

# Forest management, restoration, and designer ecosystems: Integrating strategies for a crowded planet<sup>1</sup>

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*Abstract:* As the global human population increases, the demand to conserve, restore, create, and sustainably manage ecosystems will increase as well. Forested ecosystems are of particular interest because of the biodiversity they support and their diverse values to people. Developments in conservation, restoration forestry, and in the study of designer ecosystems provide a diverse set of tools with which to pursue sustainable forestry goals. Nonetheless, we suggest that sustainable forestry can only be achieved by fully considering ecological, economic, and social needs in landscapes. This will require a clear realization of the trade-offs in site-specific management approaches and a multifaceted, landscape-scale perspective for evaluation of sustainability criteria. We propose collaborative creation of Sustainable Forestry Portfolios as a means to encourage the breadth of thinking required to guide sustainable forest management. We discuss 3 examples of Sustainable Forestry Portfolios with relevance to different settings in the future: 1) the Triad Approach, 2) Forest Landscape Restoration, and 3) Urban Forestry. In all settings, sustainable forestry is not solely a technical problem, but a challenge that must be met through a multidimensional perspective, interdisciplinary collaboration, and with active engagement of the people that live and work in the landscape.

*Keywords:* designer ecosystems, restoration, Sustainable Forestry Portfolios.

*Résumé :* Avec l'accroissement de la population mondiale, la demande pour conserver, restaurer, créer et aménager les écosystèmes de façon durable va aller en augmentant. Les écosystèmes forestiers sont d'un intérêt particulier à cause de leur biodiversité et de leurs valeurs diversifiées pour la population. Les développements dans la conservation, la restauration forestière et l'ingénierie écologique procurent un ensemble d'outils divers grâce auxquels des objectifs d'aménagement forestier durable peuvent être poursuivis. Néanmoins, nous suggérons que l'aménagement forestier durable ne peut être atteint qu'en tenant compte au sein d'un paysage de l'ensemble des besoins écologiques, économiques et sociaux. Cela requerra une vision claire des compromis liés aux approches d'aménagement spécifiques à chaque site et une perspective à l'échelle du paysage des différents aspects sera nécessaire afin d'évaluer les critères de durabilité. Nous proposons la création de portfolios collaboratifs en aménagement forestier durable comme moyen d'encourager l'ampleur de vision requise pour guider l'aménagement forestier durable. Nous discutons de trois exemples de portfolios d'aménagement forestier durable qui peuvent être pertinents à différents contextes futurs : 1) l'approche de la triade, 2) la restauration de paysages forestiers et 3) la foresterie urbaine. Dans tous les contextes, la foresterie durable n'est pas seulement une question technique mais un défi qui doit être envisagé dans une perspective multidimensionnelle, une collaboration interdisciplinaire et avec l'engagement actif des personnes qui vivent et travaillent dans le paysage.

*Mots clés :* ingénierie écologique, portfolios d'aménagement forestier durable, restauration.

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## Forests in the Future

Increasingly, ecologists are being confronted with two intellectual frontiers: the ongoing study of pristine natural systems and the exploration of ecological processes where people live and work. Although we know that many native species and processes still remain to be described in remote or untouched areas of the globe, it is becoming clear that human-dominated landscapes hold rigorous and compelling questions for ecological science (Roy, Hill & Rothery, 1999; Grimm *et al.*, 2000; Savard, Clergeau & Mennechez, 2000; Fernández-Juricic, 2004). The global human population continues to grow, leading to an increasingly desperate need for understanding how to conserve native forest ecosystems, restore those we can, and effectively design others to pro-

vide a host of services where human presence constrains natural ecological processes (Bazzaz, 2001). Consequently, forest and restoration scientists and other applied ecologists must expand their focus from intrinsic ecological phenomena to include studies of sustainability in a diversity of human-dominated landscapes (Palmer *et al.*, 2004).

Forests have long been flashpoints for societal conflicts between utilitarian and aesthetic values and biodiversity conservation (Cohen, 2004). Humans have used trees for fibre, fuel, shelter, and beauty since the earliest societies (Perlin, 2005) and will continue to do so. The loss of native forests has been a recurring chapter in human ecological history, yet there is little doubt that trees hold a special place in the heart of most people, evoking diverse and deep-seated convictions about ecological health and wholeness (Cohen, 2004). We now know that forestlands function as the great nurseries of the earth's continents, providing habitat for

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