

RIDING MOUNTAIN BIOSPHERE RESERVE

Periodic Review Report, 2000

This report is in three sections. The first summarizes the main findings and conclusions of the reviewers. The second is a narrative to highlight main events and activities of the biosphere reserve since its inception, and the context within which these occurred. The third section is the completed Periodic Review Form.

While much of the information for the periodic review was obtained from libraries or other secondary sources, this was supplemented by a site visit on November 1-4, 2000. The visit provided access to additional information from the national park reference library and the biosphere reserve office, including minutes of meetings of the Biosphere Reserve Management Committee (BRMC) and of recent meetings of the Riding Mountain Regional Liaison Committee (RMRLC). Of special importance was the opportunity to meet with people most directly involved in the BRMC and discuss topics associated with their perceptions and experiences of the biosphere reserve. Their help, information, insights, and hospitality were very much appreciated. Our thanks to:

Larry Bidlake, Regional Wildlife Manager, Manitoba Department of Conservation;

Geraldine David, Technical staff, BRMC;

Mac Estabrooks, member of the BRMC, and former Superintendent, Riding Mountain National Park;

Ray Frey, Reeve of Park South, member of the BRMC, and former Chief Warden, Riding Mountain National Park;

Sean Frey, Data Manager, Riding Mountain National Park;

Herb Goulden, member of the BRMC, former Manitoba representative on the management committee, former member of the RMRLC, and consultant to the Manitoba Habitat Heritage Corporation;

Myles Kopytko, Manager, Little Saskatchewan River Conservation District;

Dwain Lawless, Reeve of Rossburn, former member of the BRMC, Chair of the RMRLC;

Marvin Miller, Chief Park Warden, Riding Mountain National Park;

Greg Fenton, Superintendent, Riding Mountain National Park;
Virginia Shemeliuk, Secretary-Treasurer, BRMC;
Paul Tarleton, Ecosystem Secretariat Manager, Riding Mountain National
Park;
John Whitaker, Chair, BRMC, and Chair, Canadian Biosphere Reserves
Association.

Although John Whitaker relayed comments upon a first draft, the points emphasized in this report, as well as any errors, are those of the reviewers.

George Francis and Craig Stewart,
Canadian Biosphere Reserves Association,
Reviewers on behalf of the Canadian Commission for UNESCO and
Canada/MAB.

January 5, 2001.

MAIN FINDINGS AND CONCLUSIONS

The Riding Mountain Regional Liaison Committee (RMRLC), formed in 1980 to discuss recurring issues arising from having a national park in the midst of a major agricultural region, continues to function some 20 years later. It draws its membership from up to 18 municipalities adjacent or near to Riding Mountain National Park, along with *ex officio* membership from representatives of two provincial government agencies in the Province of Manitoba, and a representative from the national park. The RMRLC takes up immediate issues, some of which can be politically-charged, and it lobbies governments on matters of particular concern to it. The existence of this liaison committee was viewed very favourably when the Riding Mountain Biosphere Reserve was approved in 1986, because it was seen as a ready-made framework for developing the kinds of communication and cooperation required between the core area and transition area of a biosphere reserve.

The Rural Municipalities surrounding the Park appointed a Biosphere Reserve Management Committee (BRMC) as a sub-group with nine municipalities as members, along with the same *ex officio* representatives as are on the liaison committee, to help fulfill the functions of a biosphere reserve. In 1988, a Constitution and By-laws for the Riding Mountain Biosphere Reserve were drawn up, and these were subsequently incorporated provincially in 1991. The BRMC receives a subvention of \$5k annually from Parks Canada, while the municipalities pay expenses for their own members on the committee; all other funds, currently in the order of \$50k annually, come from different sources for particular projects.

The BRMC has had to find how best to develop a role that would be consistent with the biosphere reserve concept, be acceptable (and welcomed) within the larger rural community, and yet be feasible for volunteers to undertake

with little funding support. It also had to be clearly differentiated from the more political role of the liaison committee, and yet not be perceived merely as an “instrument” of federal government interests because of the national park connection. The BRMC opted for a public information and education role guided by broad perspectives on ecosystems and sustainability in the context of an agricultural economy. It has organized and sponsored a number of conferences or demonstration events on themes or topics of wide general interest in rural communities. With a modest increase in resources during the past two years that has allowed the BRMC to retain the part-time services of its Chair and to recruit a technical staff person, it has produced information in the form of GIS maps on themes of interest to both rural municipalities and the national park, and participated more widely in consultations or other projects sponsored by the national park, rural conservation districts, or particular municipalities in the transition area / zone of cooperation.

Although there was a period in the early 1990s when the activities of the BRMC were at a rather low ebb, there has been a distinct re-juvenation in the past two years. This came about in part from the appointment of very experienced people to the BRMC following municipal elections in 1998. But it also reflects a more receptive organizational environment for the work of the BRMC. Over the past decade there have been significant changes in the approaches taken by governments for conservation and resource management in the region. Generally, much less reliance is being placed upon “top-down” hierarchical administrative actions that maintain strict adherence to jurisdictional boundaries and mandates with little or no public consultation, and much more use is being made of consultative approaches that reach across boundaries, respond to “bottom-up” community concerns, and strive to develop horizontal networks of collaboration and trust. The BRMC has helped in its own way to nurture this, and the result is an organizational context much more conducive for developing a stronger “presence” and favourable “optics” for biosphere reserve kinds of activities.

The BRMC has laid down a basis for strengthening networks to provide public information and education, and collaboration for “technology transfer” demonstrations of new approaches for problem-solving. Extensive research and monitoring work has also been conducted in the biosphere reserve (but not by the BRMC, although they have funded some of it) and it has been directed almost entirely to management issues associated with the national park and to transboundary issues. Most of this work is discipline- or problem-based, and there are relatively few links with national monitoring programs. However, through an ecosystem conservation plan (1997) directed towards achieving “ecological integrity”, work is now underway to specify objectives and design monitoring programs. Some of these will have to be conducted on spatial scales reaching beyond park boundaries, and involve volunteer-based monitoring as a component. This points to an emerging role for the BRMC. It participated in a scientific advisory committee to help develop the conservation plan, and it might expand its role if there is some increase in the research and monitoring carried out by the national park and/or other agencies.

In reference to the criteria for biosphere reserves, i.e. Article 4 of the Statutory Framework for the World Network of Biosphere Reserves, the following can be observed [**Note:** This is Section IX from the period review report that follows]:

1. Biosphere reserves should encompass a mosaic of ecological systems representative of major biogeographic regions, including a gradation of human interventions.

The national park “core area” is representative of a more southern portion of the much larger boreal forest biome, and also includes components of aspen parkland, including rough fescue prairie, and the eastern deciduous forest, while the area immediately surrounding it has been transformed into agroecosystems

that are intensively managed. The human interventions are exhibited as a strong contrast between conditions on either side of the park borders, but the regional landscape also exhibits more nuanced mosaics of human interventions associated with early influences on the boreal forest before it became a national park, and adaptations to variable topographic conditions within the agroecosystems.

2. Biosphere reserves should be significant for biological diversity conservation:

The biodiversity significance is exhibited by maintenance of near-complete foodwebs dominated by large mammals. All guilds are represented, although a few species that once shared these guilds may no longer occur in this particular area (e.g. plains grizzly bear and wolverine). The national park “core area” provides the basis for this, and is under a statutory requirement to maintain the “ecological integrity” of this sample of boreal forest. Measures for integrity include maintaining certain forest vegetation associations and developing cooperative management with neighbouring landowners for populations of mammals that range outside of the park core area (especially black bear, elk/wapiti, moose, wolves and beaver). It is assumed that an intact ecosystem on this scale also provides for most smaller species of biota that occur in boreal forest habitats. Biotic inventory data suggest this to be so, but it would be desirable to conduct additional field surveys, especially for invertebrates and non-vascular plants.

3. Biosphere reserves should provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale:

There are three distinct opportunities here. One relates to sustainable agriculture in the transition area / zone of cooperation where there are a number of provincial government and other non-governmental programs available for giving advice and assistance to individual farmers, directed mainly to individual farm conditions. The biosphere reserve committee has contributed mainly by hosting community meetings and exhibits or demonstration events that help promote sustainable land use or farming practices. It has also been associated with a long-term project to assess ways to lessen flood and erosion damage from rivers flowing out of the core area and over a steep escarpment into agricultural lands below. More recently, it helped demonstrate water levelling devices (the

“beaver deceivers”) that reduce maintenance costs for rural roads which are threatened by flooding caused by beaver dams.

Second, the national park core area, in principle, could be viewed as a benchmark area to compare or assess different forest management practices with a comparable sized area having similar topography and forest cover to the north. The 3,370 km² Duck Mountain Provincial Forest, which also includes the 1,276 km² Duck Mountain Provincial Park, is about 30 km to the north of the western portion of the Riding Mountain National Park. The forest is being managed for the extraction of forest products, and some logging has been approved for the provincial park. The possibility for the biosphere reserve to play this role was noted at the time it was established, but deferred until such time as it might become more developed and accepted in the community. This would also require cooperation among different government jurisdictions and different rural communities which are outside of the regional liaison committee area that serves approximately to define the extent of the transition zone / zone of cooperation. There is also some interest in determining whether or not there is a “corridor” link for some wildlife between these two areas.

Third, there is an ecotourism evaluation project being undertaken in collaboration with a district marketing organization. Whereas it is questionable whether the area as a whole should support higher tourism activity, tourism pressures on the national park could be deflected to activities in local communities. An increase in tax revenues from this could be applied to supporting continued municipal involvement in the biosphere reserve.

4. Biosphere reserves should have an appropriate size to serve the three functions of biosphere reserves (set out in Article 3):

The Riding Mountain Biosphere Reserve is of sufficient size to serve these functions.

5. Biosphere reserves should include these functions through appropriate zonation:

As noted (elsewhere in this report), interpretations of the “buffer zone” in this biosphere reserve have some inherent difficulties, and the term is restricted to refer only to two zoning categories within the national park. The continued existence of populations of large mammals which also range outside of the national park could be interpreted to mean that land cover and land use practices in the biosphere reserve do serve to “buffer” them somewhat; however, this perspective can be contested. This ambiguity about “buffers” (zoning restrictions which are not acceptable to private landowners, or ecological functions which cannot easily be demonstrated) does not preclude the performance of biosphere reserve functions in some form.

6. Biosphere reserves should have organizational arrangements for the involvement and participation of various authorities and groups in carrying out the functions of biosphere reserves:

Because the Biosphere Reserve Management Committee is appointed by the elected councils of the rural municipalities which make up the transition area / zone of cooperation, it has close structural links to elected officials and local decision makers. Partly because of this arrangement, it can work through a number of community networks as the occasion may demand. It also maintains informal working relationships with officials in the national park and in provincial government agencies, in part because of these officials’ *ex officio* participation in both the liaison committee and the management committee.

Cooperative arrangements also exist for individual programs or projects, for example with the Turtle River Conservation District and the Little Saskatchewan River Conservation District for watershed studies, with the Environmental Monitoring and Assessment Network (EMAN) for SI/MAB biodiversity monitoring plots, with school districts for educational activities, with universities for assisting student research, and with various funding organizations for projects such as analyzing land use history.

7. Biosphere reserves should have provisions for management of human use and activities in the buffer zones, a management policy or plan for the area of the biosphere reserve, a designated authority or mechanism to implement this policy or plan, and programs for research, monitoring, education and training:

These provisions come under different jurisdictions and management authorities, including private landowners. The national park core area has an updated management plan (1996) with a special ecosystem conservation plan as a major sub-component (1997). This covers the core area and the buffer zone. Ten of the 14 rural municipalities in the transition area / zone of cooperation are members of Conservation Districts (and three more will be in another one being formed); there are five of these districts adjacent to the national park, two of which were established in the 1970s, three others in the 1990s, and one more scheduled to be set up in 2000. Game Hunting Areas 23 and 23A surround the national park and serve as units within which population surveys are conducted for elk/wapiti and moose and used as a basis for administering provincial hunting regulations. The biosphere reserve itself has no management authority over these, but can help informally to coordinate matters relating to them, mainly by providing an information and education service to local residents and decision makers.

The Article 4 criteria are either being fulfilled or they are being addressed in some way within the Riding Mountain Biosphere Reserve. As a relatively small volunteer-based group with few resources, the BRMC has nevertheless contributed through provision of information and education materials and events, including some demonstration projects, and it is structurally linked to elected officials in local communities as well as with national park and provincial government officials. The more collaborative approaches now being followed by government agencies in the biosphere reserve area are much more conducive to realizing the potential of the biosphere reserve concept, and the BRMC has been re-examining ways in which it could broaden and strengthen its presence in this newer collaborative context.

In light of this, the reviewers believe that the Riding Mountain Biosphere Reserve definitely merits continued membership in the World Network of Biosphere Reserves.

BACKGROUND AND OVERVIEW

In 1980, Parks Canada (now Heritage Canada-National Parks) established the Riding Mountain Regional Liaison Committee (RMRLC) as a forum to discuss problems and issues that keep arising from a national park situated in the midst of an agricultural region. It was also an expression of a federal government policy to seek “regional integration” of national parks in their neighbouring regional economies. Voluntary participation was solicited initially from 11 rural municipalities immediately adjacent to Riding Mountain National Park and from representatives of agencies in the Manitoba provincial government.

These arrangements, and some first experiences with them, were reported during a 1982 IUCN co-sponsored conference on the occasion of the 50th anniversary of the Waterton-Glacier International Peace Park to discuss national parks in regional settings and the experience of biosphere reserves. Both of these parks had received a biosphere reserve designation (Glacier in 1976 and Waterton in 1979), and a new Waterton Biosphere Reserve Committee of park officials and neighbouring ranchland owners had been established informally in 1981. The Riding Mountain initiative seemed to have set a more formal arrangement that was consistent with the concept of viewing parks in their regional setting, and of a biosphere reserve.

Informal consultations were initiated through the Canada/MAB Working Group on Biosphere Reserves (which was created in 1980) and national park officials to explore the prospects of a biosphere reserve designation for the Riding Mountain area. A local conference was held on November 4, 1984, to discuss “Should the Riding Mountain National Park Area become a biosphere reserve?” and participants were generally favourable to the idea. A nomination submission was prepared in 1985, and within a matter of weeks, the nomination was formally and unanimously approved by the RMRLC, which by that time

included 18 rural municipalities, towns and villages, each with two representatives on the committee. Resolutions of support were also received from individual municipal councils. The Manitoba Ministry of Natural Resources approved the nomination on behalf of the provincial government.

After the nomination had been submitted to UNESCO in August 1985, another local public information session was held on February 21, 1986. UNESCO officially approved the nomination in June 1986, noting in particular the appropriateness of the regional liaison committee to help foster the kinds of cooperation that biosphere reserves require between core areas and transition areas / zones of cooperation.

Now, some 20 years later, the RMRLC continues to function as a forum that addresses a variety of political issues that continue to arise from the juxtaposition of wildlife with farming, or national park values in the context of the local agricultural economy. The Committee has retained its structure of two representatives from up to 18 municipalities adjacent or close to the park along with two non-voting representatives from the provincial government (currently from the departments of agriculture and conservation), and a non-voting representative from Riding Mountain National Park. The two members from each municipality are either two elected council members, or one elected council member and one "ratepayer" (an individual holding property and paying taxes in the municipality). They are appointed either on a year-to-year basis by their municipal councils, or for a maximum of four years until the next municipal elections.

The RMRLC meets about eight times a year, it strives for consensus on matters it takes up, and it actively lobbies municipal or senior (i.e. federal and provincial) governments to take particular actions. The provincial government uses the committee to consult on proposed changes in hunting regulations each year. The committee was also represented on a Round Table of stakeholder

interests in 1994-1996 to help revise the national park management plan. Otherwise, the RMRLC directs its attention to immediate topical issues such as beaver flooding of rural roads, or most recently, the implications of incidences of bovine tuberculosis in wild elk/wapiti. Attendance at meetings varies, but at least 10-12 of the municipalities have remained active on the RMRLC over the years.

The Rural Municipalities surrounding the Park appoint the Biosphere Reserve Management Committee (BRMC) to operate the biosphere reserve. Under a Constitution for the biosphere reserve drawn up in 1988, and formalized in 1991 under The Manitoba Corporations Act, the BRMC appoints nine members and the chair of a technical committee for the biosphere reserve; this committee also includes *ex-officio* representatives from the provincial government and national park. In principle, any member of the RMRLC can become a member of the BRMC, but there is sufficient informality for the latter to suggest to municipal councils who they would like to have serve. Management committee members tend to change only after municipal elections. The BRMC meets some 6-8 times a year.

In 1988, the BRMC also developed terms of reference for a technical committee and subsequently appointed a Technical and Human Resources Committee of some 30 people, chaired by a member of the management committee. The large technical committee soon proved to be rather cumbersome, especially since many of the members did not reside near the biosphere reserve, so in 1989 it was replaced by five technical "coordinators" for different resource fields each of whom might enlist other people as occasion necessitated.

A continuing dilemma for the BRMC is how best to develop a role for itself that would be consistent with the biosphere reserve concept, acceptable (and welcomed) within the larger community, and yet feasible for volunteers with little financial support to undertake. This role had also to be clearly differentiated from

the RMRLC which takes up immediate, and at times politically-charged local issues. At the same time, the BRMC did not want to be perceived as just an “instrument” of federal government interests because of the national park connection. This sensitivity arises from a long legacy of episodic disputes over what some local people view as unwarranted government restrictions on land or resource use. This dates back, according to different accounts, to the creation of a warden system to police activities in the old Dominion Forest Reserve, to the sudden cessation of livestock grazing and haying by local farmers in the national park, and to various governmental agricultural land adjustment policies over the years. The notion of “buffer zones” triggers this legacy whenever it seems associated with private lands. One example was the local controversy that erupted during and after a 1991 public meeting at which the idea of a buffer area around the national park to lessen hunting pressures through modification in hunting regulations was raised by the park superintendent and supported by some conservation groups. Local residents still recall this occasion, and a local landowner association formed to resist this idea at the time still exists.

In light of all these considerations, the BRMC decided by 1989 to pursue a public information and education role guided by broad perspectives on ecosystems and sustainability in the context of an agricultural economy, and to become a facilitator among agencies and community groups should an occasion warrant this. One result from this decision is that the most prominent series of activities of the BRMC has been the organization and sponsorship of one day conferences or workshops on themes judged to be of wide interest to agricultural communities. Over the past decade, topics have included: “Farming and Wildlife - the Challenge of Land Management in the 1990s”; “Climate Change and Farmers”; “Farm Chemicals and Sustainable Agriculture”; “Hunting, Farming and National Parks”; “The Potential of Poplar”; “Dammed by Beaver”; and “Baffling the Beaver”.

From about June 1991 through 1994, the BRMC functioned at a low ebb, with only about 5-6 active members in the management committee. By 1994, the technical committee fell into disuse since the management committee was not, on its own, embarking upon research or technical monitoring activities. To an extent, all this had been attributed to volunteer “burnout”. It may also have been related to difficulties in obtaining funding or staff support. Provincial involvement with national park-related issues was also at a low ebb. Parks Canada, through Riding Mountain National Park, has contributed \$5k annually for expenses of the committee, while municipalities also defray expenses of their representatives for attending meetings of the committee. Any other funds obtained have been to carry out specific projects. Over the years, the BRMC has received relatively small project-related grants or contracts from federal, provincial and private sources. These currently amount to about \$50,000 a year.

Several possibilities for developing staff support were also explored during the first five years or so of the biosphere reserve’s existence, including the joint funding of a staff person by the Manitoba government and the national park, or seconding someone from the park staff to play a coordinating role. Neither came to fruition. Various re-organizations were contemplated through the mid-1990s. The national park suggested that the BRMC could become a major advisory committee for the park. But upon reflection, the BRMC felt this would draw them into time-consuming local disputes (like some associated with the Wasagaming townsite) and perhaps tie them too closely to the park’s day-to-day concerns. Instead, BRMC thought it could serve a more useful role if, from a vantage point of their acceptance in local communities, they could monitor the “pulse” of communities and provide constructive feedback to park officials.

In retrospect, however, there appears also to have been a slowly changing organizational climate. By the time the BRMC was formed, provincial government agencies had effectively withdrawn their involvement in matters perceived to be a federal responsibility such as those associated with the national park. Budget

cuts and internal re-organization within Parks Canada during the mid-1990s became a pre-occupation in Riding Mountain National Park until about 1994 when the required updating of the park management plan was initiated with a quite different consultation process than had previously been used. A “Round Table” of 20 people affiliated with different stakeholder groups worked on revisions to the management plan (1996) and an “ecological integrity study group” linked to the Round Table, and advised by a scientific advisory committee, helped develop a more detailed Ecosystem Conservation Plan (1997) as a supplement to the management plan. The biosphere reserve committee was represented on the scientific advisory committee.

The Round Table arrangement has been continued through four sub-groups who are examining issues of ecological integrity, cultural resources, recreation development, and marketing of the park and tourism. While still park-focused, the issues extend beyond park boundaries. In addition, an independent “Panel on the Ecological Integrity of Canada’s National Parks” held public hearings and made field visits to selected parks, including Riding Mountain. Among the recommendations in their February, 2000, report was the need for parks to develop stronger collaborative arrangements with agencies and groups in their surrounding region to address various stresses impacting on the parks. Biosphere Reserves were noted as one model for achieving this.

Independently from this, there was renewed provincial interest in Conservation Districts, with three new ones formed for watersheds adjacent to the national park during the 1990s, and another one planned for 2000. By then, all but one of the members of the RMRLC will be associated with these districts and the collaborative processes they foster for conservation and sustainable use of water-based resources. In 1999, the provincial government passed a Conservation Easements Act which will foster private land stewardship by individual landowners and non-governmental organizations. Recent changes in

the federal government's capital gains tax on land or easements donated for conservation helps to re-inforce this approach.

Local municipal elections in 1998 led to several new members being appointed to the BRMC. They brought considerable experience, enthusiasm and commitment to the biosphere reserve ideals. The new committee informally undertook a "strategic planning" exercise to specify their role, objectives and priorities. It has re-affirmed a primary role for information and educational activities conducted in collaboration with other agencies and organizations.

Through some "seed" funding from the national park and from projects developed by the Canadian Biosphere Reserves Association, the BRMC now has the part-time services of the Chair of the management committee to help organize activities, and a technical staff person to develop GIS materials of interest to municipalities as well as to the national park. This has fostered a stronger "presence" for the biosphere reserve. Over the past two years the BRMC has helped municipalities gather and present (on GIS maps) information on areas of possible contact between livestock and elk/wapiti which is of interest because of the recent discovery of some bovine tuberculosis in wild elk; initiate a student water quality monitoring program at a local school in cooperation with one of the conservation districts adjacent to the national park; address perennial problems of beaver damage by introducing low-cost devices for flow regulation ("baffling the beavers") that have helped cut maintenance costs on rural roads; and meet informally with each of the municipal councils to discuss activities of the biosphere reserve.

What seems then to have occurred over the past decade or so, are significant changes in the approaches taken by governments for conservation and resource management in this region. Oversimplifying it somewhat, the change has been away from a predominantly "top-down" hierarchical administration by governments with strict adherence to jurisdictional boundaries

and agency mandates and little or no community involvement, to a much more consultative approach that reaches across boundaries, responds to “bottom-up” community concerns, and strives to develop horizontal networks of collaboration and trust. The biosphere reserve concept symbolizes this, and the BRMC has been able in its own way and with very limited resources, to help nurture this change.

For matters of special interest in the experience of Canadian biosphere reserves, the following may be noted:

Continuing justification for a biosphere reserve and appropriateness of the zonation.

The benefits from having a consultative group like the regional liaison committee are still there, as is indicated by the fact that the RMRLC has remained active for 20 years. The BRMC strives to differentiate its role from that of the RMRLC by taking on information/education activities guided by the themes of ecosystems and local sustainable agriculture. The original and continuing zoning structure is “realistic” given the jurisdictional and ownership rights that overlay the biosphere reserve. As noted, there are sensitivities and ambiguities about how best to define “buffer zone”.

Continuing local involvement.

The BRMC has taken up issues and opportunities that are of interest to the rural farming communities in the transition area / zone of cooperation, while also trying to complement initiatives or programs undertaken by other agriculturally-oriented groups. They also serve as diplomatic supporters of “park values”. With the composition of the management committee remaining dependent on local electoral processes, the structural links of the biosphere reserve to local rural communities have been retained. There are also a number of people in the region who have been introduced to the ideals of a biosphere

reserve over the years from their participation in it, and they are generally supportive, if also a little frustrated about how little could be accomplished with such limited resources compared to perceived possibilities.

Effectiveness of management plans.

The management plan for the national park has been up-dated and the most recent version invoked a “round table” consultation process with various interests, including representatives from the RMRLC, and from the BRMC on a scientific advisory committee for the ecosystem conservation plan. The plan had to adhere to the statutory obligation of managing the park primarily to assure its “ecological integrity”, while striving to address some local views about the privileges that local communities should enjoy to access the park for different purposes. The maintenance or restoration of “ecological integrity” poses difficult conceptual and technical questions, including some that have to be addressed at a regional scale that extends beyond the national park. This could well open up opportunities for the BRMC over the next decade as the monitoring and management implications for “integrity” become more clearly defined.

The provincial government has created special purpose management areas or zones in areas adjacent to the national park (e.g. conservation districts, game hunting areas) but these are administered through incentive programs or regulatory guidelines rather than “master plans”. Some guidelines, such as hunting permits, are adjusted annually.

Science in the context of national and international programs.

Almost all of the research and monitoring in the biosphere reserve is directed to management issues within the national park. It is discipline- or problem-based, although there is some degree of inherent multidisciplinary involved in addressing management questions concerning, for example, watershed or vegetation management. The only links in the biosphere reserve with national programs at present are the maintenance of weather stations, some

hydrological monitoring sites, and a SI/MAB biodiversity plot, all associated with Environment Canada programs. The biosphere reserve has not been chosen for field sites under other Canadian programs associated with international research and monitoring.

The biosphere reserve and issues of sustainability.

The question of whether the biosphere reserve is itself a good example of ecological and/or socio-economic sustainability is moot. The requirement to manage the national park for ecological integrity is reflected in Riding Mountain by a commitment to sustain a large suite of ecosystem values associated in part with populations of large mammals. Although there are a number of good examples of agricultural land use practices in areas surrounding the national park, the economic viability of many farms depends upon intensification of production practices. The agricultural communities are subject to economic forces over which they have no control. The human population there has declined slightly over the past decade. The BRMC is striving to develop awareness and understanding of the inherent values in maintaining both expressions of sustainability within the area.

While there now seems to be some prospect of the Riding Mountain Biosphere Reserve Management Committee being able to develop stronger capability and a higher public profile, some longer-term matters should be addressed in looking to the next decade. These include:

1. Broadening the base of support for the biosphere reserve.

This will be a matter for the on-going informal strategic planning exercise, and raises questions about broadening the membership base of the biosphere reserve committee. While still maintaining connections with municipal decision makers, it seems desirable to seek wider collaboration with provincial government agencies, especially those more directly linked to issues of

community economic sustainability. There has been an interest all along to find ways for involvement from First Nations; one possible approach might explore how to incorporate traditional ecological knowledge (TEK) as an integral component of information systems provided by the BRMC. The growing commitment to more collaborative approaches for planning and decisions (noted above) might now provide new opportunities for enhancing the “optics” for the biosphere reserve concept, and develop a stronger presence for it in the region. Expanded support might require reconsideration of membership criteria, including the possibility of a revised biosphere reserve association with charitable status.

2. Identifying the scope of information services to be developed.

The BRMC does not see itself administering long-term, open-ended service programs for clientele in the region. It instead has to identify particular opportunities for playing some “catalytic” role, as it has done recently with the production of GIS maps for use in monitoring livestock and wildlife health. One major possibility for an enlarged role could come when the national park develops a monitoring program for ecological integrity which will of necessity have to look beyond the park. Volunteer-based monitoring can contribute significantly, and the BRMC connection with EMAN (and other biosphere reserves with monitoring issues) can be examined for possible “technology transfer” applications.

3. Information to inform larger-scale issues.

Most conservation and sustainable resource use issues have to be addressed at different spatial scales, and this can be done at Riding Mountain without necessarily changing the size of the biosphere reserve. Two issues might benefit from adopting larger spatial perspectives. One is the ecological consequences from large-scale forest harvesting in the region extending north from the biosphere reserve into the Duck Mountain complex; while on-site studies of some issues are underway, the possibility of using Riding Mountain as a “benchmark” reference area for comparative purposes goes to the heart of

having “core areas” associated with “transition areas” in biosphere reserves. The other is the question of whether or not there are (or could be, with different management practices) ecological corridor functions linking metapopulations of large mammals between these two areas, or more generally, among the sites associated with the Prairie Mountain Conservation Initiative. GIS mapping of historical changes in the land use in some of these areas could contribute to a reasoned debate on conservation biology at this larger scale.

4. Retaining the education and communication underpinnings.

When exploring these kinds of possibilities for the future, the BRMC might still maintain the kinds of activities that are deemed valuable by local communities such as the organization of workshops or conferences on topical themes, exchange of information and experience from elsewhere in Canada and abroad, and looking for new opportunities to demonstrate “technology transfers”. One important component of the education role is arranging whenever possible to have members of the BRMC or other local representatives attend events in other venues, or visit other biosphere reserves. This was much appreciated by those who were able to have such opportunities in the past.

PERIODIC REVIEW FORM FOR BIOSPHERE RESERVES

I. NAME OF THE BIOSPHERE RESERVE

Riding Mountain Biosphere Reserve

II. COUNTRY

Canada

III. PHYSICAL CHARACTERISTICS OF THE BIOSPHERE RESERVE

Latitude and Longitude

50° 45' N latitude; 100° 19' W longitude

Please enclose a map showing the general location of the biosphere reserve.

Please see Figure 1.

Biogeographical Region

Indicate the name usually given to the biogeographical region in which the biosphere reserve is located.

Udvardy Classification of Biogeographical Provinces (1985).

1.4.3 Canadian Taiga close to 1.18.11 Grasslands (and exhibiting ecotone elements)

UNESCO Major Ecosystem Types (1996).

Temperate Grasslands, at the edge of Boreal Needleleaf Forests or Woodlands.

Canadian Ecological Land Classification (1996).

Boreal Plains Ecozone, Mid-Boreal Uplands Ecoregions 153 & 154.

Prairies Ecozone, Aspen Parkland Ecoregion 161.

Natural Regions of Manitoba.

Western Upland (No. 7).

The enclosed map has been prepared on the basis of information available at the Secretariat. Indicate if the biosphere reserve is correctly sited and whether it lies within the appropriate ecosystem type.

Not applicable

Topography of the region

Briefly describe the major topographic features (wetlands, marshes, mountain ranges, dunes, landscapes, etc...).

The biosphere reserve is in a transition area between two (of the four) main physiographic regions of Manitoba, the Manitoba Lowlands and the Southwest Uplands (on the edge of the Saskatchewan Plains), and ranges in altitude from about 304-755m. Its main topographic feature is a portion of the Manitoba Escarpment which rises conspicuously some 427m from the lowland; the most abrupt elevation change is some 365m over a 6 km distance in the northeast corner of the national park. This escarpment formed the western shore of glacial Lake Agassiz (about 12 kybp - thousand years before present - to 7 kybp), and is also the eastern boundary of Riding Mountain National Park. The uplands plateau portion of the biosphere reserve extends almost 106 km to the west. It is characterized as a patchwork of some 1,940 shallow ponds and lakes, hills, wet meadows, and aspen-spruce forests situated on glacial till and hummocky ground moraines. The lowlands to the east and north are old lake bottom sand and clay deposits, all now under cultivation. Headwater sources for 13 watersheds arise on the higher plateau, and flow north and east off the escarpment into surrounding agricultural areas.

Climate

Briefly describe the climate of the area using one of the common climate classifications.

Ecoclimatic Regions of Canada (1989).

The biosphere reserve lies within the Subhumid Low Boreal Ecoclimatic Region and the Transitional Grassland Ecoclimatic Region. The climate is characteristic of the Canadian prairies, with considerable variation in seasonal temperatures and precipitation from one year to the next. Winters are characterized by a series of cold fronts moving across from the north and north-west. Summers are warm with frequent thunderstorms. The average growing season is 72 days annually.

Average temperature of the warmest month: 16.2° C

Average temperature of the coldest month: -20.7° C

Mean annual precipitation: 546 mm (about 160mm as snow) recorded at an elevation of 622 m.

Data are from Wasagaming, the townsite within Riding Mountain National Park at 50° 30'N, 99° 58' W and are Canadian Climate Normals for the period 1951-1980. Comparable data from Dauphin, a small city in the lowland section of the biosphere reserve at 51° 6' N, 100° 3' W are: Average warmest 18.5° C; average coldest -19.5° C; annual precipitation 496 mm of which 149 mm is snow; recorded at an elevation of 304 m.

Geology, geomorphology, soils

Briefly describe the main land formations and characteristics.

The foundation geology dates from the Precambrian period of about 3.5 billion years ago and represents major periods of orogeny and ocean intrusions associated with plate tectonics. The biosphere reserve is underlain more immediately by the Riding Mountain formation of grey shale, non-calcareous local ironstone, with bentonite (volcanic ash origins) near the base. This was formed during the Upper Cretaceous Epoch, some 70-75 million ybp, and is up to 300 m thick. The pre-glacial Cretaceous shales covered most of southern Manitoba 55 million ybp, and land sloped to the east from the Rocky Mountain formations much further to the west. Rivers flowed east and eroded these shales, but not the Manitoba Escarpment which was a pre-glacial feature of erosion-resistant hard gray Odanah shale derived from volcanic ash and remains of siliceous micro-organisms. This escarpment forms the eastern most edge of Cretaceous rocks in Manitoba.

There have been several periods of glaciation, the most recent being the Wisconsinan which covered this part of Manitoba from at least 23 kybp to 11 kybp before melting away by about 8 kybp. Glacial Lake Agassiz took various configurations with the progressive retreat and subsequent reformation of the Red River Lobe of the Laurentian ice mass. The lake formed about 12 kybp and extended west to the edge of the escarpment. It reached its maximum extent between about 10 and 9.5 kybp (when its surficial area was estimated to be in the order of 350 k km²). With ice thinning and retreat alternating with occasional major ice advances, the drainage outlet of Lake Agassiz changed several times over its 4k year history, and by 8 kybp it drained away rather quickly (geologically) to the north with the final disintegration of the Laurentian ice mass. Surficial geomorphology reflects erosion patterns, incised gorges, meltwater channels, ground moraines and widespread till deposits with a thickness of more than 200m in some locations. Dominant soils are gray luvisolic formations in forested areas and chernozems in grasslands and agricultural lowland areas. Most soils are of calcareous origin and are typically alkaline with a pH between 7.0 to 9.0. Given the topography, there are also local occurrences of regosols, gleysols, and organic soils. Soils associated with remnant grasslands are slightly acidic with a pH in the range of 6.4.

Significance for conservation of biological diversity: habitats and characteristic species

List main habitat types (e.g. humid tropical forest, savanna woodland, alpine tundra, coral reef, seagrass beds) and land cover (e.g. residential areas, agricultural land, grazing land).

Please see Figure 2, a general vegetation classification for the biosphere reserve, and Figure 3, a satellite image which illustrates the contrast between the national park “core area” and surrounding agricultural lands.

[a] Type of habitat: Forest ecosystems

Given the topography and landforms of the biosphere reserve (i.e. portions of the Manitoba lowlands, escarpment, and Saskatchewan upland plains), three main forest associations and at least ten forest stand types have been recognized.

1. Mixedwood.

Main species: This association is dominated by aspen (*Populus tremuloides*), balsam poplar (*P. balsamifera*), white spruce (*Picea glauca*), with patches of white birch (*Betula papyrifera*) and balsam fir (*Abies balsamifera*) on well-drained sites; black spruce (*Picea mariana*) and tamarack (*Larix laricina*) on wetter sites; and jack pine (*Pinus banksiana*) on well-drained sandy sites found in the south east portions of the national park (core area). Aspen-dominated stands comprise about two-thirds of this association.

2. Eastern hardwoods.

Main species: This association is characterized by white elm (*Ulmus americana*), Manitoba maple (*Acer negundo*), mountain maple (*Acer spicatum*), green ash (*Fraxinus pennsylvanica*) and bur oak (*Quercus macrocarpa*). It occurs along the east and northern edges of the national park and dominates the riparian and floodplain sites below the escarpment. It is deemed to be an atypical

remnant forest association that occurs because of localized microclimatic and edaphic conditions.

3. Aspen and oak parklands.

Main species: This association lies in a zone between the boreal forests and prairies, and is believed to be maintained largely by wildfire. The aspen occurs in patchy, somewhat even-aged clonal stands surrounded by grasslands. Depending on soil conditions, balsam poplar and bur oak also occur.

Main human impacts: In the late 19th century the forests were heavily cutover, and between 1885 and 1890 repeated large fires destroyed forests in the western part of what is now the national park. Creation of the Dominion Forest Reserve in 1895 prevented (or at least discouraged) settlement inside the area, but logging and hunting were unregulated until the reserve was brought under the Dominion Forest Resources Act in 1906. A 1914 report noted that the logging was largely confined to spruce which had become exhausted, and that less than 25% of the area of the forest reserve could be described as "timbered". The Forest Reserve was subsequently replaced by the Riding Mountain National Park in 1930. Logging ceased under national park management and fires were suppressed wherever possible. This has allowed considerable regeneration of the mixedwood forest association. In the transition area / zone of cooperation, much of the aspen parkland has been cleared for agriculture, although more examples of it remain in areas adjacent to the south side of the national park than elsewhere.

Hunting occurs all around the national park over a ten month season. The long season is intended to spread the intensity of different kinds of hunting pursued by different categories of hunters for different mammals over a longer period in order to avoid congestion and possible disputes with landowners. The merits of this are much discussed locally. Poaching of large mammals and illegal fishing occurs. Lucrative markets are reported for shed antlers (elk and moose), bear gall bladders, and certain insects such as swallowtail butterflies, *Papilio spp.* The provincial government outlawed trade in bear parts about a decade ago. Park wardens have put considerable effort into anti-poaching activities in and around the park and have tried to determine whether poachers are mainly

isolated individuals or are linked with criminal organizations engaged in illegal trade.

Relevant habitat management practices: Forest protection since 1930 has been under national park policies, including very effective fire suppression over the past half century. The need for controlled burns was recognized by 1996 and prescribed fires are to become a component of vegetation management in order to restore the “ecological integrity” of the park. Considerable work is underway to investigate the fire history of the area as well as the ecological effects of fire in different seasons of the year. The provincial wildlife authorities consult with local landowners and the national park (in part through the Riding Mountain Regional Liaison Committee) on hunting regulations proposed for each year. They and park officials also cooperate on aerial surveys to estimate the population size of elk/wapiti (it is the largest wild herd in Manitoba, ~5,000 animals) and moose in the area.

[b] Type of Habitat: Grassland ecosystems

Main species: The native grasslands occur as very small remnants within the national park core area, constituting only about 2.5% (or ~7,400 ha) of habitat. Some 2,058 ha of it is dominated by plains rough fescue (*Festuca halli* - part of the *F. scabrella* complex) in association with a large number (>100 species) of grasses and forbs.

Main human impacts: These grasslands once occurred throughout southern Manitoba, especially during the hypsithermal warming period some 3.5 kybp. European settlement since the late 19th century has transformed almost all of them into farmland, and only small remnants occur such as those within the national park. There was widespread grazing of cattle and horses on the native prairies within the national park until the late 1960s, and some alien species of plants such as Kentucky bluegrass (*Poa pratensis*) and smooth brome grass (*Bromus inermis*) were accidentally introduced during this period. Grasslands were also viewed as wasteland in the early years of the Dominion Forest Reserve, and a number of them were replaced with conifer plantations between

1911 and 1930, or deliberately used for gravel extraction for the construction of roads, trails or facilities.

Relevant habitat management practices: General protection since 1930 under national park policies. Fire suppression, along with the cessation of livestock grazing by the 1960s, have been accompanied by encroachment of aspen parkland vegetation into some pockets of grassland. This encroachment has been documented with the help of grassland transects/quadrats established in 1973 and re-surveyed in the mid-1990s. Means of eradicating invasive plants, including the old conifer plantations, are being considered, and some small prescribed burns have been conducted on grassland sites within the park. The current management plan for the national park has designated a 185 ha fescue prairie site for “special preservation” (Zone 1).

[c] Type of Habitat: Agricultural ecosystems

Main species: Introduced grain cereals, forage crops, canola, lentils as well as beef and dairy cattle, horses, hogs and sheep.

Main human impacts: The original (pre-European) grasslands, aspen parkland and mixedwood forest habitats and associated wetland areas have been replaced to a greater or lesser extent with a mosaic of annual cropland, perennial forage, and summer fallow. The 10 km band of land immediately adjacent to the national park is about 93% farmland, although a lot of it is maintained in forage crops, including some provincial Crown (public) land leased to private landowners. There is also some variation in the extent to which land immediately adjacent to the national park has been cleared and subjected to intensive agriculture; there is a much greater mosaic of forest and pasture lands along the southern side of the national park that can serve as wildlife habitat, especially for elk/wapiti. Along the south side of the Park, within 5 km of the Park boundary, only about half of the land has been developed for agriculture, the rest being essentially in its natural state. Some recent changes in agricultural policy, including elimination of grain transportation subsidies, have led to reductions in grain production and increased livestock production in the transition area / zone of cooperation of the biosphere reserve. Elk ranching was introduced into the

area in 1995 as part of an agricultural diversification scheme and four elk ranches have started up near the national park.

A new \$90 million oriented-strand board plant was opened by Louisiana-Pacific in 1996, about 120 km north of the national park in the Swan River valley at Minitonas. The company's forest management license includes all or part of five provincial forest management units, including the Duck Mountain Provincial Forest. One of the units is immediately adjacent to the north side of the national park. This has created a market for aspen from private and crown lands with a resulting increase in new extensive logging.

Relevant habitat management practices: Economic conditions facing the agricultural sector are the main factors influencing local management practices. There are a number of agricultural assistance programs available from the provincial government. Local conservation districts offer advice and some funding to develop farm plans, rural water supplies, streambank and other erosion control works, wildlife habitat protection and the planting of shelterbelts. Elk ranching just outside of the national park has raised concern about poaching and disease control, and a facility to monitor the baseline health of ungulates was established in the park in 1999, following detection of a few cases of bovine tuberculosis in wild elk.

Habitats of special interest:

Describe and indicate location of habitats which are unique or exceptionally important from the point of view of conservation.

The forest ecosystems within the core area of the biosphere reserve (under the jurisdiction of Riding Mountain National Park) maintain a near-complete ecosystem of larger native mammals including (especially) black bear (*Ursus americanus*), gray wolf (*Canis lupus*), coyote (*C. latrans*), Lynx (*L. canadensis*), moose (*A. alces*), elk/wapiti (*Cervis canadensis*), white-tailed deer (*Odocoileus virginianus*), beaver (*Castor canadensis*) and snowshoe hare (*Lepus americanus*). There have been recent re-introductions of pine marten (*Martes americana*) and fisher (*M. pennantii*). The current status of wolverine (*G. gula*) and cougar (*Felix concolor*) are not known, but they are presumed to be rare.

There is some concern about whether human-caused mortality of bears through bear-baiting around the perimeter of the national park is excessive. The wolf population in the park seems rather small in comparison with available prey species, and the continued shooting of wolves outside of the park is also a matter of some concern. Beaver are a perennial nuisance whenever they disperse outside of the national park (core area) and cause flooding in agricultural areas (transition area / zone of cooperation). The biosphere reserve has fostered demonstration projects over the past year on ways to control this problem by the installation of low-cost water flow devices (popularly known as “beaver deceivers”) to maintain water flow through road culverts and reduce road maintenance costs. Generally, wardens in the national park view the impacts of agriculture on wildlife in the surrounding region to be “widespread, pervasive, and inexorably increasing”; this is especially so along the north side of the national park. More cooperation and coordination among agencies and jurisdictions would be required to address this.

MABFAUNA lists the number of vertebrate species for the RMBR as 56 mammals, 255 birds, 5 fish, and 10 reptiles and amphibians. About 150 species of birds breed or summer in the national park. The park also has a relatively rich diversity of 69 species of butterflies and 13 species of skippers among the insect populations. MABFLORA reports 665 species of vascular plants from the biosphere reserve, and at least 17 are considered to be rare in Manitoba. (<http://ice.ucdavis.edu/mab/>).

There is a need for up-dated biological inventories, especially for invertebrates and non-vascular plants. A rare clone of triploid aspen poplar has been found on the east side of the national park; it is one of only seven known locations in North America and the only one so far identified in Canada. The national park has given a “special preservation” (Zone 1) designation to hibernacula (winter denning and spring breeding areas) of the red-sided garter snake (*Thamnophis sirtalis parietalis*) on the east side of the park.

Endangered or threatened plant and animal species:

Identify species (with scientific names) or groups of species of particular interest for conservation, in particular if they are threatened with extinction.

Species that were extirpated from the region of the biosphere reserve between the time of the first European settlement and the establishment of the national park, i.e. from about the 1870s to 1930, include American bison (*B. bison*), plains grizzly bear (*Ursus arctos*), fisher (*Martes pennanti*) and pine marten (*M. americana*). Fisher and marten have since been re-introduced into the national park core area where they seem to be thriving. A small “display herd” of about 35 bison is maintained in a special compound area within the national park.

The Manitoba Conservation Data Centre has identified the conservation status of rare or uncommon species (S1-S3) for the two ecoregions represented within the biosphere reserve as follows:

	Mid-boreal uplands	Aspen parklands	Total*
Plants	36	99	128
Animals	1	8	8

* Some species were listed in both ecoregions.

[Note: S-1: “Very rare in the province (5 or fewer occurrences, or very few remaining individuals. May be vulnerable to extirpation. S-2: “rare...from 6 to 20 occurrences... vulnerable to extirpation”; S-3. “Uncommon in the province (from 21 to 100 occurrences”)].

It is not certain at this point how many of these S-1 to S-3 species actually occur within the biosphere reserve.

Species of traditional or commercial importance:

Indicate the uses(s) of these species or varieties.

Aboriginal peoples made extensive use of mammals, waterfowl, fish and a variety of plant materials as an integral part of their hunter-gatherer culture and economy. Ethnobotanical studies have identified over 150 species of plants used

by aboriginals in Manitoba as a source of greens, roots and tubers, berries and seeds, sap and cambium. Sports fishing for lake trout (*Salvelinus namaycush*), speckled trout (*S. fontinalis*), rainbow trout (*Salmo gairdnerii*), walleye (*Stizostedion vitreum*) and pike (*Esox lucius*) is popular among local residents and visitors, as is hunting for deer, moose, elk, and bears outside of the national park. There is considerable local use of poplar and spruce trees for fuel and rough lumber.

IV. ZONATION

Names of the different areas

Indicate the names of the different areas which make up the core area(s) and buffer zone(s).

Core area and buffer zone: Riding Mountain National Park.

Transition area / zone of cooperation: Municipalities adjacent to the national park that are eligible for membership in the Riding Mountain Regional Liaison Committee, i.e. the Rural Municipalities of Shellmouth-Boulton, Clanwilliam, Dauphin, Gilbert Plains, Grandview, McCreary, Ochre River Park South, Rosedale, Rossburn, Shoal Lake, Silver Creek, Ste. Rose, and Strathclair; the the City of Dauphin and the Town of Grandview; and the Villages of Gilbert Plains, McCreary, Rossburn, Shoal Lake, and Ste. Rose.

Spatial configuration

A BIOSPHERE RESERVE ZONATION MAP of a relatively large scale (1:25,000 or 1:50,000) showing the delimitations of all core area(s) and buffer zone(s) must be provided. Also indicate the approximate extent of the transition area(s).

Size of the terrestrial Core Area(s):	270,800 ha.
Size of the terrestrial Buffer Zone(s):	26,800ha.

Approximate size of terrestrial Transition Area(s) 1,034,200 ha

Brief justification of this zonation (in terms of the various roles of biosphere reserves) as it appears on the zonation map.

Riding Mountain National Park serves as the “core area” for the biosphere reserve. The nomination application in 1985 noted five different zoning categories in the 1977 Master Plan for the National Park, and its subsequent elaboration. Much of the park remained as wilderness area which was strictly protected, and visitor use and services were concentrated around the townsite of Wasagaming just inside the park boundary.

The 1996 Management Plan reaffirms this general arrangement. One of the zoning categories (Zone 3, natural environment) has been dropped. Zone 1, special preservation, and Zone 2, wilderness, together constitute some 91% of the area of the national park, i.e. 270,800 ha, which also serves as the “core area” for the biosphere reserve. The “buffer zone” is formally defined by two zoning categories within the national park (as in the original nomination), i.e. Zone IV, outdoor recreation with motorized access, and Zone V, the Wasagaming townsite, which together constitute about 26,800 ha. This serves as a “buffer” by concentrating a large proportion of human recreational and seasonal uses and services, especially in and around the townsite.

The “buffer zone” is a very contentious concept among people living in the transition area / zone of cooperation of this biosphere reserve. There appear to be a number of historical reasons behind this, so the term is avoided and efforts instead are going into building cooperation and trust among private landowners.

The “transition area” (usually referred to as the “zone of cooperation” in Canadian biosphere reserves) can be formally identified by the geographic extent of the 14 rural municipalities that are immediately adjacent to the national park, and constitute the members of the Riding Mountain Regional Liaison Committee (RMRLC). This committee was established 20 years ago as a framework for considering many local issues associated with “park values” in the context of a regional agricultural economy.

Please see “Zoning for Riding Mountain National Park” (Map 4, page 30) in the park Management Plan (Annex 1), and Figure 4, Outline map of the Riding Mountain Biosphere Reserve showing the rural municipalities that constitute the transition area / zone of cooperation. This map shows 15 municipalities, but two have since been merged.

Note: Given the size of the biosphere reserve (over 1.3 million ha) small scale maps are used here. Complete coverage of the biosphere reserve at the requested scale of 1:50,000 would require a set of 22 maps from the Canadian topographical map series.

V. HUMAN ACTIVITIES

Population living in the reserve

Approximate number of people living within the Biosphere Reserve (permanently and seasonally).

Core Area(s): No permanent residents. The national park maintains eight warden stations located at different points throughout the park in the core area, and some wardens have their families with them. Total seasonal population might range from 8 to about 30 people.

Buffer zone: Permanent residents are in the order of 10-12 people, sometimes fewer. Seasonally, with people who own cottage leases and others serving tourism, the seasonal population could reach an estimated 3,000-3,500 people. Peak summer weekends bring from 10k to 15k people into the townsite area.

Transition area: The 1996 national census recorded 28,374 people in the rural municipalities, cities and towns, and four Indian Reserves in the region designated as the transition area / zone of cooperation. The population has declined a little over the past decade. There is some seasonal influx of visitors, especially around the south entrance area of the national park, and for seasonal festive occasions in rural towns and villages.

Brief description of local communities living within or near the Biosphere Reserve.

The City of Dauphin within the transition area / zone of cooperation is the largest community (1996 population: 8,266).

Indicate ethnic origin and composition, minorities etc., their main economic activities (e.g. pastoralism) and the location of their main areas of concentration, with reference to a map if appropriate.

Decendents of the Ojibwa aboriginal "First Nations" live in four relatively small Indian Reserves within the "transition zone". The rest of the area was settled mainly by people of Ukrainian, English and Scots, French, or Scandinavian descent who came from eastern Canada, the United States, or directly from Europe. The region supports a rural agricultural economy supplemented by tourism associated mainly with the national park.

Name(s) of nearest major town(s).

Brandon: about 90 km to the south. Population: 39,175 (1996 census)

Cultural significance of the site

Briefly describe the Biosphere Reserve's importance in terms of cultural values (religious, historical, political, social, ethnological).

Prior to European settlement, the area was used by aboriginal hunter-gathers, and one archaeological site in the biosphere reserve has artifacts dating back about 4,000 years. About 50 archaeological sites have been identified within the national park but more inventory and excavation work remains to be done. Establishment of the Dominion Forest Reserve (forerunner to the National Park) in 1895, soon after the first European settlers entered the area, was to help assure a supply of wood for the construction of railways and dwellings in open grasslands areas. A recent inventory by an eco-tourism project being coordinated by the biosphere reserve identified 37 cultural or heritage sites of local interest, most associated with early European settlement.

Use of resources by local populations

Uses or activities in the Core Area(s): Outdoor recreational activities such as camping, hiking, horse-riding, wildlife viewing.

Main land uses and economic activities in the Buffer Zone: Full-scale recreation and tourism service facilities along with activities such as hiking, cycling, fishing, swimming, camping, canoeing.

Main land uses and major economic activities in the Transition Area(s): Agriculture, such as cereal crops, rapeseed, flax, lentils, and forage crops; livestock farming, such as beef or dairy cattle, horses, hogs and sheep. Four elk ranches and one bison ranch exist relatively close to the national park.

Possible adverse effects of uses or activities in the transition area(s) and remedial measures taken:

Land clearing and agricultural pursuits have extended directly to the boundaries of the national park in most locations. Streams flowing from the park periodically flood agricultural lands, and beavers dispersing outside of the park can become a nuisance by damming road culverts or drainage ditches. Direct access to park boundaries has led to questionable hunting practices such as bear-baiting. Some watershed restoration projects have been carried out to restore natural flow patterns of streams through agricultural areas. Various beaver control and damage compensation schemes have been in place for a number of years. The Riding Mountain Regional Liaison Committee and/or the biosphere reserve management committee provide means for addressing these and other issues.

If known, give a brief summary of past/historical land uses(s) of the main parts of the Biosphere Reserve:

Pre-European:

In the millennia immediately following deglaciation (around 10 kybp) the Riding Mountain area was rather quickly covered by spruce forests while the region east of the Escarpment was flooded by glacial Lake Agassiz. There is evidence of a warming trend which began at about that time and lasted until about 6 kybp. During this period the vegetation in the Riding Mountain area became more prairie-like, with grasses, forbs and shrubs predominating; Lake Agassiz also retreated to the north-east. The area to the south of Riding Mountain was part of an extensive prairie region. There is some evidence (mainly an array of “projectile points” artifacts) of an “Early Plains Archaic” period of hunter-gatherers who were assumed to have come into the region from the south or west during the period from 9-7 kybp; artifacts also indicated that they visited the shoreline areas of glacial Lake Agassiz.

Following a cooling period after about 5 kybp, the grassland vegetation in the Riding Mountain area gradually gave way to some deciduous and coniferous forest by about 3-2.5 kybp. Glacial ice had disappeared from the whole region, so a relatively large territory was available for forest-adapted hunter-gatherers, who could move along rivers and lake systems and utilize fish and waterfowl as well as forest mammals.

In the late pre-historic period, from about 2.5 kybp, there is evidence from south-eastern Manitoba of a diffusion of peoples and cultures from the Middle Missouri area to the south and the Woodlands cultures to the east. By about 500 ybp, southern Manitoba was occupied by forest and plains dwelling Cree people and the prairie-dwelling Assiniboines associated with bison as their major resource. The two groups were thought to have overlapped, especially during seasonal use of aspen parklands habitat by the bison, and apparently maintained a mutual alliance in the face of incursions by the Ojibwa (Saulteau) from further east, or the Sioux (Dakota) from the south, both of whom raided and traded in the region from time to time. The biosphere reserve area was most likely occupied by the Plains Cree people during this period although it was likely visited by both the Ojibwa and Assiniboines. By 1740, the Crees were predominant along the northern wooded area of the present national park while the Ojibwa and Assiniboines camped to the south of the park area during the summer. The Ojibwa were also known to have camped in the Clear Lake area (now within the national park). Other Ojibwa people gradually moved into the woodlands area

from further east so that the Ojibwa were the aboriginals that European fur-traders encountered when they first came to the area of the biosphere reserve. The Assiniboine and Cree were thought to have moved further west and south on the central plains along with the bison, which were subsequently extirpated in this part of North America by 1880.

European Exploration:

The period of exploration in the general region of the biosphere reserve came after the establishment of the Hudson Bay Company in 1670 which was given exclusive fur trading rights over the extensive Hudson Bay drainage basin (Ruperts Land) by the British Crown. Control over the fur trade in the Hudson Bay region was contested by the French from about 1686 until the Treaty of Utrecht in 1713; this was all part of a much larger struggle between Britain and France for influence in North America and elsewhere. The first European explorers moved south and west from Hudson Bay, beginning in the 1690s in order to extend the fur trade into the interior and search for routes to the west. Given their reliance on river systems for travel, they most likely did not directly visit the area of the biosphere reserve. Francois de la Verendrye, who was associated with trading interests in Montreal, explored the region in the 1730s in search of trade routes to the west. In 1739 he came from Winnipeg to the Dauphin area (now within the transition area / zone of cooperation in the biosphere reserve). He established a trading post at Fort Dauphin in 1741, and is officially considered to be the first European visitor to reach the area of the biosphere reserve.

Independent North West Company and Hudson Bay Company trading posts were established in the larger region around the present biosphere reserve from about 1780 to 1821 when the two companies merged and carried on throughout the 19th century. The name "Riding Mountain" came into use early in the 19th century to indicate that horses were the best means for travelling along networks of aboriginal trails above the escarpment. The Hudson Bay Company maintained a winter outpost (Fort Ellis) on the east side of Lake Audy (now within the national park) from 1864 until it was burned down in 1868. The post was then rebuilt in 1870 and another was built at Riding Mountain House south of the

national park area; it was maintained until 1895 by which time the fur trade had declined considerably.

European Settlement:

Early European settlement in Manitoba began in 1811 with lands acquired by Lord Selkirk in the Red and Assiniboine Rivers within what is now generally the Greater Winnipeg area. Settlement subsequently became the focus of disputes with aboriginals and later the scene of early struggles for self-government and recognition of the rights of Metis people of mixed native and European origins. Following Confederation (the formation of Canada) in 1867 and the purchase of Ruperts Land from the Hudson Bay Company by the Dominion Government in 1869, the first Province of Manitoba (much smaller than the present day province) was created in 1870. Treaties were signed with aboriginal groups and European settlement was promoted westwards along the line of the transcontinental railroad (the Canadian Pacific) which was constructed across southern Manitoba in the 1880s. All of this was occurring some 100-250 km south and east of the present day biosphere reserve. Bison, which had been the mainstay of the Assiniboine aboriginal economy and culture, were extirpated from this area by 1880.

Treaty Number 2, which was signed with the aboriginals in August 1871, covers the area of the biosphere reserve, and established "Indian Reserves" in it. The first settlers (or squatters) came into the southern part of the present biosphere reserve in the 1870s, mainly from or through Minnedosa along an overland trail west by the Little Saskatchewan River. The original land surveys, which laid out township grids, each with 36 sections of land (one section = 1 square mile), were carried out between 1873 and 1876 for the southern portion of what is now the biosphere reserve. The first North West Mounted Police posts were established in 1874 and 1875. The pace of settlement was beset by problems of finding suitable farmlands in areas with poor soils and drainage. There was also some speculation associated with the location of an anticipated rail link with the transcontinental CPR to the south, and its location with reference to the river. Settlement continued rather slowly, but by 1879 much of the good land south and east of the present biosphere reserve was taken and settlers were moving west through Erickson, Elphinstone and Rossburn from 1878 to

1881. In addition, by 1881 some farmers had started to move up the Riding Mountain slope, others were on the plateau above, and a few had crossed through the area to settle on lands to the north of the escarpment in the Dauphin area. The Strathclair Trail was developed as a wagon trail to facilitate this movement across what is now the national park during the 1880s, but it was subsequently abandoned in favour of what has now become provincial highway # 10.

Squatters began to move into the Lake Dauphin area from Gladstone to the south-east in 1883. A land survey on behalf of the Dominion government in 1887 commented favourably on the agriculture potential of the Dauphin area, which is located on the former lake bed of glacial Lake Agassiz. Road and rail connections were constructed by 1890 and 1896 respectively, the Rural Municipality of Dauphin was created in 1898, and the City of Dauphin was incorporated in 1901. A railway was built west of Dauphin, starting in 1904, and this led to settlements such as Ashville, Gilbert Plains, and Grandview, along the north side of what is now the national park, in the transition area / zone of cooperation. By 1910, a rail connection had been built along the west side as well, thereby “surrounding” the park area.

The Forest Reserve and National Park

When the Riding Mountain timber reserve was designated in 1895, it prevented further settlement in the area of the reserve but did not prevent uninhibited logging and some associated fires. The reserve was placed under the new Dominion Forest Resources Act of 1906, and a Game Preserve was also designated within it. Regulations were brought in to restrict logging and hunting, but livestock grazing was encouraged in the reserve. Forest rangers were recruited, ranger cabins were built, telephone communications were installed, service trails were built, and illegal squatters in the reserve were moved out. The Wasagaming townsite at Clear Lake was founded in 1908, and by about 1910, some interest was expressed within the Dominion government to make the forest reserve into a national park. The first cottage lots in Wasagaming were developed in 1916-1917. The Reserve was declared to be a National Park in May 1930, and the park was officially opened in July 1933.

Tourism

If tourism is a major activity, how many visitors come to the Biosphere Reserve each year?

The only readily available data come from the national park. The number of people estimated to drive in or through the park reached about 1.2 m (million) annually by 1989-1990 and has ranged between about 1.25 m to 1.39 m between 1995 and 1998; the corresponding number of vehicles ranged from about 543 k to 585 k. "Visitors", defined as people who visit the Wasagaming townsite area and/or who apply for recreation permits ranged from about 351 k to 405 k between 1995 and 1998, while "visitor days" have been estimated to range from about 1.1 m to 1.53 m over the same period. Over the previous decade (1988-1998) the number of first-time visitors increased from 8% to 18% of the total, and more came from outside of Manitoba. Statistics from the national park's Visitor Centre in Wasagaming for 1998 indicated that the origin of visitors was:

National: About 61% from Manitoba, 11% from Saskatchewan (the adjacent province whose border is about 35 km due west of the western edge of the national park), and 14% from the rest of Canada.

Foreign: About 7% from the United States, and 7% "international".

Type(s) of touristic activities (study of fauna and flora, recreation, camping, hiking, sailing, horseriding, fishing, hunting...).

All of the above plus swimming and cross-country skiing. The national park itself has about 200 km of roads and another 400 km of trails.

Tourist facilities and description of where these are located.

The Wasagaming townsite at Clear Lake, just inside the southern boundary of Riding Mountain National Park, provides a variety of visitor services including 627 individual campsites; 240 group tenting sites; 158 trailer sites; a

few cottages (in-holdings); and 32 recreational trails. There are also several full-service motels, restaurants and shopping facilities at the centre of the townsite. Only a modest expansion of this is foreseen in the Wasagaming Community Plan, 2000. Altogether for the biosphere reserve, a recent inventory identified 66 different accommodations (hotels, motels, inns, bed and breakfast enterprises, farm holidays), 30 campgrounds (including provincial, private and First Nations), and 24 tourism operators or outfitters.

Income and benefits to local communities

Indicate for the activities described above whether the local communities derive any income directly or indirectly and through what mechanism.

The peak tourist season is from early July to mid-August, together with long holiday weekends in May through September. The national park management plan (1996) notes that an estimated \$50 m is generated annually for the local and regional economy from park-related tourism and other economic activity.

A 1993 study tried to assess the economic benefits associated with viewing large mammals (black bear, elk/wapiti, moose, deer, and bison) in the national park based on surveys of visitors' expressed interest in these mammals, their expenditures, and their expressed willingness-to-pay for these viewing opportunities. For those visitors relating to the large mammals, average daily expenditures were in the range of \$81-84 for park visitors and non-permanent residents (and \$16 per day for permanent residents) and their average willingness-to-pay was in the order of \$235 above an average total expenditure of \$835 for park visitors. This range of figures can be extrapolated by using different categories of visitors, and this suggests that the non-consumptive economic benefits attributable mainly to these wildlife species lies in the range of \$11m from residents in the area to almost \$300m if applied to all visitors (1993 estimates).

VI. RESEARCH AND MONITORING PROGRAMMES

Brief description and list of past research and/or monitoring activities.

The Wilson Creek Experimental Watershed was established in 1957 to investigate possible solutions for headwater causes of flooding and erosion on agricultural land lying below the escarpment on the eastern side of the biosphere reserve. The watershed lies partly within the national park and partly within the Turtle River Watershed Conservation District immediately to the east of the park; the experimental watershed was mainly within the park. Various engineering solutions such as flood retention reservoirs, channel clearing and straightening, and bank restoration work were investigated along with revegetation of eroded areas. However, few of these were deemed to be feasible. More recent work has examined possibilities for restoring the natural flow channels through agricultural lands by structural modifications of drainage ditches.

There have also been a series of studies on the water quality and related issues of the Clear Lake watershed, and of the possible effects of spills from the town of Wasagaming's sewage lagoon into the lake. Population studies of wolves, black bears, moose and elk have been conducted within the national park, and winter aerial censuses of moose and elk have been conducted for some time.

Although considerable work has been done in the national park over the years, bibliographic compilations and/or syntheses are either somewhat dated or incomplete. Some work is being done to update the Resource Description and Analysis documents for the park which were last compiled in 1984, and to provide background analyses for different components of the vegetation management plan for the park which is needed to help meet the statutory requirement to manage for "ecological integrity". A staff person for the biosphere reserve recently started to compile a computerized bibliography of information relating to the biosphere reserve, but this is not deemed to be a high priority.

Brief description of on-going research and/or monitoring activities.

The items below are the main examples of recent or current work, but they are not listed in some presumed order of importance.

Abiotic research and monitoring:

Erosion impacts of streams flowing off the escarpment.

Water quality in 15 lakes, and hydrological monitoring for the Clear Lake watershed and Wilson Creek; some other discharge or water quality monitoring sites are being maintained in the zone of cooperation.

Possible climate change trends through analyses of available meteorological records in the area.

Pollen analyses from lake bottom sediments to describe vegetation changes over the past 12 kybp.

Biotic research and monitoring:

Winter aerial surveys of elk, moose, and beaver caches in and around the national park as a basis for population estimates.

Nesting data on herons (*Ardea herodias*), bald eagles (*Haliaeetus leucocephalus*) and ospreys (*Pandion haliaetus*), and resumption of a breeding bird survey route in the park in 1995 after a lapse of about 20 years.

Creel surveys for fish

Monitoring cadmium uptake in liver and kidneys of moose and elk.

Establishment of an ungulate disease testing facility in the park, especially to test for bovine tuberculosis in elk, and monitor baseline health of ungulates generally.

Movement and habits of black bears.

Study of habitat suitability for lynx.

Quantification of change in habitat diversity and complexity in the national park.

Establishment of a Smithsonian Institution biodiversity monitoring plot (SI/MAB) in the eastern hardwoods forest association, and plan to establish a similar plot in a grasslands site.

Grassland ecology, and rough fescue vegetation assemblages in and adjacent to the national park; grassland restoration project, Grasshopper Valley (in national park).

Structure and dynamics of bur oak (*Quercus macrocarpus*) stands in the national park.

Socio-economic research:

Study of land use change since 1873 in the Rural Municipality of Clanwilliam (343 km²) through the use of original land survey records, air photos, and satellite imagery.

Introduction of GIS and historical land use data to five municipal offices.

GIS mapping of location of cattle herds as background information for monitoring elk/cattle interactions and related issues of animal health.

Demonstration of portable sawmills for on-farm use of poplar wood.

Study of public attitudes towards wildlife, especially wolves.

Cooperative beaver management.

Aboriginal or traditional uses of the park area.

Historical timber harvesting and forest fires (literature review).

Effectiveness of a 1972-1979 alternative land use program along the Manitoba escarpment (RM Rosedale) through air photo analyses of land use change, questionnaire survey and interviews.

Estimated number of national scientists participating in research within the Biosphere Reserve on a permanent or occasional basis.

5 or 6.

Estimated number of foreign scientists participating in research within the Biosphere Reserve on a permanent or occasional basis.

Occasional, depends on topic of interest.

Research station(s) within the Biosphere Reserve.

Two field stations, no longer operated.

Permanent research station(s) outside the Biosphere Reserve.

Facilities at the University of Manitoba, University of Winnipeg and Brandon University; Freshwater Institute, (federal) Winnipeg; some provincial government facilities maintained by the Department of Agriculture and Department of Conservation.

Research facilities of research station(s) (meteorological and/or hydrological station, experimental plots, laboratory, library, vehicles, computers etc...).

Meteorological station; hydrological monitoring (Wilson Creek and Clear Lake); grassland quadrats and transects; SI/MAB forest plot; GIS equipment and capabilities; some vehicles, computers, library and laboratory facilities maintained by the national park; biosphere reserve office and computers (in Onanole).

Other facilities (e.g. facilities for lodging or for overnight accommodation for scientists etc...).

Available at the Wasagaming townsite, local bed and breakfast establishments close to the national park, or in various villages/towns in the transition area.

Indicate how the results of research programmes have been taken into account in the management of the biosphere reserve

The Wilson Creek studies have served as a prototype for managing other streams flowing off the escarpment. GIS theme mapping is used for reference in different municipal offices. Aerial surveys are used to set seasonal hunting regulations. Review of experience elsewhere, discussed at conferences attended by people from the biosphere reserve, led to the demonstration of water levelling devices that reduce damage caused by beavers damming road culverts.

VII. EDUCATION, TRAINING AND PUBLIC AWARENESS PROGRAMMES

Describe the types of activities related to

Environmental education and public awareness:

The national park maintains a well-developed interpretive centre with a wide variety of public information materials. The biosphere reserve committee sponsors annual one-day conferences on subjects of interest to the rural agricultural community. Over the past decade topics included: "Farming and Wildlife - the Challenge of Land Management in the 1990s"; "Climate Change and Farmers"; "Farm Chemicals and Sustainable Agriculture"; "Hunting, Farming and National Parks"; "The Potential of Poplar"; "Dammed by Beavers"; and "Baffling the Beavers". Other organizations presenting information to local residents include Ducks Unlimited, Prairie Farm Rehabilitation Administration community pastures, Habitat Heritage Corporation/Manitoba Woodlot Owners Association, and a variety of local soil conservation, wildlife and naturalists groups.

Training programmes for specialists:

The Wilson Creek program provided training for university students in civil engineering and geology, and for other people on special short-term courses in hydrology and watershed management. Graduate students from the University of Manitoba (especially in The Natural Resources Institute); the University of Winnipeg, and Brandon University have done thesis-related field studies in the biosphere reserve under faculty guidance. The park area is used for training national park staff from other regions and for internships with different park services.

Indicate whether there are facilities for education and training activities, as well as visitors' centres for the public

There are a number of meeting facilities within the biosphere reserve which could be used for this purpose.

VIII. INSTITUTIONAL ASPECTS

State, Province, Region or other administrative units

List in hierarchical order administrative entitie(s) in which the Biosphere Reserve is located (e.g. state(s), counties, districts).

Federal government (Riding Mountain National Park); Manitoba government (for lands, forests, water and wildlife in the transition area / zone of cooperation); Municipal governments associated with the Riding Mountain Regional Liaison Committee.

Management plan/policy

Indicate if a management plan or policy exists for the overall biosphere reserve.

No. Policies and plans are formulated in accordance with jurisdictional authority, i.e. federal, provincial and municipal. They are subject to adjustments

under aboriginal entitlements. Because of the divided jurisdiction and extent of private ownership within the biosphere reserve, there is no overall biosphere reserve management plan nor policy in place. Biosphere reserve functions have to be carried out on a volunteer basis. A main role for the biosphere reserve management committee is to help informally to coordinate this where desirable, for example, through the provision of information and educational activities.

If yes, briefly describe the main characteristics of this plan and precise the modes of application.

[See above]. The main policies and plans associated with the biosphere reserve are:

Riding Mountain National Park Management Plan, 1996. [See Annex 1].

This is an up-date of earlier management plans and provides over-all guidance for management of the national park within the framework of the National Parks Act, and the “Parks Canada Guiding Principles and Operations Policies, 1994”. Preparation of the plan was done in consultation with a “Round Table” of 20 participants affiliated with different stakeholder interests. Following completion of the plan, the Round Table has continued as four working groups to address issues of ecological integrity, cultural resources, recreation activities, and marketing of the park and associated tourism. This process is expected to help lay a firm basis for future revisions of the management plan.

Riding Mountain National Park: Ecosystem Conservation Plan, 1997 Revision. ([http://parkscanada.pch.ca/parks/manitoba/riding_mountain/ English/](http://parkscanada.pch.ca/parks/manitoba/riding_mountain/English/)).

This elaborates long-term goals for enhanced ecosystem integrity in the national park, set within a larger regional perspective called the “Riding Mountain ecosystem”. It is to be followed by an ecological integrity statement that articulates some quantitative objectives for different components of integrity, and there are plans to recruit a conservation biologist to refine this into long-term monitoring programs. The biosphere reserve management committee was represented in this planning process.

Watershed Conservation Districts, established under The Conservation Districts Act, RSM 1987, c. C175.

Two of the earliest conservation districts in Manitoba were organized for watersheds immediately east of the national park in the 1970s, mainly to deal with drainage issues from streams flowing over the escarpment and out of the national park through the agricultural lands below. The Wilson Creek studies provided guidance for dealing with these kinds of issues. In the 1990s, three other conservation districts were established in areas adjacent to the national park, and one other is in the process of being organized in 2000. These newer districts are conducting studies of water flows and water quality, and at least one of them, the Little Saskatchewan River Conservation District (formed in 1999) seeks to develop integrated watershed management plans for sub-watersheds in the larger drainage basin; the biosphere reserve management committee is helping to develop school-based water quality monitoring by students for this district.

Game Hunting Areas, established under The Wildlife Act, RSM 1987, c. W130.

Two Game Hunting Areas (# 23 and #23A) extend out from the national park into the transition area / zone of cooperation, bounded roughly by four provincial highways that go around the park area. Hunting regulations are set for these two areas based on population monitoring, especially for elk/wapiti and moose.

Authority in charge of administration of the whole, i.e. of implementation of this plan/policy:

Parks Canada for Riding Mountain National Park; Manitoba Department of Intergovernmental Affairs, for the Conservation Districts; Manitoba Department of Conservation, for the Game Hunting Areas.

Total number of staff of Biosphere Reserve:

Currently: 1 full-time equivalent (2 people on part-time or short-term contracts).

Financial source(s) and yearly budget:

Indicate the source and the relative percentage of the funding e.g. from national, regional, local administrations, private funding, international sources etc.) and the estimated yearly budget in the national currency.

Currently in the order of about \$50,000 of which \$5k is a subvention from Parks Canada, and the remainder is for designated project activities, received from federal, provincial, and private sources.

Authority in charge of administration of each zone:

Core Area and Buffer Zone: Riding Mountain National Park

The national park has about 70 full-time equivalent staff, and it recruits an additional 65-70 full-time equivalent seasonal staff, with a current operating budget of about \$6 m annually. Not all of this goes directly into Riding Mountain National Park. Parks Canada has developed various regional service centre functions in which certain kinds of expertise based in one park is shared among parks within the province (e.g. two new national parks being developed in Manitoba) or among parks in the prairie region generally.

Mechanisms of consultation and coordination among these different authorities:

In 1980, the Riding Mountain Regional Liaison Committee (RMRLC) was established to provide a framework for consultation and coordination for a range of park-related issues in the region. The existence of this committee was noted very favourably by reviewers of the original biosphere reserve nomination submission in 1985. It continues to function, mainly as a forum to address political issues that arise from the juxtaposition of wildlife with farming, or national park values in the context of the local agricultural economy. The Committee has two representatives from up to 18 municipalities adjacent to the park along with two non-voting representatives from the provincial government (currently from

the departments of agriculture and conservation), and a non-voting representative from Riding Mountain National Park. The two members from each municipality are either two elected council members, or one elected council member and one “ratepayer” (an individual holding property and paying taxes in the municipality). They are appointed either year-by-year by their municipal councils, or for a maximum of four years until the next municipal elections. The RMRLC meets about eight times a year.

The Riding Mountain Biosphere Reserve Management Committee is appointed by the Rural Municipalities forming the Zone of Cooperation of the Biosphere Reserve. Under a Constitution for the biosphere reserve drawn up in 1988, and formalized in 1991 under The Manitoba Corporations Act, the municipalities appoint nine members and the chair of a technical committee; the committee also includes *ex-officio* representatives from the provincial government and national park. In principle, any member of the RMRLC can become a member of the biosphere reserve management committee, but there is sufficient informality for the latter to suggest to municipal councils who they would like to have serve. The management committee meets some 6-8 times a year.

Where appropriate, National (or Provincial) administrations to which the biosphere reserve reports:

The biosphere reserve committee reports informally to the Canadian Commission for UNESCO through Canada/MAB and/or the Canadian Biosphere Reserves Association.

Mechanism for consultation of local communities

Indicate how and to what extent local people living within or near the Biosphere Reserve.

Have been associated with the biosphere reserve nomination:

A local conference was held on November 4, 1984, to discuss “Should the Riding Mountain National Park Area become a biosphere reserve?” and

participants were generally favourable to the idea. The nomination was formally and unanimously approved by the Riding Mountain Regional Liaison Committee in which the 18 municipal representatives were elected officials acting on behalf of their constituents. Resolutions of support were also received from individual municipal councils. After the nomination had been submitted to UNESCO, another local public information session was held on February 21, 1986.

Participate in the decision process and management of resources:

The structure of the biosphere reserve management committee and its working relation with the RMRLC link it very closely to issues of concern to municipal councils, and to opportunities to provide information to help local decision making. In addition, members of the biosphere reserve management committee also participate in other organizations or informal networks that are undertaking work consistent with the ideals of biosphere reserves. Current examples include: the Manitoba Clean Environment Commission; the Manitoba Habitat Heritage Corporation; the Lake Dauphin Advisory Committee; the Little Saskatchewan River Conservation District; the Mixedwood Forest Research and Advisory Council; and The Prairie Mountain Conservation Initiative.

The biosphere reserve committee always welcomes more support and participation from local communities and residents, and indeed, is continually seeking ways to foster and facilitate this. It provides an information sharing and forum function for management issues of local concern, but is not involved in specific advocacy directed to management problems.

Indicate whether you consider the participation of local communities to be satisfactory, and, if not, what measures are envisaged to improve this situation.

The biosphere reserve management committee considers participation to be reasonably satisfactory, given their structural links to municipal councils and to other government agencies, as well as limited time (they are all volunteers) and resources. However, more participation from provincial government bodies, especially those associated with sustainable resource use or community economic sustainability would be welcomed, and there is also a recognized need

to try to work more directly with representatives from aboriginal First Nations in the area.

Protection regime of the core area and possibly of the buffer zone

Indicate the type (e.g. under national legislation and date since the legal protection came into being and provide justifying documents...

Federal:

An Act to amend the National Parks Act, 1988. RSC C 39. Section 5.1.2 states that “maintenance of ecological integrity through the protection of natural resources shall be the first priority when considering park zoning and visitor use in a management plan”.

Land tenure of each zone

Percentage of ownership in terms of national, state/provincial, local government, private, etc...

Core Area(s): Federal 100%

Buffer Zone(s): Federal 100% (See notes on buffers, above)

Transition Area(s): Provincial 5%, private 95%.

Foreseen changes in land tenure.

Is there a land acquisition programme, to purchase private lands, or plans for privatisation of public lands?

Two kinds of changes are occurring. Land ownerships are being adjusted as a result of native land claims. In 1991, some land along Clear Lake in the national park was returned to the Keeseekoowenin First Nations who are interested in negotiating a co-management fishing agreement for Clear Lake. Under a Treaty land entitlement program, jurisdiction over the Onanole Wildlife

Management Area immediately adjacent to the national park was turned over to the Rolling River First Nations in 2000. Additional claims or awards of land are under consideration. The other kind of change (based on anecdotal evidence) is arising from land purchases near the national park by people who are not farmers, but are securing property for either hunting or other recreational activities, or for “quality of life” values associated with the location. This is raising land prices beyond what can easily be afforded for farming purposes.

IX. CONCLUSION

Brief justification of the way in which the biosphere reserve fulfills each criterion of article 4:

1. Biosphere reserves should encompass a mosaic of ecological systems representative of major biogeographic regions, including a gradation of human interventions.

The national park “core area” is representative of a more southern portion of the much larger boreal forest biome, and also includes components of aspen parkland, including rough fescue prairie, and the eastern deciduous forest, while the area immediately surrounding it has been transformed into agroecosystems that are intensively managed. The human interventions are exhibited as a strong contrast between conditions on either side of the park borders, but the regional landscape also exhibits more nuanced mosaics of human interventions associated with early influences on the boreal forest before it became a national park, and adaptations to variable topographic conditions within the agroecosystems.

2. Biosphere reserves should be significant for biological diversity conservation:

The biodiversity significance is exhibited by maintenance of near-complete foodwebs dominated by large mammals. All guilds are represented, although a few species that once shared these guilds may no longer occur in this particular area (e.g. plains grizzly bear and wolverine). The national park “core area” provides the basis for this, and is under a statutory requirement to maintain the “ecological integrity” of this sample of boreal forest. Measures for integrity include

maintaining certain forest vegetation associations and developing cooperative management with neighbouring landowners for populations of mammals that range outside of the park core area (especially black bear, elk/wapiti, moose, wolves and beaver). It is assumed that an intact ecosystem on this scale also provides for most smaller species of biota that occur in boreal forest habitats. Biotic inventory data suggest this to be so, but it would be desirable to conduct additional field surveys, especially for invertebrates and non-vascular plants.

3. Biosphere reserves should provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale:

There are three distinct opportunities here. One relates to sustainable agriculture in the transition area / zone of cooperation where there are a number of provincial government and other non-governmental programs available for giving advice and assistance to individual farmers, directed mainly to individual farm conditions. The biosphere reserve committee has contributed mainly by hosting community meetings and exhibits or demonstration events that help promote sustainable land use or farming practices. It has also been associated with a long-term project to assess ways to lessen flood and erosion damage from rivers flowing out of the core area and over a steep escarpment into agricultural lands below. More recently, it helped demonstrate water levelling devices (the “beaver deceivers”) that reduce maintenance costs for rural roads which are threatened by flooding caused by beaver dams.

Second, the national park core area, in principle, could be viewed as a benchmark area to compare or assess different forest management practices with a comparable sized area having similar topography and forest cover to the north. The 3,370 km² Duck Mountain Provincial Forest, which also includes the 1,276 km² Duck Mountain Provincial Park, is about 30 km to the north of the western portion of the Riding Mountain National Park. The forest is being managed for the extraction of forest products, and some logging has been approved for the provincial park. The possibility for the biosphere reserve to play this role was noted at the time it was established, but deferred until such time as it might become more developed and accepted in the community. This would also require cooperation among different government jurisdictions and different rural communities which are outside of the regional liaison committee area that

serves approximately to define the extent of the transition zone / zone of cooperation. There is also some interest in determining whether or not there is a “corridor” link for some wildlife between these two areas.

Third, there is an ecotourism evaluation project being undertaken in collaboration with a district marketing organization. Whereas it is questionable whether the area as a whole should support higher tourism activity, tourism pressures on the park could be deflected to activities in local communities. An increase in tax revenues could be applied to supporting continued municipal involvement in the biosphere reserve.

4. Biosphere reserves should have an appropriate size to serve the three functions of biosphere reserves (set out in Article 3):

The Riding Mountain Biosphere Reserve is of sufficient size to serve these functions.

5. Biosphere reserves should include these functions through appropriate zonation:

As noted (elsewhere in this report), interpretations of the “buffer zone” in this biosphere reserve have some inherent difficulties, and the term is restricted to refer only to two zoning categories within the national park. The continued existence of populations of large mammals which also range outside of the national park could be interpreted to mean that land cover and land use practices in the biosphere reserve do serve to “buffer” them somewhat; however, this perspective can be contested. This ambiguity about “buffers” (zoning restrictions which are not acceptable to private landowners, or ecological functions which cannot easily be demonstrated) does not preclude the performance of biosphere reserve functions in some form.

6. Biosphere reserves should have organizational arrangements for the involvement and participation of various authorities and groups in carrying out the functions of biosphere reserves:

Because the Biosphere Reserve Management Committee is appointed by the elected councils of the rural municipalities which make up the transition area / zone of cooperation, it has close structural links to elected officials and local decision makers. Partly because of this arrangement, it can work through a number of community networks as occasion may demand. It also maintains informal working relationships with officials in the national park and in provincial government agencies, in part because of these officials' *ex officio* participation in both the liaison committee and the management committee.

Cooperative arrangements also exist for individual program or projects, for example with the Turtle River Conservation District and the Little Saskatchewan River Conservation District for watershed studies, with the Environmental Monitoring and Assessment Network (EMAN) for SI/MAB biodiversity monitoring plots, with school districts for educational activities, with universities for assisting student research, and with various funding organizations for projects such as analyzing land use history.

7. Biosphere reserves should have provisions for management of human use and activities in the buffer zones, a management policy or plan for the area of the biosphere reserve, a designated authority or mechanism to implement this policy or plan, and programs for research, monitoring, education and training:

These provisions come under different jurisdictions and management authorities, including private landowners. The national park core area has an updated management plan (1996) with a special ecosystem conservation plan as a major sub-component (1997). This covers the core area and the buffer zone. Ten of the 14 rural municipalities in the transition area / zone of cooperation are members of Conservation Districts (and three more will be in another one being formed); there are five of these districts adjacent to the national park, two of which were established in the 1970s, three others in the 1990s, and one more scheduled to be set up in 2000. Game Hunting Areas 23 and 23A surround the national park and serve as units within which population surveys are conducted for elk/wapiti and moose and used as a basis for administering provincial hunting regulations. The biosphere reserve itself has no management authority over these, but can help informally to coordinate matters relating to them, mainly by

providing an information and education service to local residents and decision makers.

Does the biosphere reserve have cooperative activities with other biosphere reserves (exchanges of information and personnel, joint programmes, etc...).

At the national level:

The Riding Mountain Biosphere Reserve is a member of the Canadian Biosphere Reserves Association/ l'Association Canadienne des Reserves de la Biosphere (CBRA/ACRB). The chair of the RMBR is currently chair of this Association. The possibility of closer cooperation with Waterton Biosphere Reserve is to be explored. Information exchange is facilitated through a CBRA website (<http://www.cbra-acrb.ca>) which also links to individual Canadian biosphere reserves.

Through twinning and/or transboundary biosphere reserves:

Not at this time.

Within the World Network (including Regional Networks):

Not at this time.

Obstacles encountered, measures to be taken and, if appropriate, assistance expected from the Secretariat

The periodic biosphere reserve managers' meetings sponsored by UNESCO were most helpful, and it would be desirable to see how more direct contacts could be fostered among biosphere reserves (perhaps through e-mail).

List of Additional Information Items.

Annex 1: Riding Mountain National Park Management Plan, 1996.

Figure 1: General location of the Riding Mountain Biosphere Reserve.

Figure 2: General vegetation classification for the biosphere reserve.

Figure 3: Satellite image of the biosphere reserve region .

Figure 4: Outline map showing municipalities that constitute the transition area.