

**ECOLOGICAL ASSESSMENT AND CONSIDERATIONS IN DEVELOPING THE
CAPE ROGER CURTIS PROPERTY**

Prepared for:

Bruce Nidle, B.Sc., R.P.Bio.
Pottinger Gaherty, Environmental Consultants Ltd.
1200-1185 West Georgia Street
Vancouver BC V6E 4E6

Prepared by:

Karel Klinka, For.Eng., Ph.D., RPF (Ret)
Forest Sciences Centre, 1711-2424 Main Mall
University of British Columbia
Vancouver, BC V6T 1Z4

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Summary and Conclusions

In reviewing the biological environment and vegetation ecology of the Cape Roger Curtis (CRS) property, I found the property a part of the Very Dry Maritime Coastal Western Hemlock (CWHxm) subzone. This finding requires revising identification of site series and mapping polygons.

I found that only a part of the property is a unique, sensitive area with high ecological and recreational values, i.e., shoreline bluffs and the adjacent sites associated with marine deposits. Other sites and especially the 'inland' sites which represent a variety of CWHxm ecosystems are not unique and, except very moist and wet sites, have a low-sensitivity to development; moreover, these ecosystems are preserved in the adjacent ecological reserve and exist elsewhere in southern coastal BC.

I propose several recommendations for consideration in developing the property in an environmentally sensible and non-controversial manner so that the most sensitive and valuable areas remain undeveloped or marginally developed.

Introduction

I was invited by T. Cox to visit a 267 hectares parcel of land referred to as Cape Roger Curtis (CRC) property (DL 1548) on Bowen Island. The visit was conducted on 17 May 2005. The purpose of the visit was to provide

- Review of biological environment, specifically vegetation ecology,
- Ecological assessment of the values and significance of plant communities on the property, and
- Considerations for developing the property in an ecologically-sensitive manner.

For the review of the biological environment and ecological assessment I used the following sources in addition to my experience: Klinka et al. 1979, Meidinger and Pojar 1991, Green and Klinka 1994, Pottinger Gaherty Environmental Consultants Ltd. 2005, and Harty and Diser 2005.

Review of Biological Environment and Vegetation Ecology

The property has a history of disturbance including logging, fire, and others, and has been used for extensively recreation. The property is covered by a low-elevation, older (mature), second-growth forest with scattered patches of old-growth Douglas-fir and western redcedar. The soil parent materials include bedrock (rock outcrops), shallow to moderately deep, moraine deposits, colluvial deposits, marine deposits (including gravelly-sandy and silt materials), and recent alluvial materials.

Climatically, the property is within the CWHxm subzone. It had been mapped as such and, indeed, the property commonly features western hemlock in all stages of growth development while hemlock is nearly absent in the drier and warmer Coastal Douglas-fir (CDF) zone. In addition, several major diagnostic (characteristic) plant species for the CDF zone are rare, infrequent (occurring in small amounts), or lacking across the property, such as: *Bromus vulgaris*, *B. tectorum*, *Festuca subulata*, *Lathyrus nevadensis*, *Lonicera ciliosa*, *Mahonia aquifolium*, *Mahonia nervosa*, *Melica subulata*, *Rhytidadelphus triquetrus*, *Rosa gymnocarpa*, *Symphoricarpos albus*, *S. mollis*, and several other species. For more information on the CDF zone see Roemer (1972)

I consider the property climatically close to the CDF zone which is well developed further west on Gulf Islands. Therefore, I recommend revising identification of eleven polygon types from the CDFmm to CWHxm site series. In addition, I recommend distinguishing in Polygon 1 between forested site series (predominantly 03 - CWHxm/Salal) and non-forested or marginally forested (shoreline bluffs) sites (Figure 7). The field guide (Green and Klinka 1994) does not describe non-forested sites as the biogeoclimatic ecosystem classification system has not classified such ecosystems; therefore they cannot be identified as site series.

Presentation of vegetation-site map included in Pottinger Gaherty Environmental Consultants Ltd. (2005) is unusual in not assigning to each polygon a unique number (i.e., from 1 to 36) but assigning a number indicating more or less the same site series or a combination of site series (i.e., from 1 through 11) but without specifying their proportions. While such presentation shows clearly the vegetation-site patterns, the polygons are without geographic identity.

Ecological Assessment

As the CDF zone includes rare species and plant communities, and is limited to a relatively small area in coastal southern BC, it has greater ecological values and deserves much greater restrictions on disturbance compared to the CWHxm subzone which occupies a large area on eastern Vancouver Island and adjacent mainland.

What are the most valuable and ecologically significant areas in the property?

Undoubtedly, the foremost area is delineated by Polygon 1 representing in part a complex of non-forested shoreline bluffs. It was also identified as most significant by Pottinger Gaherty Environmental Consultants Ltd. (2005) and by Taylor (2004) who refers to the shoreline bluffs as the richest coastal site in the Lower Mainland – a botanical gem. Compared to the floristically species-poor ‘inland’ sites, these shoreline bluffs are species-rich and diverse. Among the plant species growing in these open-areas, non-forested, rocky sites are indeed those characteristic of the CDF zone, likely due ‘extreme’ microclimatic and edaphic conditions. It may well be their last occurrence eastward of the rainshadow in the Georgia Strait; however, the assessment of the true ecological value of the CRC shoreline bluffs will require comparison with those on adjacent islands (southern Gambier, Hermit, Pasley, Popham, and Worldcombe). The plant species compiled by Taylor (2005) includes primarily those occurring on the shoreline bluffs, including a few red- and blue flagged species (e.g., *Limnanthes macounii*) and Rocky Mountain juniper, which occurs on eastern Vancouver Island but is rare on the southern coastal mainland.

The other, the most valuable and ecologically significant areas are those associated with coarse- and fine-textured, glacial marine deposits (silts, sands, and gravel deposits) which presently support very productive growth of red alder, bigleaf maple, Douglas-fir, western redcedar, and grand fir (Figures 1, 2, 3, 4, and 5). These areas appear to be delineated by Polygon Types 10, 5, 9(?), and 6(?) that are related to CWHxm/05 - Foamflower and CWHxm/07 – Lady fern) sites. The height of dominant trees is very impressive – red alder is over 35 m tall, and grand fir is over 45 m tall. The red alder stands, however, are in the ‘old-growth’ development stage and show signs of crown dieback. The question to be answered following a more in depth investigation is what will be the future vegetation development of the red alder communities on these sites.

The last valuable and ecologically significant features are scattered individual trees and clumps (cohorts) of old-growth of Douglas-fir or very productive second-growth of Douglas-fir, grand fir, and western redcedar.

In relative sense, the ‘inland’ ecosystems identified predominantly as CWHxm/03 - Salal and CWHxm/01 - *Kindbergia*) sites have a low ecological value and significance (Figure 6). In addition to other ecosystems, they are abundant on the neighbouring islands and Sunshine Coast. Furthermore, Ecological Reserve No. 48 established in 1973 and located 2 km SW of Snug Cove effectively preserves all inland Douglas-fir dominated CWHxm ecosystems occurring within the property (Figure 1 in Pottinger Gaherty Environmental Consultants Ltd. (2005); Appendix 1, BC Parks Conservation web printout).

Ecological Considerations

Taking into account the review of biological environment and ecological assessment, I recommend adopting the following courses of action prior to and in conducting development of the property in an environmentally-sensitive and non-controversial manner:

1. Mapping of surface deposits (landforms) with a particular attention to poorly drained, fine-textured marine deposits.
2. Revising identification of sites series and assigning unique number to polygons.
3. Delineating non-forested shoreline bluffs as monotypic mapping unit (polygon).
4. Predicting further development of old, red alder communities.
5. Identifying productive red alder and Douglas-fir stands or for potential preservation/recreation (to be selected by an arborist).
6. Identifying cohorts of old-growth trees and grand fir and old bigleaf maple cohorts across the property for potential preservation (to be selected by an arborist).
7. Minimizing removal of the forest cover in developing the property.
8. Maintaining buffers along two main watercourses.
9. Providing public access to shoreline bluffs by a major trail connecting the frequently visited coves and viewpoints.
10. Avoiding any development on shoreline bluffs.
11. Limiting close-to-shore development to several isolated clusters located within the least sensitive sites (*Cladina*, Salal, *Kindbergia*, and Sword fern sites), e.g., one of such clusters could be located in the southeastern corner of property.

References

- Dicer, P. and T. Taylor. 2005. The plants and birds of Cape Roger Curtis. *Discovery* 34 (1): 31-35.
- Green, R.N. and K. Klinka. 1994. A field guide to site identification and interpretation for the Vancouver Forest Region. Land Management Report Handbook Number 28, BC Ministry of Forests, Victoria, BC.
- Klinka, K., F.C. Nuszdorfer, and L. Skoda. 1979. Biogeoclimatic units of central and southern Vancouver Island. BC Ministry of Forests, Victoria, BC.
- Meidinger, D. and J. Pojar. 1992. Ecosystem of British Columbia. Special Report Series 6, BC Ministry of Forest, Victoria, BC.
- Pottinger Gaherty Environmental Consultants Ltd. 2005. CRC Joint Ventures – Overview Environmental Inventory - Caper Roger Curtis, Bowen Island, BC. PGL File 2404-01.03.

Roemer, H. 1972. Forest vegetation and environments on the Saanich Peninsula, Vancouver Island. Ph.D. thesis, University of Victoria, Victoria, BC.

Selected Images (Figures 1 through 7) in Support of the Report



Figure 1. This open-canopy, over-mature, red alder stand is one of the most productive in coastal BC. Note the dominance of sword fern in the understory and scattered sub-canopy conifers (Polygon Type 10, CWHxm/07 - Lady fern site series).



Figure 2. A closed-canopy, mature, Douglas-fir stand signifies a high productivity potential for Douglas-fir growth on Foamflower sites on Bowen Island. (Polygon Type 7, CWHxm/05 - Foamflower sites).



Figure 3. A structurally-diverse grove of old, picturesque bigleaf maple beside the major trail towards shoreline bluffs (Polygon Type 7, CWHxm/07 - Lady fern site series).



Figure 4. A mixed-species stand of grand fir and red alder. Similar to the red alder stand in Figure 1, this site support the most growth productive of grand fir in coastal BC. (unknown polygon, CWHxm/07 - Lady fern) site series).



Figure 5. A cohort of second-growth western redcedar on a Foamflower site. Although r these trees have poor growth form, the growth potential for redcedar growth on Foamflower and Lady fern sites is excellent (unknown polygon, CWHxm/05 – Foamflower site series).

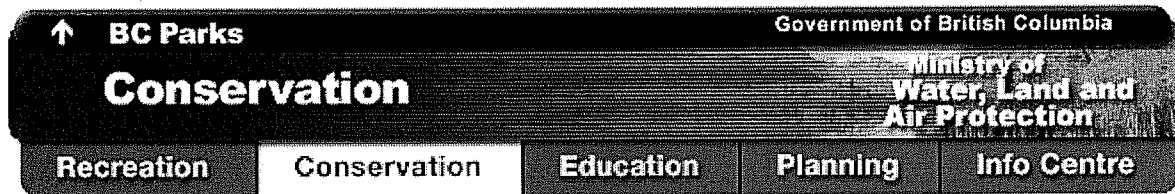


Figure 6. A typical 'inland' Douglas-fir stand on a Salal site. Associated with moraine veneers and interspersed with rock outcrops (CWHxm/02 - Cladina site series), these sites are most suitable for development (unknown polygon, CWHxm/03 – Salal site series).



Figure 7. The boundary between non-forested (shoreline bluffs) and adjacent forested ecosystems is usually very abrupt. Due to the high sensitivity of shoreline bluff ecosystems, any development should be limited to forested, preferably Salal sites.

APPENDIX 1



Ecological Reserves Listed Alphabetically: [A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#)

Ecological Reserves

Ecological Reserves preserve representative and special natural ecosystems, plant and animal species, features and phenomena. Please help us protect these areas.

Bowen Island Ecological Reserve

- Purpose
- Location
- Restrictions
- Ecological Zones
- Size
- Management Planning

Date Established: 1973

Purpose:

Ecological reserves are areas in British Columbia selected to preserve representative and special natural ecosystems, plant and animal species, features and phenomena. The key role of ecological reserves is to contribute to the maintenance of biological diversity and the protection of genetic materials. Scientific research is one of the principle uses of ecological reserves in British Columbia. [Click here](#) for more information on Ecological Reserves.

Bowen Island Ecological Reserve was established to preserve the dry subzone forest ecosystems in the Coastal Western Hemlock Zone at a location convenient for research.

Restrictions:

Ecological reserves are not created for outdoor recreation. Most ecological reserves, however, are open to the public for non-destructive pursuits like hiking, nature observation and photography. Consumptive activities like hunting, freshwater fishing, camping, livestock grazing, removal of materials, plants or animals are prohibited by regulation in ecological reserves. Motorized vehicles are not allowed. Research and educational activities may be carried out but only under [permit](#).

Size: 397 ha

Location:

- [Location Map](#)

2 km SW of Snug Cove, Bowen Island, Howe Sound

Ecological Zones:

[Biogeoclimatic Ecosystem Classification information](#)

Coastal Western Hemlock

Management Planning:

- [Management Planning](#)
- [Approved Management Statement](#)

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