

SUPPLEMENTAL INFORMATION REPORT

**TO THE CHIPPEWA AND SUPERIOR NATIONAL FOREST FINAL
ENVIRONMENTAL IMPACT STATEMENT FOR FOREST PLAN REVISION**

AND THE

**2004 CHIPPEWA NATIONAL FOREST LAND AND RESOURCE
MANAGEMENT PLAN**

DISCLOSING

**EFFECTS ON ANALYSIS DISCLOSED IN THE FINAL ENVIRONMENTAL
IMPACT STATEMENT FOR THE 2004 CHIPPEWA NATIONAL FOREST
PLAN OF THINNING HARVESTS THAT EXCEED THE AMOUNT OF
THINNING ESTIMATED IN DECADE 1
OF FOREST PLAN IMPLEMENTATION**

BELTRAMI, CASS and ITASCA COUNTIES, MINNESOTA
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Introduction	3
Chapter 1 - Scope of Supplemental Information Report	3
Chapter 2 – New Information.....	4
Chapter 3 - Relationship to Environmental Issues Analyzed in the FEIS.....	9
Chapter 4: Final Summary	17
Chapter 5: Preparers	19
Appendix A: Assessment of Effect of Increased Thinning on Outcomes Projected in the Forest Plan revision FEIS by Indicator.	20
(Insert A)	20
Appendix B: Excerpts from Chippewa National Forest Monitoring Evaluation Reports (FY 2005 and Draft 2006)	21
Appendix C: Examples of Recent Thinning Prescriptions – Chippewa National Forest	24

Introduction

In July 2004, Regional Forester Randy Moore signed the Record of Decision for the Chippewa and Superior National Forest Final Environmental Impact Statement for the Forest Plan Revision (FEIS). The Record of Decision authorized the revised 2004 Chippewa National Forest Land and Resource Management Plan (Forest Plan) that provides guidance for the management of the Chippewa National Forest in Beltrami, Cass and Itasca Counties, Minnesota.

Chapter 4 of the Forest Plan includes direction on monitoring and evaluation as required by law (36 CFR 219.7(f) and 36 CFR 219.12(k)). Monitoring and Evaluation of the revised Forest Plan began concurrently with Forest Plan implementation. Forest Plan Monitoring and Evaluation reports based on implementation of the 2004 Forest Plan were issued for fiscal years 2005 and in Draft for FY 2006.

The level of harvest and the type of harvest methods implemented are monitored and evaluated as components of the following two monitoring requirements:

Monitoring requirements identified in the forest plan shall provide for—(36 CFR 219.12(k)

[1] A quantitative estimate of performance comparing outputs and services with those projected by the forest plan;

[2] Documentation of the measured prescriptions and effects, including significant changes in productivity of the land

The results of that monitoring triggered the need to prepare this Supplemental Information Report (SIR). Specifically, monitoring has identified that thinning may be appropriate for more acreage than projected in the Forest Plan and that there may be a need to correct the Plan to allow increases in thinning during the first decade of Plan implementation.

Chapter 1 - Scope of Supplemental Information Report

This SIR addresses the extent of the effects, if any, to the analysis in the FEIS of utilizing thinning harvest treatments at higher rates than proposed in the Forest Plan. Direction for preparing a SIR is found in Forest Service Handbook (FSH) 1909.15(18) (1), Review and Documentation of New Information Received After a Decision Has Been Made. This SIR is prepared in accordance with the procedures outlined in FSH 1909.15(18)(1) and cited below:

“If new information or changed circumstances relating to the environmental impacts of a proposed action come to the attention of the responsible official after a decision has been made and prior to completion of the approved program or project, the responsible official must review the information carefully to determine its importance. If, after an interdisciplinary review and consideration of new information within the context of the overall program or project, the

responsible official determines that a correction, supplement or revision to an environmental document is not necessary, implementation should continue. Document the results of the interdisciplinary review in the appropriate program or project file. If the responsible official determines that a correction, supplement, or revision to an environmental document is necessary, follow the relevant direction in section 18.2-4.”

Federal regulation guides the preparations of supplements. 40 CFR 1502.9 (c) (1) (ii), Draft, Final and Supplemental Statements (Appendix D) states: “Agencies shall prepare supplements to either draft or final environmental impact statements if ... (ii) there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.”

This SIR evaluates whether or not use of the thinning harvest prescription beyond the level estimated in the Forest Plan for Decade 1 (Forest Plan, Appendix D Table D APP-D2, pg D-3) creates a “significant new circumstance” or results in “new information” relevant to environmental concerns that may have a bearing on the proposed action or its impacts. This SIR will also provide technical information to the decision maker to assist him in determining whether an amendment or correction to the Forest Plan is necessary.

This report is divided into three general sections: identification of the new information, a discussion of how that information relates to the environmental impacts discussed in the Forest Plan EIS, and a finding as to whether or not correction, supplementation or revision of the EIS is necessary.

The Regional Forester selected Modified Alternative E as the revised Forest Land and Management Resource Plan (Forest Plan or Plan) for the Chippewa National Forest. Throughout the SIR the terms “selected alternative” or “Modified Alternative E” reflect the Regional Foresters decision and the management direction carried forward into the Forest Plan.

Chapter 2 – New Information

At the project level analysis teams are finding that many more acres would benefit from thinning at this time than were projected by the Dual Plan model and displayed in Table App-D2 (Forest Plan pg D-3). The 2004 Forest Plan includes an Estimate of Proposed and Probable Management practices (Plan Appendix D) as required by National Forest Management Act (16 U.S.C. 1604(g)(3). Table APP-D2: Estimate of Acres of timber harvest by treatment method (Forest Plan pg D-3) displays an estimate of each harvest treatment for the first two decades of Plan implementation based on the results of the modeling conducted for the FEIS. See Figure 1.

Table APP-D2: Estimate of Acres of timber harvest by treatment method (Forest Wide)

Treatment Method	Decade 1 (proposed)		Decade 2 (probable)	
	Acres	Percent	Acres	Percent
Thinning	6,749	9%	11,578	14%
Clearcutting	29,866	39%	30,881	38%
Shelterwood & partial cut 30	11,149	14%	11,101	14%
Uneven-aged (red pine, white, pine, spruce fir, northern hardwood, oak, black ash)	19,524	25%	22,742	28%
Uneven-aged (aspen-aspen/fir)	9,851	13%	5,920	7%
Totals	77,139	100%	82,222	100%

Figure 1: Table App-D2 (Plan pg D-3)

These figures are projections. The Forest Plan states: “Actual treatments during plan implementation may vary from these modeled outputs.” (Plan pg D-2). There are no Forest Plan desired conditions, objectives, guidelines or standards directing that a specific level or proportion of harvest method be implemented.

Accomplishments to Date: Forest plan implementation monitoring began concurrently with implementation of the revised Plan and the results of monitoring harvest methods were reported in 2005 and in Draft for FY 2006. The results of that monitoring are displayed in Table 1.

Table 1: Excerpt from the Draft FY 2006 Monitoring and Evaluation Report

Treatment Method	Decade 1 (Proposed)		Actual Accompl (FY 2005)		Actual Accompl (FY 2006)		Total (FY 2005-2006)	
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Thinning	6749	9	2172	54	1371	53	3543	54
Clearcutting	29886	39	949	24	782	31	1731	26
Shelterwood/ Part. Cut 30	11149	14	489	12	295	11	784	12
Uneven age (all types)	29375	38	387	10	124	5	511	8
Totals	77139	100	3997	100	2572	100	6569	100

For monitoring purposes, the Forest tracks acres of harvest methods as they are implemented. Thinning treatments in Table 1 reflect those acres that have actually been harvested through FY 06. At this time the acres of thinning harvests that have been implemented are well within those proposed in the Forest plan. However, more acres of thinning have been authorized in signed Decision Notices and will be implemented in the coming years. District specialists expect a continued need to prescribe thinning treatments where that is the most appropriate prescription to meet site level objectives and desired future conditions. This may result in acreage of thinning treatments exceeding the Plan projection.

The Draft Monitoring and Evaluation Report (2006) summarizes Table 1 as follows:

“The Decade 1 harvest treatment numbers projected in the Forest Plan are decadal projections not annual projections and are based on full funding and implementation of the Plan. Mixes of potential harvest treatments is a tool to accomplish Forest Plan objectives but are not an objective in and of themselves. Harvest treatment acres in any fiscal year are a reflection of the relatively few environmental decisions being implemented during that year. Each environmental analysis (EA) and the set of harvest treatments resulting from that decision are based on meeting the vegetation objectives for the Landscape Ecosystem (LE) in which the project is being implemented. Vegetation objectives and existing conditions vary by LE, so some peaks and valleys are expected in annual harvest treatment types, but over the decade meeting the vegetation objectives across a mix of project areas should yield harvest treatments similar to those projected in the Plan. Comparing the percentages on an annual basis will be useful as harvest treatments are tracked over time.

Based on current percentages, thinning acres are over accomplished. There are several reasons for this. This is in part a reflection of a large thinning project that was implemented in the first two years of Forest Plan implementation. In addition, our highest priority LEs for treatment tend to be the Dry Mesic Pine and Dry Mesic Pine-Oak LEs. These are the LEs that are most out of sync ecologically and have the highest fire hazards. Red pine is a significant component on these LEs and has been a focus for treatment. In addition, there is a large amount of red pine that has recently become the age and size that would benefit from commercial thinning.

Clearcutting is lower than Forest Plan projections. During Forest Plan revision it was recognized that there would be less regeneration in the initial years of Forest Plan implementation as the youngest vegetation age classes are over-represented in most LEs.

The actual percentage of shelterwood and partial harvest is comparable to that proposed in the Plan and are not a concern at this time.

Uneven-aged harvest prescriptions are less than projected thus far. More emphasis has been placed on uneven-aged treatments in hardwood and some conifer stands in recent planning projects.

It is recognized that some shifts will need to be made in planning and implementation to meet the decadal Forest Plan objectives at the current rate. “

The reporting system is also relevant to the apparent under accomplishment of uneven age harvest. The Forest uses the FACTS database to monitor accomplished and planned activities. A query of FACTS shows that there are approximately 2,300 acres of planting and seeding activities planned in conjunction with thinning treatments. The objective of planting and seeding is to create a second age class in gaps, understocked areas and landings to create more diverse conditions within the stand. In some cases the entire unit is scheduled for light underplanting. Planting and seeding in conjunction with thinning share objectives with uneven age management. However, FACTS only allows for a single harvest code for each unit – either thinning or uneven age management. Units cannot have both codes even though often both objectives are being met within the stand. Furthermore, current thinning prescriptions often include retention of other species and direction for maintaining or restoring within stand diversity. (See Appendix C for examples). Through implementation of these prescriptions we are moving toward similar Plan objectives as would be achieved through uneven age management treatments, such as increased within stand diversity and structural complexity, though likely at a reduced intensity. FACTS does not account for this.

In many conifer stands initially considered for uneven age management through variable density thinning or other such management prescription, the district specialists believe that an initial thinning would benefit the stands prior to initiating an uneven age treatment. This is particularly true for younger pine plantations that have not been previously thinned. An initial thinning now will yield larger, healthier and more wind firm trees that in successive entries will be more resilient and better suited to future uneven age management.

Future Accomplishments: Activities implemented between 2004 and 2007 reflect projects largely initiated under the 1986 Forest Plan. All of the projects were reviewed for consistency with the 2004 Forest Plan and where necessary were adjusted for consistency prior to implementation. Still, many of the projects are reflective of the general management strategy of the 1986 Forest Plan. Projects initiated after 2004, move more progressively toward the objectives and desired conditions of the 2004 Forest Plan. In a review of the four most recent vegetation management decisions, we see a shift in the types of harvest methods being utilized.

Table 2: Harvest Methods in Four Most Recent NEPA Decisions (Veg. Mgmt projects only)

Project	Thinning	Clearcutting	Shelterwood/Partial	Uneven Age	Total Acres	
Northwoods	861	1426	98	693	3078	
Southeast	1464	560	159	932	3170	
Big Fork	423	2108	1636	894	5061	
Portage	275	311	201	717	1400	
Totals	3023	4405	2098	3236	12709	
Percent	24	35	17	25	100	

The most recent vegetation management projects are more closely aligned with the proportion of harvest treatments proposed in the Forest Plan for Decade 1 than those projects initiated prior to 2004. The mix of harvest methods implemented in each year will vary greatly and will be dependant on the relatively few decisions being implemented in any given year. However thinning treatments will be largely equal to the amount proposed by the Forest Plan at the time that these four decisions are fully implemented.

Summary: In 2005 and 2006, the forest over accomplished thinning treatments and under accomplished uneven age management treatments as compared to projections in the Forest Plan. Some of the treatments coded as thinning in the FACTS database could as well be coded as uneven age management. In many cases thinning is meeting similar objectives to those desired from uneven age management treatments. Many of the pine thinnings being planned in Decade 1 will establish conditions that will make uneven age management a more viable option in successive entries. In the future, the mix of harvest methods will more closely approximate that envisioned by the Forest Plan; however the thinning projections for Decade 1 are likely to be exceeded.

Explanation: Maintenance of forest health and biological diversity drives the increased use of thinning relative to plan projections. Maintenance of health and diversity is consistent with the most fundamental objectives of the plan. The need to maintain or restore forest health and biological diversity was recognized from the onset of the Forest Plan revision process. Biological diversity, including the composition and structure of forest vegetation communities, was recognized as a Focus Area in the Notice of Intent (NOI) to Revise the Forest Plan (NOI, Section D, 1997). This issue was carried through Forest Plan revision and Section 3.2.1 of the FEIS, Forest Composition and Structure (FEIS pgs. 3.2-1 to 3.2-84), analyzes the effects of each alternative on forest composition and structure at two scales: across the landscape as a whole (Forest Types and Age Class Distribution) and at the stand level (Use of Management Treatments that Increase Within-Stand Complexity). The Forest Plan (Chapter 2) includes many desired conditions and objectives for increasing forest health and maintaining or restoring biological diversity. The Record of Decision (ROD) also clearly states that through implementation of the revised Forest Plan: “Timber harvest methods will be designed to contribute toward increased restoration of important components of healthy ecological systems,” and “Utilizing partial harvest methods enables the Forest to treat more acres for increased health, reduced fuel loads and increased growth and vigor while moving towards vegetation objectives for an older, more structurally diverse forest (ROD pg . 20-21). Thinning contributes to the resolution of two important planning issues, the amount of even-age harvest and insect and disease potential.

Regarding the latter issue, deferring some uneven-age management provides an opportunity to benefit from on-going research by the Northern Research Station (Grand Rapids, MN; see the Red Pine Study Progress Report, 2005).

Planning Implications: There is no need to amend the Forest plan based on these trends, however Table APP-D2 should be corrected to more accurately reflect current projected implementation and allow future projects the flexibility to choose the harvest treatment most suited to the site. The Forest will continue to track those units that have multiple objectives (thinning and uneven age) and if necessary, correct the FACTS database as appropriate. Multi-age natural pine stands existed historically and there are some examples on the Forest. Past management has led to a simplification of pine systems on the Forest. There is agreement that maintenance and restoration of biological diversity at the landscape and the stand level is an important component of Forest Plan implementation. However there are also questions about the success of managing for multi-age pine in the presence of pests such as *Armillaria* and *Diplodia* (recently reclassified as *Sphaeropsis sapinea*).

Based on these concerns, the Northern Research Station (Grand Rapids, MN) is conducting a large scale experiment in the Cutfoot Sioux Experimental Forest located within the Chippewa National Forest to evaluate different methods and strategies for uneven management in red pine. The Red Pine Study Progress Report (2005) states that: “Results from this study will be useful to both ecologists and forest managers. These relationships will also be useful in developing silvicultural systems for the restoration of heterogeneous, pine-dominated forests in the Great Lakes region. Collaborative meetings arranged annually by the UDSA Forest Service North Central Research Station will provide an avenue for educating ecologists and forestry professionals about the dynamic

relationships that shape stand development in structurally complex systems.” Uneven age management is moving forward but the Forest is using caution in light of the concerns regarding uneven age management of pine, and will continue to work closely with the Northern Research Station on research designed to increase the likelihood of successfully establishing uneven age conditions in pine types.

Chapter 3 - Relationship to Environmental Issues Analyzed in the FEIS

The relationship of increasing the amount of thinning (relative to initial projections) to the environmental effects discussed in the Forest Plan FEIS can best be described by assessing the level of change in the outcomes for the environmental indicators presented in the FEIS.

A multidisciplinary review of the indicators and projected environmental effects analyzed in the FEIS was conducted. For each indicator a determination was made as to whether increased levels of thinning treatments in decade one of Plan implementation could result in a Potential Effect, No Effect or was Not Applicable (NA). See Appendix A. “Potential Effect” means that increased thinning could potentially affect analysis outcomes for that indicator. Potential Effects could be positive or negative effects. “No Effect” means that increased thinning has potential to effect, but does not actually affect analysis outcomes for that indicator, usually as a result of implementation of standards and guidelines included in the Plan. “Not Applicable” means that increased thinning has no potential to affect analysis outcomes for that indicator. Indicators determined to have a Potential Effect are discussed further in the SIR. See discussion by “*Indicator*” below.

***Indicator:* Even-aged, Even-aged with Clearcutting, and Uneven-aged Management**

Outcomes for this indicator are covered in Chapter 2. The selected alternative estimated that in Decade 1 even age systems would be used 53% of the time, uneven age systems would be used 38% of the time and thinning would be used 9% of the time (FEIS pg. 3.4-4). Thinning is tallied separately but is considered “an intermediate harvest in even age regeneration systems” (FEIS pg 3.4-4). Based on accomplishments to date, and expected future accomplishments, the corresponding percentages would now be 53%, 26% and 21%.

This change would affect outcomes for shade tolerant and shade intolerant species. The FEIS (pg. 3.4-4) states that “generally, tree species that require more sunlight to survive and grow do better with even-aged management. Such species include aspen, paper birch, tamarack, jack pine, and red pine” and (FEIS 3.4-3) “Species that can survive under shade can be managed with either even-aged or uneven-aged management. Such species include sugar maple, spruce, and balsam fir.” The ranking of the selected in relation to other alternatives considered in the Plan FEIS, is unchanged by shifts between thinning and uneven age management in Decade 1. The ranking of the selected alternative was stated as follows: This alternative would result in a relatively lower amounts of even-aged treatments in decade 1 and moderate amounts in decade 3 on the

Chippewa. This would be less than Alternatives A and C. Clearcutting increases on the Chippewa between the first and third decade, but remains at moderate levels (FEIS 3.4-5). More shade tolerant species are expected in this alternative than in Alternatives A and C (FEIS 3.4-5).

Indicator: Mix of Forest Products

The FEIS used a relative ranking system to analyze the mix of forest products by alternative. Products were grouped by aspen pulpwood, hardwood pulpwood other than aspen, softwood pulpwood, hardwood sawtimber and softwood sawtimber. The bulk of products generated from our thinning treatments would be grouped into the softwood pulp and softwood sawtimber categories. The ranking used in the Plan FEIS was as follows (FEIS 3.4-16-19):

Table 4: Ranking Categories for Product

Rank	Mmbf/yr
High	+25
Moderate	10 - 24
Low	<10

The outcome of the ranking for Modified E, the selected alternative, was that in Decade 1, the Chippewa National Forest was anticipated to produce moderate levels of softwood sawtimber and softwood pulp (FEIS 3.4-18). Actual products produced are displayed in table 5.

Table 5: Softwood produced (harvested) FY05 – FY07

	FY '05 (mmbf)	FY '06 (mmbf)	Estimated FY '07 (mmbf)	Rank
Softwood sawtimber	3.0	2.7	3.0	low
Softwood pulp	7.3	6.4	6.0	low

The mix of forest products is more a function of budget, markets and implementation levels rather than the mix of harvest methods used. Forest Plan projections for the mix of forest products are based on full implementation (7,700 acres treated and 58 mmbf per year). We are currently harvesting about 50% - 75% of Plan projections. The amounts displayed in Table 5 for softwood pulpwood are proportionally reasonable amounts at current implementation levels. Softwood sawtimber production is lower than Forest Plan projections. The 2005 Monitoring and Evaluation Report (pg. 17) states that “Pine harvested in FY 2005 was mainly smaller diameter pine from thinning operations rather than the higher valued sawtimber.” Market prices for pulpwood were very high in 2005 and 2006, so selling pulpwood harvest may have been a higher priority than sawtimber harvest in these years. However over the decade the proportion of sawtimber is expected to increase as the level of thinning in older and previously thinned pine stands increases.

Increased levels of thinning are contributing towards the Forest Plan projections of moderate levels of softwood production.

Indicators: Relative Fire Risk Management and Use of Management Ignited Fire for Hazardous Fuel Reduction

These indicators characterizes relative fire risk as “high” for untreated upland conifer greater than 40 years old, “moderate” for untreated grasslands, lowland conifer and mixed conifer/hardwoods over 40 and “low” for any forest type that has been treated and is over 40 years old. The Use of Management Ignited Fire for Hazardous Fuel Reduction considers both high and medium risk categories as acres available for treatment. Based on the acres of timber harvest by alternative, the relative fire risk for the selected alternative is moderate (FEIS pg. 3.5-5) for both of these indicators and the selected alternative as a whole.

Level of implementation is more a matter of budget and available burning windows than of the mix of harvest prescriptions. Thinning (or any harvest treatment) in upland conifer would move an individual stand from the high risk category to the low risk category. Even with increased thinning the total maximum harvest acreages are not expected to be exceeded, so the relative fire risk among the alternatives would remain at moderate. Prescribed fire in forested stands is mainly used in conjunction with mechanical treatments rather than in lieu of mechanical treatments. Increased thinning could increase the potential for using prescribed fire. In the analysis of the indicator: Use of Management Ignited Fire for Hazardous Fuel Reduction, the FEIS states that; “A reduction factor was applied to the number of acres available to help realize a feasible amount of acres that could be treated.” (FEIS pg 3.5-7). Meaning that there are many more acres that could benefit from hazardous fuels treatments than could reasonably be projected for implementation in Decade 1. Regardless of the amount of thinning conducted there are ample opportunities to use prescribed fire for hazardous fuels reduction. Across the Forest increased thinning reduces total fire risk, but does change the relative risk among the alternatives analyzed.

Indicators: Employment and Income by Forest Service Program Area, Employment and Income by Major Industry, Net Present Value (NPV), Cumulative Economic Impacts

Recreation, wildlife and fisheries expenditures and revenues do not vary between alternatives and are unaffected by an increase in thinning. Revenues, expenditures and Net Present Value (NPV) for timber production do vary between alternatives and while the overall driver is level of total harvest, the type of product produced does influence the employment, income and NPV outcomes to some extent (FEIS p. 3.9-16). The type of prescription is not a factor in the analysis, it is the product mix produced that influences the economic outcomes. The current product mix is an outcome of meeting the Forest Plan objectives for vegetation age and composition and forest health rather than the selected prescription for a given stand. The bulk of the accomplished and planned thinning occurs in the pine, spruce or fir (softwood) types. In 2005 and 2006 most of the softwood produced was pulpwood (See Table 5 above); however over the first ten years

of implementation, the proportion of sawtimber sold is expected to increase as the level of thinning in older and previously thinned pine stands increases. For all economic indicators, increased sawtimber production could positively affect the level of employment, income and NPV for the selected alternative but would not change the relative ranking of the alternatives. Modified E would still fall in the middle with Alternatives G, F and B and would provide somewhat fewer jobs, income and NPV than Alternatives A or C, as depicted based on the original thinning projections (FEIS p. 3.9-16).

“The results of the IMPLAN economic modeling should not be viewed as absolute economic values that accurately portray the infinitely complex economic interactions of the regional economy, but rather as an estimate of relative potential effects. Interpretations of the IMPLAN data should be as comparisons amongst Forest Plan revision alternatives of the potential relative economic effects because of limited economic data, associated assumptions, and the limitations of the IMPLAN model itself” (FEIS pg 3.9-10). In general, the more gross volume harvested, the more jobs an alternative would create (FEIS 3.9 – 19). The timber harvest associated with each alternative does influence the total number of jobs and income in the analysis area within the first decade. Two factors influence the changes in numbers of jobs across alternatives as identified by IMPLAN/FEAST: 1.) The differences in employment and income between alternatives are for the most part, associated with changes in timber volume and 2.) the type of species product groups harvested. Quantity and type of timber vary considerably by alternative within the first ten years and directly affect the number of jobs within each alternative (FEIS 3.9-16). The type of species and product harvested under each alternative also influences the number of jobs and income. There are fewer jobs per cubic feet of harvest in the pulpwood industry than sawtimber related industries. In the impact area, as defined by the IMPLAN/FEAST model, harvested sawtimber would result in more labor-intensive work, resulting in more jobs. Examples include softwood sawtimber used in the log home construction business, and also hard and softwood custom wood products. There is also a higher income associated with sawtimber harvesting due to less utilization of mechanization to accomplish the final product.”

“Overall, based on the five categories of products, (softwood and hardwood pulpwood and sawtimber and aspen) analyzed within IMPLAN/FEAST, Alternatives A and C would provide for the most job opportunities and labor income as a result of forest expenditures for both Forests. Alternatives modified E, G, F, and B would provide somewhat less jobs and income in different order by each Forest.” (FEIS 3.9-16).

Most important,

“As displayed in Tables ECN-10 and ECN-11, the overall volume of forest related jobs in the local economy is less than 10%, and would not change much between alternatives. For this reason, despite the differences between the

alternatives, the (impact area) economy-wide effects of any alternative would be minimal” (FEIS 3.9 – 17).

Therefore the increased amount of thinning expected in Decade 1 will make little difference in the economic impact.

Indicator: Community Resilience

The findings for this indicator are very similar to those for the economic indicators listed above in that overall it is the total level of timber harvest that affects the outcomes. There is some influence from product type (sawtimber produces more jobs), however, the analysis does not consider harvest method as a measurement of community resilience. The current product mix is an outcome of meeting the Forest Plan objectives for vegetation age and composition and forest health rather than the selected prescription for a given stand.

The FEIS states that those counties that rely less on timber harvest revenue to finance appropriate operations and have a higher diversity index would be less affected by the selection of one alternative over the other, even those alternatives providing less revenue, in their allocation of payments. Counties that rely more on federal revenue and are less diverse may see reductions in revenue and support of appropriate functions based on selection of an alternative that provided less federal revenue from the sale of timber. (FEIS 3.9-24). Revenues from the Chippewa National Forest account for approximately 1% or less of the operating budgets for the Minnesota Counties (Beltrami, Cass and Itasca) that are potentially affected by activities on the Chippewa National Forest. (FEIS 3.9 – 22, Figure ECN-7). Ranking of the alternatives for this indicator are also similar to the ranking for the other economic indicators, Alternatives A and C provide for the highest community resilience while Modified E, G and B are in the middle.

Since none of the affected Counties relies heavily (1% or less) on revenues from the Chippewa National Forest, community resilience is largely unaffected by changes in product type. Increased levels of thinning do not change the relative ranking of the alternatives as described in the FEIS (see pages 3.9-17).

Indicator: Non-native Invasive Species

The FEIS used two measures to analyze this indicator: Miles of Temporary Roads and level of Water Access. Level of water access is unaffected by thinning. Miles of temporary roads could potentially be affected by the level of thinning harvest; however the FEIS used the following factors to display the differences between alternatives: From FEIS Vol II Appendix F pg F-19:

- * It is assumed that the need for additional system roads will continue at the historic (1997-2002) rate of 1.0 mile per 4,000 acres treated, all of which would be OML roads.
- * It is assumed that the need for temporary roads will continue at the historic (1997-2002) rate of 5.0 mile per 1,000 acres treated.

The measure is total acres of harvest and does not consider differences by method of harvest. There is no indication that we will exceed the total acres of harvest proposed in the Forest Plan for Decade 1. Realistically fewer new temporary roads are built for thinning harvest than for other types of harvest as the thinning occurs largely in pine plantations or pine stands that have been previously thinned. The road system is largely in place to accomplish thinning harvests. However since the analysis of effects considers only total acres of harvest, the analysis is unaffected by shifts in harvest method. The ranking of the alternatives does not change as a result of increased thinning.

Indicator: Soil Quality Associated with Treatment Activities, Temporary Roads, Objective Maintenance Level 1 (OML-1) Roads, Skid Trails, and Landings

The measures for the analysis of this indicator include compaction class, temporary roads, OML 1 roads, skid trails and landings. Of these measures only compaction class of proposed harvest units considers the differences between types of treatment or harvest method. The other measures consider only total acres of harvest by alternative (FEIS 3.6-26) and are unaffected by shifts in harvest method. The FEIS (pg. 3.6-13) states: “Compaction can be controlled by imposing season-based limitations on operations on sensitive sites. Limiting activities to periods of frozen or dry soil on those sites provides for the use of heavy equipment only under conditions where soil strength is maintained and soil has low susceptibility to rutting, compaction or puddling.” The FEIS (pg. 3.6-13) goes on to state: “Compaction resulting from partial cut harvest treatments, although less studied, can also negatively affect soil productivity under some conditions. Although partial harvest treatments are frequently assumed to result in comparatively lower amounts of potential resource damage []”. In decades 1 and 2, for the Chippewa NF, Modified Alternative E ranks fifth overall among the alternatives and has medium potential to have the most treatment units, roads, skid trails, landings and wetlands to be impacted (FEIS pg 3.6-25).

Most measures used for analysis of this indicator use total acres of harvest rather than harvest method to rank the alternatives. Thinning and uneven age management are both considered partial harvest methods though the outcomes are different (even age vs. uneven age). Table WSM-6 (FEIS pg 3.6-26) displays the basis for the ranking of alternatives. In this table, thinning would be included in the even age management categories. For compacting activities it shows that even age treatments would need to nearly double in order to change the ranking of the alternatives. It is not expected that the acres of even age treatments would double in Decade 1 as a result of increased thinning acres.

Indicator: Narrative Description of the Scenic Character of Alternatives

This indicator is qualitative rather than quantitative and provides a general characterization of the scenic character of a given alternative compared with the other alternatives. For Modified Alternative E the scenic quality is described as follows:

Under this alternative, during the first 20 years, some areas of the Forests would change swiftly and abruptly. Visitors would see markedly increased sizes of

newly created openings and decreased sizes of patches of continuous canopy. In the decades that follow, future generations of Forest visitors would see some perpetuation of large newly created open areas and a mix of older forest and increased conifer growing up in the previously created openings. This alternative would produce forests that have slightly more continuous canopy than Alternative A and frequent openings of various size up to 1000 acres (FEIS pg 3.8-38).

And:

Generally, large tracts of same-aged trees would dominate views of the Forests; in the early decades of management under this alternative, the forest's general appearance would tend to be characterized by younger, smaller trees such as aspen and birch. As decades pass, there would be an increasing number of stands of later-successional species such as red pine, white pine, spruce, fir, and northern hardwoods. During the early decades of this alternative, common views of the actively managed areas of the Forest would include less diversity in vertical structure, a decreased presence of ground- and shrub-layer species, standing dead trees, and fallen trees. The relative importance of sustaining a natural appearance in these areas is lower under this alternative than in Alternatives B, D, or G. (FEIS 3.8-39).

The analysis for this indicator is very general. The major difference between this alternative and some of the others is that it allows for larger temporary openings and proposes more conversion from early successional to late successional species. The establishment of larger temporary openings or conversion from aspen to conifer is not precluded by increased thinning. Since the ranking of alternatives for this indicator is largely based on the "theme" of the alternatives rather than specifics of harvest method, the ranking is unchanged by shifts in harvest methods.

Indicator: Stream Crossing density

Stream crossing densities are calculated by extrapolating miles of additional roads needed for vegetation treatment for each alternative. The increase in stream crossings associated with additional road construction was estimated by reviewing typical road building activity associated with timber harvest from 1997 – 2002 (FEIS 3.6-3). That figure was then multiplied by the total acres of harvest by alternative regardless of the mix of harvest methods anticipated.

The alternatives are listed below in order from the lowest to highest percent increase in stream crossing density (least to most potential affects on stream resources). For Chippewa NF - Alternative: D, F, B, G, Modified E, A, C (FEIS 3.6-20).

The amount of thinning is not considered separately and the analysis would be unaffected by changes to proposed harvest other than changes to the total acres harvested. Increases to the total level of harvested are not predicted at this time.

Indicator: Effects of increased thinning on Maximum Allowable Sale Quantity, long term sustained yield and non-declining even flow of timber

Figure APP-D1 (Forest Plan pg D-2) displays the maximum allowable sale quantity (ASQ) and the long-term sustained yield (LTSY) for non-declining flow of timber over the next ten decades. The long term sustained yield is 600 million board feet (mmbf) per decade and the allowable sale quantity is 580 mmbf in Decade 1 and 600 mmbf in Decade 2. Over the planning horizon (10 decades) the LTSY is approximately 3% greater than the ASQ. In the first four years of Forest Plan implementation sell volumes have ranged between 25 – 39 mmbf annually. Similar levels of harvest are predicted for the next five years.

It is difficult to compare estimates of yields per acre between thinning and uneven age management prescriptions for pine as yields are highly variable depending on existing conditions and desired outcomes for each unit. The Dual Plan model used an average 22 cords per acre for thinning in pine types and an average of 20 cords per acre for uneven age management in pine types.

In general uneven-age (UEA) management prescriptions will result in slightly lower yield per acre than traditional thinning, though the differences are small. Increased thinning and reduced UEA management in Decade 1 is expected to produce slightly higher yields than those projected in the Forest Plan. However recent and predicted harvest levels remain considerably lower than the ASQ. We do not anticipate that the maximum allowable sale quantity would be exceeded in Decade 1 and in fact, the Forest has harvested below the average annual ASQ in the first four years of implementation. At the site level the choice between whether to implement uneven age management and thinning is made based on existing condition of the stand, desired condition of the stand and maintaining or increasing the health, productivity and yield of the stand into the future. As explained in Chapter 2, these conditions have led to use of thinning in pine to a greater degree than predicted. However, this should not appreciably affect long term sustained yield.

Indicator: Effects of increased thinning on the determinations of the biological assessment and the Biological Opinion issued for the FEIS

The Federally Listed Threatened and Endangered Species Programmatic Biological Assessment for the Revised Forest Plans for the Chippewa and Superior National Forests (BA) assessed potential effects of the Proposed Forest Plan on three species: the Bald eagle, the Gray wolf and the Canada lynx. Table A (pg vii) of that document summarized the effects of the proposed and probable management practices on these species. Thinning, clearcutting, shelterwood and partial harvest, and uneven age management are determined to have discountable or insignificant effects for all three species. The Bald eagle and the Gray wolf have been delisted since the BA was signed in 2004.

Since the timber harvest activities considered in this report have insignificant or discountable effects for all three species, increased thinning would not change the determinations made in the BA and would not cause the U.S. Fish and Wildlife Service to render a different biological opinion on the revised Forest Plan.

Chapter 4: Final Summary

This report contains the following findings of Chippewa National Forest Supervisor, Robert Harper. It was developed pursuant to the plan maintenance requirements of the National Forest System planning rule currently in effect (36 CFR 219.31, November 9, 2000). The report will be filed with the project record for the Chippewa and Superior National Forest Final Environmental Impact Statement for Forest Plan Revision, as required by the planning rule. The official project record is located on the Superior National Forest in Duluth, MN.

NFMA Findings: When assessing the preceding information in the context of the entire FEIS and full implementation of the Forest Plan, I find that an amendment to the Forest Plan is unwarranted. I do believe that a correction to the Table APP D-2 (Forest Plan pg D-3) would more clearly reflect our management intent and would maintain flexibility at the site level to choose the treatment that best protects forest health and meets the objectives of the Forest Plan.

NEPA Findings: Correction of the plan projections does not warrant supplementation or revision of the Forest Plan EIS. After thorough Interdisciplinary review I find that increased thinning and a concurrent decrease in uneven age management over that proposed for Decade 1 in Appendix D of the Forest Plan has little impact on the outcomes for indicators analyzed in the FEIS; that the outcomes of the biological assessment and the biological opinion are unaffected by shifts in harvest treatments; that long term sustained yield is maintained; that the new information has little bearing on the proposed action or its impacts; and that implementation of the 2004 Forest Plan should continue.

Other conclusions: Forest Plan monitoring has proven an effective tool in tracking and evaluating implementation of the Forest Plan and the Forest will continue to emphasize effective monitoring consistent with Chapter 4. The Forest will continue to work with North Central Research to increase our understanding and effectiveness in uneven age management of pine.

The 2000 Planning Rule (219.31(b) allows the following administrative corrections to made at any time, are not plan amendments, and do not require public notice or the preparation of an environmental document under Forest service NEPA procedures:

- (1) Corrections and updates of data and maps;
- (2) Updates to activity lists and schedules as required by § 219.30(d)(1)–(6);
- (3) Corrections of typographical errors or other non-substantive changes; and
- (4) Changes in monitoring methods other than those required in a monitoring strategy (§ 219.11(c)).

CFR 219.30(d)(1-6) referenced under item #2 above includes changes to projected ranges of outcomes which may include anticipated uses, values, products and services for the next 15 years[]. These projections are estimates and as such often contain a high degree

of uncertainty; they are intended to describe expected progress in achieving desired conditions and objectives within the plan area.

The results of this SIR demonstrate to me that an administrative correction to Table APP-D2 of the Forest Plan constitutes a non-substantial change and is consistent with the 2000 Planning Rule.

Robert Harper
Forest Supervisor
Chippewa National Forest

Chapter 5: Preparers

Brenda Halter-Glenn	Planner
Alan Williamson	Wildlife/TES/RFSS
Ann Long-Voelkner	Social/Economics
Sonia Hoie	Recreation/SIO
James Barrot	Soils

Appendix A: Assessment of Effect of Increased Thinning on Outcomes Projected in the Forest
Plan revision FEIS by Indicator.

(Insert A)

Appendix B: Excerpts from Chippewa National Forest Monitoring Evaluation Reports (FY 2005 and Draft 2006)

Excerpt # 1 Excerpt from FY05 M&E Report pgs 14-16

1. All – Outputs

The information presented below is for timber harvest. There is also output information on road decommissioning presented in Section 5 – Transportation.

Monitoring Question:

How close are projected outputs and services to actual?

Monitoring Driver:—Desired Condition and Objectives:

(36 CFR 219.12(k)[1]. A quantitative estimate of performance comparing outputs and services with those projected by the forest plan.

Background:

Outputs for timber are discussed in this section. Figures for the projected outputs are from Appendix D. Proposed and Probable Practices, Goods Produced, and Other Information (Forest Plan, pages D-1 through D-3).

a. Timber harvest --Evaluation and Conclusions

The Chippewa National Forest harvested timber on a total of 3,997 acres in FY 2005. Listed below is a table comparing the acres harvested by treatment method to the Proposed Decade 1 (Table APP-D2: Forest Plan, D-3, Estimate of Acres of timber harvest by treatment method (Forest Wide).

Table 3: Comparison of acres harvested by treatment method to the Proposed Decade 1

Treatment Method	Decade 1 (Proposed)		Actual Accomplishment (FY 2005)	
	Acres	Percent	Acres	Percent
Thinning	6749	9	2,172	54
Clearcutting	29,866	39	949	24
Shelterwood/Partial Cut 30	11,149	14	489	12
Uneven-age (all forest types)	29,375	38	387	10
Totals	77,139	100	3,997	100

The Decade 1 harvest treatment numbers projected in the Forest Plan are decadal projections not annual projections and are based on full funding and implementation of the Plan. Mixes of potential harvest treatments is a tool to accomplish Forest Plan objectives but are not an objective in and of themselves. Harvest treatment acres in any fiscal year are a reflection of the relatively few environmental decisions being implemented during that year. Each environmental analysis (EA) and the set of harvest treatments resulting from that decision are based on meeting the vegetation objectives for the Landscape Ecosystem (LE) in which the project is being implemented. Vegetation objectives and existing conditions vary by LE, so some peaks and valleys are expected in annual harvest treatment types, but over the decade meeting the vegetation objectives across a mix of project areas should yield harvest treatments similar to those projected in the Plan. Comparing the percentages on an annual basis will be useful as harvest treatments are tracked over time. Based on current percentages, thinning acres are over accomplished. There are several reasons for this. This is in part a reflection of a large thinning project that was

implemented in the first two years of Forest Plan implementation. In addition, our highest priority LEs for treatment tend to be the Dry Mesic Pine and Dry Mesic Pine-Oak LEs. These are the LEs that are most out of sync ecologically and have the highest fire hazards. Red pine is a significant component on these LEs and has been a focus for treatment. In addition, there is a large amount of red pine that has recently become the age and size that would benefit from commercial thinning. Consequently, the apparent high percentage of thinning is not a concern at this time.

Clearcutting is slightly under-utilized compared to the Forest Plan projections. The proposed and actual percentages are relatively close. During Forest Plan revision it was recognized that there would be less regeneration in the initial years of Forest Plan implementation as the youngest vegetation age classes are over-represented in most LEs. The actual percentage of shelterwood and partial harvest is comparable to that proposed in the Plan. The percentages of clearcutting and shelterwood harvest are not a concern at this time. Uneven-aged harvest prescriptions are significantly under-utilized at this time. It may be difficult to meet the decadal Forest Plan objectives for uneven-aged management at the current rate.

Excerpt #2 Excerpt from Draft FY 06 M & E Report

The Chippewa National Forest harvested timber on a total of 2,572 acres in FY 2006. **Table X** compares the acres harvested by treatment method to the acres Proposed for Decade 1 (Table APP-D2: Forest Plan, D-3, Estimate of Acres of timber harvest by treatment method (Forest Wide)).

Table x. Comparison of acres by treatment method to that Proposed for Decade 1

Treatment Method	Decade 1 (Proposed)		Actual Accompl (FY 2005)		Actual Accompl (FY 2006)		Total (FY 2005-2006)	
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Thinning	6749	9	2172	54	1371	53	3543	54
Clearcutting	29886	39	949	24	782	31	1731	26
Shelterwood/ Partial Cut 30	11149	14	489	12	295	11	784	12
Uneven-aged (all types)	29375	38	387	10	124	5	511	8
Totals	77139	100	3997	100	2572	100	6569	100

The Decade 1 harvest treatment numbers projected in the Forest Plan are decadal projections not annual projections and are based on full funding and implementation of the Plan. Mixes of potential harvest treatments is a tool to accomplish Forest Plan objectives but are not an objective in and of themselves. Harvest treatment acres in any fiscal year are a reflection of the relatively few environmental decisions being implemented during that year. Each environmental analysis (EA) and the set of harvest treatments resulting from that decision are based on meeting the vegetation objectives for the Landscape Ecosystem (LE) in which the project is being implemented. Vegetation objectives and existing conditions vary by LE, so some peaks and valleys are expected in annual harvest treatment types, but over the decade meeting the vegetation objectives across a mix of project areas should yield harvest treatments similar to those projected in the Plan. Comparing the percentages on an annual basis will be useful as harvest treatments are tracked over time.

Based on current percentages, thinning acres are over accomplished. There are several reasons for this. This is in part a reflection of a large thinning project that was implemented in the first

two years of Forest Plan implementation. In addition, our highest priority LEs for treatment tend to be the Dry Mesic Pine and Dry Mesic Pine-Oak LEs. These are the LEs that are most out of sync ecologically and have the highest fire hazards. Red pine is a significant component on these LEs and has been a focus for treatment. In addition, there is a large amount of red pine that has recently become the age and size that would benefit from commercial thinning.

Clearcutting is lower than Forest Plan projections. During Forest Plan revision it was recognized that there would be less regeneration in the initial years of Forest Plan implementation as the youngest vegetation age classes are over-represented in most LEs.

The actual percentage of shelterwood and partial harvest is comparable to that proposed in the Plan and are not a concern at this time.

Uneven-aged harvest prescriptions are less than projected thus far. More emphasis has been placed on uneven-aged treatments in hardwood and some conifer stands in recent planning projects.

It is recognized that some shifts will need to be made in planning and implementation to meet the decadal Forest Plan objectives at the current rate.

Appendix C: Examples of Recent Thinning Prescriptions – Chippewa National Forest

Example 1

Silvicultural Diagnosis/Prescription

Pipeline Sale

Site Description: Stand ID: 2-123-21

Location	East of Portage Lake
Access	Along road 2131; see comp. map
Ecological Class	
LE— DryMesic Pine/Oak	This fire dependent LE has a jack pine, red pine and white pine supercanopy either alone or as mixed pines. Deciduous trees usually occur as a subcanopy comprised of quaking aspen, paper birch, northern red oak, bur oak, red maple and bigtooth aspen. These deciduous trees grow to merchantable size and in the absence of pines form a cover type. These forests, in a mature condition, typically are a mix of pines and deciduous trees, frequently with 2 pine species and a subordinate canopy of 3 deciduous species.
LT 6	Primarily forested with red and jack pine. Significant portions were burned, dead, or scattered timber. Forest occurred as large patches. Tamarack, aspen, and birch tended to co-occur with each other or with pines. Aspen occurred as forests and thickets. Wetlands tend to tamarack or cedar. Fire dependent for species to persist and regenerate. Frequent, low intensity, ground fires (every 20 years or so) and severe crown fires at 100-150 year intervals. Ground fires diminished hardwoods and shrubs and created seedbed for overstory pines. Evenaged forested resulted from crown fires or multi-aged forests from ground fires.
Soils	Bena dunes and peatlands, phase f
Slope/Aspect	Flat
Elevation	~1300
Site Index	55

Stand Description

Component	Existing	Desired
Forest Type	RP with scattered aspen and birch	RP with WP; good hardwood representation
Stocking: density, trees/ac	BA ~120 sq ft in red pine plantation	
Structure	EA, single storied	Multi storied
Composition	OS: 90-95% RP; groups of hardwood throughout Mid: generally lacking US: light hazel, raspberry, a few aspen	Increase hardwood & conifer components
Age/Yr Origin	1965	
Size	9-12" dbh; fairly uniform	
Condition (I&D, damage, wind)	None noted	
Growth rate	Slowed	Increase/maintain growth
Diversity	low—conifer with some hardwoods; hazel understory, uniform stand in species composition & diameters	Increase species & structure: White pine, hardwoods, woody debris, snags
Snags	minimal	5/ac > 7" dbh
Coarse Woody Debris	light	5/ac > 7" dia; preferably > 8" dis
Disturbance history		
Treatment history	previous thinning resulted in uniform stand conditions	
Noxious weeds		Weed free or minimal occurrence

Mitigation Measures Applicable to this Stand –5, 17, 18, 19

(In addition to those listed in the sale design package)

Mitigation Measures (for Wildlife, Fish, and Rare Plants; Soil and Water)

5. All temporary roads will be obliterated once treatment activities requiring road access associated with this project are completed. The road surface would be loosened and seeded using a mixture of annual rye for quick green up, and native perennial grasses for long-term cover. Any culverts would be removed. The roads would be made impassable to snowmobiles and to two or four wheel drive vehicles, by placing slash, dropping trees, or creating barriers across the road for approximately 150 feet from the main road. The point of departure from the main road would be blocked with root wads, soil berms, rocks, or logging debris. This applies to all treated stands requiring temporary road construction and to those with temporary roads which have not been effectively closed. Within identified Lynx Analysis Units, the Forest Service will monitor vehicular use on the obliterated roadbed for a period up to five years. **(Mitigation Measure – Canada lynx, Gray wolf, and other wildlife)**

17. Forest management activities will not take place in wetlands, including building landings, skid trails and roads, harvesting or running equipment through the wetland depression. **(Mitigation Measure – All stands with wetland features)**

18. Seasonal Pond Mitigation: For all seasonal ponds/Type 1 wetlands/vernal pools (forested and non-forested), do not drive equipment through them and leave no tops or slash in them.

19. Filter strips are applied to all streams (perennial and intermittent), lakes, and wetlands, including wetland inclusions and seasonal ponds, seeps and springs. **(Mitigation Measure – All stands with lakes, streams, or wetland features)**

- a. Limit mineral soil exposure to less than 5%, well distributed throughout the filter strip
- b. Avoid concentrating disturbance in the filter strip, to prevent concentration of flows across the filter strip. Keep skid trails, haul roads, and landings outside of the filter strip area.
- c. Temporary roads will be constructed outside of the filter strip area.

Detailed Prescription

Stand ID—2-123-21	Gross Acres--56	Est. Thinned Acres--52
MA—General Forest		

Management Goals—

- Maintain or improve health, growth, and vigor of conifer stands.
- Improve the within-stand complexity (species and structural diversity) of conifer stands.
- Maintain or improve wildlife habitat conditions of conifer stands.
- Provide wood fiber.
- Reduce fire hazard or fuels accumulations.
- Re-introduce fire

Layout: Stand boundary is easily defined by forest type and road.

Harvest Treatment: Variable Density Thinning with gaps

Design Features	See sale design package: 1,2,3,4,5
Basal Area	<p>Target BA=90 sq ft. on approx. 28 ac. (~50 % of stand).</p> <p>Lower BA=60-70 where trees > 10" dbh occur. Apply where largest trees occur. ~ 21ac. (~37 % of stand). Consider lower basal areas where white pine occur (these would be good areas to plant later.)</p> <p>Retain best trees with balanced and deepest crowns -- at a minimum 30% crown ratio; straight boles, single top, healthy color and vigor; minimal signs of blister rust. BA of hardwoods will be included and be part of the target basal area.</p>
Species Preference	Leave all hardwood species. Prefer WP 7"+ dbh > RP to increase/promote WP. Leave balsam fir if good form. .
Gaps	<p>Create 1/10-1/4 ac gaps (2-5% of unit) at rate of 1 gap/5ac. 1-3 ac. in gaps. Create approx. 11 gaps.</p> <p>Retain 1-4 scattered trees within gaps. These can be wildlife trees and/or quality leave trees</p> <p>Apply:</p> <ol style="list-style-type: none"> a) in pockets of young, vigorous seed/sap/pole conifers in order to release/promote another age class (crown ratios of > 40%) b) where small gaps naturally occur & can be enlarged c) randomly locate gaps distributed across the unit
Unthinned patches	10%-- approx. 4 acres.
Snag Replacements Wildlife trees	<p>Snag objective is for 5/ac > 7"dbh. For wildlife, leave WP with defect & JP. Also leave trees with cavities, porcupine damage, dead or spike tops; basal or bole scars, or defect indicators. Additional snags are anticipated over time from fire stress, beetle activity, blister rust, & competition mortality in unthinned patches.</p> <p>Recommend placing unthinned patches where groups of wildlife trees occur.</p> <p>Snag replacements and wildlife trees left would be in addition to the specified BA.</p>
TE&S	LAU 15. goshawk foraging
Riparian	No Inner and outer zone riparian zones identified Possible wetlands.
Fuels	See map. 50' Slash removal along Rd 2131; 25' slash removal along U2025; 25' along E&S property boundary.
SIO	Moderate along road.
Heritage	None identified.
Roads	No temp or maintenance identified.

Post harvest Treatments

Pre-treatment exam for reforestation 4314	Survey to determine amount of snags and woody debris, size of openings created, and to verify planting Rx. Assess the amount of ground disturbance and likelihood of natural regeneration esp. in proximity of WP (don't recall any WP in portion I walked thru)
Reforestation Enhancement--Planting for within stand diversity 4450	Where --Plant approx. 22-25 acres where BA is lowest and in gaps. Species — Plant white pine and balsam fir (80-90/10-20 ratio). Tamarack also suitable if right conditions exist (mineral soil, full sunlight, and generally found in transition from lowland to upland). Density —200-400 trees/ac; variable spacing; average of 300 trees per ac. Animal Control - Apply Plantskyd as needed for survival.
Stocking Survey 4341	Survey planted area in years 1, 3 and 5 to estimate survival and assess need for release and pruning. Schedule if needed. Objective is an average of 80 % survival (average of 240 trees per acre) at year 5.
Individual Tree Release 4451 x 3 Pruning 4530	Release planted species from competing brush. Pruning of lower branches of planted WP to minimize blister rust.
Create snags, down logs	Create as needed to meet a minimum of 5 per acres greater than 7" diameter.

Example 2

District: Deer River		Compartment: 144		Stand: 10	
Project Name: Mississippi		Sale Name: Hwy 9		PU#	
Legal Description: W½ W½ Sec 13, Twp 145N, Rge 27W.					
ELT Group:		LTP Group:			
Forest Type (TSD)	Stand Acres	Treatment Acres	Year of Origin	DBH	BA
red pine	9	9	1910	11”	265 ft²/ac

LE DESCRIPTION: Dry Mesic Pine/Oak (DMPO). Historically, the Dry Mesic Pine/Oak LE had a supercanopy of Jack pine, red pine, or white pine either as mixed or single species. It had a subcanopy of deciduous trees (quaking aspen, paper birch, northern red oak, bur oak, red maple, and bigtooth aspen) with oak and maple dominating as the stands aged.

MANAGEMENT AREA DESCRIPTION: 29% GF. General Forest MAs emphasize land and resource conditions that provide a wide variety of good, uses and services. These include wood products, other commercial products, scenic quality, developed and dispersed recreation opportunities, and habitat for a diversity of terrestrial and aquatic wildlife and fish. Numerous roads open to public travel provide access to resources and roaded recreation opportunities. Non-motorized recreation opportunities also occur. Compared to other management areas, the General Forest MA has the most amount of young-forest and the largest sized timer harvest units.

71% UB. Unique Biological, Aquatic, Geological, or Historical (UB) management area includes areas with outstanding biological, aquatic, geological, historical and other special values. Although this management area preserves these values, the UB areas are primarily managed for interpretive purposes.

EXISTING STAND CONDITION: This 94 year old stand is mixed, though typed as red pine, size/density “9”. The basal area of balsam fir and spruce exceed the basal area of red pine, though the pine are the largest trees. Red pine range in size from 12” to 24” DBH, with a basal area of 100 ft²/ac. Balsam fir range from 6” to 10” in DBH and have a basal area of 80 ft²/ac. White spruce ranges in size from 2” to 12” DBH, with 407 stems/acre found in the 4” diameter class. The basal area of white spruce is 62 ft²/ac. Twenty ft²/ac basal area is in aspen that are 10” in DBH. There are also 150 red oak saplings/acre in the 2” DBH class.

The largest blocks of pine are found in the north and south ends of the stand. These have aspen and other species scattered through them.

No regeneration is recorded in the stand exam, but this may have been missed. Regeneration of balsam fir and spruce are likely. Other stands in the area also have abundant red maple regeneration.

DESIRED STAND CONDITION: Maintain a red pine stand into the future. Consider a shelterwood in the next entry to introduce a new cohort of pine and move the stand into a two-age condition. Balsam fir is very abundant and will be cut in this entry in preparation for burning by reducing ladder fuels.

TREATMENTS

Harvest Method: Thinning.

Stand Establishment

Site Preparation:

Reforestation:

Release:

Pathological Pruning:

Cultural Operations:

TSI:

Stand Protection

Animal Control:

Fuel Reduction:

Insect or Disease:

Fire Use:

Burn Objectives: The stand will be burned following harvest. Broadcast burning will be used post harvest to reduce ground fuels. Specific burn objectives will be found in attached, burn plan.

Management Objectives:

- Reduce 1-hr, 10-hr and 100-hr down and dead woody fuel loadings by at least 50% immediately post burn.
- Reduce brush density by at least 30% 2 years post-burn

- Expose mineral soil on at least 30% of the site immediately post-burn through combined harvest and burn operations.
- Some mortality of residual trees is expected. Mortality rates of the pine will not exceed a maximum of 10% of the basal area (8 ft²/acre) two years post burn.

Site Preparation:

Wildlife Habitat:

Other:

DESIGN FEATURES & MITIGATIONS:

See Mississippi Vegetation Management Project EA, Table B-4, Alternative 3, for all specific stand design features. For this stand B-WS-1, B-WS-2, B-WS-3, B-WS-4, S-WS-11, G-WS-13, M-WL-03, M-WL-13, M-WL-14, M-WL-06, M-WL-07, M-WL-08, M-WL-09, M-WL-10

Reserve Trees	None required in a thinning.
Reserve Areas and Snags	Reserve 10% unthinned. Place unthinned areas adjacent to wetlands or on slopes when possible. Snags are standing dead trees. Leave all snags possible standing except when removal is necessary for safety. Where snags must be dropped, leave them where they fall when ever possible.
Riparian/Wetland/Lake/Stream	None of the stand is within a designated riparian area. 1) Filter strips a) Required on all wetlands to limit soil disturbance. b) Limit soil exposure to less than 5% (well distributed), except where it is necessary to regenerate certain desirable species. c) Widths i) slope 0-10% 50 feet ii) slope 11-20% 51-70 feet iii) slope 21-40% 71-110 feet
Visual	SIO(s) = 71% “high”, 29% “moderate” Visible from = Mississippi River
Heritage Survey	R3-158
TE&S species	
Soils	65% Excessively well-drained or somewhat excessively well-drained, glacial outwash, dune sand or lacustrine sand, low fertility sites. 35% Moderately well-drained or well-drained, sand over glacial till, medium fertility sites
Other Ownership Adjacency	None.
Season of Operation	Generally permitted except during spring breakup and periods of prolonged or heavy rain.
Access (existing)	FR 2162 travels east of the stand. Take FR 2162 from Hwy 9,

	approximately 3.1 miles SE. At this point there is an unidentified woods road running west. Following this about .2 mile will take you to the center of the stand.
Recreation	
Fuels	Avoid creating jackpots of fuel. Lop and scatter slash to within two feet of the ground to reduce the fuel bed depth. Designate balsam fir. Distribute slash and lop and scatter to within two feet of the ground.
Pest Management	
Wildlife	
Other	

TIMBER SALE MAKING GUIDES

The intent of this entry is to reduce the average basal area from 265 ft²/ac to 145 ft²/ac. Designate balsam fir. Reserve aspen. Reduce the density of pine by 20 ft²/ac by thinning from below so that average stand basal area following harvest will be about 145 ft²/ac., not including gaps. Densities through the stand will vary. There should be about 1 acres of gaps ¼ to ½ acre in size following harvest. These will probably be produced from cutting the balsam fir. About 1 acre of the stand should be left unthinned.

Distribute slash throughout the stand to avoid jackpots and lop and scatter to within two feet of the ground.

PESTICIDE USE PROPOSAL (FS-2100-2)

No pesticide use proposed.

MONITORING AND EVALUATION

Survival / Stocking Exams

Sale Administration

Quality Control

Treatment Effectiveness

Silviculturist:

Date:

- 1/ Prescription will direct the next sequence of entries in the stand, usually over the next 5-10 years.
 - 2/ The correct implementation of a prescription depends on a clear set of instructions that are provided in the documentation of the detailed prescription.
 - 3/ Prescriptions shall list the sequence and timing of actions required to carry out the treatment.
 - 4/ Thresholds should be established for key parameters that will trigger remedial treatment (e.g. minimal stocking of natural regeneration beneath which artificial regeneration must occur to meet stand objectives).
 - 5/ Always include a detailed map.
- (maps and photos removed for inclusion in this SIR)