

EXECUTIVE SUMMARY

The purpose of this project was to evaluate the ecological and policy issues related to introducing exotic tree species in the western boreal forest of the Prairie Provinces.

Review of global experience

- Global experience with exotic introductions was reviewed as the basis for this analysis.
- Rationales for introducing exotic tree species include higher productivity, easier management, and suitability for reclaiming disturbed land.
- A new rationale is the role of exotic tree species in adaptation to climate change, which may make the environment increasingly unsuitable for native trees.
- Threats from introducing exotic species include economic losses, spread of diseases, genetic impacts on native species, site degradation, loss of aesthetic values, and invasion of adjacent ecosystems.
- Globally, invasion has been the largest threat associated with exotic introductions. Species used in exotic forestry tend to be fast-growing and seed heavily, and are therefore likely to be invasive. The greatest damage results from invasive species that alter ecosystem function (e.g. forming a dense canopy that excludes other species).
- There are many examples from around the world of introduced forest trees causing serious invasion problems (e.g. lodgepole pine in New Zealand).
- Research has shown that one of the best predictors of which species will become invasive is invasive behaviour elsewhere. Invasiveness is also more likely for species with wide native ranges, and with high reproductive capacity.
- Several systems have been developed for screening proposed introductions to prevent invasion problems. In the American system, exotic tree species from other continents are considered to pose a greater threat than those that are native to other parts of North America.

Potential species for introduction in the western boreal forest

- A simple climatic envelope model was used to assess suitability of the western boreal environment for a large number of tree species, both under the current climate and under three GCM scenarios for the 2050s.
- Native boreal species are expected to shift northward in distribution, probably declining in viability in the southern parts of their current range.
- Hardwoods of the southern prairies such as Manitoba maple and green ash may be suitable for a larger and more northerly range in the future.
- Species of the Great Lakes region may be limited in suitability for our region by climatic dryness, which is expected to increase with climate change.
- Western conifers such as Douglas-fir and ponderosa pine may increase in suitability for our region with the shift to warmer, milder-winter climates.

- Eurasian boreal species such as Scots pine and Siberian larch may show similar trends to our native boreal species, declining in viability in the southern part of the region with climate change.
- The biology of selected species, including assessment of invasion problems, was reviewed in more detail.

Policy on introduction of tree species

- Conservation organizations advocate the use of native species and recommend biological assessment, benefit/risk analysis, and controlled field trials prior to widespread introduction.
- Most governments do not have strong policies against the introduction of exotic species.
- Recent policies in South Africa and New Zealand have placed the legal onus on those introducing exotic species to prevent their spread to adjacent land.
- In Canada, legislation is largely aimed at plant diseases, not at plants themselves. Provincial weed acts are aimed at agricultural weeds.
- Policy for provincial forests generally requires regeneration of native trees following timber harvesting.

Role of exotic species in adaptation to climate change

- The new ecosystems that result from climate change can be expected to be different from those we see now, and probably different from those seen previously.
- The idea of protecting representative examples of natural ecosystems may become meaningless, and be replaced by focus on maintaining resilience, diversity and connectivity.
- Climate change may require abandoning the laissez-faire approach and assisting the movement of species to newly suitable habitats.
- The key question is not whether species is exotic, but whether it contributes to biodiversity preservation, or causes problems because of exponential population growth.

Stakeholders' workshop

- A stakeholders' workshop, attended by representatives of various forest management agencies and companies, was used to explore these issues.
- The above information was presented to the stakeholders. A series of discussion questions was then used to obtain input on desired exotic tree policies.

Policy recommendations

- Planting of exotic tree species is acceptable in some situations, but not in all situations.
- Individual exotic species should be subject to a standardized assessment process and evaluation of benefits versus risks.
- Assessments should vary with the type of land proposed for planting.

- Invasiveness should be one of the most important considerations in assessment.
- Value in adapting to climate change should be an important consideration in the assessment.
- Limited planting trials, with appropriate monitoring and evaluation, should precede widespread planting.
- In the case of species and situations where widespread planting has already happened, assessment should still take place.
- Plantation planning guidelines should be developed to reduce risks associated with planting exotic species.
- Governments should review their current policy on exotic trees and develop new policy to address exotic species issues.