Cayuga Project Monitoring Plan

Use of Stocking Surveys to Determine Natural and Artificial Regeneration Success

Natural regeneration

The objective of natural regeneration stocking surveys is to determine natural reforestation success. The surveyors (District Silviculturist or District Reforestation Technician) will check the stand at the first and third years after site preparation for aspen, or at the third and fifth years after site preparation for other species, using milacre (a 1000th of an acre) plots. A minimum of two plots will be taken per acre. A successful plot would contain two vigorous hardwood seedlings or one vigorous conifer seedling, at least one foot tall. A minimum of 60% of the plots taken would have to be adequately stocked for the regeneration of that stand to be considered successful. Additional objectives of these stocking surveys are to determine the distribution of stocking, the need for release from competition, areas that failed, and the need for fill-in planting or additional site preparation. The surveyor will certify the stand if adequately stocked.

Paper birch regeneration

Paper birch regeneration will be surveyed for success using the milacre plot system described above. Stocking surveys would be taken one and two years after the initial shelterwood harvest and site preparation. Adequately stocked birch types would require the overstory to be harvested to ensure an open growing environment for the regeneration. Additional stocking surveys would be done one and three years after the removal harvest to determine the success of the regeneration. A minimum of 60% of the plots taken would have to be adequately stocked with paper birch for the regeneration of the stand to birch to be considered a success. If paper birch stems do not meet the minimum levels, other species would be considered to determine an adequate stocking of other desirable species such as aspen, red oak, pine, or maple. A dominance of other species could move the stand into another timber type.

Natural hardwood regeneration

The objective for natural hardwood regeneration stocking surveys is to determine reforestation success of hardwood selection harvests. The surveyor will check the stand at the third and fifth years after harvest, using milacre plots, to determine success of hardwood regeneration in the canopy gaps, and to certify the stand if adequately stocked.

Artificial regeneration

The objective for artificial regeneration stocking survey activities is to determine artificial (planting) reforestation success. The surveyor will check the stand at the first and third years after establishment for distribution of stocking, need for release from competition, areas that failed, need for fill-in or replanting, and finally certify the stand is adequately stocked. Stands will be surveyed using 10-tree plots. A series of ten trees planted in a row will be surveyed (at a rate of one 10-tree plot per acre) to determine the success of the planting. Due to the lower planting densities (100-400 trees per acre), the milacre plot system will not be used. Surveys will be done one, three, and five years after the planting. A successful planting will have 80% of the planted trees surviving after five years.

Aspen conversion

Aspen stands being converted to other forest types will be monitored using the stocking survey most applicable to each stand. Stands being underplanted with conifers would be surveyed at the first, third, and fifth years after establishment, using 10-tree plots, to determine success of the artificial regeneration, areas that failed, the need for release from competition, or for fill-in planting. A series of ten trees planted in a row will be surveyed (at a rate of one ten-tree plot per acre) to determine the success of the planting. A successful planting will have 80% of the planted trees surviving after five years.

Stands being shelterwood cut to obtain natural regeneration of either conifers or hardwoods would be surveyed at the third and fifth years after harvest or site preparation, using milacre (a 1000th of an acre) plots. A minimum of two plots will be taken per acre. A successful plot would contain two vigorous hardwood seedlings or one vigorous conifer seedling, at least one foot tall. A minimum of 60% of the plots taken would have to be adequately stocked for the regeneration of that stand to be considered successful.

Some aspen conversions are already mixed stands that will become another forest type simply by discriminating against aspen when thinning the stand. In these cases, an informal survey will be done to determine if milacre plots need to be taken.

All survey costs for artificial and natural regeneration within the Cayuga Project Timber Sale Areas would be funded by KV funds at a rate of $8.00 to $15.00 per acre. Surveys would be conducted during the leaf off time of the year (fall or spring).

Non-Native Invasive Species (NNIS)

Monitoring would be implemented to determine the effects of management activities on existing populations of NNIS. Known NNIS sites affected were identified in Table 3.3.7a of the Cayuga Final Environmental Impact Statement (FEIS) on page 59. One stand (compartment 204, stand 19) containing reed canary grass would be affected by management activities. A District or Zone Biologist, Botanist, Ecologist, or Biological Technician would survey this stand prior to management activity and for three years following close of activity. Prior to management activity and for three successive years following close of activity, the affected NNIS site would have a photo point created; the perimeter of the site would be accurately mapped and marked using flagging and stakes to determine total area affected; and quantitative measurements of NNIS density within the site boundary would be taken using ocular estimates placing species or groups (guilds) of species into cover classes across the entire site (the site is defined as the area bounded by the outer edge of the NNIS population).

A District or Zone Biologist, Botanist, Ecologist, or Biological Technician would continue to do surveys of National Forest lands within the project area, to further identify and evaluate NNIS populations. It is estimated that the cost of monitoring NNIS in the Cayuga Project Area would be approximately $500/year.

Use of Biological Control (flea beetle) to control Leafy Spurge

Monitoring of sites infested by leafy spurge (Euphorbia esula) identified in the Cayuga Project Area EIS is required under Mitigation Measure N5 for a minimum of five years after biological control agents are applied. The following plan is designed to: 1) ensure that biological control agents have become established; 2) determine if biological control agents have moved from release sites; and 3) assess the impact of biological control agents on the targeted invasive.

Key questions to ask as part of monitoring:

Are the biological control agents already present at the site prior to release?
Did the biological control agents successfully establish after release?
How far have biological control agents dispersed from the release sites?
Are the biological control agents causing visible damage to the target weed?
Are there noticeable changes occurring within the localized plant community?
Are the biological control agents impacting non-target species?
Are the biological control agents found in high enough concentrations to be collected and distributed to new release sites?

Answers to these questions will allow land managers to do the following:

Determine the success of biological control efforts for target species.
Determine if supplemental release or additional control methods are needed.
Determine that biological control agents are impacting target species.
Document changes in the plant community.

Monitoring Time Table:

Initial site characterization and reconnaissance will take place in year one of the Cayuga Project implementation prior to placement of biological control agents. If possible, this should be accomplished by mid-June so that biological control agents can be released immediately following work. This initial work will: 1) establish photo points of each release site; 2) establish actual release points marked with a permanent stake; 3) measure and map the outer bounds of the site, giving total square footage of the impacted site; 4) characterize density and distribution classes (life stages) of all vegetation in the site; and 5) determine whether biological control agents are already present due to natural dispersal from other release sites not associated with this project.

Initial release of biological control agents will take place in mid-June to mid-July of year one of the Cayuga Project Area EIS if feasible. If not feasible, the release should be planned for the same time period of year two.

Biological control agent (both larval and adult stages), vegetation monitoring, and photo point updates should happen for a minimum of five successive years following release. Larvae should be monitored in early June and adult stages and vegetation should be monitored in July.

Monitoring Methods:

Create a photo point at each release site. Point should include a general view of the site with an identifiable reference point. Choose an angle during establishment that will best show changes over time. Close up photos of the site showing vegetation, ground, and litter may also be of use.

Larval biological control activity should be monitored in early June in years following release by examining roots and shots of leafy spurge plants that look unhealthy for active larvae.

Adult biological control activity should be monitored in years following release by sweep netting in July. Adult feeding damage should also be monitored along a line transect. Light feeding, indicating small biological control agent populations appears as "pitting or shot holing" of leaves. Heavy feeding, indicating a well established, large population of spurge beetles results in ragged, shredded leaves.

Qualitative vegetation monitoring will include:

1) Determination of density of all vegetation using ocular estimates placing species or groups (guilds) of species into cover classes across the entire site (the site is defined as the area bounded by the outer edge of the spurge population); 2) determination of general spurge distribution in the site; and 3) spurge phenology class at time of monitoring (see monitoring form).

2) Re-measure and map the outer bounds of the site each successive year throughout the life of the project using GPS and/or stakes and a measuring tape to determine the total area of the site.

Water Quality

A Hydrologist or Watershed Specialist will monitor the use and effectiveness of Wisconsin's Forestry Best Management Practices (BMP's) for Water Quality on at least three timber sale units with lakes, streams, or wetlands within or adjacent to them within one year after the sale has closed. The sales to be monitored will be randomly selected. The Hydrologist or Watershed Specialist will look the sale over, concentrating on the portions of the sale near the water resource involved. The monitoring form that the Wisconsin Department of Natural Resources Bureau of Forestry has been using for the statewide monitoring program will be used to document the use and effectiveness of BMP's. This would be in addition to monitoring that the State may do as part of their on-going Statewide BMP Monitoring Program. Water quality of sales within the Cayuga Project area may also be monitored by an inter-disciplinary team as part of a timber sale activity review, which has occurred on each District every other year in the past.

A Hydrologist, Watershed Specialist, or other qualified individual would also monitor the results of the watershed improvement projects. All of the culvert replacement sites would be monitored after project implementation for effectiveness of the erosion control measures. The project leader would check the sites within a week after project completion to ensure erosion control measures were working. The sites would be checked several times throughout the following year for continued effectiveness of the measures taken. One of the 7 culvert replacement or removal sites would be randomly selected for monitoring the effectiveness of sediment reduction. Measurements of the stream channel including cross-sections above and below the road crossing would be taken prior to and following project completion to identify changes in channel morphology and sediment deposits.

Soil Productivity

A soil scientist would monitor the effectiveness of the mitigation measures identified to minimize soil erosion, displacement, compaction, and rutting. At least 3 sales where soil related mitigation measures were identified would be randomly selected. These sales would be monitored within a year after the sale was closed for any visible signs of rutting, compaction, erosion or displacement. If any soil disturbance is identified, it would be quantified in terms of percentage of the stand affected and approximate measure of the affected area itself (e.g. depth and length of ruts, square footage of eroded area, etc.). The soil productivity on sales within the Cayuga Project area may also be monitored by an inter-disciplinary team as part of a timber sale activity review, which has occurred on each District every other year in the past

McCarthy Lake and Cedars RNA

All RNA's on the Forest, including McCarthy Lake and Cedars, are scheduled for monitoring "checkups" every two years. Items checked include signs of natural impacts such as wind damage, flooding, or over browsing; public uses within the area; evidence of unauthorized use or encroachment; and potential impacts adjacent to the area. This checkup will be used to evaluate the effectiveness of project area activities such as aspen conversion and the closure of the FR 1333 spur road that enters the RNA.

McCarthy Creek trout habitat improvement

Monitoring is planned to evaluate the effectiveness of trout stream habitat improvement on McCarthy Creek. Typically, stream channel measurements are used to record channel morphology before and after instream habitat work. Features measured include average stream width and depth, structural features (such as large woody debris), and substrate. Electroshocking is sometimes also used, to measure trout population and size distribution before and after habitat work.

Structural features of hardwood stands

Monitoring is planned to measure the quantity and distribution of structural features in northern hardwood stands within the project area, before and after harvest, to help understand the effects of harvest on these features. Methods used would be similar to those described in Tyrell and Crow

(1994). Features that would be tracked include large snags, downed woody debris, tip-up mounds, and cavity trees. Some of the pre-harvest monitoring is planned for summer of 2003, and would include representative stands of various ages and harvest history. GPS coordinates would record location of plots measured, so that the same plots could be remeasured shortly after selective harvest was completed.

Northern goshawk activity

The known goshawk territory in the project area will be monitored on a yearly basis for as long as the territory is active, or for at least 5 years following last known activity. Monitoring will be conducted by district personnel and/or the WDNR, and will include both presence/absence information and productivity. This monitoring will also be used to evaluate the effectiveness of proposed protection and mitigation measures.

Wildlife population monitoring

American marten
The marten will continue to be monitored by a combination of species-specific monitoring and general winter track surveys. A road transect through the project area will be surveyed for tracks twice each winter, once for marten detection and once for predators in general, by WDNR personnel. The WDNR and/or volunteer trackers will survey a carnivore survey block that includes the project area several times each winter. Research activity focused on marten will continue at least into the near future, and will include a large portion of the project area. Personnel from Great Lakes Indian Fish and Wildlife Commission and USDA Forest Service Research are conducting the research.

Gray wolf
The wolf will continue to be monitored by existing survey methods, primarily by WDNR personnel. These methods will be the winter carnivore survey, in several blocks that include the project area, and by the same winter predator survey transect as described for the marten. In addition, wolf packs that contain radio-collared wolves will be monitored on a regular basis for pack locations.

Trumpeter swan
The trumpeter swan will continue to be monitored on a yearly basis by WDNR personnel, for nesting activity and productivity. The area monitored will include the Iron River and McCarthy Lake area.

Other bird species (songbirds in particular)
Bird species will continue to be monitored as part of the yearly Breeding Bird Survey contracted to the Natural Resources Research Institute in Duluth, MN. This survey includes three stands in the project area, none of which are proposed for management activity. This monitoring therefore provides limited information in relation to project implementation, but helps provide overall population and trend information useful at a larger scale.

Management Indicator Species

These species will continue to be monitored as described in Appendix H of the EIS, for at least as long as they remain listed as Forest MIS. Approval and implementation of the Forest Plan revision would involve a change in species listed as management indicators.