

## PERSPECTIVE

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## Forest Plantations as Components in a Global Biodiversity Conservation Strategy: The Role of Developed, Temperate-Forest Countries (Part I)

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Forest management in many developed countries is characterized largely by low- to moderate-intensity management for a variety of uses and values. Multiple-use forest management has proven enormously durable in many different circumstances. This flexible, adaptive approach has, for the most part, allowed forest managers to balance a wide variety of demands on forests while keeping within the bounds of sustainability.

The need to conserve biological diversity—and especially to protect habitat for threatened and endangered species—represents a fundamental challenge to the multiple-use model of forest management. Scientific uncertainty as to just where the limits of sustainability lie, and the degree of sensitive species' resilience to recover should these limits be exceeded, have resulted in a conservative approach to biodiversity conservation. In many instances, this precautionary approach regards even a modest level of human manipulation in the ecosystem as exceeding the limits of what can be sustained.

We are now in an era in which the downward trend in biodiversity, and the potential of forest protection to slow that decline, is seen by many as sufficient reason to cease any and all forest management activities that potentially interfere with that objec-

tive. With the boundaries of sustainability—between the ecologically acceptable maximum for management intensity, and the economically accepted minimum—thus so tightly drawn, it is difficult for forest managers to discern a new pathway by which biological diversity can be conserved within the context of active forest management (see Figure 1).

The world's greatest concentration of biological diversity in forest ecosystems—and the greatest threats to conserving that diversity—is in the tropics (Raven 1997). These seemingly lush and irrepressible forests are more vulnerable to ecological damage than most temperate-zone forests, and much slower to recover from deforestation (Wilson 1992). The continuing losses of forest area in the tropics are the single-greatest threat to global biodiversity, a trend that is exacerbated by population growth rates in many tropical nations that far



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exceed those in most temperate-zone nations. "An awful symmetry binds the rise of humanity to the fall of biodiversity: the richest nations preside over the smallest and least interesting biotas, while the poorest nations, burdened by exploding populations and little scientific knowledge, are stewards of the largest." (Wilson 1992).

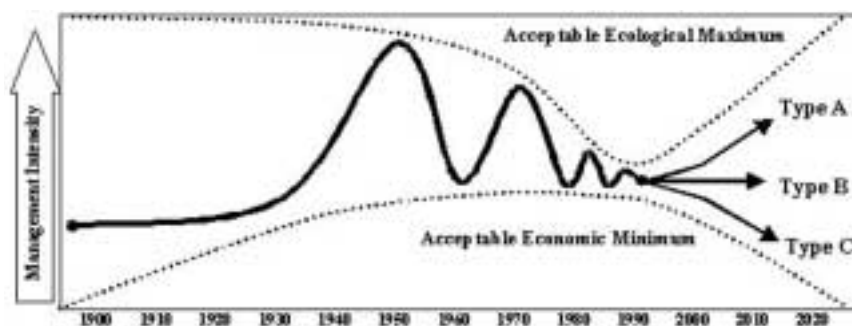


Figure 1. Forest management and the changing bounds of sustainability.

Today, to greatly improve our conservation of biological diversity in forest ecosystems worldwide, while at the same time managing these renewable resources to help meet the material needs of an expanding human population, demands that these needs are reflected in both policy and practice. These means should consider that: (1) all forests are *not* equally suited to multiple-use management, (2) there are important forest uses and values that are clearly *not* compatible with one another, and cannot be adequately protected under management aimed at accommodating a wide range of commodity and non-commodity uses, and (3) a more specialized approach to forest management, capitalizing on attributes that make some areas well suited to intensive management for particular uses, can result in significant increases in *both* biodiversity conservation and sustainable wood production.

#### SUSTAINABLE FORESTRY AS A SPECTRUM OF MANAGEMENT INTENSITIES

The necessity of increasing both biodiversity conservation and wood production *simultaneously*, is accelerating the evolution toward three separate and distinct types of forest management (Hunter and Calhoun 1996):

- ✿ Commercial forest plantations that are intensively managed for the production of wood and wood fiber-based commodities—what Aldo Leopold alluded to as “Group A” forestry (Leopold 1949). Due to their small tract size and/or history of past land use, this approach will likely be centered on highly productive lands with relatively low actual or potential value as a habitat for rare or sensitive species.
- ✿ Forests that are managed at a moderate or low intensity for a wide variety of goods, services, and natural values, or Leopold’s “Group B” forestry. These “work-

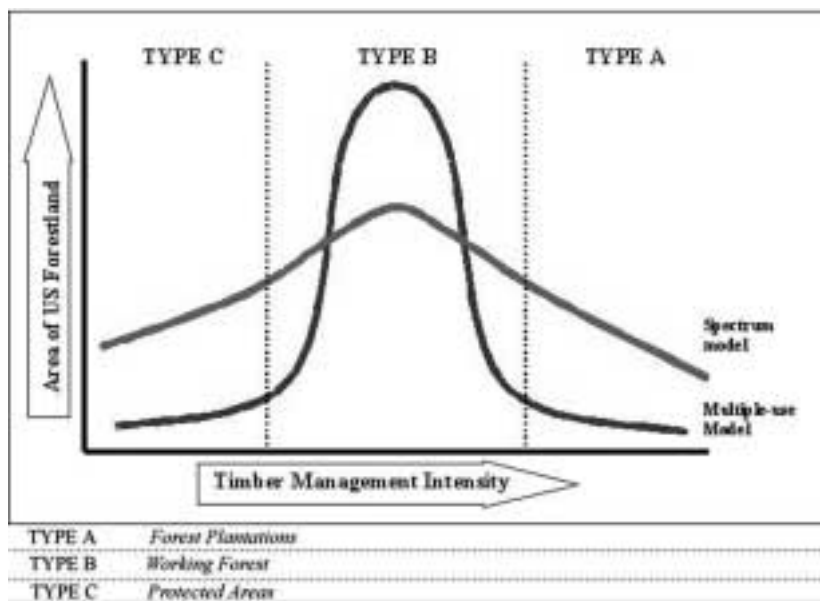


Figure 2. Relative distributions of forest management intensities under two models.

ing forests” would provide habitat primarily as it is being maintained in forest land use. These lands, both public and private, would encompass the majority of the forest area of the U.S., with a broad diversity of management approaches on individual tracts of varying size providing an accompanying diversity of habitats in terms of age, successional stage, vegetative composition, climate and landform.

- ✿ Native forest reserves that are managed first and foremost for conservation and restoration of biological diversity—what Leopold might have termed “Group C” forestry. Management of these forests would be centered on identified biodiversity hot spots of global and national significance, and will likely encompass most of the remaining large tracts of undeveloped native forests on federal public lands, in some state parks, and in private lands where this style of management is consistent with the landowner’s goals and objectives.

In essence, a spectrum approach to

defining “sustainable forestry” must encompass all three categories—protected areas and plantations as well as “working forests” managed for multiple values and purposes (see Figure 2).

Alone, none of these three elements can be regarded as sustainable forestry. It is the overall system—with all its elements represented at the national, regional, and local levels—that will constitute “sustainable forestry” in the future. There is no single set of standards to define how forestry should be practiced in every location and in every circumstance. Any set of standards purporting to describe a system of sustainable forestry must take into account the need for bioreserves and intensively-managed forest plantations, as well as “working forests” managed to provide an array of forest values, renewable resources, and ecological services (see Figure 2).

In the next segment of this article (printed in Vol. 9, No. 2 of *The Pinchot Letter*), I will discuss how forest plantations are integral to the conservation of biodiversity, and will describe the new, political consensus on sustainable forestry.

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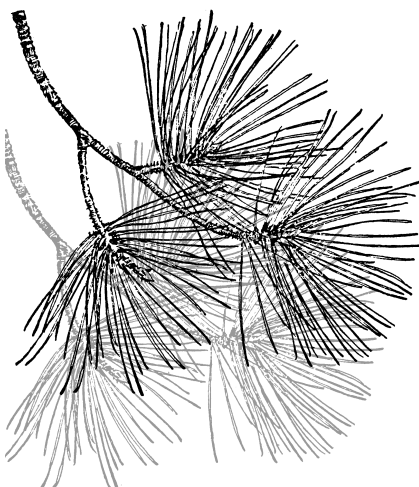
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