BIOSPHERE RESERVES

Canadian Man and the Biosphere Committee (Canada/MAB)
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1. WHAT ARE "BIOSPHERE RESERVES"?

Biosphere reserves are representative examples of landscapes, each with their characteristic plants, animals and human uses, which have been given an international designation under the Unesco Man and the Biosphere Programme. Each biosphere reserve is made up of a protected "core" of undisturbed landscape together with nearby areas showing some of the ways in which once similar landscapes are being managed to meet human needs. For example, a biosphere reserve may be made up of a protected undisturbed forest together with other tracts of similar forest managed for wood products, wildlife or as catchment protection for the headwaters of important rivers. Or it could be a core of remnant natural grasslands together with adjacent agricultural crop or grazing areas.

Collectively, biosphere reserves constitute a worldwide network which eventually will include examples of all the world's main ecological systems with their different patterns of human use and adaptations to them. MAB has in effect continued and extended some of the work started under the International Biological Programme of the 1960's.

Waterton Lakes National Park, Alberta

A view from the Buffalo Paddock exhibit shows rolling grasslands at the foot of Mount Crandell and Bellevue Hill.

2. HOW MANY BIOSPHERE RESERVES ARE THERE?

As of December 1981, there were 209 in 55 countries around the world. There are two in Canada: Mont-Saint-Hilaire (Quebec) and Waterton Lakes (Alberta). Other possibilities are being looked into.

3. WHAT PURPOSES DO THEY SERVE?

Besides conserving the natural characteristics of each sample of landscape selected, biosphere reserves help advance the achievement of sustainable development. They provide locations to demonstrate how renewable resources can be utilized without exceeding their productive capacities. By documenting environmental changes brought about by human activities and comparing the undisturbed landscape with areas managed for resources or areas degraded by abuse, good resource management practices can be developed.

In the Waterton Lakes Biosphere Reserve, the Waterton Lakes National Park provides the protected natural landscapes for a reserve along with basic facilities in the townsite. In the area around the Park, there is controversy about how best to control a pine bark beetle infestation, concern over the long-term effects of agricultural land use practices on soils, and interest in knowing more about the movements of elk and grizzly out of the Park. These are the kinds of resource management and land use questions which could benefit from comparative study of undisturbed conditions in the Park with management practices outside of it. Arrangements are being made to cooperate with other government agencies, federal and provincial, and private landowners outside of the Park on these and other questions of mutual interest. When these arrangements are complete, the basic concept of a fully functioning biosphere reserve will be in place. Biosphere reserves are organized especially to provide for such long-term work which has been fostered throughout the world under the Unesco/MAB Programme since 1971.

Mont-Saint-Hilaire, Quebec

Mont Saint-Hilaire is one of the ten Monteregian Hills forming an arc across the Laurentian Lowlands. The master plan for its development and management has set aside a sector for the public, where an interpretation programme has been set up, while the rest of the mountain is reserved for university research. Mont Saint-Hilaire thus possesses the features of a biosphere reserve: a central core — the research zone (middle of the photograph) — which provides the basis for measurement of the parameters observed in the buffer zone (foreground of photograph), which is the sector open to the public, and the developed zone (background of photograph) which surrounds the first two zones.

4. HOW ARE BIOSPHERE RESERVES DIFFERENT FROM NATIONAL OR PROVINCIAL PARKS, ECOLOGICAL RESERVES, NATURE RESERVES, AND SO ON?

Biosphere reserves share the conservation goal of such areas, and in fact they are often created around some already protected natural landscape. They differ in three ways. First, the protected areas within biosphere reserves must be representative examples of some of the natural features which characterize one of the world's "biogeographical provinces". Second, biosphere reserves must have examples of managed or transformed landscapes included within them in order to provide for the kinds of long-term comparative research and monitoring which is their main purpose. In many cases, this would require arrangements with agencies and/or owners of lands outside of established parks or reserves in order to create a fully functioning biosphere reserve. Third, biosphere reserves can be organized to provide a means for involving non-governmental organizations, and private landowners' interests in land and resource management without affecting private ownership rights.

Waterton Lakes National Park, Alberta

The northern limit of the beargrass is reached in Waterton. Many mountain slopes are carpeted with this beautiful lily. Mount Custer in the background.

5. WHAT ARE "BIOGEOGRAPHICAL PROVINCES"?

Unesco/MAB adopted a classification of the major natural regions of the world drawn up by Professor Miklos Udvardy (formerly of the University of British Columbia) in 1975. This classification system defines a set of 14 representative "biome types" such as forests, grasslands, mountains, or tundra which can be found in one or more of the 8 "realms" of the world. The "realms" are essentially the world's major continental land masses and large oceanic archipelagos. Each "realm" is subdivided into "biogeographical provinces" classified by biome type. Altogether, the world has been subdivided into 193 biogeographical provinces and the system is being extended to define major coastal environments along the continental sea coasts. Canada falls within one realm (the Nearctic) and has 12 biogeographical provinces representing 7 of the 14 basic biome types. Ideally, there should be at least one biosphere reserve established in each biogeographical province.

6. WHAT ADVANTAGES DO BIOSPHERE RESERVES HAVE OVER OTHER KINDS OF PROTECTED AREAS?

This depends a lot on the local situation. When it is recognized that an area has natural characteristics which are worthy of recognition in a global context, then this can strengthen the commitment needed to provide proper protective management. Because biosphere reserves deliberately acknowledge the importance of resource use along with conservation objectives, they are a more acceptable approach to resolve conflicts between protection and use in situations where strict preservation over large areas is not feasible. The collaboration needed among agencies and individuals to create and maintain a biosphere reserve results in a better awareness of, and support for, more concerned efforts at resolving resource management problems based in part on strengthened research efforts.

Mont-Saint-Hilaire, Quebec

Mont Saint-Hilaire rises from a flat, parcelled terrain and forms a living example of the rich deciduous forest that existed when the first settlers came to this part of the country. Over 600 species of higher plants have been identified in the reserve. The forest consists mainly of deciduous trees such as sugar maple, beech, oak, basswood and ash. In the spring, the damp ground of the forest is covered with a stunning array of flowers which include trilliums, shown in the photo above.

7. HOW BIG DO BIOSPHERE RESERVES HAVE TO BE?

The only guideline is that the protected examples of undisturbed natural areas within a biosphere reserve should be large enough to be self-sustaining ecological systems (ecosystems). This applies particularly to the size of area needed to maintain representative populations of plants and animals which are most characteristic of the area. Otherwise there are no set limits on size. Sometimes it is not possible to find the right mix of undisturbed and managed landscapes adjacent to each other, so a "cluster biosphere reserve" made up of several sites is possible. The world list of biosphere reserves has areas ranging all the way from 100 to 7 million hectares. The smaller ones are usually in heavily-settled regions where the "original" landscapes have been considerably modified.

8. DO BIOSPHERE RESERVES ALWAYS HAVE TO HAVE A FEDERAL SPONSORING AGENCY?

No. Although Unesco/MAB is an international programme in which Canada has been participating in various ways, biosphere reserves are not part of some federal or federally-controlled programme. Whether or not a federal government agency is involved depends entirely on whether or not some component of a given biosphere reserve is under federal jurisdiction. One Canadian biosphere reserve, Mont-Saint-Hilaire, is privately owned and managed. The possibility of establishing new biosphere reserves based on provincially-administered core components is under study in at least two provinces. However, in any case where a biosphere reserve is based on a core area such as a National Park, as for example the Waterton Lakes Biosphere Reserve, or a National Wildlife Area, then the appropriate federal official would be a member of whatever local management advisory group might be set up.

9. WHOSE JOB IS IT TO SET UP BIOSPHERE RESERVES?

There is no single agency or private organization in charge of biosphere reserves in Canada, nor is one planned. The designation of areas as biosphere reserves is done through the International Co-ordinating Council of Unesco/MAB on the basis of nominations and recommendations channelled to them through MAB national committees. The Canada/MAB Committee is the agency through which Canadian nomination submissions are to be channelled. However, the initiative to establish a biosphere reserve in Canada can be taken by anyone who may be able to act on behalf of some government agency or private organization that is active and known in the nature conservation or resource management field. The main challenge will be to work out the kind of cooperative administrative arrangements including funding and other support among all concerned for an area that meets the essential criteria of composition and characteristics needed to gain recognition as a biosphere reserve.

10. WHAT DIFFICULTIES WOULD BE ENCOUNTERED IN ESTABLISHING A BIOSPHERE RESERVE?

This also depends a lot on local circumstances. The initial difficulties would likely arise from the need to reach consensus among the various groups and individuals who would have to be involved in agreeing to the establishment and maintenance of a biosphere reserve. Because areas of both protected and utilized landscapes are included within each biosphere reserve, no single government agency, private organization or landowner would have exclusive authority. Thus, the arrangements for maintaining each biosphere reserve have to be worked out through mutual cooperation and consultation. Creation of a biosphere reserve does not affect legal titles or rights of use to lands unless those directly involved agree to changes. Attention does have to be paid to longer-term arrangements for carrying out the research, monitoring and other associated activities which biosphere reserves are meant to serve.

11. HOW MIGHT THESE LONGER-TERM ARRANGEMENTS BE ORGANIZED?

If possible, a local management advisory committee should be established for each biosphere reserve. It would consist of representatives from agencies or private interests responsible for each main component of the biosphere reserve, together with individuals from organizations involved with the research, monitoring and educational activities in the reserve. Thus, for example, a committee might be made up of representatives from one or several of the provincial and/or federal agencies responsible for parks, ecological reserves, agricultural lands or natural resources along with local municipal officials, private landowners, and university research staff. This local management advisory committee would, without interfering in the management responsibilities of the agencies and landowners concerned, advise on and develop suitable cooperative research, monitoring, and education programmes in order to ensure that significant benefits are derived from the establishment of the reserve.

Mont-Saint-Hilaire, Quebec

Current knowledge of evolution shows without a doubt that the first forms of life appeared in the aquatic environment. This habitat is particularly well suited to several plant and animal species which have adapted in special ways to their environment. In addition, the hydrographic system of any region has an effect on the climate, the flora and fauna and the quality of human life. Thus, man's use of this environment must be based on a thorough knowledge of the specific laws of nature which govern aquatic ecosystems.

12. WHERE CAN MORE INFORMATION AND ADVICE ABOUT BIOSPHERE RESERVES BE OBTAINED?

The Canada/MAB Committee would be pleased to provide additional information concerning the "Nomination of Canadian Biosphere Reserves". Canada/MAB, if requested, will assist with the preparation of a nomination submission. Please address inquiries to:

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