



fragments

FRAGMENTS: MANAGEMENT, PROTECTION, AND RESTORATION PROPOSALS
FOR THIRTEEN ECOLOGICAL RESERVES IN BRITISH COLUMBIA, CANADA

G. BRENT INGRAM

A REPORT TO THE ECOLOGICAL RESERVES COMMITTEE AND ADVISORY
BOARD AND THE MINISTRY OF LANDS, PARKS, AND HOUSING OF THE GOV-
ERNMENT OF THE PROVINCE OF BRITISH COLUMBIA--June 1981

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EXECUTIVE SUMMARY

This report is concerned with the quality of the ecosystems within established ecological reserves in British Columbia. It examines this ten-year-old government program in terms of the objectives stated in the Ecological Reserves Act of 1971 and emerging imperatives of the 1980s. Thirteen ecological reserves in three regions: Gulf Islands, southern Interior valleys, and Queen Charlotte Lowlands were assessed for ecological disturbance. Disturbances are defined as significant changes in species composition and biomass that have been initiated by humans since European/eastern North American contact. These particular ecological reserves were chosen from the 100 in the province as significant examples of the conditions and problems of the reserves of each region.

Habitats and plant associations are outlined for each reserve. Prehistoric and historic profiles of human influences are compiled. Disturbances are categorized and described. Viable preservation objectives are proposed for each reserve. Management proposals for minimizing destructive uses in and impacts on ecological reserve wildlife and for hastening natural restoration processes are formulated.

The purpose of this research (originally part of an M.Sc. thesis) is to identify needs for active management of ecological reserves. This involves regulating destructive activities of individuals and impacts of modern society. Preservation policy, and in particular the stance towards curtailing these disturbances, is in a

formative stage in the Ecological Reserves Unit. This report is aimed at providing theoretical approaches and information on which policy decisions can be based. It also provides information for choosing sites for ecological reserve status which are less prone to disturbance.

This paper presents a format for determining and analyzing significant ecological disturbances, clarifying management objectives, and formulating proposals. This is on a relatively small-scaled and site-specific basis. This is an approach that has only recently been applied to land management activities in British Columbia. This format has been tailored for the needs of resource agencies in British Columbia for the coming decade. It is a synthesis derived from British and U.S. nature preserve management plans. Its features are brevity and readability for non-scientists. The following is the outline of this format:

text

BIOPHYSICAL SETTING

NATIVE (PRE-CONTACT) USES

MODERN USES

ECOLOGICAL DISTURBANCE

PRESERVATION OBJECTIVES

PROPOSALS

maps (overlays based on 5 chain aerial photographs)

TOPOGRAPHY

BIOTA

DISTURBANCE

PROPOSALS

All of the ecological reserves in this study have endured disturbances, initiated by modern society, that impair their values for research on natural ecosystems and as preserves of pre-contact ecological relationships. The majority of these disturbances were present at the time of ecological reserve establishment, e.g. they had been previously logged or grazed. These earlier disturbances, whose affects continue, comprise the following portions of the overall disturbances: Gulf Islands 96%, southern Interior 92%, Queen Charlotte Lowlands 100%. Of these disturbances, some have continued or have been aggravated since ecological reserve status: Gulf Islands 20%, southern Interior 29%, Queen Charlotte Lowlands 57%. New distur-

bances initiated since ecological reserve status represent the following portions of the totals: Gulf Island 4%, southern Interior 8%, Queen Charlotte Lowlands 0%.

Of the disturbances of each region, the following portions are those that no longer recur and where natural ecosystem restoration processes are working: Gulf Islands 49%, southern Interior 21%, Queen Charlotte Lowlands 15%. Of these disturbances, the following portions represent ecological "healing" processes that could be significantly accelerated by management actions: Gulf Island 74%, southern Interior 63%, Queen Charlotte Lowlands 57%. The following portions of overall disturbances are the result of illegal activities (in terms of the Ecological Reserves Act and the 1975 Regulations): Gulf Islands 8%, southern Interior 10%, Queen Charlotte Lowlands 27%. Of the illegal disturbances, the following portions are the results of activities that posted signs indicated to be illegal: Gulf Islands 83%, southern Interior 81%, Queen Charlotte Lowlands 81%.

Nearly all of the disturbances associated with recreation were from vehicle (truck or bike) use. Two of the ecological reserves have degradations that have been aggravated by lack of government resolution of Native land claims. Logging and grazing are the activities that have caused the greatest impacts on biomass and species composition. Introduced herbs and mammals and altered fire regimes have created management problems that will continue indefinitely. The only recorded extinction, of the Dawson Caribou on the Queen Charlotte Islands, was well before the bulk of post-contact ecological changes. Nearly all of the ecological reserves have mammal extirpations.

Ecological reserves that were surrounded by wildland buffers such as park tended to have smaller numbers of disturbances. These disturbances tend to be less pervasive and less irreversible than the majority of those in the study.

A large portion of the on-going disturbances were initiated before ecological reserve status. Local people often have not been sufficiently informed about the ecological reserve concept. Resentment for the new status and the lack of participation in planning decisions has fueled self-righteous vandalism.

Because these ecological reserves are so disturbed, they are only fragments of complete ecosystems. For example, vegetation is intact but mammal populations are not. In these three lowland areas, no fully intact (pre-contact) ecosystems have survived. We must make do with pieces that when organized on a regional basis and then restored can reconstruct the truly wild ecosystems that is the purpose behind

the British Columbia Ecological Reserves Program. This report formulates preservation objectives for each ecological reserve. Each reserve is examined for the wildlife and ecological relationships that it will be able to maintain over the coming decades and beyond. This varies greatly between reserves. Field's Lease Ecological Reserve will never be able to hold large mammals in any undisturbed form. However, relatively intact mammal populations could survive in Soap Lake Ecological Reserve.

The proposals were developed for both the short and long terms. Nearly all of them can be carried out by the Ecological Reserves Unit and other provincial natural resource agencies without addition of large numbers of new personnel.

Restoration of pre-contact fuel levels and fire frequency patterns through combinations of site-specific suppression, tolerance, and controlled burning is outlined. Revegetation of roadbeds and tracks through manual efforts is proposed for eleven of the reserves. Activities for control of invasive exotic flora and fauna are proposed for a majority of the reserves. Reintroductions of extirpated flora and fauna, either active or toleration of natural reintroduction, are proposed for a majority of the reserves.

There are six reserves with proposals for acquisition of adjacent lands. These lands are either provincially or privately owned. Seven of the ecological reserves have proposals for buffer strips ("conservation easements") with specific limitations such as on logging and residential development. Several proposals suggest managing reserves as part of larger natural or wildland units. Several proposals consider the need for greater regulation of specific technologies, e.g. pesticide use in adjacent areas.

There are proposals for limiting recreational, educational, and research use of reserves. Where ecologically viable, proposals for expanded non-consumptive uses, e.g. nature trails, are made. Stewarding committees are proposed for each reserve. The degree of formality and the spectrum of local and government representation should vary with problems, needs, and interest.

Over the long run (the coming decades) the benefits of the added planning and management (more healthy, diverse, and intact ecosystems in ecological reserves) will greatly outweigh the costs (personnel, acquisition moneys, materials, "hassles" from added regulation). However, the advantages of these trade-offs will not always be evident to people who lack training in ecology. Education and subse-

quent community involvement must expand to all levels of establishment and management of ecological reserves in British Columbia.

RECOMMENDATIONS FOR RESEARCH

1. Each ecological reserve in British Columbia should have a management/protection/restoration plan formulated for it. These should be developed and approved through the Ecological Reserves Committee and Advisory Board. All new ecological reserves should have a set of preservation objectives, that proposals can be based around, at the time of their establishment.
2. Each plan should be based on a standardized format that is developed through the Committee. The advantages of the format presented in this paper are discussed elsewhere.
3. The major habitats, plant associations, and ecological disturbances of each reserve should be mapped from 5 chain (1:3960) aerial photograph enlargements that are available from the Maps and Survey Branch, Ministry of the Environment, Victoria. Proposals should be described on site plans of the same scale.
4. The Ecological Reserves Program is the primary effort for the preservation of natural diversity in British Columbia. Preserve design, regional contexts, and social dimensions in this emerging field have only recently begun to be considered. The Committee should encourage and support such research for British Columbia.
5. A remarkable amount of confusion, pessimism, and paralysis about restoration possibilities was evident with a range of scientists and resource management personnel. The Act clearly mentions the need for restoration and there is a growing body of relevant material, notably British and western U.S., on the subject. The Committee should actively review and encourage research on revegetation, reintroduction, and the control of exotic species that is relevant to B.C. ecological reserve settings.
6. The former cultural ecologies of indigenous peoples must be considered in both ecological reserve establishment and management. The Committee should encourage related ethnographic and ecological research.

POLICY RECOMMENDATIONS

1. The Ecological Reserves Act of 1971 is a sound piece of legislation that should continue to provide an adequate, legal framework for ecological reserve establishment and protection for the coming decade. This legislation was developed for a wide range of settings and needs. The scope of the intent of the Act should be reviewed on an on-going basis to minimize narrowing of the program, e.g. baselines over education.
2. So far, no individual or group who has conducted illegal activities, such as dirt bikes in ecological reserves, have been charged or tried. The 1975 Regulations should be tested for their legal powers and then evaluated.
3. The volunteer warden system should be expanded to include small advisory committees for individual or clusters of ecological reserves. These bodies should recommend management activities as well as monitor for any destruction.
4. In some cases, ecological reserves have been perceived as another form of encroachment by predominately white, urban, middle-class people into rural and remote areas. Conflicting uses will not be resolved until underlying social and economic problems in surrounding areas are solved. This was particularly evident with both Native land claims and regional recreational needs.
5. Because these ecological reserves are so degraded, we need more reserves in the same regions. They too may be disturbed but should contain habitats or communities that other, similar ecological reserves do not hold. Since new reserves in the regions studied will continue to be small parcels, a substantial number of new ecological reserves should be established.
6. Truly wilderness ecological reserves are a small minority of the program. However, they often provide the only kind of setting for the preservation of certain ecological relationships such as wolf and deer dynamics. A wilderness system for the entire province should be developed for both recreation and conservation. Wilderness ecological reserves should be those in the wilderness system which are managed most strictly for preservation of pre-contact ecological patterns.
7. Some ecological reserves should be expanded from their original boundaries. Funds should be made available, annually, to purchase private lands that are adjacent to ecological reserves. Land acquisition should occur where surrounding lands provide key habitat for wildlife in ecological reserves and where acquisi-

tion would create more integrated natural units such as an entire mountainside or the upper part of a watershed.

8. Where acquisition of key, provincially or privately owned, areas is not feasible or forthcoming, conservation easement should be established. These buffers should have use limitations, for instance subdivision limits of 10 acres rather than the surrounding 1 acre limit, that are agreed upon by the Unit and regional planning agencies. A separate bill or an amendment to the Act would need to be created.
9. The Committee, Advisory Board, and Unit should maintain their control over management activities of ecological reserves. However, once a plan is completed, regional natural resource management personnel such as from parks and the Ministry of Forests should carry out as much as is cost effective. This will require a great deal of coordination between ministries and divisions. The basis of these relationships should be intra-governmental education (the need for ecological reserves and preserve management theory and techniques) and the principle that responsibility of the day-to-day protection of ecological reserves lies with the entire provincial government and not just with the Unit. At the present time, it is crucial that local, "middle management" personnel be trained in the fine points of these concepts and emerging management needs.

ACKNOWLEDGMENTS

For my mother and father who taught their children to love the Earth.

This project is both a report to the Ministry of Lands, Parks and Housing of the Government of British Columbia, Canada, and a thesis. The enclosed work completes my studies in the Master of Science program in Ecosystem Management at Antioch University West's San Francisco Center. I am presently teaching in the same program and am studying environmental planning at the University of California, Berkeley.

Completing this report has been the most difficult experience of my life. I received very little funding to conduct field work, data compilation, and writing. Trudi Carson very kindly shared her July 1979 Ecological Reserves Unit salary. My brother and mother made short-term loans available in desperate periods. David Millhauser, as well as being a dear and faithful friend, accompanied me and paid for much of the field work for the Interior areas. The British Columbia Cultural Fund provided support to photograph these areas. Antioch University West provided a teaching assistantship position when the bulk of the text was written. The Ecological Reserves Unit has paid for one-half of the typing of the report.

Bristol Foster, the director of the Ecological Reserves Unit, provided many of the initial ideas for this project. I am indebted to him for patient, meticulous, and thoughtful overseeing of the final draft. Along with Bristol, Trudy Carson and Hans Roemer, of the Unit, helped me obtain essential internal government information. Sheila Daar, formerly of Antioch University West, was my original faculty advisor and directed the initial thesis outline.

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The neighbors of these ecological reserves were generally supportive of my efforts. They provided a crucial portion of information and hospitality. Tom Reimchen and Sheila Douglas also shared invaluable insights on living in an ecological reserve. The land, itself, was very kind. I had safe and inspiring field trips. Friends, in several regions, were wonderfully hospitable and helped me maintain a vision and a practical perspective on scientific research and environmental problem solving. Joe McBride, of the University of California at Berkeley, gave me crucial suggestions on map formats. Peggi Oakley, the typist/information processor, has done an impeccable, sensitive, and protracted job of making this report a reality. Thank you all!

G. B. I.
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