

**598 Management Report**

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**A North American Biosphere Reserves  
Network: Background and Prospects**

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**Prepared For:**

**Canadian Biosphere Reserves Association**

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## EXECUTIVE SUMMARY

Much attention is being paid to the potential role of a North American Biosphere Reserves Network in addressing regional conservation and sustainability concerns. As such, members of the Canadian Biosphere Reserves Association must have a clear understanding of network development literature, examples and parties that may be involved. This article offers a background review and some prospects to further this understanding.

## SECTION 1 – INTRODUCTION

"Biosphere Reserves are places where nature nurtures the minds, hearts and bodies of the people, and the people strive to live gently and maintain vital processes to sustain themselves and the other species that share the biosphere. The Canadian Biosphere Reserves Association (CBRA) supports this interdependence by helping Biosphere Reserve communities to mobilize government agencies, industries, businesses and individuals needed to support economic and environmental well-being"

– Cited from the CBRA website<sup>1</sup>

### 1.1 Background

The Canadian Biosphere Reserves Association (CBRA) is a non-profit association, incorporated in 1997, to provide support and networking relationships that help develop and maintain biosphere reserves throughout Canada. Currently CBRA is examining a potential North American (Canada-

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<sup>1</sup> Retrieved from <http://www.biosphere-canada.ca/home.asp>

United States-Mexico) Biosphere Reserves networking plan, a regional plan that will promote better communication and collaboration of communities in projects that address regional conservation and sustainability concerns. This report sets out the results of a study report undertaken by a volunteer for this purpose.

## **1.2 Objectives and Structure**

The purpose of this report is to:

- Review the history and theories of the Biosphere Reserve program;
- Review the development of biosphere reserves in Canada, the United States and Mexico;
- Discuss theories and examples of Biosphere Reserves regional networking; and
- Draw some conclusions about pursuit of a North American regional network within the Man and the Biosphere Programme.

There are many complexities involved in determining what will constitute a functional North American regional biosphere reserves network. This report can only examine limited documents (books, reports, research papers, Internet articles), provide some background information and offer several suggestions.

However, this study will be of value to those involved with developing biosphere reserves and fascinated by the idea of a regional networking.

The report is broken into six sections:

- Section 1: Introduction
- Section 2: Organizational Overview
- Section 3: Literature Review
- Section 4: Regional Overview
- Section 5: Regional Networking Overview
- Section 6: Concluding Thoughts

## SECTION 2 – ORGANIZATIONAL OVERVIEW

### 2.1 UNESCO Man and Biosphere Programme and the Biosphere

#### Reserves

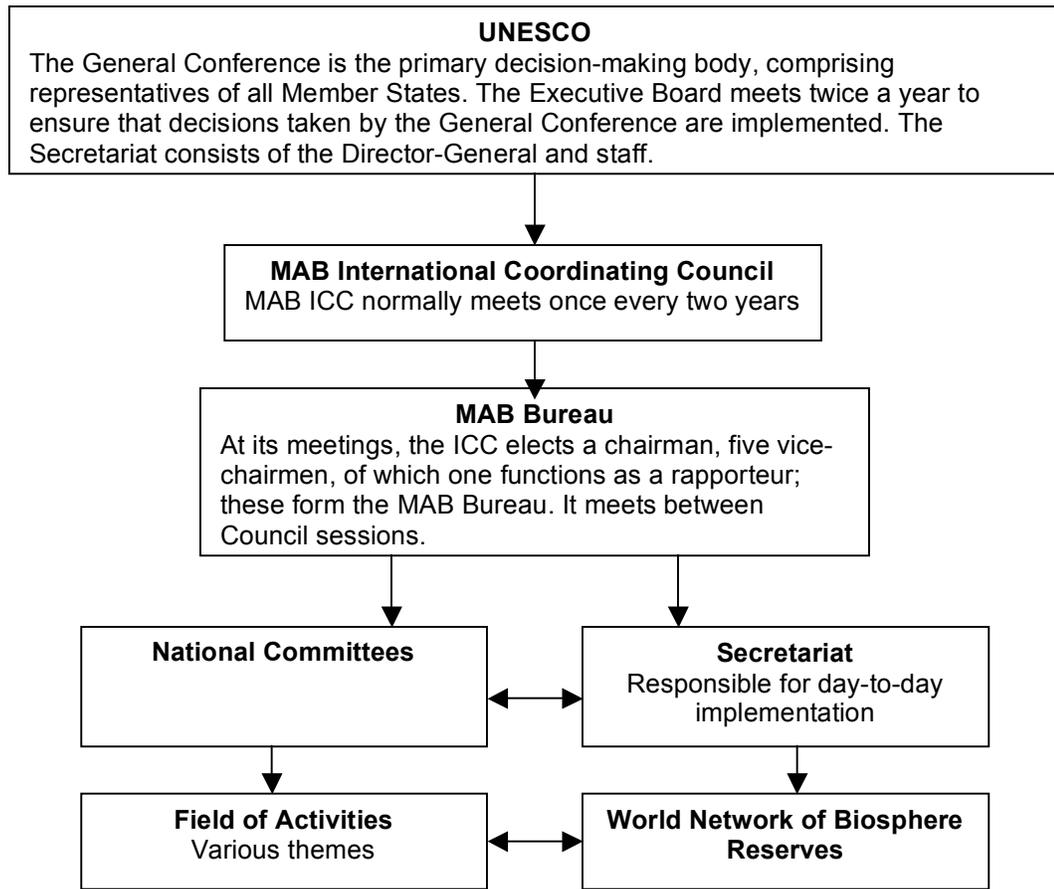
The United Nations Educational, Scientific and Cultural Organization (UNESCO) was born on November 16, 1945. For this specialized UN agency, education, science, culture and communication are the means to a far more ambitious goal: to build peace in the minds of men (UNESCO, 2003, p.2). UNESCO launched the Man and the Biosphere (MAB) Programme in 1970. Its general mission was defined as:

...to develop within the natural and social sciences a basis for the rational use and conservation of the resources of the biosphere and for the improvement of the relationship between man and the environment; to predict the consequences of today's actions on tomorrow's world and thereby to increase man's ability to manage efficiently the natural resources of the biosphere (cited by Boyden, 1992, p.2).

The MAB Programme has involved and encouraged many projects that promote interdisciplinary research on the relationship between human society and the natural environment (Figure 1 illustrates MAB's organizational structure). One of the most important demonstrations of MAB's objective is the Biosphere Reserves (BRs) project. At its first session in November 1971, the governing body of MAB, the International Coordinating Council for the MAB programme, discussed the proposal for Biosphere Reserves (Project 8) and recognized that "the establishment of reserves protected and managed in various ways, is of importance to mankind through the role they can play in meeting scientific, economic, educational, cultural and recreational needs." (UNESCO/UNEP, 1974, p. 9). It was suggested that international concern for the long-term conservation

of such areas, which represent a means of maintaining the gene pools of species of plants, animals and micro-organisms, might be achieved through their designation as "Biosphere Reserves" (UNESCO/UNEP, 1974, p. 9). The term "biosphere reserve" is sufficiently distinctive, with "biosphere" referring to the MAB program, and "reserve" to the inclusion of formally protected areas as part of the configuration of land uses (Francis, 1998). In September 1973, the Expert Panel on Project 8 outlined general criteria and guidelines for conservation of natural areas and their genetic diversity. In 1974, the Expert Panel and its special group established the criteria and guidelines for the selection and establishment of biosphere reserve. In that document, the primary objectives of biosphere reserves were described as 1) to conserve for present and future use the diversity and integrity of biotic communities of plants and animals within natural ecosystems; 2) to provide areas for ecological and environmental research; and 3) to provide facilities for education and training (UNESCO and UNEP, 1974, pp 11-12). As of July 2003, 97 countries have established 440 biosphere reserves.

**Figure 1 – Organizational Structure of MAB**



Source: UNESCO/MAB structure, retrieved from <http://www.unesco.org/mab/about.htm#structure> and <http://unesdoc.unesco.org/images/0013/001315/131585e.pdf>

MAB has changed extensively over the past decades. In 1992, *Agenda 21*, including the *Convention on Biological Diversity*, *Climate Change* and *Desertification*, was developed at the United Nations Conference on Environment and Development (The Rio Conference or World Summit). Provisions of *Agenda 21* (1992) were agreed upon to “show the way forward towards what is now termed sustainable development, incorporating care of the environment, living from the interest of the land without depleting its capital, with greater social equity,

including respect for rural communities and their accumulated wisdom”<sup>2</sup>. It significantly shaped MAB’s agenda. As a result, MAB’s current general objective has been defined as:

...(to)develop the basis, within the natural and the social sciences, for the **sustainable use** and conservation of **biological diversity**, and for the improvement of the relationship between people and their environment **globally** (MAB, emphasis added).<sup>3</sup>

This statement emphasizes that “sustainable use” and “biodiversity” are two major MAB objectives. It also suggests that worldwide networking, including regional and sub-regional cooperation, is a useful tool to seek concrete solutions of various issues.

In 1995, the International Conference on Biosphere Reserves, hosted by the Spanish authorities in Seville (Spain), confirmed that Biosphere Reserves offer such examples and developed a strategy for the future development of the World Network of Biosphere Reserves. The *Seville Strategy* (1995) indicates that one of the primary objectives for the program is to "promote biosphere reserves as a means of implementing the goals of the *Convention on Biological Diversity*".<sup>4</sup> Likewise, the *Statutory Framework of the World Network of Biosphere Reserves*, which resulted from the work of the Seville Conference (1995), states,

The (Biosphere Reserve) Network constitutes a tool for the conservation of biological diversity and the sustainable use of its components, thus contributing to the objectives of the Convention on Biological Diversity and other pertinent conventions and instruments (UNESCO/MAB).<sup>5</sup>

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<sup>2</sup> MAB, retrieved from <http://www.unesco.org/mab/nutshell.htm>

<sup>3</sup> MAB, retrieved from <http://www.unesco.org/mab/about.htm>

<sup>4</sup> *Seville Strategy*, retrieved from <http://www.mabnet.org/publications/seville/seville1.html>.

<sup>5</sup> UNESCO/MAB, retrieved from <http://www.unesco.org/mab/docs/statframe.htm#8>

## 2.2 The Development Function of Biosphere Reserves

The vagueness or flexibility of the 1970s biosphere reserves concept created conceptual and practical difficulties for communities that have started to assume a more active role in the designation of biosphere reserves (Sian, 2000, Abstract). Many people tend to think that the notion of biosphere reserve is very similar to the notion of “national park”, which is based on the assumption that by setting up a discrete protected area the biodiversity of species will be then maintained. One has to admit that the 1970s BR model is largely based on the park model especially the establishment of the “core area”. The latter, many scholars have argued, is based on the nineteenth century colonial concept and European philosophy. Mingled with indigenous people’s political claims about their rights to land and resources, some local indigenous communities expressed their worries about this “reserve” concept. For example, a First Nation delegate indicated his opinion in a symposium hosted by the Clayoquot Biosphere Trust, Canada:

Starting at least ten years ago our territory got carved up into different designations: parks, tree farm licenses, marine protected areas . . . We were not told that these designations are coming in. There was no consultation. Suddenly one day no hunting is allowed because the campers will call in and say those crazy Indians are shooting at us again (Clayoquot Alliance, 2003).<sup>6</sup>

Historically, these kinds of criticisms are not rare. One report that studied game parks in Kenya, Africa, has pointed out that in establishing those parks, “European law turned indigenous human inhabitants of the ‘nature reserves’ into poachers, invaders in their own terrain, or into part of the wildlife” (Haraway, 1991, as cited in Ingram, 1997).

The *Seville Strategy* (1995) and the *Statutory Framework* (1995) advocate the refinement of the biosphere reserves concept. The *Seville Strategy* indicates that biosphere reserves are much more than just protected areas or national parks:

Biosphere reserves offer such models. Rather than forming islands in a world increasingly affected by severe human impacts, they can become theatres for reconciling people and nature; they can bring knowledge of the past to the needs of the future; and they can demonstrate how to overcome the problems of the sectoral nature of our institutions (The Vision from Seville for the 21st Century).

The *Seville Strategy* further refined the role of biosphere reserves, stating,

Not only will they be a means for the people who live and work within and around them to attain a balanced relationship with the natural world, they will also contribute to the needs of society, as a whole, by showing a way to a more sustainable future. This is at the heart of our vision for biosphere reserves in the 21st century (The Vision from Seville for the 21st Century).

Thus, besides conservation and scientific activities (research, training and education), BRs should have a “development function”. As Peter Bridgewater (2001) stated, the conservation of biodiversity must be linked with sustainable human development; and, as such, Biosphere Reserves are as strongly centred on economics as on ecology (Minutes of the 29th session of the IGCP SCIENTIFIC BOARD, 11(b)).

In 2000, a “Seville +5” international meeting of experts on the implementation of the Seville Strategy was held in Pamplona, Spain. Following a recommendation of this meeting, the MAB Secretariat established the MAB Task Force on the Development of Quality Economies in Biosphere Reserves (Biosphere Reserves Bulletin of the World Network, 2002, p.6). The objective of the Task Force is to provide policy advice that could help biosphere reserves become regional models for sustainable development:

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<sup>6</sup> Retrieved from [http://www.clayoquotalliance.uvic.ca/Symposium2003/Summaries\\_Final.pdf](http://www.clayoquotalliance.uvic.ca/Symposium2003/Summaries_Final.pdf)

In particular, it should contribute to the development of quality economies in biosphere reserves, i.e. activities, goods and services that are produced and consumed in ways that are compatible with and supportive of the objectives set forth in the Seville Strategy and the articles in the Statutory Framework of the World Network of Biosphere Reserves (Biosphere Reserves Bulletin of the World Network, 2002, p.6).

The new role of BRs is not only as a means to achieve a better balance between people and the natural ecosystem surrounding them, but also to help the society to develop opportunities for sustainable livelihoods and then to achieve a more sustainable future. Ultimately, BRs will offer examples for the world of how people can live in productive harmony with the natural world. The details of the definition and functions of biosphere reserves can be found in Text Box 1.

***Text Box 1 – The Current Definition and Functions of Biosphere Reserves***

Biosphere Reserves are areas of terrestrial and coastal ecosystems promoting solutions to reconcile the conservation of biodiversity with its sustainable use. They are internationally recognized, nominated by national governments and remain under sovereign jurisdiction of the states where they are located. Biosphere reserves serve in some ways as 'living laboratories' for testing out and demonstrating integrated management of land, water and biodiversity. Each biosphere reserve is intended to fulfill three basic functions, which are complementary and mutually reinforcing:

- A conservation function - to contribute to the conservation of landscapes, ecosystems, species and genetic variation;
- A development function - to foster economic and human development which is socio-culturally and ecologically sustainable;
- A logistic function - to provide support for research, monitoring, education and information exchange related to local, national and global issues of conservation and development.

Source: UNESCO/MAB, retrieved from <http://www.unesco.org/mab/nutshell.htm>

## **2.3 Organizational Structure of Biosphere Reserves**

### **2.31 Nomination and Management**

The International Coordinating Council of the Man and the Biosphere Programme (MAB Council or ICC) is responsible for guiding and supervising the MAB Programme. The Council normally meets once every two years, usually at UNESCO Headquarters in Paris. At its meetings, the Council elects a MAB Bureau, which meets between Council sessions.<sup>7</sup>

Individual countries must nominate areas they identify as meeting the requirements for a biosphere reserve and complete an UNESCO nomination form. The nominations then are submitted to UNESCO through the designated national committee or "focal point" organization for the UNESCO/MAB program in the country (Francis, 1998). Nominations are reviewed by UNESCO's Secretariat and an international Advisory Committee on Biosphere Reserves. Recommendations from these reviews then go before the MAB Bureau that decides on the nominations.<sup>8</sup>

Each biosphere reserve remains under the sole sovereignty of the State where it is situated (*Statutory Framework*, 1995). Normally, after receiving the designation, a not-for-profit committee will be formed to manage each BR. For example, in Canada, volunteers with broad backgrounds manage most of the biosphere reserves. This "committee" can be in various forms and funded by different sources. In some countries, such as Mexico, federal government officials and

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<sup>7</sup> UNESCO, retrieved from <http://www.unesco.org/mab/mabiccc.htm#About>

<sup>8</sup> CBRA, retrieved from [http://www.biosphere-canada.ca/what\\_are\\_br.htm#How](http://www.biosphere-canada.ca/what_are_br.htm#How).

delegates administrate or oversee BR operations. While in the U.S., some BRs are managed by the U.S. Parks.

### **2.32 Structure<sup>9</sup>**

Biosphere reserves are organized into three interrelated zones, known as the core area, the buffer zone and the transition area (see Figure 1 for detailed illustration). This **core area** is the most protected area. It is usually made up of a park or other protected area. The core area is not subject to human activity, except research and monitoring and some traditional extractive uses by local communities.<sup>10</sup>

An adjacent **buffer zone** (or zones), which is clearly delineated and which surrounds or is contiguous to the core area, is also protected but less restricted. The buffer areas may be used for research, education, training, tourism and recreation activities. "Organized use" is allowed here as long as the core area remains protected.<sup>11</sup>

The third zone is an **outer transition area** (or area of cooperation extending outwards). The outer transition area allows for other human use of the reserve, including various kinds of agricultural activities, human settlements and other economic development uses.<sup>12</sup> The existence of buffer zone and transition zone indicates the development function of BR, and therefore distinguishes biosphere reserves from parks.

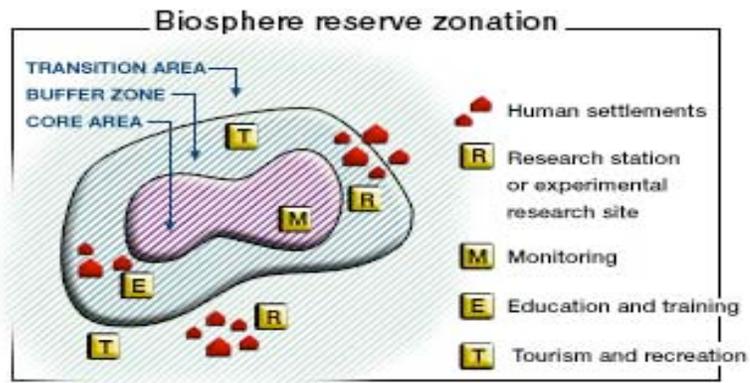
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<sup>9</sup> This section is based on UNESCO/MAB, "Frequently asked questions on biosphere reserves", <http://www.unesco.org/mab/nutshell.htm>

<sup>10</sup> UNESCO/MAB, "How are Biosphere Reserves organized? ".

<sup>11</sup> Ibid. 10

**Figure 2 – Organizational Structure of Biosphere Reserves**



Source: From UNESCO MAB website: <http://www.unesco.org/mab/nutshell.htm>

## SECTION 3 – LITERATURE REVIEW

### 3.1 Discussions of Biosphere Reserves

Though limited, there is some literature dealing with the biosphere reserve model. For example, there is some discussion of how big this area (including the core area, the buffer zone and the outer transition area) should be, and whether this somehow “isolated patch” will effectively fulfill its goal and how this will affect the ecosystem that surrounds it. Some scientists argue that biosphere reserves are usually not large enough to be successful (e.g. Corn, 1993).

Some scholars have also questioned the application of the biosphere reserve model. One concern is about the selection of sites. As Ray and McCormick-Ray (1994) pointed out, one question to reconsider in terms of the application of a

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<sup>12</sup> Ibid. 10

biosphere reserve model to coastal-marine protected area design is the defining and applying of "representativeness":

In order that a protected area be truly representative, as the biosphere reserve model seems to require, one must define the scale, both in time and space, of the area to be represented. We have seen that ecosystems are hierarchically nested. What is to be the scale for inclusion, the biogeographic assemblage? If so, which assemblage? Or, which characteristic of estuarine systems is to be the basis for comparison among systems? Which species, groups of species, or habitat is to be promoted as a 'core'? Or, which process? And how does whatever entity is chosen represent the whole? (Section 4).<sup>13</sup>

The scale definition also affects the effectiveness of the core-buffer-transition design. "A simple inclusion of a protected area within a biogeographic province cannot be said to represent all the attributes of that province, unless the protected area is the province itself" (Ray and McCormick-Ray, 1994). But in reality, a large-scale commitment to establishing a designation that represents all the attributes is difficult to obtain. The much more practical solution, as Ray and McCormick-Ray (1994) suggested, is to build "*networks of protected areas*, which together can be inclusive of the features of a biogeographic region as a whole and which are interconnected both by common ecological properties and by communications links" (Section 4). The network model will be discussed in the following section.

Another concern is about local acceptance. In theory, the establishment of BR is a "bottom-up" community – led process. Biosphere reserve is a useful mechanism to create and implement a conservation-development strategy, particularly in rural areas where natural and/or cultural heritage values and local economies are strongly dependent (Helmer, 1999). The theory is marked by an

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<sup>13</sup> Ray and McCormick-Ray, retrieved from <http://www.deh.gov.au/coasts/mpa/nrsmpa/paradigm/ray.html>

emphasis on open-ness, wide-ranging discussion, consensus building, experimentation and adaptive management; and it provides a means to increase community involvement and direction in planning and activities of a region (Birtch, 2001).

Moreover, as Sian suggested, the biosphere reserve designation is “not a static reward for a local commitment to sustainability but rather a social contract to achieve sustainability using a dynamic, learning approach for ongoing improvement” (Sian, 2000, Abstract). Thus, it is important to identify and include social learning as part of ecosystem management. The biosphere reserve should work with communities; and together, seek sustainability priorities that are suitable to the local context. One useful tool is to use illustrative examples and best practices of communities that have fully functional biosphere reserves. In this way, “the community values and the sense of place are institutionalized as part of the biosphere reserve vision” (Sian, 2000, Abstract). Nevertheless, there are instances of local resistance. Section 3.3 will further discuss this issue.

### **3.2 Discussions of Biosphere Reserves Regional Networking**

International networking among BRs was pictured when the program was first proposed. One MAB task force report stated that: “ Inter-country cooperation will be necessary in many instances in the selection, establishment and management of biosphere reserves. This cooperation could be between countries in the same region which share common interests and problems or between countries in different regions which wish to exchange technology, information and personnel

in the field of conservation and research” (UNESCO and UNEP, 1974, p.40). A long-term goal of the MAB Biosphere Reserve program is to “create an international network of biosphere reserves that will collectively represent the world’s major ecological system (ecosystem) with their different patterns of human use and adaptations to them. “ (Francis, 1982, p.1). The importance of regional cooperation has been recognized by various meetings. It is reflected in the *Seville Strategy*, the discussions of the MAB International Coordinating Councils, and the decisions of the 28th General Conference of UNESCO. The benefits are obvious: networking will facilitate sharing of information and experiences among biosphere reserves and foster cooperative activities (such as research, education, monitoring and training).

A World Network is formally constituted by the *Statutory Framework of the World Network of Biosphere Reserves*. Article 8 of the *Statutory Framework* illustrates the desire to build successful regional and thematic subnetworks:

States should encourage the constitution and co-operative operation of regional and/or thematic subnetworks of biosphere reserves, and promote development of information exchanges, including electronic information, within the framework of these subnetworks (Article 8).<sup>14</sup>

Currently, there are ten regional and sub-regional networks worldwide such as EuroMAB, Northern Sciences Network and ArabMAB. Along with help from UNESCO/MAB, many BRs networking and joint projects receive help from many other international organizations, such as the World Bank, the United Nations Development Programme (UNDP), the United Nations Environment Programme

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<sup>14</sup> Retrieved from <http://www.unesco.org/mab/docs/statframe.htm#8>

(UNEP), the Food and Agriculture Organisation of the United Nations (FAO), the World Conservation Union (IUCN), Conservation International and the World Wide Fund for Nature (WWF). A list of regional Biosphere Reserves networks can be found in Appendix 1.

### **3.3 Challenges for Biosphere Reserves Regional Networking**

The international networking of UNESCO/MAB biosphere reserves is a tempting model. Nevertheless, some scholars have questioned the design and application of this model. First of all, biosphere reserves are nominated by national governments and remain under the sovereign jurisdiction of the countries in which they are situated. On one hand, this setting eases the legislation burden and simplifies the designation process - no new legal provisions are required at national level. On the other hand, however, it weakens the political power of biosphere reserves, especially at the local level. Few BRs can set up their own conservation regulations. Similar to many other international networking, efforts by NGOs, the loose connections among BRs may not reach many practical solutions. This setting gives power to individual national biosphere reserve committees and this creates an international program (Corn, 1993). While participants agree that there is a common interest to seek concrete solutions to reconcile the conservation of biodiversity with the sustainable use of natural resources, one has to admit that each biosphere reserve committee has its own priorities, criteria and administration procedure. Moreover, with little or no money from the United Nations, each biosphere reserve has to seek funding from its own country, and the resulting level of activity varies greatly between countries

(Corn, 1993). Many biosphere reserves do not have funding available to commit to a large scale BRs communication and cooperation in a networking initiative. Ray and McCormick-Ray (1994) suggested that the biosphere reserve network is not a network in reality:

Its individual units were assembled *ad hoc*. No comparative methods were used for their selection. Information networking is presently marginal among them. Ecological networking is virtually non-existent (Section 4).

The second challenge is local resistance to the biosphere reserve concept and its networking model. MAB/BR has clearly identified the local community as one of the parties that potentially will gain benefits from biosphere reserve project:

These range from local indigenous communities to rural societies, including country home owners. There are various potential benefits to such people, such as protection of basic land and water resources, a more stable and diverse economic base, additional employment, more influence in land-use decision-making, reduced conflict with protected area administrations and interest groups, a continued opportunity to maintain existing traditions and lifestyles, and a more healthy environment for these local communities and their children.<sup>15</sup>

Yet, some local communities, especially those located in or very close to the potential biosphere reserve, have misconceptions or apprehensions about this reserve status. One common fear is that biosphere reserve status is designed to inhibit use of the area and the resource. Concerns of the impact on the local economy have proven to be a problem in the success of a biosphere reserve. An international initiative may face even more local resistance since local people are afraid that they will have to sacrifice their own interests for some people far away. Moreover, some biosphere reserves transact the boundaries of cities, provinces and/or countries. The conflict of priorities and interests can become a real

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<sup>15</sup> UNESCO/MAB, retrieved from <http://www.unesco.org/mab/nutshell.htm>

challenge. It was and will be very difficult to find a set of boundaries and conservation commitments that can operate within the local political environment. It is worth mentioning that economic concern expressed by local people is not the only major reason that may hinder the biosphere reserve and its networking. Culture is another vital factor. In some cultures, Nature cannot properly be divided. For example, the Nuu-chah-nulth people who live in Clayoquot Sound on Vancouver Island, Canada, believe in Hishuk ish ts'awalk, or "everything is one". A First Nation elder expressed his confusion about zoning activities that "It is strange that Parks are being created...It is not a healthy sense of responsibility or management to create one place where nothing can be touched and to destroy other places" (Ahousaht Community Meeting notes, November, 2003). In addition to the fragile financial and political situation of most biosphere reserves, and the possibility of local resistance, the third challenge is the management and performance evaluation of biosphere reserves and networking. Article 9 of the *Statutory Framework* foresees a periodic review of biosphere reserves:

1. The status of each biosphere reserve should be subject to a periodic review every ten years, based on a report prepared by the concerned authority, on the basis of the criteria of Article 4, and forwarded to the secretariat by the State concerned.
2. The report will be considered by the Advisory Committee for Biosphere Reserves for recommendation to ICC<sup>16</sup>.
3. ICC will examine the periodic reports from States concerned.

Article 4 of the *Statutory Framework* lists the criteria for evaluation:

Article 4 - Criteria

General criteria for an area to be qualified for designation as a biosphere reserve:

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<sup>16</sup> International Co-ordinating Council (ICC) of the MAB programme

1. It should encompass a mosaic of ecological systems representative of major biogeographic regions, including a gradation of human interventions.
2. It should be of significance for biological diversity conservation.
3. It should provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale.
4. It should have an appropriate size to serve the three functions of biosphere reserves, as set out in Article 3.
5. It should include these functions, through appropriate zonation, recognizing:
  - (a) a legally constituted core area or areas devoted to long-term protection, according to the conservation objectives of the biosphere reserve, and of sufficient size to meet these objectives;
  - (b) a buffer zone or zones clearly identified and surrounding or contiguous to the core area or areas, where only activities compatible with the conservation objectives can take place;
  - (c) an outer transition area where sustainable resource management practices are promoted and developed.
6. Organizational arrangements should be provided for the involvement and participation of a suitable range of inter alia public authorities, local communities and private interests in the design and carrying out the functions of a biosphere reserve.
7. In addition, provisions should be made for:
  - (a) mechanisms to manage human use and activities in the buffer zone or zones;
  - (b) a management policy or plan for the area as a biosphere reserve;
  - (c) a designated authority or mechanism to implement this policy or plan;
  - (d) programmes for research, monitoring, education and training.

However, it is very hard to judge if a reserve or a regional network is more "successful" than others. What are the evaluation indicators? Will the number of projects be one indicator? Or the success of one particular project that is important to the local community? The fact is that, as patches within much larger systems, many biosphere reserves are vulnerable to domestic policy decisions and actions far beyond their borders. For example, U.S. government budget cuts and the Mexican economic depression in 1994 -1995 significantly reduced funding for environment projects in Mexico (Fraser, 1996).

Moreover, some biosphere reserves have less capacity and financial sources. For example, in Canada, except for the Clayoquot Biosphere Reserve, most BRs do not have direct federal funding and do not have permanent full time staff. But one has to admit that BRs have nevertheless educated many communities and facilitated discussions on some balance between conservation and sustainable development. George Francis, who has been actively participating in Canadian MAB/BR development since the beginning, answered the question about the evaluation of the Canada/MAB program as follows:

If the answer sought is in conventional terms of administering independent well-funded programs of its own, then it was not successful. However, if viewed as the extent to which the collaborative approaches promoted through the MAB ideal have been widely diffused and taken up by others, then success has been widespread, certainly in Canada (Francis, 1998).

The issue of evaluation has been discussed in many formal and informal gatherings among BRs. For example, at the “Seville +5” international meeting (Pamplona, Spain, 2000), delegates from the United Kingdom, Indonesia, Switzerland, Argentina, Egypt, and Poland shared their review experiences with other delegates and showed “the practical value of this process in helping nations understand and improve the awareness, support, and function of these dynamic conservation and sustainable use models”(MAB Notes, 2001, p. 3).

Some recommendations from this meeting are listed below:

1. Actively involving in the review both local stakeholders and multidisciplinary groups of experts through workshops and field visits;
2. Stimulating development and use of new evaluative indicators of success of a biosphere reserve; and
3. Sharing the experiences of national reviews internationally to help other nations conduct their own productive reviews. ”(MAB Notes, 2001, p. 3).

In summary, since its introduction in 1971, the biosphere reserve model has achieved many successes; and at the same time, developed some problems and displayed some limitations. A UNESCO analysis, which was published sixteen years ago, indicated some shortcomings that some of us may still think it is important to note for the current improvement of BRs: "shortcomings include the dispersion of program activities over too large a number of subject areas, a need for greater scientific coherence, and inadequate mechanisms for selection and evaluation of projects under the MAB label" (Dyer and Holland, 1988).

## SECTION 4 – REGIONAL OVERVIEW

### 4.1 Canadian Biosphere Reserves

Canada has been associated with MAB since the beginning through sequential arrangements for Canada/MAB as the national committee (Francis, 1998). The Canadian National Committee for MAB (Canada/MAB) is appointed by the Canadian Commission for UNESCO<sup>17</sup> (CC/UNESCO). CC/UNESCO was created in 1957 as a division of the Canada Council for the Arts. As such it benefits from the Council's arm's length status to the federal government. The Commission advises the Government of Canada on matters relating to UNESCO's programme and budget, and helps in coordinating and catalyzing the participation of Canadian organizations and committed individuals in UNESCO's

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<sup>17</sup> UNESCO is the only UN agency to have a system of National Commissions in 190 Member and Associate States. The Commissions form a vital link between civil society and the Organization. They provide valuable insight concerning the Organization's programme and help implement many initiatives including training programmes, studies, public awareness campaigns and media outreach. The Commissions also develop new partnerships with the private sector, which can provide valuable technical expertise and financial resources (UNESCO, 2003, p.3).

mandated areas: education, natural and social sciences, culture and communication.<sup>18</sup> The Commission is the official contact for Canadian biosphere reserves.

Canada/MAB represents Canada on the MAB International Coordinating Council and meets annually to plan and coordinate MAB-related activities in Canada (Amos, 1997). However, Canada/MAB does not have a permanent home in a government department nor does it have a full-time secretariat: Canada/MAB members are volunteers and Canada/MAB operates primarily through voluntary working groups to foster projects that are consistent with MAB ideals (Amos, 1997). During the 1970s, with secretariat services provided by Environment Canada, this small group led Canadian contributions to MAB (Francis, 1998 and Amos, 1997). From 1979 to 1992, the secretariat services were assigned to a staff person in the Canadian Commission for UNESCO, but funds for particular projects had to be found elsewhere (Francis, 1998).

With the help from the Biosphere Reserve Working Group of Canada/MAB, the United Nations designated the Mont St. Hilaire Biosphere Reserve in 1978 as the first Canadian Biosphere Reserve. A year later, Waterton Biosphere Reserve was established. Three BRs were recognized in the 1980s.

The 1990s witnessed a slow progress of the formation of new BRs within Canada; Niagara Escarpment is the only Canadian BR recognized during this period. This slowdown might be seen as part of a general drive for environmental

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<sup>18</sup> Detailed information can be found from <http://www.unesco.ca/english/home.htm>

deregulation<sup>19</sup>, and partially due to the reductions and uncertainties in funding for Canada/MAB. There was dramatic general reduction in the rate of increase of government expenditures throughout the 1990s. CC/UNESCO withdrew its staff support following budget cuts it received in 1992, and Canada/MAB itself has not met for almost five years (Francis, 1998). As the Waterton Biosphere Reserve Periodic Review Report (1997) states,

By the early 1990s, changes occurred both in the biosphere reserve group and in the context within which they worked... Government funding for projects carried out to meet interests of non-governmental organizations or local communities all but 'dried up'. The technical advisory committee became inactive, and in response to budget reductions, government agencies generally became pre-occupied with program maintenance rather than new initiatives. Waterton Lakes National Park also experienced major reductions in budget and staff during the first half of the 1990s (p.2).<sup>20</sup>

Nevertheless, during this period, Canada established the Biodiversity Convention Office (1991) and ratified the United Nations *Convention on Biological Diversity*.<sup>21</sup> In 1996, the *Canadian Biodiversity Strategy* was delivered as a result of the work of a federal-provincial-territorial working group, established by the Federal, Provincial & Territorial Ministers responsible for Forestry, Parks, Environment and Wildlife (retrieved from CBIN). Under the International Clearing-house Mechanism (CHM) of the Convention treaty, the Canadian Biodiversity Information Network (CBIN) was launched, which provides efficient access to biodiversity-related information from academia, industry, non-governmental organizations (NGOs), and governments.<sup>22</sup>

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<sup>19</sup> According to UNEP 2000 report, some provinces in Canada provide funding for citizens making legal interventions on issues of public concern but this was discontinued in the late 1990s in some provinces, such as Ontario. URL: <http://www.grida.no/geo2000/english/0199.htm>

<sup>20</sup> Retrieved from <http://www.biosphere-canada.ca/reserves/waterton/WBR97Rev.pdf>

<sup>21</sup> CBIN, retrieved from [http://www.cbin.ec.gc.ca/default\\_e.cfm](http://www.cbin.ec.gc.ca/default_e.cfm)

<sup>22</sup> Ibid. 21

The *Canadian Biodiversity Strategy* recognizes the Biosphere Reserve program as one of the tools that help implementing the Convention treaty on the ground:

1.18 Manage, in consultation with landowners, regional and urban governments, local and indigenous communities, and interested stakeholders, human activities in and around protected areas to minimize adverse impacts on protected area biodiversity and to maintain connectivity, using mechanisms such as United Nations Educational, Scientific and Cultural Organization Biosphere Reserve Program. (*Canadian Biodiversity Strategy*, 1.18).

With help from Parks Canada and Environment Canada's coordinating office for the Ecological Monitoring and Assessment Network (EMAN), the Canadian Biosphere Reserves Association (CBRA-ACRB or CBRA) was incorporated in 1997.<sup>23</sup> CBRA replaced the Working Group on Biosphere Reserves, first convened in 1980 by Canada/MAB, Canadian National Committee of MAB Program.<sup>24</sup> Under this new structure, the Canada/MAB ensures nomination proposals meet all the criteria for an UNESCO MAB Biosphere Reserve; the CBRA provides support and networking relationships that help develop and maintain BRs in Canada. The vision of CBRA can be found in Text Box 2.

## **Text Box 2 – The Vision of CBRA-ACRB**

The CBRA/ACRB aims to sustain our communities, our country and our planet through research, education, conservation and demonstration in the Canadian biosphere reserve network. The CBRA/ACRB will:

- Develop and implement projects for conservation, protection, and sustainable resource use suited to national and local needs;
- Train and involve local communities and volunteers in biosphere reserve activities;
- Promote Canadian biosphere reserves and the biosphere reserve concept as a model for responsible, community-based resource management and sustainable development;
- Build a national network of biosphere reserves by encouraging the formation of new UNESCO biosphere reserves within Canada; and
- Share information and services so that biosphere reserve activities can be used as models for national and international organizations.

Source: Vision, retrieved from <http://www.biosphere-canada.ca/about.htm>

CBRA successfully helped expand the Biosphere Reserves regime. The year 2000 was a turning point; six Canadian BRs obtained their designations that year.<sup>25</sup> It also fostered cooperation among Canadian BRs. Its first national project was the Biosphere Reserves Land Use Change Project, which involved all six of Canada's Biosphere Reserves at that time (Craig, Ramsay and Whitelaw, 1998). The nomination and development of Canadian BRs, however, has been challenging. This is partly because of insufficient funding, partly due to

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<sup>23</sup> CBRA, retrieved from <http://www.biosphere-canada.ca/about.htm>

<sup>24</sup> CBRA, retrieved from <http://www.biosphere-canada.ca/about.htm>

<sup>25</sup> The federal government provided \$12 million grant for an endowment fund for the Clayoquot Biosphere Trust (CBT) the cornerstone of the Clayoquot Sound UNESCO Biosphere Reserve.

community misunderstanding. As Fraser and Jamieson (2003) found, “the phrase ‘biosphere reserve’ itself leads to misunderstanding and misrepresentation of the nature of UNESCO’S vision for these areas”:

The word ‘biosphere’ is technical jargon not immediately understood by the public. In Canadian common understanding, the term ‘reserve’ denotes a place set aside to preserve environmental values, not cultural and human values. The term ‘biosphere reserve’ then is a misnomer that leads to common assumptions that the area is a government-designated park with associated restrictions that will be enforced by authority, and suggests regulations rather than participation. Under this title, the average person does not naturally appreciate the biosphere reserve process as an opportunity for the community to create its own vision of sustainability (Fraser and Jamieson, 2003).

CBRA and individual BR, along with environmental groups, local community members, have spent significant amount of time on community consultation and capacity building. CBRA has also actively engaged in other governmental initiatives and tried to find linkages of projects. For example, the concept of the Marine Protected Area (MPA) initiated by the Government of Canada<sup>26</sup> has attracted CBRA’s attention. Even though some scholars do not think that the model of Biosphere Reserve is suitable for the development of MPA (Ray and

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<sup>26</sup> Under 35. (1) of the *Oceans Act* (1996):

A marine protected area is an area of the sea that forms part of the internal waters of Canada, the territorial sea of Canada or the exclusive economic zone of Canada and has been designated under this section for special protection for one or more of the following reasons:

(a) the conservation and protection of commercial and non-commercial fishery resources, including marine mammals, and their habitats;

(b) the conservation and protection of endangered or threatened marine species, and their habitats;

(c) the conservation and protection of unique habitats;

(d) the conservation and protection of marine areas of high biodiversity or biological productivity; and

(e) the conservation and protection of any other marine resource or habitat as is necessary to fulfil the mandate of the Minister.

McCormick-Ray, 1994), some scholars believe BR is a good model to learn from and to work with. Brunckhorst & Bridgewater (1994) suggested the following:

The multiple functions of coveted, but fragile, coastal areas around the world are in critical need of integrated land, coastal and water-use planning to reconcile and sustain their use and resources. The UNESCO Biosphere Reserve Program, redesigned and properly planned and implemented for the coastal-marine realm would provide a very useful tool to meet these goals.

...

The objectives of biodiversity and environmental management at the land-seascape scale should be to maintain ecological processes. The longevity of coastal dwelling societies and the resources on which they depend is reliant on continuation and health of these functions. **The identity which human communities have with their environment provides an important underpinning to the framework** (Section: Biosphere Reserves – Sustain Nature and Society, emphasis added).

In 2003, “MPA and Coastal Zone Planning” was included as a theme of the 2003 Clayoquot Symposium. The Clayoquot Biosphere Trust and the Clayoquot Alliance for Research, Education and Training not only informed both aboriginal and non-aboriginal communities on this issue but also offered them tools to cope with the MPA process. This symposium also helped to avoid misunderstandings about BRs and MPAs. As Dobell pointed out, there is a difference between the concept of MPA and the concept of BR: MPAs focus on conservation and protection; BRs view development as an integral priority.<sup>27</sup>

As of 2004 there are twelve Biosphere Reserves in Canada. A list of the Canadian Biosphere Reserves can be found in Table 1. Some Canadian

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<sup>27</sup> Rod Dobell (October 2004), personal communication. Dobell also pointed out the National Marine Conservation Areas (NMCAs), a policy was first approved in 1986 as a basis to protect and conserve a network of areas representative of Canada's marine environments, is also different from BRs. Even though NMCAs have a mandate to promote “ecologically sustainable use”, it supports a different balance between conservation and sustainable use.

Biosphere Reserves are also involved in other UN projects, e.g., Ramsar Wetlands and World Heritage Sites<sup>28</sup>. The list can be found in Table 2.

**Table 1 – List of Canadian Biosphere Reserves**

<b>Biosphere Reserves</b>	<b>Year designated</b>	<b>Major ecosystem type</b>
Charlevoix, QC	1988	Boreal needleleaf forests or woodlands
Clayoquot Sound, BC	2000	Temperate rainforests including marine/coastal component
Lac Saint-Pierre, QC	2000	Estuarine systems and freshwater wetlands
Long Point, ON	1986	Temperate and sub-polar broadleaf forests or woodlands including lake system
Mont. St. Hillaire, QC	1978	Temperate broadleaf forests or woodlands
Mount Arrowsmith, BC	2000	Temperate rainforest including marine components
Niagara Escarpment, ON	1990	Temperate broadleaf forests or woodlands
Redberry Lake, SK	2000	Temperate grassland; saline lake
Riding Mountain, MB	1986	Temperate grasslands / Boreal needle-leaf forests or woodlands
Southwest Nova, NS	2001	Boreal needleleaf forests or woodlands
Thousand Islands - Frontenac Arch, ON	2002	Temperate and sub-polar broadleaf forests or woodlands / Boreal needleleaf forests or

<sup>28</sup> Ramsar Wetlands are sites inscribed on the List of Wetlands of International Importance (the "Ramsar List") under the Convention on Wetlands (Ramsar, Iran, 1971). Sites on the World Heritage List are cultural and/or natural properties with outstanding universal value recognized by the World Heritage Committee.

		woodlands
Waterton, AB	1979	Mixed mountain and highland systems; lakes and freshwater wetlands

Source: UNESCO-MAB Biosphere Reserves Directory, retrieved from <http://www2.unesco.org/mab/br/brdir/directory/contact.asp?code=CAN>

**Table 2 – List of Canadian Biosphere Reserves Which Are Ramsar Wetlands and Canadian Biosphere Reserves Which Are World Heritage Sites**

Biosphere Reserves	Ramsar Wetlands	World Heritage Sites
Long Point (1986)	Long Point National Wildlife Area (1982)	
Lac Saint-Pierre (2000)	Lac Saint-Pierre (1998)	
Waterton (1979)		Waterton Glacier International Peace Park (1995) (with USA). Glacier is designated as a separate BR.

Source: Retrieved from <http://www.unesco.org/mab/BR-Ramsar.htm> and <http://www.unesco.org/mab/BR-WH.htm>

#### **4.2 Biosphere Reserves in the United States**

In 1974 the U.S. Department of State established the U.S. National Commission for the MAB Program, composed of representatives from supporting federal agencies and state and private institutions.<sup>29</sup> However, in 1984, the United States withdrew from UNESCO citing concerns over mismanagement. Consequently, the development of BRs was halted for a long time. In October 2000, the responsibility for the USMAB program was transferred from the Department of State to the Department of Agriculture, Forest Service. Currently, the USDA

Forest Service is the official contact for biosphere reserves in the United States. Year 2003 was a vital year. In September 2003, the Department of State released a fact sheet stating that the United States had decided to rejoin the UNESCO and fully support its mission (2003 U.S. Biosphere Reserves Survey, p.iii). Later on, First Lady Laura Bush stressed the importance of UNESCO's mission in the world and announced the United States was ready to become actively involved again in UNESCO as of October 1 (2003 U.S. Biosphere Reserves Survey, p.iii). Consequently, the Forest Service restarted its efforts to establish a home and a new vision and mission for USMAB.<sup>30</sup> In the same year, The United States Biosphere Reserves Association (USBRA) was incorporated, whose purpose is to "provide leadership and support for a United States biosphere reserves program, convey factual information about the purposes and activities of biosphere reserves, and develop cooperation among biosphere reserves in North America."<sup>31</sup> As of 2004, the United Nations has designated 47 Biosphere Reserves in the U.S.

Similar to Canadian Biosphere Reserves, many U.S. Biosphere Reserves are involved in other UN projects. For example, Everglades & Dry Tortugas Biosphere Reserve (1976) was recognized as the Ramsar Wetlands in 1987. Table 3 lists the name of U.S. Biosphere Reserves that are also World Heritage Sites. A list of U.S. Biosphere Reserves can be found in Appendix 2.

Biosphere Reserves	World Heritage Sites	Notes
<sup>30</sup> Ibid. 30. California Coast Ranges (1983)	Redwood National Park (1980)	California Coast Ranges BR is made up of several units, one of which is the Redwood National Park, also a WH site. <sup>32</sup>
Glacier (1976)	Waterton-Glacier	Waterton is designated as a

### **Table 3 – List of U.S. Biosphere Reserves Which Are World Heritage Sites**

Source: UNESCO directories of WH and Ramsar Wetland sites that are BRs, retrieved from <http://www.unesco.org/mab/BR-WH.htm> and <http://www.unesco.org/mab/BR-Ramsar.htm>

Even though the United States has many influential environmental groups (the National Wildlife Federation, the World Wildlife Fund, the Environmental Defense Fund, the Natural Resources Defense Council and the National Audubon Society), interesting enough, the biosphere reserves concept and those US biosphere reserves have not received much recognition and power.

The serious objections raised by local communities, land rights groups and American politicians are the major factors that impede Biosphere Reserves development in U.S. One argument is about the statutory authority of BRs. Different from the World Heritage Sites, which were authorized by the World Heritage Treaty, there is no treaty that authorizes biosphere reserves development in US. The U.S. did not ratify the U.N. *Convention on Biological Diversity*<sup>32</sup>, even though the existence or creation of a biosphere reserve network is commonly viewed as the starting point for implementation of this treaty. Moreover, the U.S. Congress, which has the constitutional responsibility for managing federal lands, was not involved in the designation process of the current 47 BRs (Lamb, 1999). Therefore, many opponents claim that the Biosphere Reserves program is not legitimate.

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<sup>32</sup> Former U.S. President Clinton signed the Treaty in 1993. But it failed to pass the ratification process.

Another concern is that the UN connection will threaten state sovereignty and private property rights. Some critics suggested that the “dark side” of the USMAB /BR program could force Americans to “cede a portion of our national sovereignty in order to meet those terms and conditions” and could result in unacceptable limitations on uses of the land.<sup>33</sup> A good example of those fears is the frustrating nomination process of an Ozark Highlands Biosphere Reserve in southern Missouri and north central Arkansas. In the book, "Anti-Environmentalism and Citizen Opposition to the Ozark Man and the Biosphere Reserve", Rikoon and Goedeke examined the dynamics of the effort by several Federal and State land management agencies to establish an Ozark Highlands Biosphere Reserve; and, vividly, they pointed out that community concerns about private property rights and the belief in “UN conspiracies” eventually halted the nomination process (Rikoon & Goedeke, 2000).

In order to address these concerns, the *American Land Sovereignty Protection Act* has been introduced in the 104<sup>th</sup>, 105<sup>th</sup>, and 106<sup>th</sup> Congresses. This requires congressional approval of nominations of federal lands for recognition under international programs, including the MAB program, and places other conditions on U.S. participation in such program (Fletcher, 1999). Even though the administration testimony at the Congressional hearing (September 12, 1996) pointed out that the United Nations does not have any authority to affect federal land management decisions within the U.S. and international agreements have not been used to exclude Congress from land management decisions, nor do

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<sup>33</sup> Retrieved from Sovereignty International website

they have the ability to do so (Dennis, 1997), fears remain. The *American Land Sovereignty Protection Act* passed the House in 1997 (H.R. 901)<sup>34</sup> and on May 20, 1999 (H.R. 883), and the Senate held hearings on S. 510, a companion bill, on May 26, 1999. In 2000, another companion bill S.3146 was introduced in the Senate (Fletcher, 1999). As Fletcher warned, the passage of this legislation could “significantly limit U.S. participation in the MAB Biosphere Reserve program”:

The current bills (H.R. 883 and S. 510), much like their predecessors, provide conditions that apply to nominations of sites to the Biosphere Reserve or World Heritage programs. In particular, it would prohibit federal officials from nominating any lands in the United States for recognition as a Biosphere Reserve under the MAB program without express approval by Congress, and would require that all existing Biosphere Reserves would cease to be in effect unless they are specifically authorized by law by a certain date. It would also require that Biosphere Reserves consist solely of lands owned by the United States and subject to a management plan that ‘specifically ensures that the use of intermixed or adjacent non-Federal property is not limited or restricted as a result of that designation.’ Additional reporting requirements would be imposed, for instance to account for money expended and to describe disposition of complaints (Fletcher, 1999).

Fortunately the *American Land Sovereignty Protection Act* failed to move in the Senate and it did not become a law. But activists are not giving up and are still working on moving this bill.

The alternative way for aspiring BRs is to seek help from the U.S. National Park Service (NPS). The authority for NPS involvement in the Biosphere Reserve program is based on the NPS *Organic Act* and the NPS *Omnibus Management Act* of 1998. Currently, 23 biosphere reserves are managed by U.S. National

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<http://www.sovereignty.net/p/land/mapmabwh.htm>

<sup>34</sup> H.R.901 Title: To preserve the sovereignty of the United States over public lands and acquired lands owned by the United States, and to preserve State sovereignty and private property rights in non-Federal lands surrounding those public lands and acquired lands.

Park Service.<sup>35</sup> However, this method could reduce the visibility of BRs and alter the purposes of BRs. Thus, national parks usually only represent the "core area" of the biosphere reserve model and can not fully carry out the multiple functions of BRs, especially the development objection.

A USMAB delegate sadly pointed out in 2001 that the biosphere reserves in the US "are failing to contribute research and monitoring, are focal points for people who oppose any program affiliated with the United Nations, are not viewed as models of sustainable development, are lacking in effective coordination, are not supporting quality economies, have not been reviewed, antagonize national decision makers, and are failing to educate stakeholders about the opportunities that biosphere reserves can bring to regions of the United States" (Park Science, Fall/Winter 2001, p.3).

Nevertheless, there are good signs. The United States rejoined the UNESCO in 2003. As a result, this January, the USMAB National Committee convened and discussed "the status of USMAB including the network of 47 biosphere reserves, raising the USMAB profile, funding, the new US Biosphere Reserves Association and its role, the role of the National Committee, and a visioning and strategic planning process" (SAMAB News Briefs, 2004). "Plans for a rejuvenated USMAB and North American network of biosphere reserves will emerge by the end of the year"(SAMAB News Briefs, 2004).

### **4.3 Biosphere Reserves in Mexico**

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<sup>35</sup> For more information: <http://www.nature.nps.gov/rm77/SpecialDesignations/BR.htm> & <http://usparks.about.com/blparkbiosphere.htm>

In 1977, Mapimí and La Michilía MAB biosphere reserves were adopted in Mexico. Biosphere reserves are part of the System of Natural Protected Areas in Mexico (La Sistema Nacional de Areas Naturales Protegidas or SINAP). However, the term “biosphere reserves” (Reserva de la Biosfera) can be very confusing in Mexico - not all of Mexico's biosphere reserves are part of MAB. Because of the use of the same denomination of BRs for protected areas as defined by the Mexican Law and also for areas integrated within UNESCO/MAB network of protected areas, some protected areas in Mexico are considered Biosphere Reserves under Mexican Law but not under MAB's international system, while other Reserves are recognized by MAB but do not have formal Biosphere Status under the Mexican legislation (Gómez-Pompa and Dirzo 1995, and SEDUE 1989, cited by Oceanoasis website).<sup>36</sup> Table 4 shows the list of those that are included in the MAB international system (14 BRs).

There are nine different types of natural protected areas in the SINAP:

1. Biosphere Reserves
2. Special Biosphere Reserves
3. National Parks
4. Natural Monuments
5. National Marine Parks
6. Natural Resource Protected Areas which include Forestry Reserves
7. Flora And Fauna Protected Areas
8. Urban Parks

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<sup>36</sup> Oceanoasis, Present Status of the Islands as Protected Areas, retrieved on November 29, 2004 from <http://www.oceanoasis.org/conservation/status.html>

## 9. Ecological Conservation Zones<sup>37</sup>

The federal government has jurisdiction over the first seven types, while state and municipal government manages urban parks and ecological conservation zones.<sup>38</sup> In Mexico, BRs were established and managed by the Federal Authority.

The official contact is the Departamento de Ecología y Comportamiento Animal.

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**Table 4 – List of Mexican UNESCO/MAB Biosphere Reserves**

<b>Biosphere Reserves</b>	<b>Year designated</b>	<b>Other UN Programme</b>
Mapimí	1977	
La Michilía	1977	
Montes Azules	1979	
El Cielo	1986	
Sian Ka'an	1986	World Heritage Site: Sian Ka'an (1987)
Sierra de Manantlán	1988	
Calakmul	1993	
El Triunfo	1993	

<sup>37</sup> Mader, retrieved from <http://www.planeta.com/ecotravel/mexico/mexparks2.html>

<sup>38</sup> Ibid. 36

<sup>39</sup> I do not think this is a valid contact even though it appears on the UNESCO website (<http://www2.unesco.org/mab/mab-cont/country.asp?code=MEX>). According to VN website, currently, the most important tool in Nature and Landscape Protection in Mexico is the General Law of Ecological Equilibrium and Environment Protection (Ley General del Equilibrio Ecológico y la Protección al Ambiente - LGEEPA), which institutes the National Council of Nature Protected Areas as an advisory board to SMARNAT (Ministry of Environment and Nature Resources) and enforces the process of decentralization and administration of Protected Areas management and involvement of federal entities, municipalities, agricultural communities, indigenous people and social organizations. I believe an office in the SMARNAT is the one that supervises current BRs activities.

El Vizcaíno	1993	World Heritage Sites: Whale Sanctuary of El Vizcaino (1993) and Rock Paintings of the Sierra de San Fransisco (1993)
Alto Golfo de California	1993	Ramsar Wetland: Humedales del Delta del Río Colorado (1996)
Islas del Golfo de California	1995	
Sierra Gorda	2001	World Heritage Cultural Site: Franciscan Missions in Sierra Gorda of Querétaro (2003)
Banco Chinchorro	2003	
Sierra La Laguna	2003	

Source: UNESCO-MAB Biosphere Reserves Directory, retrieved from <http://www.unesco.org/mab/brlistlatin.htm>, <http://www.unesco.org/mab/BR-Ramsar.htm> and <http://www.unesco.org/mab/BR-WH.htm>

In recent years, Mexico has taken important steps towards the conservation of environmental quality in the region. In the 1990s, the creation of the Secretariat of Environment, Natural Resources, and Fisheries (SEMARNAP) that was formerly part of the National Ecology Institute, helped ensure that environmental issues become part of the government's agenda and decision-making (UNEP, 1997, Chapter 3). Later on, Mexico established the Ministry of Environment and Natural Resources/ Secretariat of Environment and Natural Resources (Secretaría del Medio Ambiente y Recursos Naturales, SEMARNAT) whose main purpose is to create a national environmental protection policy reversing the

tendencies of ecological deterioration and establishing the bases for sustainable development in the country.<sup>40</sup>

Mexico also created separate bodies to deal with specific environmental sectors such as the National Commission for Knowledge and Use of Biodiversity (CONABIO) (UNEP, 1997). Moreover, as UNEP's Global Environment Outlook (1997) pointed out, in Mexico, environmental laws are granted with wide regulatory power: the power is given "to establish requirements, conditions, procedures, parameters, and permissible limits that must be observed in development of activities or use and benefit of products which cause, or might cause, ecological imbalance or damage to the environment" (UNEP, 1997). New laws also require the government to establish environmental planning committees with broad social representation at the provincial or local levels (UNEP, 1997).

Mexico has pioneered the use of a zoning system in the "biosphere reserves". Mexico's *Regulation of the General Law of Environmental Protection and Ecological Balance on Matters of Natural Protected Areas*, rules that nucleus zones in natural protected areas and biosphere reserves can be divided into sub-zones, as long as there is a management plan in place that spells out the sub-limits (Thompson, 2002). For example, officials in the National Commission of Natural Protected Areas (CNANP), an autonomous agency within the SEMARNAT, have authority to issue access permits for sportfishing (Thompson,

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<sup>40</sup> For more information please check the SEMARNAT website:  
[http://carpetas.semarnat.gob.mx/dgeia/web\\_ingles/what\\_is\\_semarnat.shtml](http://carpetas.semarnat.gob.mx/dgeia/web_ingles/what_is_semarnat.shtml)

2002). This zoning system, on one hand, offers flexibility that may benefit the residents in BRs and gain local support; but, on the other hand, it may cause problems and erode BRs' mission. Some tourism and economic developments may not fit in the " ecotourism" or the "sustainable development" categories. Lack of financial resources to monitor and enforce those sub-rules may also be a negative factor.

There are doubts about how effective those institutions are and how effectively those laws are implemented in practice. For example, in the case of implementing the *North American Agreement on Environmental Cooperation*, questions are being raised about "how much blurrier the lines are in Mexico" (Wheat, 1996). Michael McCloskey, chair of the Sierra Club and a member of the U.S. National Public Advisory Committee, commented on this issue that, "If you had a unitary government, a government such as that of Mexico, it would decide it was not going to enforce and that's the end of the story. You don't go into deciding who failed to do it - the government failed to do it" (Wheat, 1996).

Nevertheless, accompanied with Mexico political changes, many successes have been achieved during the past decade. Mexican environmental groups along with international organizations have been urging the administration to put in place more effective policies and processes. For example, in 2002, the World Bank approved a loan of \$202 million to support the Government of Mexico's efforts to mainstream environmental concerns into the agendas of key economic sectors such as water, energy, tourism, and forestry (World Bank, 2002). Mexico has also worked closely with its North American Free Trade Agreement (NAFTA)

partners, Canada and the United States, in dealing with both domestic and regional environmental issues. Section 5.2 will explore this cooperation in more detail.

## SECTION 5 – REGIONAL NETWORKING OVERVIEW

### 5.1 MAB Networking

#### 5.11 *EuroMAB*

EuroMAB was founded in 1987 through a cooperative agreement between the MAB National Committees of Europe and North America. It covers 30 countries and over 200 biosphere reserves in Europe and North America (details can be found in Appendix 2). EuroMAB is the largest of the MAB Networks, with a vast diversity of socio-economic and ecological conditions, cultural backgrounds and languages.<sup>41</sup> Therefore, EuroMAB functions through groups of countries and biosphere reserves that have a common interest in a given theme, for which a site or a country takes the lead.<sup>42</sup> The Secretariat for EuroMAB is located in Paris and for the period 2003-2004, the Chair of EuroMAB is the Chair of MAB Italy.<sup>43</sup>

The Biosphere Reserve Integrated Monitoring Program (BRIM) is one of EuroMAB's major initiatives - this proposal was discussed in EuroMAB's Strasbourg Congress (Strasbourg, France, 1991). The goal of BRIM is to link the

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<sup>41</sup> UNESCO, retrieved from <http://www.unesco.org/mab/networks.htm>

<sup>42</sup> UNESCO, retrieved from <http://www.unesco.org/mab/regions/Euromab/Euromab.htm>

scientific community to the numerous databases created in biosphere reserves of Europe and North America under the EuroMAB umbrella and provide information for cooperation between other parties interested in biosphere reserves.<sup>44</sup> As a result, BRIM has developed ACCESS 1993, ACCESS 1996, MABFlora and MABFauna, BioMon and Observe. These tools help standardizing methods in the collection, storage, and retrieval of bioinventory information, and facilitating its transfer and analysis.<sup>45</sup>

Since its creation, EuroMAB has organized many thematic international conferences and workshops relate to MAB/BR development. It works closely with the Council of Europe, including the European Diploma of Protected Areas, The Pan-European Ecological Network, and the Emerald Network. Details of these meetings and their proceedings can be found in EuroMAB's website.<sup>46</sup> EuroMAB offers a unique forum for BRs in Europe and North America to listen and to learn from each other. Canada has actively participated in EuroMAB activities. In 2002, Canada hosted the EuroMAB Workshop on Ecotourism in Biosphere Reserves.

Nevertheless, EuroMAB's image is fairly vague in the North American context. This is partly due to the difficulty of providing direct solutions to practical issues such as identifying potential funding in regions outside Europe. North American BRs may also find difficulty in establishing meaningful cooperative programs since their ecosystems and problems are very different from European BRs. The

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<sup>43</sup> UNESCO, retrieved from

<http://www.unesco.org/mab/regions/Euromab/Euromab.htm#secretariat>

<sup>44</sup> MAB, retrieved from <http://www.mabnet.org/euromab/euromab.html>

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cost of travel and communication is another concern since most conferences and workshops are held in European countries. BRs with limited budgets may be excluded from those networking and training events.

### **5.12 MABNetAmericas**

The idea of creating a MABNetAmericas, which will establish an Internet-based linkage among the 101 biosphere reserves in 17 countries in North, Central, and South America, was first proposed at the 1994 Summit of the Americas by the IberoAmerican Program and U.S. MAB. The goals of MABNetAmericas are to “increase access to scientific, social, and economic data obtained at protected sites; promote the use of common data standards for reporting species inventories and biological monitoring; and, facilitate the sharing of management experiences for sustainable development”.<sup>47</sup> Inspired by this idea, the MAB National Committees of Canada, Mexico and the U.S. signed a Memorandum of Understanding in 1995 to improve communications and the exchange of information on environmental issues.<sup>48</sup> The main activity of MABNetAmericas is to promote BRIM development, especially the application of MABFauna and MABFlora database.

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<sup>46</sup> <http://www.unesco.org/mab/regions/Euromab/meetings.htm#past>

<sup>47</sup> Retrieved from MABNetAmericas website: <http://www.mabnet.org/mabnet/mnainfo.html>

<sup>48</sup> Ibid. 41

Unfortunately, as explained in Section 4.2, the lead of MABNetAmericas, the U.S.MAB, has been struggling to survive domestic oppositions.<sup>49</sup> At present, there is not much updating of this network.

### **5.13 *IberoMAB***<sup>50</sup>

This Latin American Biosphere Reserves Network aims to strengthen the MAB Programme in Latin American countries, Spain and Portugal, notably by consolidating their MAB National Committees and cooperative links, and promoting the creation of new biosphere reserves.<sup>51</sup> Mexico is a member of this network.

### **5.14 *The Northern Sciences Network***

The Northern Sciences Network (NSN) is a collaborative initiative established in 1983, between MAB National Committees of Canada, Denmark/Greenland, Finland, Iceland, Norway, Russia, Sweden, the United Kingdom and the United States of America (Roots, 1998).

One of NSN's major projects is the International Tundra Experiment (ITEX), which was established at a meeting of tundra ecologists in 1990, as a response to the forecasts by Global Circulation Models that global warming would occur

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<sup>49</sup> At the home page of MABNetAmericas, a FAQ link is provided by the U.S. MAB to inform those "individuals and organizations have been seriously misinformed about the nature of the Biosphere Reserve element of the U.S. MAB Program".

<sup>50</sup> Since I cannot read Spanish, I cannot find more information about this network.

<sup>51</sup> Retrieved from <http://www.unesco.org/mab/networks.htm>

earliest and most intensely at high latitudes (Henry, 1998). The NSN Secretariat publishes *ITEX Update*, a newsletter for participants (Roots, 1998).

NSN also publishes *Northern Sciences Network Newsletter* twice a year, a platform for ITEX, the International Permafrost Association (IPA) and the Indigenous Peoples Secretariat (IPS).<sup>52</sup> As of 1998, there are more than 800 subscribers in 27 countries (Roots, 1998). However, the Danish Polar Center, Copenhagen, no longer hosts the website for this newsletter. The latest version that can be found is dated as July 2001.

## **5.2 North American Commission on Environmental Cooperation (CEC)**

The North American Free Trade Agreement (NAFTA) created by Canada, Mexico and the United States, is one of the most influential international agreements in this region. It created the world's largest low-tariff trading zone and has a goal to improve North American economies. Negotiations around NAFTA also established institutions such as the North American Commission on Environmental Cooperation (CEC), the North American Commission on the Border Environmental Cooperation Commission (BECC) and the North American Development Bank (NADBank) to improve this region's environment.

CEC was established under the parallel accord to the NAFTA, the *North American Agreement on Environmental Cooperation (NAAEC)*.<sup>53</sup> In November 1994, a 35-person CEC Secretariat opened its offices in Montreal, Quebec. The

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<sup>52</sup> UNESCO, retrieved from <http://www.unesco.org/mab/publications/publications.htm>

<sup>53</sup> Details can be found on CEC website:  
[http://www.cec.org/who\\_we\\_are/index.cfm?varlan=english](http://www.cec.org/who_we_are/index.cfm?varlan=english)

official goal of CEC is “to address regional environmental concerns, help prevent potential trade and environmental conflicts, and to promote the effective enforcement of environmental law”.<sup>54</sup> The CEC has three segments known as the Council, the Joint Public Advisory Committee (JPAC) and the Secretariat. Details can be found in the Text Box 3.

### ***Text Box 3 – The Organizational Structure of CEC***

The Council, the governing body of the CEC, is composed of the environment ministers (or the equivalent) of each country; it meets at least once a year to discuss CEC programs and activities.

The Joint Public Advisory Committee is composed of fifteen members, five from each of the three countries (Canada, Mexico and the United States), who are appointed by their respective governments. Its members act independently and their responsibility is to provide the Council, which is composed of the environment ministers of each country, with their advice on all matters within the scope of the North American Agreement on Environmental Cooperation. The Chair is elected for a one-year term and by rotation from among the JPAC members appointed for each country.

The Secretariat is composed of professional staff who implement initiatives and conduct research in core program areas on topics pertaining to the North American environment, environmental law and standards, and other environment/trade issues, in addition to processing citizen submissions on enforcement matters. The Secretariat, which is located in Montreal, Canada, with a liaison office in Mexico City, provides technical and operational support to the Council, as well as to committees and groups established by the Council.

Source: The Council, from CEC website

[http://www.cec.org/who\\_we\\_are/council/index.cfm?varlan=english](http://www.cec.org/who_we_are/council/index.cfm?varlan=english)

JPAC, from CEC website [http://www.cec.org/who\\_we\\_are/jpac/index.cfm?varlan=english](http://www.cec.org/who_we_are/jpac/index.cfm?varlan=english)

The Secretariat, from CEC website

[http://www.cec.org/who\\_we\\_are/secretariat/index.cfm?varlan=english](http://www.cec.org/who_we_are/secretariat/index.cfm?varlan=english)

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<sup>54</sup> CEC website, retrieved from [http://www.cec.org/who\\_we\\_are/index.cfm?varlan=english](http://www.cec.org/who_we_are/index.cfm?varlan=english)

CEC is viewed as an international organization to secure effective enforcement of the parallel agreement (NAAEC) and other environmental laws and regulations in this region. One of its unique features, as Wheat (1996) suggested, is that CEC has a petition process open to non-governmental organizations: the Secretariat may consider petitions from non-governmental organizations that urge the CEC to write factual reports on an environmental problem (Article 13 of the side agreement) or to look into allegations that a NAFTA member government has failed to enforce one of its own environmental laws (Article 14).

CEC is a leading advocate of many regional initiatives. Programs cover four major categories:

1. The Environment, Economy and Trade program: (1) to continue improving our understanding of the environmental effects of free trade and related economic integration in North America, as well as to identify opportunities for policy integration between environmental and trade policies in a manner that actively promotes transparency and public participation; (2) to identify opportunities among the NAFTA partners for cooperation and trade in environmental goods and services including renewable energy and energy efficiency; and (3) to strengthen partnerships with the private financial services sector in the area of finance and the environment.

2. Conservation of Biodiversity in North America program: promotes cooperation among Canada, Mexico and the United States in furthering the conservation and sustainable use of North American biodiversity. With the direction and guidance from Council, the program will start implementing the "Strategic Plan for North American Cooperation in the Conservation of Biodiversity," a long-term agenda to catalyze trilateral conservation action at the North American level.

3. The Pollutants and Health program: to establish cooperative initiatives on a North American scale to prevent or correct the adverse effects of pollution on human and ecosystem health. Guidance on methods to accomplish this mission is embodied within the language of NAAEC Article 10.

4. The Law and Policy program: monitor and report on regional trends in implementing and enforcing environmental laws and standards, including innovations in regulation, economic instruments and voluntary initiatives.<sup>55</sup>

Under these four programs, CEC has launched a series of regional workshops, meetings and joint investigations. In 1995, CEC created the North American

Fund for Environmental Cooperation (NAFEC). From its creation in 1995 until 2003, NAFEC awarded 196 grants for a total of C\$9.36 million.<sup>56</sup>

CEC has been actively supporting Mexico's environment improvements. For instance, after much work done by the CEC, Mexico dramatically improved its pollutant release and transfer register (PRTR). On 3 June 2004, President Fox signed Mexico's mandatory reporting rule, which requires industries under federal jurisdiction to measure, record and report emissions and requires government agencies to provide public access to that information<sup>57</sup>. This is a significant success.

However, despite the distinguished achievements of NAFTA/CEC, some environmentalists and NGOs have argued that the CEC has not effectively achieved its goals. For example, in a report published in 1996, "NAFTA's Broken Promises: The Border Betrayed," Public Citizen examined the NAFTA institutions (CEC, BECC and NADBank) and listed NAFTA's failures in promoting a healthier and environmentally cleaner US-Mexico border. The report pointed out that "(CEC) has not heard a single case involving the failure of the Mexican government to enforce environmental laws; they have, however, rejected two petitions by U.S. groups involving the failure to enforce the U.S. Endangered Species Act and a law protecting forests on federal lands." (Public Citizen Press Release, 1996). As the Public Citizen report argued, this maybe due to the

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<sup>55</sup> Details of each programme can be found in sublinks of this web page:  
[http://cec.org/programs\\_projects/index.cfm?varlan=english](http://cec.org/programs_projects/index.cfm?varlan=english)

<sup>56</sup> Details of each program's current progress and publications can be found from CEC website ([http://cec.org/programs\\_projects/](http://cec.org/programs_projects/)).

<sup>57</sup> Public reporting on industrial pollution in Mexico almost a reality, from <http://www.cec.org/trio/stories/index.cfm?ed=13&ID=149&varlan=english>

limited power of the CEC. Thus, although the Secretariat, on its own or at the request of a NGO, can prepare reports on North American environmental issues, the institution has no authority to inspect environmental sites and must rely on documents that are already in the public domain or submitted voluntarily (Public Citizen Press Release, 1996). And two or more members of the CEC Council can object and reject such investigation proposal. Thus, the CEC cannot issue binding recommendations (Public Citizen Press Release, 1996). It worth mentioning above quoted comment was made during the first several years of CEC's operation. During that period, the CEC was still in an "under-construction" status - seeking priorities and designing program. As an institution with wide-ranging goals and limited resources, the newly establish CEC faced tremendous challenges<sup>58</sup>.

The efforts of the CEC cannot be overlooked. In 2003, the CEC Council mandated the Ten-year Review and Advisory Committee (TRAC) to assess NAAEC's implementation over its first decade and provide recommendations for the future. The TRAC report indicates that the CEC was and remains a unique, innovative and important institution (TRAC report, p. ix). The TRAC report also identifies a number of areas that need attention:

1. Greater engagement on the part of the environment ministers of the three countries.
2. Greater engagement on key constituencies, including business and academic interests.
3. A sharper focus in the program activities of the Secretariat.
4. The need for renewed funding from the Parties and the need for leveraged resources through contributions and partnerships.

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<sup>58</sup> Ten-year Review and Advisory Committee report (2003), p. 10, retrieved from [http://www.cec.org/files/PDF/TRAC-Report2004\\_en.pdf](http://www.cec.org/files/PDF/TRAC-Report2004_en.pdf)

5. The need to integrate capacity building into the CEC's activities, with an emphasis on helping Mexican institutions and organizations to play a greater role. ( pp. x-xi)

### **5.3 Canadian Biosphere Reserves Association Networking**

Since its establishment, CBRA has worked with Canada/MAB, Parks Canada, Environment Canada and EMAN<sup>59</sup> and actively participated in many projects. For example, EMAN helped Biosphere Reserves in developing Smithsonian Institution/Man and Biosphere Permanent Biodiversity Monitoring Plots (SI/MAB)<sup>60</sup>, which will help local communities in meaningful research and monitoring activities.

CBRA has been involved in international projects and conferences, such as the Northern Sciences Network and the Biosphere Reserve Integrated Monitoring Programme. It has also participated in EuroMAB's meetings and workshops. The following are projects and programs being undertaken through the CBRA/ACRB:

- The Biosphere Reserve Information Database Project
- Effects of Climate Change on Biosphere Reserves in Canada
- The Biosphere Reserve Land Use Change Project

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<sup>59</sup> The Ecological Monitoring and Assessment Network (EMAN) was established in 1994 with a coordinating office supported by Environment Canada to establish the national agenda and to complete the establishment of the 15 terrestrial and 5 marine Ecological Science Cooperatives (ESC). Most of the terrestrial ESCs have now been organized with almost 80 cooperating long-term monitoring and research sites. EMAN operates in the context of sustainable management of natural resources and takes an ecosystem perspective. It focuses on issues at both ecozone and national levels in attempting to answer the question "what is changing in our ecosystems and why". From <http://www.iltinternet.edu/meetings/panama96/canada/canada3.html>.

<sup>60</sup> The Smithsonian Institution in Washington DC, in the late 1980's, developed a program for measuring and monitoring biodiversity on permanent inventory plots in forests which tied into the UNESCO/MAB initiative. The main premise of their work is to have various plots set up around the world in different biomes which will facilitate a global network of ecological health. The plots are used to document species diversity and tree composition in secure forest areas in both protected and unprotected areas. From <http://www.eman-rese.ca/eman/reports/publications/eco-monit-yoho/chap2-1.htm>

- Habitat Restoration in Biosphere Reserves
- World Biosphere Reserves Ecotourism Consortium
- Biosphere Monitoring Plots (SI/MAB)
- Canadian Biosphere Reserves Association's Student Network

During the past three years, various domestic and international networking ideas have been introduced. In 2003, at the CBRA Annual Meeting, Glen Jamieson reported on an encouraging meeting to develop North American Biosphere Reserve linkages and several members also discussed a related meeting on North American Cooperation in Conservation of Biodiversity (CBRA Newsletter, January 2004). The same year, the Clayoquot Biosphere Trust began to establish an education consortium of universities and research institutions to provide leadership in education, research and the wise use of natural resources in the temperate rain forest regions of the world. This can be viewed as a result of the rapid development of biosphere reserves in Canada. The unique feature of biosphere reserve theory, especially the expressions of “locally led process” and “link conservation with human needs”, has successfully attracted attention from communities, officials and scholars.

New government policy is another important factor. For example, the Government of Canada announced *Canada 's Oceans Strategy: Our Oceans, Our Future* in 2002. Under “International Leadership: International oceans governance”, this strategy states an intent to “develop management arrangements with bordering nations for trans-boundary coastal and marine ecosystems” (p.25). Under “International Leadership: Share experience, promote

compliance and build capacity, in particular for developing nations”, it states the following:

- Support and promote consultative processes at the United Nations;
- Provide capacity for effective implementation of ocean management regimes such as the United Nations Convention on the Law of the Sea;
- Support capacity development for developing countries for the sustainable development of marine resources and ocean spaces; and
- Promote a coherent approach to managing oceans within the global governance system at both a regional and global level (P.25).

The three principles proposed by this *Strategy* (sustainable development, integrated management and the precautionary approach) are also in harmony with Biosphere Reserve theory.<sup>61</sup> CBRA is seeking cooperation with the MPA designation (See Section 4.1). A regional network for trans-boundary coastal and marine ecosystems can be the first step of a North American Biosphere Reserve Network. Canada’s interests in Arctic ecology<sup>62</sup> may also offer the CBRA an opportunity to renew the Northern Sciences Network.

## SECTION 6 – CONCLUDING THOUGHTS

### **6.1 A North America Biosphere Reserves Network?**

#### **6.11 Why Do We Need A Regional BR Network?**

It is important to address what the benefits of this proposed NABRNet might be.

Why are we doing this? One major concern is that the existing EuroMAB network

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<sup>61</sup> Chapter 17 of Agenda 21 is specifically devoted to oceans, and outlines principles and objectives for oceans management. The *Oceans Act* and *Canada’s Oceans Strategy* represent a concerted effort to implement the Agenda 21 principles of sustainability, integrated management, and precaution. As such, the *Strategy* is a significant tool for addressing Canada’s international sustainable development commitments (*Canada’s Oceans Strategy*, p.17).

cannot address regional needs and provide effective leadership. Dobell has illustrated several problems arise from fragmented biosphere reserve regimes:

- Inadequate knowledge sharing and learning;
- Inadequate handling of cross-border ecosystem linkages;
- Uncoordinated contributions to major research initiatives;
- Inadequate effort to achieve efficiencies in administration; and
- Failure to export opportunities for greater impacts.<sup>63</sup>

There is a possibility to build a network that links BRs and other conservation/ecology protection areas, as some BRs have national or provincial parks as their core areas while some BRs have joint programs with different initiatives and areas. This network may help BRs to solve some above problems and gain more support. For example, in Canada, BRs are seeking linkages with MPAs. But this kind of universal network may bring many problems. First of all, biosphere reserve model is different from other forms of protected area strategies. BR has a special emphasis on the interaction of settlement with conservation. The focus on special management of activities in “zones of cooperation” (buffer zones and transition zones) is distinct from many programs which only concentrate on conservation (i.e., MPAs, parks). It will be difficult to find a goal that accommodates all parties’ needs. The image of BR model will be undermined and some BR’s initiatives may face rejections.

In theory, the establishment of a NABRNet does not exclude joint programs with other initiatives. A BR regional network is easier to manage as they have similar

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<sup>62</sup> Under "International oceans governance": Support and promote an Arctic/circumpolar agenda through the Arctic Council (Canada's Oceans Strategy, p.24).

goals and functions. It will also help pave the way for a more holistic and coherent BR approach to environment and development issues. Potential benefits are listed as below:

- This NABRNet may improve the management of biosphere reserves and minimize the problems that arise from uncoordinated biosphere reserve regimes.
- Individual North American BR may learn from each other's experience and then lead a better community-based resource management process.
- A North American alliance may be established and/or reinforced, which includes governments, communities, researchers, NGOs, and international organizations.
- NABRNet may create more funding opportunities and cross-border programs.
- Regional issues may be better addressed and major research initiatives may be developed.

### **6.12 A Canada – U.S. – Mexico Network?**

The idea of a network that links Canada, the United States and Mexico does not come out of nowhere. There is a common ground for tri- and bi-national cooperation between Canada, the United States and Mexico that promotes the conservation and sustainable use of North American ecological resources (Table 5 illustrates some important treaties that help building this cooperation).

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<sup>63</sup> Prof. Rod Dobell (October 2004), personal communication.

The North American Commission on Environmental Cooperation is the institutional model of such networking.

**Table 5 – Tri- and Bi-Treaties Between Canada, the United States and Mexico**

<b>Treaty</b>	<b>Date of Adoption</b>
Boundary Waters Treaty	1909
Migratory Bird Convention	1916
Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere	1940
Treaty on the Utilization of Waters of the Colorado and Tijuana Rivers, and of the Rio Grande	1944
Convention for the Establishment of an Inter-American Tropical Tuna Commission	1949
Treaty Concerning the Diversion of the Niagara River	1950
The Great Lakes Water Quality Agreement	1972/78/87
Convention on Future Multilateral Cooperation in the North-West Atlantic Fisheries	1978
Agreement on Cooperation for Protection and Improvement of the Environment in the Border Area (La Paz Agreement)	1983
The Canada-US Agreement on the Transboundary Movement of Hazardous Waste	1986
Agreement on the Cooperative Management of the Porcupine Caribou Herd	1987
Canada-US Agreement on Arctic Cooperation	1988
Canada-Mexico Agreement on Environmental Cooperation	1990
The Canada-US Air Quality Accord	1991
Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean	1992
North American Agreement on Environmental Cooperation (NAAEC)	1993
US-Mexico Agreement concerning the Establishment of a Border Environment Cooperation Commission and a North American Development Bank (BECC-NADBank Agreement)	1994

Source: "Major regional MEAs", Chapter Three: Policy Responses - North America MEAs and non-binding instruments, UNEP Global Environment Outlook 2000, UNEP, URL: <http://www.grida.no/geo2000/english/0194.htm>

The idea of a network that links biosphere reserves in these three countries does not come out of nowhere as well. As illustrated in Section 5, BRs in each country have been participating in various networking processes.

The idea of creating a network including biosphere reserves in Canada, the United States and Mexico is spreading. In May 2003, the proposal of establishing an effective and functional North American Biosphere Reserve network gained unanimous support from participants at the Fifth Conference of Science and Management of Protected Areas Association (SAMPAA), held in Victoria, BC, Canada (U.S. MAB, 2003). With the help from the rejuvenated USMAB, the newly incorporated United States Biosphere Reserves Association (USBRA) has also announced that one of its goals is to “develop cooperation among biosphere reserves in North America” (U.S. MAB, 2003). In order to realize this goal, the USBRA, supported by the Southern Appalachian Man and the Biosphere (SAMAB) Foundation, carried out a 2003 U.S. biosphere reserves survey. The survey shows that “Ninety percent of the units are interested in planning a renewed program. Three-quarters of the areas are interested in planning collaborative activities with Canada and Mexico” (U.S. MAB, 2003).

### ***6.13 A Canada – U.S. Network?***

As indicated in Section 4.3, the Government of Mexico directly administrated the BR program. This regulatory approach is different from Canadian BRs and some BRs in the U.S. (23 of 47 biosphere reserves are managed by U.S. National Park Service). This volunteer-based NGO network maybe is not attractive to Mexican BRs. Language is another barrier. Spanish is the working language of Mexico.

Few volunteers can manage both English and Spanish. Moreover, Mexico has been participated in the IberoMAB. If the proposed NABRNet will include Mexico, the issue of separation needs to be discussed.

Both CBRA and USBRA are interested in establishing a North American network (See Section 5.3 and Section 6.11). They share similar experience and same language. A network that links Canadian BR and American BR will be much easier to build.

## **6.2 The Next Step**

As indicated in Section 1.2, this paper only provides background reviews and some prospects. There are three questions for potential future investigation. First, what is the vision of the NABRNet? There is a need to define the common ground for a network that links biosphere reserves in Canada, the United States and Mexico. As reviewed in previous sections, biosphere reserves in each country have unique styles and face different challenges. Need assessment is a critical step. Representatives from each country should have a chance to meet and answer the question “What would success mean to you?” Ultimately, the goal should be to promote the conservation and sustainable use of North American ecological resources. The short-term goal, however, can be flexible and “small” since it depends on the nature of each project. For example, it can be

establishing an effective system to monitor migrating birds or regulating whale-watching tourism.

Second, should CBRA take the lead in establishing this regional network? CBRA has significant experience in networking and current Chair and Board members are interested in such an initiative. The most challenging issue is financial support. If and how Canada/MAB/CBRA will obtain financial help is still a question. Moreover, most Canadian BRs are running under a very small office/staff; the heavy workloads of regional networking may in conflict with domestic projects. If CBRA attempts to take the lead, examination of opportunities for cooperation with institutions such as Parks Canada and Environment Canada are needed. As discussed in previous sections, the Canadian government may offer some help if CBRA can successfully link this network plan with other government programs and initiatives. There is also a possibility to gain funding from the UNESCO/MAB program if the importance of such a NABRNet is recognized. Private parties are important as well. As a UNEP report (1997) indicated, private funds have become increasingly important in the area of research and development as federal programmes in both Canada and the United States feel the effects of budget constraints.

Third, based on the need assessment proposed above, a study of organizational and networking models is crucial. What model should be used to promote the cooperation of the different actors involved in this “North American Biosphere Reserves Network” so that the goals of BRs can be better achieved? The CEC model grasps the regional characteristics. But it is based on a treaty signed by

each national government. The network of BRs will be a NGO network and it can be very difficult to gain such high level support. The creation of a North American Biosphere Reserve network also implies a separation from the EuroMAB (biosphere reserves in Canada and the U.S. separate from the EuroMAB) and a separation from the IberoMAB (biosphere reserves in Mexico separate from the IberoMAB). If this independent action succeeds, what is the relationship among EuroMAB, IberoMAB and NABRNet? Personally, I think a Canada-US BR network within the MAB international network, which exists as a separate entity, is a better choice. The cooperative approaches that these two countries use is different from Mexico's regulatory approach. At the operational level, it will be much easier if we do not need to consider the IberoMAB.

In summary, this North American Biosphere Reserve network will put Canadian Biosphere Reserves and its North American partners at the forefront of international cooperation in addressing regional conservation and sustainability concerns. This is a long journey that requires effective cooperation and endless work. And the success can be difficult to measure, as the value added to this process is intangible: the change of people's mind and behavior.

Maybe, after all the efforts, parties involved will fail to establish such a network.

The idea of linking BR sites into one **functional** regional network may not be realistic(as discussed in Section 5.12, MABNetAmericas did not achieve its goal).

Several factors can halt this process: insufficient capacity (funding, personnel); different approaches and structure of BRs in the region (see Section 6.11 above); and lack of necessary infrastructure. But as biosphere reserves are trying and

seeking solutions, as communities are talking to each other and discussing their relationships with the environment, as scholars and officials are participating and contributing ideas, this networking approach, along with other initiatives, is valuable. It will promote the understanding of ecosystems and the understanding of human activities. And, hopefully, it will help humans to develop ways of living sustainably.

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## APPENDIX

### **APPENDIX 1 – List Of Biosphere Reserves Regional and Subregional Networks**

<b>Regional Networks</b>	<b>Descriptions</b>
AfriMAB	This network was created by the "Regional Conference for Forging Co-operation on Africa's Biosphere Reserves for Biodiversity Conservation and Sustainable Development" which took place in Dakar (Senegal) in 1996.
ArabMAB	The ArabMAB Network was officially launched in Amman (Jordan) in 1997. The overall objective of ArabMAB is to promote co-operation between National Committees in order to strengthen the MAB programme in the Arab region including through the establishment of biosphere reserves.
EABRN	East Asian Biosphere Reserve Network consists of China, the Democratic People's Republic of Korea, Japan, Mongolia, the Republic of Korea and the Russian Federation. This network was initiated in 1994.

EuroMAB	The EuroMAB Network, founded in 1987, covers 30 countries in Europe and North America. It is the largest of the MAB Networks, with a vast diversity of socio-economic and ecological conditions, cultural backgrounds and languages.
IberoMAB	This Latin American Biosphere Reserves Network aims to strengthen the MAB Programme in Latin American countries, Spain and Portugal, notably by consolidating their MAB National Committees and co-operative links, and promoting the creation of new biosphere reserves. The seventh IberoMAB Meeting took place 17 - 23 June 2002 in Rio de Janeiro and Parati, Brazil.
CYTED	CYTED, the Ibero-American Programme for the Development of Science and Technology. A thematic network on biosphere reserves has been established within the larger framework of CYTED.
Northern Sciences Network (NSN)	The Northern Sciences Network is a collaborative initiative between MAB National Committees of Canada, Denmark/Greenland, Finland, Iceland, Norway, Russia, Sweden, the United Kingdom and the United States of America.
REDBIOS	East Atlantic Biosphere Reserve Network comprises Canary Islands (Spain), Cape Verde, Mauritania, Madeira and Azores (Portugal), Morocco and Senegal. The network fulfils an interregional mandate in enabling countries from the Macaronesian Region to co-operate and to exchange their experiences.
SeaBRnet	The Southeast Asian Biosphere Reserve Network is a subregional network proposed by China, Cambodia, Indonesia, Laos, Japan, Philippines, Thailand and Vietnam and it was officially launched in Vietnam in October 1998.
South and Central Asia MAB Network (SACAM)	In 2002, MAB-Sri Lanka hosted the "South and Central Asian MAB Meeting of Experts on Environmental Conservation, Management and Research" in Hikkaduwa, which was attended by representatives from Bangladesh, Bhutan, India, Islamic Republic of Iran, Maldives, Nepal, Pakistan and Sri Lanka. One important outcome of the meeting was the creation of a new sub-regional MAB network entitled "South and Central Asia MAB Network (SACAM)".

Source: <http://www.unesco.org/mab/networks.htm>

## **APPENDIX 2 – List Of Europe and North America Biosphere Reserves**

225 biosphere reserves in 31 countries (As of July 2003)

<b>Countries</b>	<b>Biosphere Reserves</b>	<b>Date of Approval</b>
<b>AUS</b>	<b>AUSTRIA / AUTRICHE / AUSTRIA</b>	
	1 Gossenköllesee	1977
	2 Gurgler Kamm	1977
	3 Lobau	1977
	4 Neusiedler See	1977
	5 Grosses Walsertal	2000
<b>BYE</b>	<b>BELARUS</b>	
	1 Berezinskiy	1978
	2 Belovezhskaya Pushcha	1993
<b>BU</b>	<b>BULGARIA / BULGARIE / BULGARIA</b>	
	1 Steneto	1977
	2 Alibotouch	1977
	3 Bistrichko Branichté	1977
	4 Boitine	1977
	5 Djendema	1977
	6 Doupkata	1977
	7 Douпки-Djindjiritza	1977
	8 Kamtchia	1977
	9 Koupena	1977
	10 Mantaritza	1977
	11 Ouzounboudjak	1977
	12 Parangalitza	1977
	13 Srébarna	1977
	14 Tchervenata sténa	1977
	15 Tchoupréné	1977
	16 Tsaritchina	1977
<b>CAN</b>	<b>CANADA</b>	

	1 Mont Saint Hilaire	1978
	2 Waterton	1979
	3 Long Point	1986
	4 Riding Mountain	1986
	5 Charlevoix	1988
	6 Niagara Escarpment	1990
	7 Clayoquot Sound	2000
	8 Redberry Lake	2000
	9 Lac Saint-Pierre	2000
	10 Mount Arrowsmith	2000
	11 South West Nova	2001
	12 Thousand Islands - Frontenac Arch	2002
<b>CRO</b>	<b>CROATIA / CROATIE / CROACIA</b>	
	1 Velebit Mountain	1977
<b>CZ</b>	<b>CZECH REPUBLIC / REPUBLIQUE TCHEQUE / REPUBLICA CHECA</b>	
	1 Krivoklátsko	1977
	2 Trebon Basin	1977
	3 Palava	1986
	4 Sumava	1990
	5 Bílé Karpathy	1996
	Krkokonose (see <a href="#">C/P 1: Czech Republic-Poland</a> )	
<b>C/P</b>	<b>CZECH REP-POLAND / REP.TCHEQUE-POLOGNE REPUB. CHECA-POLONIA</b>	
	1 Krkokonose/Karkonosze	1992
<b>DEN</b>	<b>DENMARK / DANEMARK / DINAMARCA</b>	
	1 North-East Greenland	1977
<b>ENA</b>	<b>ESTONIA / ESTONIE / ESTONIA</b>	
	1 West Estonian Archipelago	1990
<b>FIN</b>	<b>FINLAND / FINLANDE / FINLANDIA</b>	
	1 North Karelian	1992
	2 Archipelago Sea Area	1994

<b>FRA</b>	<b>FRANCE / FRANCIA</b>	
	1 Atoll de Taiaro	1977
	2 Vallée du Fango	1977
	3 Camargue	1977
	4 Cévennes	1984
	5 Iroise	1988
	6 Mont Ventoux	1990
	7 Archipel de la Guadeloupe	1992
	8 Luberon	1997
	9 Pays de Fontainebleau	1998
	Vosges du Nord/Pfälzerwald (see <a href="#">F/G 1</a> : France-Germany)	
<b>F/G</b>	<b>FRANCE-GERMANY / FRANCE-ALLEMAGNE / FRANCIA-ALEMANIA</b>	
	1 Vosges du Nord / Pfälzerwald	1998
<b>GER</b>	<b>GERMANY / ALLEMAGNE / ALEMANIA</b>	
	1 Flusslandschaft Elbe	1979
	2 Vessertal-Thüringen Forest	1979
	3 Bayerischer Wald	1981
	4 Berchtesgaden Alps	1990
	5 Waddensea of Schleswig-Holstein	1990
	6 Schorfheide-Chorin	1990
	7 Spreewald	1991
	8 Rügen	1991
	9 Rhön	1991
	10 Waddensea of Lower Saxony	1992
	11 Waddensea of Hamburg	1992
	12 Oberlausitzer Heide- und Teichlandschaft	1996
	13 Schaalsee	2000
	Pfälzerwald (see <a href="#">F/G 1</a> : France - Germany)	
<b>GRE</b>	<b>GREECE / GRECE / GRECIA</b>	
	1 Gorge of Samaria	1981
	2 Mount Olympus	1981

<b>HU</b>	<b>HUNGARY / HONGRIE / HUNGRIA</b>	
	1 Aggtelek	1979
	2 Hortobágy	1979
	3 Kiskunság	1979
	4 Lake Fertő	1979
	5 Pilis	1980
<b>IRE</b>	<b>IRELAND / IRLANDE / IRLANDA</b>	
	1 North Bull Island	1981
	2 Killarney	1982
<b>ISR</b>	<b>ISRAEL</b>	
	1 Mount Carmel	1996
<b>ITA</b>	<b>ITALY / ITALIE / ITALIA</b>	
	1 Collemeluccio-Montedimezzo	1977
	2 Circeo	1977
	3 Miramare	1979
	4 Cilento and Vallo di Diano	1997
	5 Somma-Vesuvio and Miglio d'Oro	1997
	6 Valle del Ticino	2002
	7 Tuscan Islands	2003
<b>LVA</b>	<b>LATVIA / LETTONIE / LETONIA</b>	
	1 North Vidzeme	1997
<b>NET</b>	<b>NETHERLANDS / PAYS BAS / PAISES BAJOS</b>	
	1 Waddensea Area	1986
<b>PO</b>	<b>POLAND / POLOGNE / POLONIA</b>	
	1 Babia Gora	1976
	2 Bialowieza	1976
	3 Lukajno Lake	1976
	4 Slowinski	1976
	5 Puszcza Kampinoska	2000
	6 West Polesie	2002
	Karkonosze (see <a href="#">C/P 1</a> : Czech Republic - Poland)	
	East Carpathians (see <a href="#">P/S/U 1</a> : Poland - Slovakia -	

	Ukraine)	
	Tatra (see <a href="#">P/S 1</a> : Poland - Slovakia)	
<b>P/S</b>	<b>POLAND-SLOVAKIA / POLOGNE-SLOVAQUIE / POLONIA-ESLOVAQUIA</b>	
	1 Tatra	1992
<b>P/S/U</b>	<b>POLAND-SLOVAKIA-UKRAINE / POLOGNE- SLOVAQUIE-UKRAINE / POLONIA-ESLOVAQUIA- UCRAINA</b>	
	1 East Carpathians	1998
<b>POR</b>	<b>PORTUGAL</b>	
	1 Paúl do Boquilobo	1981
<b>ROM</b>	<b>ROMANIA / ROUMANIE / RUMANIA</b>	
	1 Pietrosul Mare	1979
	2 Retezat	1979
	Danube Delta (see <a href="#">R/U 1</a> : Romania - Ukraine)	
<b>R/U</b>	<b>ROMANIA-UKRAINE / ROUMANIE-UKRAINE / RUMANIA-UCRAINA</b>	
	1 Danube Delta	1998
<b>RUS</b>	<b>RUSSIAN FEDERATION / FEDERATION DE RUSSIE / FEDERACION DE RUSIA</b>	
	1 Kavkazskiy	1978
	2 Okskiy	1978
	3 Sikhote-Alin	1978
	4 Tsentral'nochernozem	1978
	5 Astrakhanskiy	1984
	6 Kronotskiy	1984
	7 Laplandskiy	1984
	8 Pechoro-Ilychskiy	1984
	9 Sayano-Shushenskiy	1984
	10 Sokhondinskiy	1984
	11 Voronezhskiy	1984
	12 Tsentral'nolesnoy	1985
	13 Baikalskiy	1986
	14 Tzentralnosibirskii	1986
	15 Chernyje Zemli	1993

	16	Taimyrsky	1995
	17	Ubsunorskaya Kotlovina	1997
	18	Daursky	1997
	19	Teberda	1997
	20	Katunsky	2000
	21	Prioksko-Terrasnyi	1978
	22	Barguzinskiy	1986
	23	Nerusso-Desnianskoe-Polesie	2001
	24	Visimskiy	2001
	25	Vodlozersky	2001
	26	Commander Islands	2002
	27	Darvinskiy	2002
	28	Nijegorodskoe Zavolje	2002
	29	Smolensk Lakeland	2002
	30	Ugra	2002
	31	Far East Marine	2003
<b>YUG</b>		<b>SERBIA AND MONTENEGRO / SERBIE ET MONTENEGRO</b>	
	1	Tara River Basin	1976
	2	Golija-Studenica	2001
<b>SLO</b>		<b>SLOVAKIA / SLOVAKIE / ESLOVAQUIA</b>	
	1	Slovenský Kras	1977
	2	Polana	1990
		Tatra (see <a href="#">P/S 1</a> : Poland - Slovakia)	
		East Carpathians (see <a href="#">P/S/U 1</a> : Poland - Slovakia - Ukraine)	
<b>SVN</b>		<b>SLOVENIA / SLOVENIE / ESLOVENIA 1</b>	
	1	Julian Alps	2003
<b>SPA</b>		<b>SPAIN / ESPAGNE / ESPANA</b>	
	1	Grazalema	1977
	2	Ordesa-Viñamala	1977
	3	Montserrat	1978
	4	Doñana	1980

	5 Mancha Húmeda	1980
	6 Las Sierras de Cazorla y Segura	1983
	7 Marismas del Odiel	1983
	8 La Palma	1983
	9 Urdaibai	1984
	10 Sierra Nevada	1986
	11 Cuenca Alta del Río Manzanares	1992
	12 Lanzarote	1993
	13 Menorca	1993
	14 Sierra de las Nieves y su Entorno	1995
	15 Cabo de Gata-Nijar	1997
	16 Isla de El Hierro	2000
	17 Bardenas Reales	2000
	18 Muniellos, Gran Cantábrica	2000
	19 Somiedo	2000
	20 Redes	2001
	21 Las Dehesas de Sierra Moreno	2002
	22 Terras do Miño	2002
	23 Valle de Laciana, Gran Cantábrica	2003
	24 Picos de Europa, Gran Cantábrica	2003
	25 Monfragüe	2003
	26 Valles del Jubera, Leza, Cidacos y Alhama, Gran Cantábrica	2003
<b>SWE</b>	<b>SWEDEN / SUEDE / SUECIA</b>	
	1 Lake Torne Area	1986
<b>SWI</b>	<b>SWITZERLAND / SUISSE / SUIZA</b>	
	1 Parc Suisse	1979
	2 Entelbuch	2001
<b>UKR</b>	<b>UKRAINE / UCRANIA</b>	
	1 Chernomorskiy	1984
	2 Askaniya-Nova	1985
	3 Carpathian	1992
	4 Shatskiy	2002
	Dunaisky (see Danube Delta <a href="#">R/U 1</a> : Romania - Ukraine)	1998
	East Carpathians (see <a href="#">P/S/U 1</a> : Poland - Slovakia - Ukraine)	

<b>UK</b>	<b>UNITED KINGDOM / ROYAUME UNI / REINO UNIDO</b>	
1	Beinn Eighe	1976
2	Braunton Burrows	1976
3	Cairnsmore of Fleet	1976
4	Dyfi	1976
5	Loch Druidibeg	1976
6	Moor House-Upper Teesdale	1976
7	North Norfolk Coast	1976
8	Silver Flowe-Merrick Kells	1976
9	Taynish	1977
<b>USA</b>	<b>UNITED STATES OF AMERICA / ETATS UNIS D'AMERIQUE / ESTADOS UNIDOS</b>	
1	Aleutian Islands	1976
2	Big Bend	1976
3	Cascade Head	1976
4	Central Plains	1976
5	Channel Islands	1976
6	Coram	1976
7	Denali	1976
8	Desert	1976
9	Everglades & Dry Tortugas	1976
10	Fraser	1976
11	Glacier	1976
12	H.J. Andrews	1976
13	Hubbard Brook	1976
14	Jornada	1976
15	Luquillo	1976
16	Noatak	1976
17	Olympic	1976
18	Organ Pipe Cactus	1976
19	Rocky Mountain	1976
20	San Dimas	1976

21	San Joaquin	1976
22	Sequoia-Kings Canyon	1976
23	Stanislaus-Tuolumne	1976
24	Three Sisters	1976
25	Virgin Islands	1976
26	Yellowstone	1976
27	Beaver Creek	1976
28	Konza Prairie	1978
29	Niwot Ridge	1979
30	University of Michigan Biological Station	1979
31	Virginia Coast	1979
32	Hawaiian Islands	1980
33	Isle Royale	1980
34	Big Thicket	1981
35	Guanica	1981
36	California Coast Ranges	1983
37	Central Gulf Coast Plain	1983
38	South Atlantic Coastal Plain	1983
39	Mojave and Colorado Deserts	1984
40	Carolinian-South Atlantic	1986
41	Glacier Bay-Admiralty Is.	1986
42	Golden Gate	1988
43	New Jersey Pinelands	1988
44	Southern Appalachian	1988
45	Champlain-Adirondak	1989
46	Mammoth Cave Area	1990
47	Land Between The Lakes	1991

Source: <http://www.unesco.org/mab/brlistEur.htm#C>