectives in a percent commensurate with its share of an LE landscape.
- As described in Section 1. Overview, changes made to the Landscape Ecosystem GIS layer resulted in changes in percentages of forest types and ages of some LEs. Additionally, field stand exam conducted for vegetation management projects resulted in some reclassification of stands. Other factors, such as limitations of Dualplan modeling, projects implemented under decisions of the previous Forest Plan, natural disturbances, forest succession, land adjustments, or technical errors in the data may have contributed slight changes in forest type and age conditions that are not a result of Plan implementation.

C. Forest Vegetation Spatial Distribution

Monitoring Drivers:

Objective. FWD. O-VG-1. Move vegetation conditions from Year 2003 conditions toward the long-term desired composition, age, spatial distribution, and within stand diversity.

Objective. FWD. O-VG-17. In mature or older upland forest types managed to maintain large patches (>300 acres of all types) manage patches to maintain the characteristics of mature or older native upland forest vegetation communities and promote the maintenance or development of interior forest habitat conditions.

Objective. FWD. O-VG-18. In mature or older red and white pine forest types managed to maintain large patches (100 acres or greater), manage patches to maintain the characteristics of mature or older native upland forest vegetation communities and promote the maintenance or development of interior forest habitat conditions.

Objective. FWD. O-VG-19. Maintain a representative array of large patches (>300 acres) of mature or older lowland forest.

Objective. FWD. O-VG-20. Create large patch temporary openings up to 1000 acres through management activities.

Objective. FWD. O-VG-21. Increase average size of temporary openings. Reduce amount of forest edge created through vegetation management activities, while still retaining a range of small patches and edge habitat.

Objective. FWD. O-VG-24. In Spatial Zone 3 strive to minimize the decrease in acres and numbers of patches of mature or older upland forest in patches >300 acres. Age and composition objectives will be considered the primary drivers of forest condition in this Zone. When determining which large upland mature patches will be retained, take into consideration the contribution of BWCAW acres and other unmanaged lands within the same ecological setting and proximity.

In addition to above objectives the following standards and guidelines are included as additional drivers to provide a more complete picture of spatial management achievement.

G-VG-1: The number of patches >300 acres that are older red and white pine forest types will generally not be reduced below 8.

S-VG-2: Maintain a minimum of 4,700 acres of mature and older red and white pine forest types in patches >300 acres.

G-VG-2: Maintain a minimum of 88 patches of mature and older red and white pine forest types in patches >100 acres in size.

S-VG-3: Maintain a minimum of 17,300 acres of mature and older red and white pine forest types in patches >100 acres.

G-VG-4: In Spatial Zone 2 maintain a minimum of one patches of mature and older upland forest in patches of >10,000.

S-VG-5: In Spatial Zone 2 maintain a minimum 11,700 acres of mature and older upland forest in patches of >10,000 acres.

G-VG-5: In Spatial Zone 1 maintain a minimum of 8 patches of mature or older upland forest in patches of >1,000 acres.

G-VG-6: In Spatial Zone 2 maintain a minimum of 14 patches of mature and older upland forest in patches of >1,000 acres.

S-VG-6: In Spatial Zone 1 maintain a minimum 44,700 acres of mature and older upland forest in patches of >300 acres.

S-VG-7: In Spatial Zone 2 maintain a minimum 54,400 acres of mature and older upland forest in patches of >300 acres.

MANAGEMENT DIRECTION & ACHIEVEMENT OF FOREST PLAN DIRECTION										
Patch Type and Size in Acres	Forest Plan Standards and Guidelines		Existing Condition (ROD date- July 2004)		FEIS Projected Condition for DECADE 1 :		April 2005 Condition		Forest-wide Condition in September 30, 2005	
	Acres	#	Acres	#	Acres	#	Acres	#	Acres	#
Red/White Pine Mature and Older Forest (Forest-wide)										
100 ac+	17,300	88	17,300	88	21,000	100	20,000	100	20,400	100
300+	4,700	8	4,700	8	7,100	12	5,700	9	6,000	9
All Upland Mature and Older Forest										
ZONE 1										
300+	44,700	n/a	51,500	86	36,600	57	45,100	82	45,500	79
1000+	n/a	8	13,200	8	10,500	6	6,500	4	9,200	5
ZONE 2										
300+	54,400	n/a	60,700	35	58,000	36	59,100	40	63,000	37
1000+	n/a	14	50,000	14	48,400	17	46,000	18	52,700	16
(5000-9999 ¹)	n/a	n/a					7,400	1	33,600	5
10000+	11,700	1	13,000	1	0	0	0	0	0	0
Forest Plan O-VG-24										
ZONE 3										
300+	Strive to minimize the decrease in acres and numbers of patches of mature or older upland forest in patches >300 acres.		185,200	177	152,000	155	164,100	177	207,400	179
1000+			116,500	47	92,900	40	97,100	47	139,400	49
10,000+			10,100	1	0	0	10,000	1	29,800	2
Lowland Conifer Mature and Older Forest										
FOREST-WIDE Forest Plan O-VG-19										
100+	Maintain a representative array of large patches (>300 acres) of mature or older lowland forest.		72,500	310	79,800	334			99,400	415
300+			30,300	52	35,400	59			44,838	77
1000+			6,600	4	6,800	4			11,299	7
1. Patch size class 5-10m added for reference because 10m+ class has 0 acres and objective for at least one patch. These acres also may have been connected in 2004 (FEIS) and broken up by 2005 analysis. This one patch size class down may provide source for future 10m+ patch.										

ACHIEVMENT OF FOREST PLAN DIRECTION

Forest Vegetation spatial distribution: Conditions and trends that address spatial management are mostly consistent with Plan direction with two exceptions:

Zone 1 G-VG-5 for maintaining a minimum of 8 >1,000-acre patches of mature and older upland forest: current condition shows only 5 patches, though total acres in these patches are close to what was expected at the end of the decade. New projects in Zone 1 should maintain remaining 5 patches and seek opportunities to replace a minimum of three additional patches by the end of the first decade.

Zone 2 G-VG-4 for maintaining one patch >10,000 acres in mature and older upland forest: Current condition shows this patch has been fragmented to less than 10,000 acres. Some of the acres that were in the 11,700-acre patch that existed when the FEIS was conducted (April 2004) are now likely encompassed in one or more of the current five patches in the 5000-10,000-acre class. New projects in Zone 2 should maintain a minimum of 10,000 acres in the 5,000-10,000-acre patches and seek opportunities to reestablish a 10,000-acre patch.

Standard & Guide	Standard & Guide Description	Compliance	Applicable Design Criteria or Other Necessary Follow up Action (If Any)
S-VG-1	When implementing projects under authority of the Healthy Forest Restoration Act [Section 102(e)(2)(3b)], fully maintain or contribute toward the restoration of the structure and composition of structurally complex old growth stands according to the pre-fire suppression old growth conditions characteristic of the forest type, while considering the contribution of the stand to landscape fire adaptation and watershed health, and retaining the large trees contributing to old growth structure.	Yes No N/A	No projects that affected old growth forest were implemented under HFRA authority in FY05
G-VG-1	The number of patches >300 acres that are older red and white pine forest types will generally not be reduced below 8.	Yes No N/A	See Monitoring section above on Vegetation Spatial Management
S-VG-2	Maintain a minimum of 4,700 ac of mature & older red and white pine forest types in patches >300 acres.	Yes No N/A	"
G-VG-2	Maintain a minimum of 88 patches of mature & older red & white pine forest types in patches >100 acres.	Yes No N/A	"
S-VG-3	Maintain a minimum of 17,300 ac of mature & older red & white pine forest types in patches >100 acres.	Yes No N/A	"
S-VG-4	In mature or older red and white pine forest types managed to maintain patch sizes of >100 acres, vegetation management treatments that maintain a 60% minimum canopy closure and maintain large diameter trees are allowable.	Yes No N/A	"
G-VG-3	In Spatial Zones 1 & 2, in mature and older upland forest types managed to maintain patch sizes of >300 acres, vegetation management treatments are allowable where they maintain a 50% (60% for red and white pine) minimum canopy closure at time of treatment & favor retention of larger and older trees characteristic of the patch.	Yes No N/A	"
G-VG-4	In Spatial Zone 2 maintain a min. of one patch of mature & older upland forest in patches of >10,000.	Yes No N/A	"
S-VG-5	In Spatial Zone 2 maintain a min 11,700 ac of mature & older upland forest in patches of >10,000 acres.	Yes No N/A	"
G-VG-5	In Spatial Zone 1 maintain a min of 8 patches of mature or older upland forest in patches of >1,000 ac.	Yes No N/A	"
G-VG-6	In Spatial Zone 2 maintain a min of 14 patches of mature & older upland forest in patches of >1,000 ac.	Yes No N/A	"
S-VG-6	In Spatial Zone 1 maintain a min 44,700 acres of mature & older upland forest in patches of >300 acres.	Yes No N/A	"

Standard & Guide	Standard & Guide Description	Compliance	Applicable Design Criteria or Other Necessary Follow up Action (If Any)
S-VG-7	In Spatial Zone 2 maintain a min 54,400 acres of mature & older upland forest in patches of >300 acres.	Yes No N/A	"
G-VG-7	Permits will generally be required for commercial gathering of special forest products from trees (such as boughs, Christmas trees, birch bark, and firewood), or other vegetation (berries, clubmosses, lichens, fungi, and moss).	Yes No N/A	To be determined (TBD)
G-VG-8	Permits will specify allowable quantities and collection restrictions designed to protect or maintain ecological and cultural resource values.	Yes No N/A	TBD
G-VG-9	Gathering of tree products will generally be at least 50 feet from trails, roads, or water bodies that have high scenic integrity objectives and at least 100 feet from a perennial water body	Yes No N/A	TBD
G-VG-10	Gathering of special forest products for personal or scientific use will generally require a permit. Exception: Gathering of nuts, fruits, berries, and fungi for personal use will not generally require a permit.	Yes No N/A	TBD
G-VG-11	Commercial peat mining and sphagnum moss collection are generally prohibited.	Yes No N/A	TBD

(4) Necessary Follow-up and Management Recommendations

Monitoring Driver	Follow-up Actions
D-VG-1 to D-VG-8	Since desired conditions are long-term and not easily measured (FP, Page 1-7), detecting impediments to reaching desired conditions is difficult during a first year of Forest Plan implementation. During this first year of implementation, projects generally are promoting conditions that should trend the Forest toward desired conditions. For example, Landscape Ecosystem (LE) vegetation conditions are generally trending toward objectives and associated standards and guidelines are being met. Where LE vegetation conditions are not trending toward objectives, no obvious factor or problem with implementability has been singled out in this first year that would drive either a Forest Plan amendment or reanalysis. It will continue to be important to annually measure and evaluate vegetation and LE objectives (FP, p. 2-55).
O-VG-1-3,9,13,14 & 16	<u>Forest composition, structure, age.</u> Continue to monitor conditions. Efforts to improve forest inventory should continue.
O-VG-1 O-VG-6 to -8 O-VG-15	Seek opportunities to promote within-stand diversity. <u>Supporting rationale.</u> Forest vegetation within-stand diversity. No management recommendations other than continuing to expand manager's knowledge of the ecological conditions of native ecosystems, including expanding knowledge of Native Plant Community classification.
O-VG-12.	To implement this Forest Plan objective for seeking to reestablish adequately stocked stands to address timber management objectives while maintaining an adequate representation of brushy or sparsely-treed habitats, a more comprehensive Forest-wide inventory is needed. Managers should consider plan objectives and information on range of natural variability of native ecosystems to form a better understanding of how to implement and monitor this objective.
O-VG-4,5,10, & 11	Continue to monitor conditions. Efforts to improve forest inventory should continue.

Monitoring Driver	Recommended Management Actions
O-VG-1 to -3 O-VG-9 O-VG-13-14 O-VG-16	<p>Correct error in Table JPB-2 for age class groupings: Forest Plan Supporting rationale. Implementation has used correct groupings in all NEPA projects, but the correction should be published in the Forest Plan <u>Supporting rationale</u>. Implementation has used correct groupings in all NEPA projects, but the correction should be published.</p> <p>Clarify Lowland Conifer Landscape Ecosystem: Make changes between the Forest Plan FEIS Landscape Ecosystem map and the implementation layer Landscape Ecosystem map through either an errata or an amendment. <u>Supporting rationale</u>. Current implementation of Lowland Conifer LE (LLC-A, LLC-B, LLC-C) age objectives addresses lowland black spruce and tamarack, not white cedar and black ash (no measurable objectives were developed for the latter two forest types). One possible resolution is to add sections similar to LLC for white cedar and black ash to provide a framework for monitoring general objectives in the Plan that address these types.</p>
O-VG-1 VG-17 to -21 Spatial S&Gs	<p>Forest Vegetation spatial distribution: Conditions and trends that address spatial management are mostly consistent with Plan direction with two exceptions:</p> <p>New projects in Zone 1 should maintain remaining 5 patches greater than 1000 acres and seek opportunities to gain a minimum of three additional patches of that size by the end of the first decade. <u>Supporting rationale</u>. Zone 1 G-VG-5 for maintaining a minimum of 8 >1,000-acre patches of mature and older upland forest: current condition shows only 5 patches, though total acres in these patches are close to what was expected at the end of the decade.</p> <p>In Zone 2 seek opportunities to reestablish a 10,000-acre patch. <u>Supporting rationale</u>. Zone 2 G-VG-4 for maintaining one patch >10,000 acres in mature and older upland forest: Current condition shows this patch has been fragmented to less than 10,000 acres. Some of the acres that were in the 11,700-acre patch that existed when the FEIS was conducted (April 2004) are now likely encompassed in one or more of the current five patches in the 5000-10,000-acre class.</p>

(5) Collaborative Opportunities To Improve Efficiency And Quality Of Program

Collaborator/Partner	Monitoring Activity
NRRI	Native plant community classification
MN DNR	(a) MCBS-Native plant community classification (b) GAP analysis Change detection (c) FIA-Forest Inventory
ITC	Forest Inventory