Fifth Forum on the Conservation of Forest Genetic Resources

"Conservation and Use of Forest and Tree Genetic Diversity"

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ABSTRACTS

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Table of Contents

Forest Genetic Resources on the Global Stage – Opportunities and Challenges.

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Tree genetic resources typically receive little attention on the global stage in spite of their value for improvement of tree-based products and for adaptation to change, most notably related to climate. The development and release of the first ever State of the World's Forest Genetic Resources report and associated Global Plan of Action by the FAO (http://www.fao.org/forestry/fgr/64582/en/) provides an opportunity to bring attention to the need for focused conservation efforts. Bioversity International (http://www.bioversityinternational.org/), a member of the CGIAR Consortium, is a research for development organisation which carries out research on agricultural and tree biodiversity, working closely with FAO and other international organisations. Bioversity's forest-related work aims to facilitate implementation of the Global Plan of Action by developing methods and tools for diversity characterisation and threat analysis, working with partners to prepare strategies and guidelines for conservation, supporting regional genetic resource conservation research networks, and producing training materials. A project focused on a valuable but threatened African species, *Prunus africana*, exemplifies Bioversity's approach to prioritising populations through diversity and threat analyses. Recommendations to local managers include putting greater emphasis on planting the species in identified areas that are likely to continue to be suitable habitat as the climate changes. The species is one of thousands that are both useful to local people and threatened to some degree and while specific patterns of diversity and threats may be species-specific, methods to understand them can be more broadly applied. Approaches developed in Canada may be highly applicable to other regions. In fact a challenge for forest geneticists everywhere is how to monitor changes in genetic diversity – identifying indicators that can be readily applied, easily understood, and affordable.

The Development of an Access and Benefit-Sharing (ABS) Regime for Canada

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The presentation provided an overview of the further development of domestic ABS policy in Canada, and the potential impact on the forest sector and forest-related activities.

The domestic policy development process will help Canada to better understand the implications of the Nagoya Protocol for Canada, including helping to inform a decision on whether Canada should accede to (become legally-bound by) the Protocol.

International Protocol

The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity was adopted in 2010 with the objective of achieving the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. The Protocol came into effect in October 2014, and 62 Parties have now ratified. Canada has indicated that it wants to undertake additional analysis before determining its response.

Under the Protocol, genetic resources are defined "*any material of plant, animal, microbial or other origin of actual or potential value containing functional units of heredity*". "Utilization of genetic resources" means to "*conduct research and development on the genetic and/or biochemical composition of genetic resources, including through the application of biotechnology*[1]".

The utilization of genetic resources (e.g., researching plant extracts for active components that could be used as the basis for developing cancer drugs) may result in benefits that could be monetary, such as royalties or up-front payment, and/or non-monetary, such as collaboration in scientific research and institutional capacity-building. The Protocol also covers traditional knowledge (TK) associated with genetic resources from indigenous and local communities (e.g., knowledge about the healing properties of certain plants).

1

"Biotechnology" ... means any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use.

"Derivative" means a naturally occurring biochemical compound resulting from the genetic expression or metabolism of biological or genetic resources, even if it does not contain functional units of heredity.

Under the Protocol:

- Access to genetic resources will be subject to the **prior informed consent (PIC)** of the Party providing the resource (unless otherwise determined by that Party); and

- Genetic resources will be accessed and used according to **mutually agreed terms (MAT) negotiated between users and providers**. The terms may serve as a contract that can spell out how the resources are to be used, by whom, for what purpose, and how monetary and non-monetary benefits will be shared.

Parties are also required to have compliance measures in place to implement the Protocol, as well as monitoring. For further information: http://www.cbd.int/abs/

The Further Development of ABS Policy in Canada

Federal, provincial, and territorial governments have discussed the further development of ABS policy in Canada. The federal government has also engaged extensively with stakeholders and Aboriginal communities on these issues. Environment Canada has produced a Discussion Document outlining a potential approach to ABS policy in Canada. The Discussion Document proposes a policy that would initially only apply to some genetic resources on federal lands or waters. Genetic resources which are currently in seed banks and other *ex situ* collections would be excluded. Genetic resources entering collections accompanied by PIC and MAT agreements in future would need to track and honour the terms of those agreements, including with regard to third party transfer.

If Canada decides to implement a federal policy, it would likely be some years before it is in place. In the meantime, Canadians accessing genetic resources from countries which have ABS systems will need to abide by the requirements of those systems. The U.S. is not a Party to the Convention on Biological Diversity (CBD) under which the Protocol was negotiated and thus cannot become a Party to the Protocol, although it does have some domestic ABS rules, for example in national parks.

Engagement of, and Impacts on, the Forest Sector

Forest sector stakeholders, especially the forest genetics community, have been engaged in this process to some extent, although more widespread engagement would be welcome as the policy development process continues. The general feeling from stakeholders is that a domestic policy will need to be as simple and efficient as possible to avoid slowing the transfer of genetic resources unnecessarily.

Effects in the forest sector could be felt in the academic, biotech, and non-forest products communities where there could be additional administrative requirements when exchanging forest genetic resources for research and development (e.g., having an agreement covering conditions for use and the sharing of benefits). It should be noted that forest genetic resources are found in trees, non-timber forest species (e.g., shrubs, fungi, forest herbs), and forest soil (e.g., fungi, bacteria).

An Overview of Forest-Tree Genetic Conservation Work in British Columbia

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British Columbia integrates genetic conservation efforts for forest-tree species with other forest genetics activities. Forty-two indigenous species are recognized. The core of this provincial program is a catalogue outlining the *ex situ*, *in situ,* and *inter situ* genetic conservation status of each species. Some 9,000 *ex situ* conservation seedlots are maintained at the Provincial Tree Seed Center. New collections are added for priority needs when seed is available in wild stands. Projects to better understand genetic diversity and to meet specific species needs are supported.

Multi-Species Approach to Recovery Planning: Potential Application in New Brunswick Forests

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There is a growing emphasis on applying a multi-species approach to recovery planning in Canada, as the list of species at risk continues to lengthen. The forested landscape of New Brunswick is an appropriate candidate for this approach, as it is home to a number of species that are at risk across their Canadian range (e.g., Eastern Wood Pewee (*Contopus virens*), Chimney Swift (*Chaetura pelagica*)). The challenges, requirements and limits of multi-species planning were explored through an overview of our forests at a broad scale (ecoregions, ownership) followed by consideration of habitat requirements at a finer scale (e.g., stand structure and composition) using forest birds as examples. This scenario was presented within the broader context of recovery planning and the regulatory framework for species at risk.

Prioritizing Forest Tree Species Requiring *ex situ* Conservation in Canada

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Thirty five species were identified as requiring *ex situ* conservation measures base on a pan-Canadian survey conducted in 2012 by CON**FOR**GEN to identify native tree species which may be of concern and requiring conservation measures. An *ex situ* prioritization scheme was developed to assist in determining which of these species identified as requiring *ex situ* conservation by the survey may be in more urgent need of conservation. This scheme considers 3 indicators: 1: conservation ranking criteria, 2: eco-geographical ranking criteria and 3: feasibility of *ex situ* conservation. For each indicator a number of parameters were considered. These included: for indicator 1 - SARA designations, official jurisdictional risk designations, and NatureServe designations; for indicator 2 - number of jurisdictions in which the species occurs in Canada and number of ecozones in which the species occurs in Canada; for indicator 3 - seed storage type, duration seed can be stored, and existing seed collections in storage. Total scores from each indicator were summed to generate an overall score for each species. Low scores indicated species to be prioritized. The results showed three general groupings: species most in need (9), moderate need (12), and low need (14). Seven of the nine species in the "most in need" group produce recalcitrant seed posing a challenge for storing seed but at the same time providing an opportunity for research to develop storage methods.