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## Conservation strategies for forest gene resources

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### Abstract

Gene conservation has three facets: (1) the maintenance of diversity in production plantations to buffer against vulnerability to pests and climatic extremes; (2) the preservation of genes for their future value in breeding; (3) the protection of species to promote ecosystem stability.

Maintaining diversity as a hedge against damaging agents is a simple strategy in theory. In practice, economic forces tend to favor genetic monocultures to maximize short-term gain.

Genes are the raw material from which new strains will be constructed, but only if they are preserved. Gene resources can be preserved in situ in reserves or special management areas or ex situ in seed banks or arboreta. Because timber harvest and gene conservation are compatible, in situ preservation can be quite inexpensive. However, viable reserves depend on the maintenance of adapted gene complexes, not just the preservation of genes. Ex situ preservation is a prudent back-up system. Studies of genetic architecture are necessary to optimize the sampling strategy for ex situ preservation or the size and location of reserves for in situ preservation.

Extinction results in the loss of genes, but even more important, it has the potential to undermine entire ecosystems. Even rare species may serve as keystones, upon which entire, coevolved systems may depend.

The technical aspects of gene conservation are relatively simple, compared to the socio-economic aspects. The real problem for gene conservation is the competition for land and economic resources, and the solutions are social and political.



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