

Making Connections—Forest Restoration on Galiano Island

Keith Erickson

Galiano Conservancy Association

Abstract

Until 150 years ago, more than 75% of the forest landscape of East Vancouver Island and the adjacent Gulf Islands was dominated by trees greater than 100 years of age. Today only 2.6% of the same landscape is characterized by older forest (McPhee et al. 2000). Regenerating forests, agricultural lands, roads and urban development have replaced and fragmented old forest, making ecosystems of the Coastal Douglas-fir Biogeoclimatic Zone some of the most endangered in BC. Although the protection of remaining old forest is essential, the sheer rarity of these opportunities dictates that we must also focus on the protection and subsequent restoration of degraded land. This project will put into action a detailed restoration plan developed for a 160 acre plantation forest on Galiano Island. Restoration activities will help to increase the structural, species and genetic diversity within the single-species, single-storied Douglas-fir plantation. Activities include the dispersal of coarse woody debris, erection of wildlife trees, thinning treatments and reclamation of landing and gravel pit sites.

This project will provide the research, methodology, evaluation, and monitoring information required for a successful forest restoration project. It will also contribute to the monitoring of long-term global environmental change through the Smithsonian Institute's Monitoring and Assessment of Biodiversity program.

The Galiano Conservancy Association is a community-based land trust with a mandate to preserve and protect the human and natural environment of Galiano Island. We are working towards conservation through an integrated and comprehensive program of environmental education, planning and land stewardship. One of our current projects is focused on the restoration of biodiversity within a young coastal Douglas-fir plantation on the island. The project intends to enhance ecological connections between surrounding mature forest stands.

Historically, trees greater than 100 years of age dominated more than 75% of the forest landscape of East Vancouver Island and the adjacent Gulf Islands. After 150 years of logging and settlement, older forest now characterizes 2.6% or only 10,605 hectares of the same landscape (McPhee et al. 2000). Within these remaining lands, no unmodified forests exist greater than 100 hectares in size (Eng c.1990). Regenerating plantations, agricultural lands, roads and urban development have replaced and fragmented old forest, making ecosystems of the Coastal Douglas-fir Biogeoclimatic Zone (CDF) some of the most endangered in British Columbia. All old-growth forest types that are either dominated or co-dominated by Douglas-fir within the CDF are currently on the province's list of rare and endangered ecosystems (Flynn 1999).

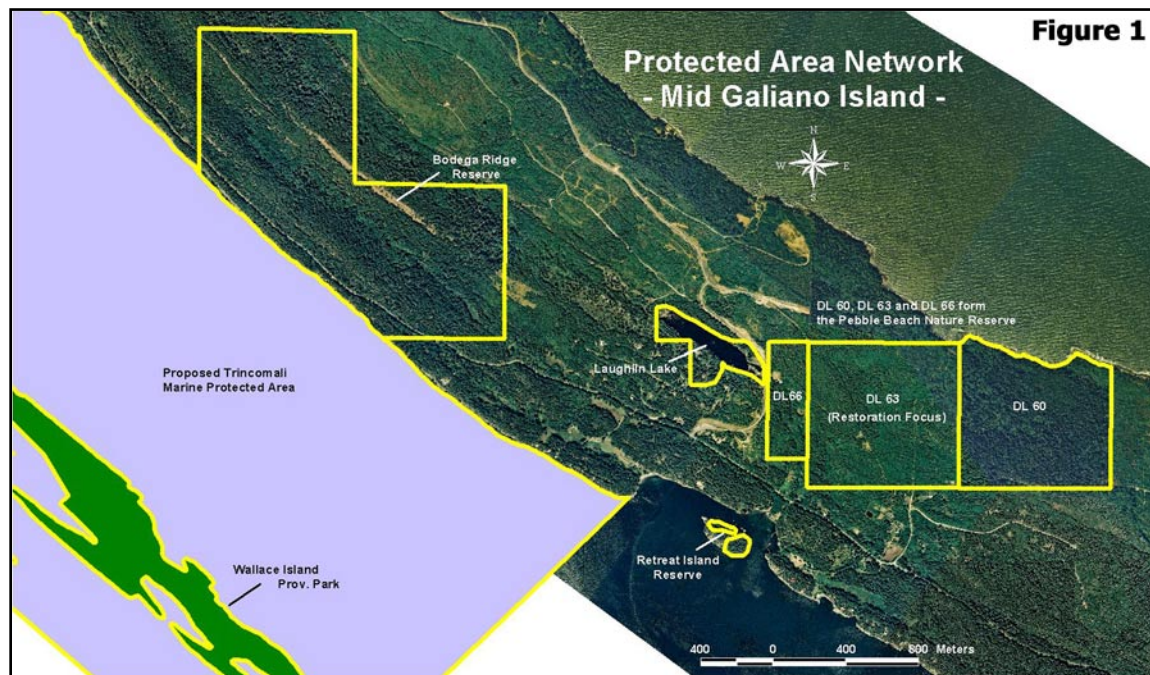
To address such a critical ecological scarcity requires conservation efforts focused on land protection and ecosystem restoration. Preserving the few remaining parcels of land that exhibit intact natural ecosystems is the first priority. However, the sheer rarity of such opportunities within the CDF dictates that the restoration of degraded land must play a vital role.

Over the last half century, commercial reforestation has confined its focus to regeneration of uniform, fast-growing conifer stands on freshly cutover areas (Horowitz 1990). To pursue its narrow goal of timber production, commercial reforestation imposes on ecosystem functioning a few large-scale, discrete events, such as clearing and burning remaining woody structure, planting evenly spaced, tightly packed, conifer monocultures, and suppressing any competing vegetation.

Ecological restoration takes a holistic approach by recognizing the discontinuity that commercial forestry leaves in biological interrelationships. The goal of restoration is "...to emulate the natural composition, structure and continuous functioning in a manner that will leave a degraded ecosystem self-sustaining and integrated with the surrounding landscape" (Higgs 1997). Forest restoration provides the appropriate composition and structure to allow for renewal of a healthy, functioning and characteristic ecosystem.

Ecologists and foresters have only recently begun to consider systemic restoration within a damaged forest ecology. Commonly, post-harvest forest “rehabilitation” has meant large-scale tree planting, rehabilitation of roads and landings, and silvicultural techniques focused on promoting tree growth. It is very difficult to find practical examples of ecological restoration that address the full range of biological diversity in a healthy functioning forest. What we propose will form a major contribution to the available information base. We will implement ground-level holistic restoration plans in a coastal Douglas-fir plantation forest, demonstrating and then communicating the feasibility and effectiveness of this new approach.

Canada has identified the Strait of Georgia Region as the nation’s most at-risk natural environment, given the expanding urban pressures of Vancouver, Victoria and Seattle. At the heart of this highly developed region lies Galiano Island, the second largest of the southern Gulf Islands. Galiano’s landscape is an ideal testing ground for holistic ecological restoration of forest, with roughly one-third of the Island recovering from clearcuts created over the last 30 years. While habitat loss and fragmentation have been extensive, a network of protected areas on Galiano encompasses more than 13% of the total land base. Central to this network is the 325-acre Pebble Beach Reserve, that encompasses 175 acres of intact mature coastal Douglas-fir forest and a 150-acre 20- to 30-year-old Douglas-fir plantation. The Reserve plays an integral role in connecting several protected areas from the eastern shoreline on Georgia Strait, across the island’s central ridge into Trincomali Channel and over to Wallace Island Provincial Marine Park to the west of Galiano (Figure 1). Exhibiting much of Galiano’s overall ecosystem variation, this connected refuge could accommodate species and genetic migration in response to large or long term events, such as fire or climate change. Introducing “ecological bridges” within the plantation component (District Lot 63) of the Reserve will connect and enhance existing sanctuaries of more complex forest biodiversity.



“To keep every cog and wheel is the first precaution of intelligent tinkering.” (Leopold 1949)

This celebrated quote embodies the underlying philosophy of the Galiano Forest Restoration Project. Intelligent tinkering in an already degraded ecosystem depends first on determining which cogs and wheels existed prior to the disturbance and how they all fit together. Restoration is then the process of mending and arranging the parts that remain, and sometimes replacing those that are missing.

Coarse woody debris provides an excellent example of this concept. In an intact mature forest, some trees grow old, shed limbs and eventually die. Decomposition progresses and snags eventually topple to the forest floor to continue their role in the ecosystem for at least as long as the trees lived. On District Lot 63 after the clear cut, logging slash and large pieces of wood were bulldozed into long linear piles. The intended broadcast burn failed, and the concentrated heaps remain. To recover the natural functioning of coarse woody debris in the ecosystem, this “cog” must now be rearranged by dispersing the wood over the entire forest.

This is only one example taken from the comprehensive Forest Restoration Plan (Erickson, Gaylor, Scholz 2002) for District Lot 63. Other activities will include erection of wildlife trees, thinning plantation trees and reclamation of heavily impacted landing and gravel pit sites. Monitoring strategies, including our continued participation in the globally applied Smithsonian Institute, Monitoring and Assessment of Biodiversity program, have been developed for all restoration activities. While ground level results are expected to occur over a 200-year timeframe, tangible ecological responses ranging from the establishment of native vegetation on landing sites to increased diversity of soil fungi around dispersed woody debris are expected in the short-term (1-5 years). Educational activities will raise public awareness, generate public support for restoration, provide hands-on experience for youth and valuable training opportunities for university students. In a letter of support for the Galiano Forest Restoration Project, accomplished ecologist and forester Herb Hammond (Silva Forest Foundation) wrote:

Not only are the restoration treatments well formulated and practical, but also evaluation of these treatments will form the basis for improving future restoration efforts. This information will not only guide future restoration efforts on Galiano Island, but will also be widely applicable to many forest areas in British Columbia and elsewhere...this will be an important contribution to understand how to assist natural processes to effectively remedy the mistakes of past land use activities.

By monitoring and evaluating restoration activities, the Galiano Forest Restoration Project will encourage and inform similar projects throughout the coastal Douglas-fir ecosystems in BC, Washington and Oregon. Documentation of the project's methods and findings will be made available to non-government organizations, government agencies, consultants, and researchers.

References

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