SILVICULTURE ACTION PLAN

STRATEGY 1

Increase the use of long-term stand-level management plans - prescriptions - that consider the full spectrum of silvicultural practices and technologies and apply the most appropriate for increased productivity.

• *Increase productivity through comprehensive use of silvicultural systems*

Discussion

A silvicultural system is an approach to harvesting, regenerating and growing a forest. There are various systems. Selecting a system is based on management goals, the current condition on the site, and the potential of the site. Some systems are more efficient and may produce more fiber than others. A silvicultural system is the foundation of a prescription; a planned series of treatments including site preparation, planting, cleaning, pre-commercial thinning, commercial thinning, and final harvest intended to meet the management goals. It is important that a prescription is comprehensive and well documented. The expected outcomes also need to be documented to evaluate the prescription.

As part of the prescription writing process, insect and disease issues both non-native and endemic need to be addressed to be proactive. With more invasive species, concerns over climate change and minimizing endemic insect and disease problems, an integrated approach between forestry practices and pest control needs developing. Problems with regeneration of trees and other vegetation have come to the forefront with increased deer populations and the earthworm destruction. A central silvicultural principle for optimizing timber productivity is to match the tree species with the site. This has become impossible in some parts of the state due to heavy browse damage on desired species, especially white, red, and jack pines and red oak. The cost of protecting seedlings from browsing has escalated; over $300,000 was spent in 2006 on state forestlands alone.

The spread of the gypsy moth and the emerald ash borer has raised the issue of how to protect our forests from invasives so that other species are not put in jeopardy like the American chestnut or American elm. The spread of plant invasives threatens both terrestrial and aquatic ecosystems upsetting the natural control systems.

Key Components & Potential Outputs

- Offer training designed for different landowners and different levels of expertise
- System selection
- Prescription writing
- Encourage the use of systems not typically used because of agency policy or culture
- Develop recommendations for system use and modification that consider forest

type and stand condition
- Control infestation, damage, and spread of forest pests (invasive and endemic species/diseases and deer) that affect forest productivity.

ACTION 1-A: Write prescriptions that consider the life of the stand from stand initiation to final harvest.	
BACKGROUND	
BARRIERS	**RESPONSE**
Harvesting has been planned and implemented independently of regeneration planning and implementation.	Harvest and regeneration are not separate actions but are part of a silvicultural system. Looking at the entire system (regeneration, intermediate entries, harvesting) will better utilize the full potential of the site, reduce costs, and lead to more accurate planning for a sustainable wood supply.
Intermediate stand treatments have been neglected due to limited resources which focus primarily on harvesting and regeneration	Intermediate stand treatments are critical for capturing mortality and utilizing more fully the potential of the site. A well-thought out prescription will identify potential intermediate stand treatments and help address mortality and quality in a timely fashion. Identifying stand treatment needs well in advance will help develop budgets and resources to implement intermediate stand treatments.
Markets are not available for intermediate harvests, and harvesting of small-diameter products is relatively expensive.	Opportunities may exist to maximize productivity and improve quality of stands through thinning of both red pine and aspen. Biomass markets may develop in the future which could increase markets for non-merchantable timber via intermediate thinnings. Policy makers must be educated as to the need for pre-commercial treatments so that adequate funding can be proved in the absence of biomass markets.

ACTION PLAN		
WHO	**ACTION**	**DATE**
Public forestry agencies; timber companies.	Develop and implement policies that encourage the preparation of prescriptions using all available knowledge such as ECS, insects and	FRP review policies by FRP by October, 2008.

	disease information, soils, etc.	
FRP	Develop a prescription writing workshop for forestry agencies to share ideas on preparing effective prescriptions to insure adequacy and commonality of prescriptions.	Workshop scheduled during summer of 2008.
U of MN, timber industry, logger groups,	Develop harvesting technologies to allow efficient harvesting of small-diameter material.	FRP review progress in developing emerging small-diameter harvesting technologies by October, 2009
Productivity Cooperative	Support research to develop optimal thinning strategies by MFPRC and Univ. of MN.	Report progress to FRP by October, 2009.
Public forestry agencies; timber companies.	Promote the use of biomass.	FRP review efforts by agencies and companies by October 2008.

ACTION 1-B: Use the full range of silvicultural systems to meet productivity goals, capture mortality, and increase stand quality.	
BACKGROUND	
BARRIERS	**RESPONSE**
Forestry culture may not be receptive to trying new silvicultural/harvest methods.	Past management has often been based on single species management through clear-cutting. With different harvesting equipment, there are more options for using different silvicultural systems, conducting multiple entries, and capitalizing on silvics of tree species. Preparing prescriptions will allow analyses of the range of silvicultural systems available and allow adequate planning time to develop and implement new approaches and use newer, evolving equipment.
Because past timber harvest has been related to species desirability by consumers and forest products processes, forest management has centered on those species thus creating a forest age imbalance.	By managing for a range of forest products that are harvested at the appropriate age, current industry needs will be met while attracting new industries.

ACTION PLAN		
WHO	**ACTION**	**DATE**
FRP	Coordinate the development of a workshop, which demonstrates the range of silvicultural systems and options possible.	Develop plans and draft curriculum by October, 2008; offer workshop by summer of 2009.
DNR, Counties, timber industry	Develop demonstration areas that show the range of options for silvicultural systems appropriate for MN forests types, NPCs and environmental conditions.	FRP review plans for demo areas by the agencies and companies by October, 2008; first demo area available for viewing by October, 2009.
DNR, Counties, timber industry	Implement a user-friendly modeling system that considers all facets of forest management and indicts the appropriate entry times for management activities.	December, 2008

ACTION 1-C: Control infestation, damage, and spread of forest pests (invasive and endemic species/diseases and deer) that affect forest productivity.	
BACKGROUND	
BARRIERS	**RESPONSE**
A significant amount of timber volume and degradation in quality occurs due to a lack of information on stand breakup and effects of pathogens. Work is needed to ensure that mortality losses are reduced	Preparation of prescriptions can assist foresters in the identification of stand conditions and the potential for continual damage and losses to the stand if the stand is left untreated. Developing prescriptions that rely on a wide range of scientific knowledge can help with wiser decision making so that stand damage and mortality is captured before they become excessive.
Some stakeholders prefer high deer population levels.	Deer populations must be kept in balance with other resource management goals, both in forested and agricultural settings. A strong public education effort, and the cooperation of wildlife managers, will be necessary to get this message out.

ACTION PLAN		
WHO	**ACTION**	**DATE**
MFRC, MFRP, Forest Protection Task Force	Collaboration and coordinated efforts between ownerships, interest groups and agencies (similar to MIFC)	October 2008
University system, DNR Pathologists, Management Foresters	Application of research findings to the field (often there is a disconnect)	October 2008
Coordinate with Information Strategy	Bulletins (or something, Internet?) that compiles known information in one location	December 2008
MFI, MFRC, Wildlife managers	Educate the public and legislators about the problems associated with high deer numbers (focus on reaching the urban population)	Coordinated action plan developed by Jan 1, 2008
MFRC, MFI, MFRP, MN Deer Hunter Assoc.	Introduce legislation to ban recreational deer feeding.	January, 2009

STRATEGY 2

Enable loggers to be more self-directed when conducting first-entry thinnings.

- *Use innovative sales structures to increase efficiency*

Discussion

Thinning stands, starting at a relatively young age, can increase timber productivity by capturing mortality and by optimizing the composition and spacing of the residual stand. However, such stands are often inefficient for a professional forester to set up, due to the large number and small size of the trees to be marked. Foresters, because of higher priority workload demands, may pass up thinning opportunities.

Loggers, with the proper training and equipment, should be able to thin these stands according to the forester's prescription without having trees individually marked. This will free up foresters to spend their time managing more complex stands, and increase the number of acres treated annually. In the longer term, this will also enable stands to be thinned more often, resulting in higher quality products and improved stand health.

Key Components & Potential Outputs

- Build on existing logger training programs (MLEP, Vermilion Community College)
- Provide incentives such as loan guarantees for loggers to purchase cut to length harvesting equipment
- Public agencies may need to alter timber sale policies to allow logger-select thinning, and to be able to reward loggers for good performance.
- Provide training to improve logger performance

ACTION 2-A: Public agencies should ensure that their timber sale policies allow and promote logger-select thinning, with appropriate performance standards.	
BACKGROUND	
BARRIERS	**RESPONSE**
Policy manager reluctance to change, agency demands for accountability	Review policies, and the results of logger-select thinnings, as practiced by other agencies

ACTION PLAN		
WHO	**ACTION**	**DATE**
Land Commissioners, Forest Supervisors, State Foresters, Procurement Managers, NIPF managers, Wood Brokers	Prepare a report to the FRP including the following information: ❑Results of an analysis of timber sale policies that identify organizational barriers and opportunities for logger-select thinnings; ❑ Baseline of how many sales and acres have been in logger select sales over the past five years; and ❑Projection of how many acres and sales the organization can promote and support during the 5-year period of 2009-2014.	October, 2008

ACTION 2-B: Build on existing logger training programs (MLEP, Vermillion CC, etc.)	
BACKGROUND	
BARRIERS	**RESPONSE**
Lack of funding	Explore dedicated funding sources to Logger ed programs
Loggers may be unwilling to invest the necessary time to attend training.	Provide incentives, such as preference given on sale award to trained loggers

ACTION PLAN		
WHO	**ACTION**	**DATE**
Mill Managers, Procurement Managers	Reward loggers for training	January 2008
MFI, MFRC, MFRP, ACLT,	Sponsor Career Days to promote recruitment of the next generation of loggers	June 2008

ACTION PLAN		
WHO	**ACTION**	**DATE**
MFI, MFRC, MFRP, ACLT,	Lobby Legislature to increase $$$ for logger education	June, 2008
Dave Chura, MLEP; Dixon Shelstad Vermilion CC; Mark Jensen, Bemidji CC, etc.	Develop a training module focused on self-directed logging operations, Master Logger Certification.	August, 2008
Land Commissioners, Forest Supervisors, State Foresters, Procurement Managers, NIPF managers, Wood Brokers	Develop policies to allow only qualified (trained) loggers to bid on logger-select thinning sales	January 2010

ACTION 2-C: Provide incentives such as low interest loans for loggers to purchase harvesting equipment most appropriate for thinning sales.	
BACKGROUND	
BARRIERS	**RESPONSE**
Lack of funding	Lobby Legislature to support this as a necessary short-term investment in the forest products industry

ACTION PLAN		
WHO	**ACTION**	**DATE**
Mill Managers, Procurement Managers	Guarantee contracted wood can be delivered regardless of temporary market conditions	January 2008
Land Commissioners, Forest Supervisors, State Foresters, Procurement Managers, NIPF managers, Wood Brokers	Offer logger-select thinning sales	January 2008
Area Chambers of Commerce	Pressure lending institutions to make loans	November 2007
MFI, MFRP, ACLT, Area Chambers of Commerce	Lobby Legislature to subsidize interest rates for equipment loans	May 2008

STRATEGY 3
Use ecological classification systems to better match site, species, and silvicultural prescriptions

Discussion

With the many demands on forest land, need for increased productivity, the need to reduce costs, and environmental issues, using an ecological classification system combines many environmental attributes so that silvicultural prescriptions can better reflect species requirements and capitalize on natural conditions to accomplish desired forest conditions.

Using an ecological system, also, helps validates forestry decisions to maintain the social license to operate. The implementation of an ecological classification system addresses timber values by matching trees to sites and encouraging the growth of the most productive species or combination of species.

There are three systems in use in Minnesota: Native Plant Communities of Minnesota, Kotar's system, and Don Prettyman's biophysical. The native plant communities and Kotar's system are very compatible systems and work well with silvicultural systems. Kotar's system is used throughout Michigan and Wisconsin as well as parts of Minnesota. The native plant communities is a statewide system within Minnesota. Don Prettyman's biophysical is quite different from the other systems and is not used extensively in Minnesota and not outside of Minnesota. The discussion that follows will center on the two main systems.

Key Components & Potential Outputs

- Education and training for practitioners through continuing education (SFEC), the university system, and mentoring
- Silvicultural interpretations/ suggestions for plant communities
- Growth and yield metrics for mixed species stands
- Demonstration sites ("seeing is believing") both successes and failures with reasons
- System to inventory and/or map ecological units
- Plant ID tools specific for Minnesota
- Develop monitoring system to measure implementation success
- Increase funding
- Provide time for individuals to learn and understand the use of an ecological

ACTION 3-A: Provide classes through different venues depending on the audience.	
BACKGROUND	
BARRIERS	**RESPONSE**
Time and funding to go to classes is lacking for practioners.	Evaluate current training requirements for personal performance and the funding to stay up-to-date.
The number of instructors with experience using ECS for forest management is limited.	Provide opportunities to train more people to train others (Train the trainer)
Recently graduated foresters need strong backgrounds in the use of ECS, silvics, and ecology and their connection to each other.	Incorporate into existing college curriculum and/or increase the level of awareness and use of these subjects.
There are notions that implementing ECS takes more time and is difficult to do. Lack of buy-in.	With use and practice, newly learned skills take less time. As more prescriptions are implemented, buy-in will come with time.

ACTION PLAN		
WHO	**ACTION**	**DATE**
Forestry supervisors	While doing performance reviews, provide the opportunity for training in ECS	Performance review for fiscal/calendar year 2008.
Forestry supervisors	Determine the number of employees that need training so classes and funding are available.	Provide summary of numbers and needs to FRP by October, 2008.
SFEC	Provide additional sessions of the Ecological Silviculture class as needed to fulfill the practioner needs	Offer session(s) during calendar 2008.
University of Minnesota, Community Colleges	Evaluate and change classes to reflect the use of ECS and how to integrate ECS with silvics and ecology. Develop outreach workshops on ECS.	Report how ECS is or will be integrated into curricula by October, 2008.
Experienced users and trained individuals	Mentor co-workers and network with other groups to keep people informed and provide continual improvement in the use of ECS	Initiate immediately.

ACTION 3-B: Provide the tools to implement an ECS	
BACKGROUND	
BARRIERS	**RESPONSE**
Growth and yield metrics for mixed species stands lacking especially by plant community.	To evaluate economics both from a volume and cost perspective and the timing of management activities, these are critical.
Demonstration sites to learn from are not well documented.	"Seeing is believing" Both successes and failures with reasons are necessary to improve the implementation of ECS and incorporate what has worked in the past.
System to inventory and/or map ecological units is missing.	For landscape planning and site level implementation, inventories and maps would give a clearer picture of resource availability and ecological conditions
Plant ID tools specific for Minnesota needed.	Many of the books for plant ID cover large geographic areas, such as the eastern US, a book for Minnesota would make classifying sites easier.
Silvicultural interpretations based on plant communities are not completed.	Initially, these are needed to get people thinking of different ways to do management and to show the classification can be interpreted.

ACTION PLAN		
WHO	**ACTION**	**DATE**
Researchers (University of Minnesota, USFS, NRRI)	Evaluate and provide new growth and yield models correlated to ECS.	Progress report made to MFRP by October, 2008.
Land Management Organizations (USFS, State, Counties, Private Industrial, TNC) and Research Groups (University of Minnesota, USFS, NRRI)	Provide field demonstration sites with documentation on forestry activities performed. The information for the sites would reside in one location that anyone could access.	See Action 1-B.
Land Management Organizations (USFS, State, Counties, Private Industrial, TNC) MFRC	Utilize established inventories as a base to assess what needs to be changed, added, or modified so inventory data is compatible across ownerships.	Provide progress report to MFRP by October, 2009.
Botanists, Natural Heritage Program, MN DNR	Compile the information needed for a Minnesota Plant ID book.	Complete a web version by May, 2008.

ACTION PLAN		
WHO	**ACTION**	**DATE**
Forest Ecologists and Foresters (Land Management Organizations and Research Organizations)	Work together to provide silvicultural interpretations/ suggestions by plant communities. Create demonstration sites using these interpretations/suggestions to provide "on-the-ground" examples.	DNR serve as coordinator of this effort. provide a progress report to MFRP by October, 2008.

ACTION 3-C: Capitalize on existing monitoring systems and change and/or modify as needed.	
BACKGROUND	
BARRIERS	**RESPONSE**
Difficult to change existing systems	To evaluate any method of operation, a system of monitoring needs to be in place.
Resources to implement a monitoring system.	Resources spent on monitoring will convince managers, investors, and legislators that money needs to be invested throughout the life of a stand and will reduce costs.

ACTION PLAN		
WHO	**ACTION**	**DATE**
Foresters and Forest Managers (Land Management Organizations)	Evaluates the effectiveness of implementing an ECS; establish case studies to begin documentation.	Provide preliminary assessment and progress report by October, 2009.
Field Foresters (do measuring), Agency Analysts (report to management the trends)	Monitor planting survival rates, stocking levels, number of intermediate entries, fiber quality, variety of available products, health (insect and disease problems), volume	December 2008; Annual Report
Managers, Investors, Legislators	Provide resources for a monitoring system	Seek funding via legislature during 2009 session.