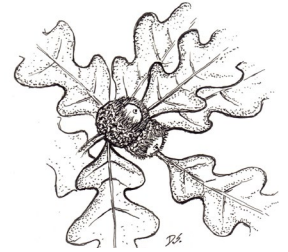


Forest Establishment and Management

Document Purpose – This fact sheet is a companion to the *BWSR Native Vegetation Establishment and Enhancement Guidelines* and provides detailed considerations for project planning and design with an emphasis on vegetation selection, installation and management.



Introduction – The goals of forest plantings can vary greatly, but can include natural regeneration efforts following tree harvest, efforts to increase diversity in forest stands, seeding or planting of trees and shrubs into agricultural fields to establish forest stands, or the planting of urban forests. This fact sheet focuses on silviculture and forest management on private lands in the forested regions of Minnesota.

Site Selection – Projects should be planned to meet program and partner goals that often include soil stabilization, water quality, habitat, timber production, equity and aesthetics. When selecting projects for wildlife it is important to define specific species that will be benefitted by the project. The [Minnesota Wildlife Action Plan](#) is a document that outlines a set of species of greatest conservation need for different areas of Minnesota. New information is also available about the [value of different tree species for native insects](#) from the National Wildlife Foundation. Local forestry staff play a key role in providing site selection recommendations and developing forest stewardship plans.

General Planning Considerations – County-level programs are often aligned with work being done by the Minnesota Department of Natural Resources, using easements and other conservation practices to protect wildlife and water quality. Unlike more traditional agricultural easements, working forests easements allow landowners to continue to harvest and manage their timber under an approved [Forest Stewardship Plan](#).



Trees in protective plastic tubes

A landscape stewardship plan is a multi-landowner Forest Stewardship Plan developed at a watershed scale. [Managing Private Forests on a Landscape Level \(pdf\)](#) summarizes the process of developing landscape stewardship plans, their relationship to comprehensive watershed management plans (under One Watershed One Plan), and the prioritize-target-measure approach to watershed management. A general sequence of concepts and products, outlined on BWSR's [Forest Land](#) webpage, provides a suggested ecological pathway to help land managers and owners work from the landscape scale down to the site level when planning specific forest management activities.

Plant Community, Plant and Seed Selection - Target species for forest/woodland projects will vary depending on the plant community being restored, and project goals for water quality, wildlife and timber production. Many resources have been developed in Minnesota to guide decision making for project planning and species selection based on plant community information.

High diversity levels of 10 to 25 species are recommended for wildlife habitat focused projects. Diversity levels will often be limited by the number of species available that are suitable for a project site. Herbaceous species

may also be planted at the same time as trees and shrubs if the site is transitioning from a disturbed condition (agricultural field, etc.). Mix diversity will depend on site conditions and project goals. Relatively low diversity mixes may be used if woodland trees, shrubs, forbs, ferns, and grasses may re-establish at the project site. Appropriate species will vary depending on project locations. [The Minnesota State Forest Nursery](#) website is a good information source for species selection.

Species should be selected that are native to the area and well adapted to site conditions. Species will vary across the state depending on the ecoregion and predominant native plant communities. The DNR's [Field Guides to Native Plant Communities of Minnesota](#) offer a useful starting point in identifying these communities, listing the dominant tree, shrubs, grass, forb, rush, sedge and fern species for each community type. However, potential changes in the range of these species should also be considered in response to existing and expected climate change. See discussion of climate change considerations in Section 2 of the Guidelines.

Plant Source Considerations - Many forest nurseries document the seed source for their trees and shrubs, this is useful information for making decisions about suitable sources and to ensure that trees and shrubs that are planted will produce viable seed. Some nurseries can also contract grow trees and shrubs from seed or cuttings. The seed source guidance in Section 2 of these guidelines, based on ecological subsections, should be used in most cases. The DNR has also developed [seed zones for Minnesota](#) that are widely used in sourcing seeds for forest projects. Additional source maps developed by the US Forest Service are currently under review and may be incorporated into these guidelines in the future.

Vegetation Establishment - A variety of techniques are used for forest/woodland establishment. Seedling trees are commonly used with tree tubes or other protection from herbivores. Seeds of trees and shrubs planted into a prepared seedbed has also become a more common practice for restoring large areas. After logging is conducted, natural regeneration is often the primary method of establishment, though additional species may be added to increase diversity or improve wildlife habitat.

Operations and Maintenance - Maintenance for conservation and restoration plantings often involves mowing around trees and shrubs, so it is important that they are well marked and spaced far enough apart to allow for mowing. Mowing can also be conducted above the height of woody plants that have been planted as seed. Weed mats and wood chips can also be used to suppress weeds around young trees. Herbicide treatment may also be used around seedlings with herbicides that will not affect woody plants or by taking precautions to go around the seedlings. Watering may also be needed, with at least one inch of water per week from rainfall or supplemental watering as trees establish.

Information Sources

DNR Forestry Website: <http://www.dnr.state.mn.us/forestry/index.html>

DNR Ecological Classification System: <https://www.dnr.state.mn.us/ecs/index.html>

Minnesota Forest Resources Council: North Central Landscape Plan: <https://mn.gov/frc/landscape/nc/>

Minnesota Forest Resources Council: East Central Landscape Plan: <https://mn.gov/frc/landscape/ec/>