Gene Conservation Research

Submitted by Andreas Hamann

While our understanding of genetic structure of major conifer species is extensive, we know relatively little about other tree species. Studies of the genetic structure of some minor tree species will be useful for investigating the current degree of protection of genetic resources, for selecting insect or disease resistance in species that may be affected by introduced pests, and for developing seed transfer guidelines for restoration plantings.

Prioritizing Tree Species

Because not every species can be investigated, we need to focus on trees that are representative of a larger group of species with similar distribution (e.g., widespread or narrow, and rare or common) and life history attributes (e.g., wind or insect pollinated, wind or animal dispersed seed, early or late successional), or for species that are likely to experience loss of genetic diversity due to reductions in population size.

We used several sources of information to prioritize minor tree species for further genetic research and conservation: (1) a literature review on species-specific issues such as pests, regeneration capacity, and economic, ecological, and cultural values; (2) first results from the GIS survey for the extent of current *in situ* protection; and (3) a survey soliciting field observations of professionals who work with particular species.

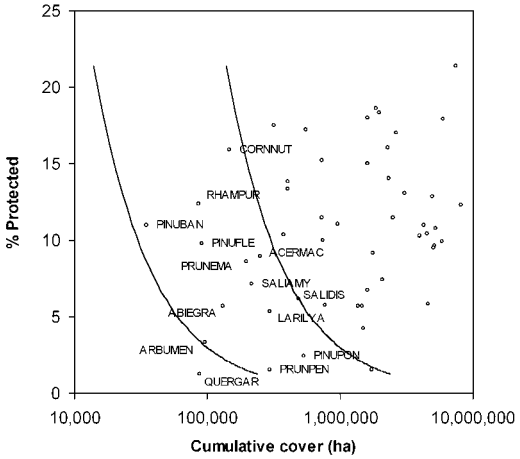
Results of the GIS survey for all three species in British Columbia are displayed in the following figure for comparison. Species that are located in the lower left corner of the graph are least abundant (x-axis) and least protected (y-axis). Examples are arbutus (ARBUMEN) and Garry oak (QUERGAR). Curves indicate an equal area protected. For example, Pacific dogwood (CORNNUT) and bigleaf maple (ACERMAC) have equal *in situ* protection. However, dogwood has a larger percentage of a smaller total area protected. This information can also be used to assess the feasibility of additional conservation efforts. For example, reserves for species that fall into the lower right

Experts ranked species for attention based on:

- **a literature review of species-specific issues**
- **first results from the study on the *in situ* protection of these species**
- **a survey soliciting field observations from professionals.**

corner of the graph may easily be found if necessary.

Current status of *in situ* protection. Cumulative cover is calculated as range (ha) x average cover (%). Curves indicate an equal area protected.



The results were presented to an expert panel in a workshop at the University of British Columbia in March 2002. The panel ranked minor species for further research in consideration of this new information and projects that have already been initiated (see table). Although whitebark pine and Garry oak are high priority species, as indicated by the survey, they received fewer expert votes at the workshop than some other species. This result reflects the recognition of the research currently underway by the Centre for Forest Gene Conservation (CFGC) and the Garry Oak Task Force. Over the coming months, we will begin projects on some of the high-ranking species.

The top 10 ranking species for genetic research or conservation activities based on votes from an expert panel

Scientific name	Common name	Abbreviation	Expert votes	Survey replies
Arbutus menziesii	Arbutus	ARBUMEN	13	4
Cornus nuttallii	Pacific dogwood	CORNNUT	8	1
Pinus flexilis	Limber pine	PINUFLE	7	1
Salix scouleriana	Scouler's willow	SALISCO	6	4
Quercus garryana	Garry oak	QUERGAR	4	10
Crataegus douglasii	Douglas hawthorn	CRATDOU	4	2
Juniperus scopulorum	Rocky Mountain juniper	JUNISCO	3	3
Populus tremuloides	Trembling aspen	POPUTRE	2	4
Malus fusca	Pacific crab apple	MALUFUS	2	2
Pinus albicaulis	Whitebark pine	PINUALB	1	12