

Maintaining Genetic Diversity



ALBERTA FOREST GENETIC RESOURCES COUNCIL

*Forest genetic resources:
Conserving diversity, enhancing productivity*

Diversity in Alberta Forests

It is desirable that human activities such as timber harvesting and reforestation are carried out in such a way that the breadth and depth of a tree species' genetic diversity are maintained. Maintaining genetic diversity allows the various tree populations to retain their ability to adapt to environmental changes.

Government, academic and industry partners of the Alberta Forest Genetic Resources Council maintain genetic diversity with the support of international and national codes and through continual development of provincial policy, regulations and planning.

Forestry's Role

Alberta forests are constantly subjected to natural disturbances such as wildfire, pest outbreaks and climate variation. Genetic evolution enables tree populations to adapt to these changes provided the patterns change slowly enough for evolution and adaptation to occur.

Forest practice – just one of many human interventions in the forest – aims to emulate natural disturbance so that natural evolutionary processes can continue and diversity is maintained. Through this practice, both natural regeneration and planting of seedlings grown from seeds collected from designated seed zones or tree improvement programs are used to reforest natural stands.

In reality, forestry is a relatively small component of the developmental and industrial pressures facing Alberta forests today. Oil sands, conventional oil and gas exploration and extraction, mining, utility corridors, agricultural and municipal expansion, tourism facilities and recreational sites combine to produce a far more persistent footprint.

Given the significance of the cumulative impacts from all of these pressures on the landscape, it becomes crucial for forestry, as well as other sectors, to take a leadership role in conserving diversity within tree populations, along with the diversity of other flora and fauna within the forest.

The genetic diversity of trees is regulated by Alberta policies and standards related to harvest/reforestation planning and tree improvement.

The Council

The Alberta Forest Genetic Resources Council advises the Alberta government, provides input on standards and policies, and helps set directions for research on any matter to do with the conservation, biodiversity and productivity of forest genetic resources.





Harvest/Reforestation Planning

Alberta's *Forest Management Planning Standard* sets out government expectations that are based upon the principles of sustainable forest management developed by the Canadian Council of Forest Ministers and organized by the Canadian Standards Association.

Forest management plans must establish measurable objectives describing the desired future forest that will result from timber harvesting and reforestation. These objectives incorporate the conservation of biodiversity.

Biodiversity is addressed through objectives related to ecosystem, species and genetic diversity, with particular attention paid to ecosystem diversity at both the landscape and stand levels. Examples include maintenance of diverse forest cover types and retention of coarse woody debris. Objectives that address the many attributes of forest ecosystems form the basis for conserving the habitat requirements of most tree and other forest-dwelling species.

Forests with unique requirements and sensitivities must be addressed with individualized maintenance programs within a company's Forest Management Plan.

Tree Improvement

Commercial tree species such as white spruce, aspen and poplar perform particularly well in Alberta and have been targeted for tree improvement programs to raise their productivity and threat-resistance levels above native forests.

Alberta has implemented *Standards for Tree Improvement in Alberta* to ensure sound management of the genetic attributes of all commercial tree species. The standards contain rules for tree improvement and deployment, with the aim of ensuring that a healthy genetic base is maintained while improvements in growth rate and insect or disease resistance are made. Tree improvement is achieved through traditional plant breeding and propagation methods. Deployment of genetically modified (GM) trees is not allowed on Alberta's forest landbase.

Examples of the controls placed on tree improvement and deployment of trees from these programs include requirements to maintain conservation areas containing populations of a given species within the forest, and to ensure that reforestation of those conservation areas is done using seed collected from within the conservation area. These practices maintain natural variation in the population.

The Big Picture

Forest management is just one part of a much larger ecosystem management picture in Alberta, and interested readers are urged to explore the many other avenues Alberta and Canada are following in the interests of maintaining biodiversity. Some starting points include:

- <http://srd.alberta.ca/fishwildlife/biodiversity.aspx>
- http://srd.alberta.ca/forests/pdf/Alberta_Forest_Management_Planning_Standard_Version_4_1_April_2006_Final_2.pdf
- <http://www.abtreegene.com/images/STIA.pdf>
- www.abtreegene.com
- <http://www.ccfm.org/>
- <http://www.csa.ca>
- <http://www.abmi.ca>

For more information

You can learn more about this topic and more by checking the Council's website at www.abtreegene.com

If you have further questions, contact Cliff Smith, Chair of the Council
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