C. Unit Monitoring - Compliance with Decisions, Standards and Guidelines, and Design Features

Implementation of the Forest Plan is evaluated in annual field trips to determine how well objectives have been met and how closely management standards, guidelines, sale design features, and best management practices (BMPs) have been applied.

Key Points

- Overall the Forest is doing a good job of identifying the appropriate treatments during planning and effectively implementing the activities on the ground to achieve forest and project objectives while meeting resource standards, guidelines and design features.

Monitoring Question

Monitoring and evaluation requirements will provide a basis for a periodic determination of the effects of management practices. 36 CFR 219.11(d).

Results

Since 2006, timber harvest units across the forest have been monitored annually. Planned activities in Forest's environmental assessments and decisions were compared to implemented activities and mitigation measures in the units.

The table below identifies the area or resource evaluated and then a summary of the pertinent results for monitoring conducted from 2006-2010. It is assumed results would be representative of other completed projects unless unusual conditions were encountered.

Table 2-6. Summary of monitoring results for resource areas.

Area/Resource	Monitoring Results
Implementation of EA	• Generally good follow through from what was in the EA to implementation.
Prescriptions	• Generally good incorporation of treatment activities and design features into prescriptions. Portions of some stands were appropriately deferred due to proximity to Unique Biological Areas and eagle nests. • Prescriptions planned and implemented are appropriate to achieve Desired Future Condition. Species composition objectives are being met. • Good species and structural diversity in harvest units. In one instance, oak which is usually saved was cut. • For stands lacking Common Stand Exam (CSE) data during planning, modifications often occurred during implementation. Changes to the prescription should involve discussions with the interdisciplinary team members, be documented, and appropriately filed. There were instances where this was done well and other times when it could have been improved.

	• Modifications to prescriptions were appropriate and more accurately reflect site conditions and treatment needs. • Residual basal area is frequently higher than planned in thinning units. • Effectively switching from rigid spacing in plantations to more variable spacing. • Indicators of excellent communication and coordination with layout crew and some instances where communication could have been improved.
Sale Administration	• Seasonal restrictions for wildlife and soil protection were included in timber sale contracts and activities were conducted within the seasonal restrictions. • Overall, little or no damage to residual trees. Additional trees were sometimes left to protect residual trees. Advanced marking of skid trails in thinning units resulted in minimal bole damage to residuals. • Variable density thinning in units commercially thinned for the first time can make it difficult to harvest and protect residual trees. • Understory conifers can be easily damaged during harvest. • On the Walker district, evidence of good coordination with the soils scientist in particular with regard to season of operation and retention of < 3 inch diameter slash.
Landings and Skid Trails	• Skid trails are < 10-15% of the unit and landings are < 3% in accordance with soils guidelines. • Minor or no signs of compaction, rutting or erosion. • Coarse Woody Debris (CWD) was generally adequate. • In one instance, there was too much slash on a landing for regeneration to be established.
Soils	• Slash was returned on sandy sites for nutrient retention. In some cases, this requirement was waived during harvest after consultation between sale administrator and soil scientist. • Harvest during the winter or on dry soil conditions was appropriately identified. On the Walker district, evidence of good coordination with the soils scientist with regard to season of operation and retention of < 3 inch diameter slash. • In a few instances there was some rutting that occurred on steep slopes, but generally slash was placed on slopes. Quick vegetative recovery minimizes the erosion potential. • Coarse woody debris is limited in some plantations but there is the future potential for recruitment.
Riparian Areas Riparian Management Zones (RMZ)	• Typically unit boundaries exclude RMZs so there are no impacts from harvesting. As a result opportunities and funding through KV to improve riparian function by establishing longer lived conifers are also being lost.

	• Generally CWD is adequate or there is the future potential to recruit CWD.
Wetlands	• Wetlands are protected by specifying harvest on frozen ground. Generally filter strip guidelines of less than 5% soil disturbance were met. There was little or no evidence of rutting and soils were well protected. Occasionally ruts occurred in wetland edge indicating harvest should have been on frozen ground. • Wetlands are difficult to identify during winter when layout occurs. In one unit, several vernal ponds were not identified during winter layout. Consequently, 70% canopy cover was not retained. • Unit boundaries tend to exclude wetlands when on the edge of unit. • Harvest in small ash wetland is consistent with FP Standards and Guidelines.
Legacy Patches	• Retaining uncut patches in clearcut units is a well established practice on the Chippewa NF. This guideline is being met.
Green Tree Residuals	• Green tree retention and species diversity are being met. • Good retention of larger diameter, older red or white pine. • Unthinned patches are being retained in thinning units when prescribed.
Snags and down woody debris	• Snag density is usually adequate in even-aged regeneration units but limited in thinning. Snags are retained where they occur but are often limited to begin with. • Green residual trees with defects such as broken tops are left to provide future snags and down woody debris. • Large down woody debris is limited on some sites but is retained on site if it was present before harvest.
Threatened and Endangered Species Regional Forester Sensitive Species (RFSS)	• Standards and guidelines for the protection of eagle, black-backed woodpecker (BBWP), goblin fern, Blanding's turtle, and lynx were met. Buffers and seasonal restrictions were applied for eagle, forage was left for BBWP, buffers were left for goblin fern, temporary roads were obliterated for the turtle, small slash piles were created for lynx habitat. These measures were effective. • During a sale layout, discovery of BBWP activity in an area resulted in modification of units for its protection. • Timing for eagle was met but ground scarification during harvest was not achieved. • Creation of small slash piles for lynx habitat was incorporated into many harvest units. This activity is no longer being routinely applied in lynx habitat. • 50% canopy closure for goshawk is not always met. In one instance, the line officer was aware of this situation during planning process and after a site visit approved its inclusion in the

	planning project and timber sale. • Good mast species were retained when available.
Canopy Closure	• Based on ocular estimates which are highly variable, standards and guidelines for meeting canopy closure for goshawk, goblin fern, or mature patches are not being met consistently across the forest. • Tools for marking crews to use to achieve this objective are not available. When marking during the winter in stands that contain hardwoods it is difficult to know when 50% canopy closure is achieved and even more so when 70% canopy closure is required. • Systematic methodology for post-harvest measurements of canopy closure has not yet been developed.
Regeneration	• Conversion from aspen to spruce/fir, conifer, or oak is difficult and costly and in some cases not achievable. • Dense understories of brush or aspen make planting conifers such as white pine difficult and likelihood of success low. Planting for species diversity is may be limited due to lack of KV funds. • When ground disturbance needed for natural regeneration doesn't occur due to frozen ground requirements for harvest, planting is needed. • Site preparation is required but due to visual objectives and spacing of residual trees, may not be feasible to accomplish. • Internal debate exists on the appropriateness of certifying a stand that meets the trees per acre requirements but does not meet the species objectives.
Temporary Roads	• Temporary roads are effectively being closed with slash placement. Other methods have not been as effective.
NNIS	• Clover, tansy, knapweed, and thistle typically occur on landings and temporary roads. • Winter logging and equipment cleaning is being done to minimize NNIP spread.
Visuals Scenic Integrity Objectives (SIOs)	• In even-aged regeneration units with moderate scenic integrity objectives, design features include scalloped edges, groups or leave trees along roads. • Leave tree marking is not visible from trails. • It is unclear if SIOs are being met. The Forest lacks expertise, consistency in application, and appropriate monitoring.
Prescribed Burning	• Burning treatments originally planned have been dropped due to lack of hazardous fuels, changes in the prescription, costs of burning, or narrow burning windows. • Most often mechanical scarification would be more appropriate, timely, and effective.
Biomass removal	• A few units had slash piles available for biomass removal. Adequate coarse woody debris was retained.

Implications

Overall the Forest is doing a good job of identifying the appropriate treatments during planning and effectively implementing the activities on the ground to achieve forest and project objectives while meeting resource standards, guidelines and design features. Prescriptions are incorporating unit specific activities and design features that assist the marking crew. The appropriate clauses are being included in timber sale contracts. Layout crews and sale administrators are doing a good job for the most part implementing contract clauses and in some circumstances identifying and resolving concerns before resource damage is incurred.

Recommendations

Based on monitoring findings, the following recommendations are made to strengthen implementation.

Table 2-7. Recommendations based on monitoring findings.

Prescriptions	• Maintain good coordination and communication with the marking crew. • Based on input from the IDT, adequately document modifications with rationale and file. • In thinning units, continue working with marking crew to insure residual basal area objectives are achieved.
Sale Administration	• Continue close coordination and communication during planning, layout, and harvest operations to identify and resolve any potential problems.
Soils	• Continue close coordination with sale administrator with regard to season of operation, retention of < 3 inch diameter slash, and slash placement on steeper slopes.
Riparian Areas Riparian Management Zones (RMZ)	• Hydrologist and silviculturists should work closely with marking crew to insure activities to enhance riparian function are implemented and funded.
Wetlands	• Since vernal pools are difficult to identify in hardwood stands on aerial photos and during the winter when unit layout usually occurs-- 1. Provide ongoing training to marking crews on identifying indicators of vernal pools. 2. Defer layout and marking of hardwood stands to “no snow” periods. 3. Use LIDAR photos to assist in identifying vernal pools during project planning. Currently data is available for Beltrami County and is expected to be available for Cass and Itasca Counties in the next few years.
Threatened and Endangered Species Regional Forester Sensitive Species	• IDT should review of design features identified prior to implementation to identify potential conflicts and trade-offs.

(RFSS)	
Canopy Closure	• Canopy closure expressed in terms of percentages is difficult to apply and achieve on the ground. There is limited information and tools available to help the practitioner. • Continue to pursue with research or area Universities the development of tools that correlate basal area and canopy closure by forest type. • Provide for post-harvest measurements of canopy closure across the forest (funded for 2011) to determine success of past techniques used to meet canopy closure objectives.
Regeneration	• Conversions from aspen to other species are difficult and costly. Implementation costs should gathered and compared to costs estimates used during Forest Plan revision. • Success of conversions are undetermined due to the time it takes to implement the harvest (contract period is 3-5 years), then to establish desired regeneration. Release often is needed for several years to assure success. • IDT review of design features should occur to identify potential trade-offs to achieving timely and cost effective regeneration. • Funding has not been available to do as many conversions or as much diversity planting as desired. • Clarification is needed on requirements for trees per acre and species composition for certification of a stand as adequately regenerated.
Visuals	• Forest should identify training or shared personnel needed to attain expertise on scenic integrity objectives. Conduct monitoring across the forest.
Burning	• Burning units need to be prioritized, objectives well defined, and achievable.
Other	• Look for opportunities/ways to close or obliterate non-system roads within cutting units not used by timber purchasers.

D. References

Ostry, M.E., J.O'Brien, and M. Albers. 2002. Disease considerations in red pine management. In *Proceedings of the Red Pine SAF Region V Technical Conference,* eds., Gilmore, D.W., and L.S. Yount, 107-111. Staff Paper no. 157. St. Paul, MN: University of Minnesota, College of Natural Resources, Department of Forest Resources.