

Genetic Guidelines for ‘Forest Managers’*

*The threats of **Climate Change & Invasive Alien Species** make it more important than ever to respect these guidelines that can help us conserve our options for a very uncertain future.*

Understanding the genetic foundation of forests is important - genetic health is key to forest health. Whether we are breeding trees for improved wood fibre or species recovery, managing an urban or rural planting program, planning forest harvests or undertaking landscape planning to conserve ecological function; as a planner, tree marker, logger, seed collector, tree planter or nursery worker, **we are also a genetic practitioner when we choose one tree over another.**

Reforestation

- Keep an adequate seed supply on hand from a broad range of ‘climates’.
- Within each 'climate' or seed zone, ensure that each seedlot represents many individuals and genotypes to ensure a broad genetic base, as opposed to planting clones of one 'superior' tree.
- Follow established transfer rules to guide movement of seed (e.g. tree seed zones).
- Support continued development of seed transfer guidelines for commercial and non-commercial tree species and native herbaceous plants.
- Where appropriate seed orchards are unavailable, establish and maintain seed production areas.

Forest stand improvement, harvesting and natural regeneration

- Discourage diameter-limit cutting which can result in a residual stand of smaller, often poorer quality trees, which may reduce the genetic quality of the next generation.
- When managing for early succession species, minimize single-tree selection and small-group selection harvesting, or encourage opening sizes greater than 40** acres to reduce inbreeding problems and encourage regeneration of these species. ** note – this principle applies in general but must be adjusted to the socio-economic realities and land use history of southern Ontario
- Coordinate leave tree guidelines with wildlife objectives to minimize the number of live culls. They contribute to the next generation as a form of negative selection.
- Reduce or delay removal of large trees with good growth, form and resistance until regeneration is established.
- Retain trees exhibiting resistance to insect and disease problems.

Conserving genetic diversity

- Keep on hand an adequate seed supply from a broad geographic area.
- Follow established transfer rules to guide movement of seed. Be aware of climate change projections for your area when selecting species and seed sources.
- Allow/mimic natural disturbances to retain adaptation for traits related to such stresses (e.g. fire).
- Remove off-site material and regenerate with proven adapted stock.
- Protect and maintain existing genetic tests as libraries ‘on the stump’.
- Develop strategies to conserve unique and disjunct populations.

* Source – adapted from an Excerpt from **The Role of Genetics in Managing Ecosystems** by Laura E. DeWald and Mary Frances Mahalovich, in Journal of Forestry, April 1997, Volume 95, Number 4

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