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Reporting progress on internationally designated sites: The periodic review of biosphere reserves

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ABSTRACT

For sites designated within international networks, reporting processes have been established to ensure that these sites continue to exhibit their special characteristics and contribute to the goals of their respective network. One such network is the World Network of Biosphere Reserves (WNBR), composed of sites designated under UNESCO's Man and the Biosphere programme. This paper summarises the evolution of the concept and the realities of biosphere reserves since 1976; describes the introduction of the Statutory Framework for the WNBR, which formalised the concept and introduced a periodic review process to provide oversight of its implementation; evaluates the extent to which, since 1996, this process has been successful in achieving its aims; discusses changes which have been proposed and implemented; and provides suggestions for future action.

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1. Introduction

At the global scale, protected areas designated by national governments because of their value for protecting particular species, habitats, and/or land- or seascapes cover about 21 million square kilometers: 12.2 per cent of the terrestrial area and 5.9 per cent of the world's territorial seas (UNEP-WCMC, 2010). Overlaying these national protected areas networks are a number of international networks, largely comprising land and sea that is already nationally designated. Four of these networks are global. Two derive from international conventions which emphasise conservation: the Convention on Wetlands (Ramsar Convention), signed in 1971, and the World Heritage Convention, signed in 1972. Respectively, these include 1847 sites in 159 States (Ramsar Convention Secretariat, 2008) and 890 sites in 148 countries (World Heritage Centre, 2009). A third network, the World Network of Biosphere Reserves (WNBR), includes 553 biosphere reserves in 107 countries, designated since 1976 under the Man and the

Biosphere (MAB) programme of the United Nations Educational, Scientific, and Cultural Organisation (UNESCO). As discussed below, biosphere reserves differ, in principle, from World Heritage and Ramsar sites in a number of ways, particularly the fact that only parts of them necessarily comprise nationally designated areas; and, according to the Statutory Framework for the WNBR (UNESCO, 1995b), the objectives of their designation explicitly include sustainable development. A fourth network, the Global Geoparks Network (GGN), established in 2004, has 58 sites in 18 countries. In addition to protecting geodiversity and promoting geological heritage, a key objective is to create employment opportunities, usually through the development of sustainable tourism (Global Geoparks Network, 2009).

International protected area networks also exist at the regional scale, particularly in Europe (Harrison, 2002). These include the sites awarded the European Diploma of Protected Areas by the Council of Europe since 1965; the Natura 2000 sites, designated under the Birds and Habitats Directives (1979,

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1992, respectively) of the European Commission; the members of the European Geoparks Network (EGN), which have signed a charter originating in 2000 (<http://www.europeangeoparks.org/>); and Pan Parks, a network established in 2002 following joint work between WWF and the Dutch leisure company Molecaten (<http://www.panparks.org/>). Again, these four networks fall into two types. The two former networks exclusively comprise nationally designated areas, with a primary management focus on the conservation of biological and landscape diversity. The two more recent networks explicitly include sustainable (economic) development, particularly through tourism, as a key objective.

The sites within these various global and European networks are not spatially exclusive. Just as each site within an international network includes one or more nationally designated sites, many sites are wholly or partially designated within multiple networks. For instance, in 65 locations in 42 countries, World Heritage Sites and biosphere reserves overlap (<http://whc.unesco.org/en/activities/497/>); many members of the EGN were involved in the creation of the GGN and are members of it; and, remarkably, Doñana National Park in Spain is involved with seven different international agreements and programmes (CBD, 2003).

The designation of a site in recognition of particular biological, landscape or geological characteristics – whether or not this designation is also for other purposes, such as sustainable development – results from a process of identifying the site and its specific characteristics and then establishing boundaries – which increasingly involves consultation with local people and other stakeholders (Bakarr and Lockwood, 2006). Designation cannot be an end in itself; it leads into a second process of management to achieve the desired goals in (and sometimes also around) the site itself and, in the case of global networks, to contribute to wider goals to safeguard the special characteristics of sites which may be regarded as ‘global common goods’ (Debarbieux and Price, 2008).

For nationally designated sites, ‘management effectiveness’ has become a major topic of concern in recent years, with a significant literature emerging, particularly under the auspices of a task force within the World Commission on Protected Areas of the International Union for the Conservation of Nature (IUCN) (Hockings et al., 2006; Leverington et al., 2008) as well as work for the WWF and the World Bank (Dudley et al., 2007) and at the European scale (Stolton, 2008). For sites designated within international networks, there are additional reporting processes intended to ensure that the sites continue to exhibit their special characteristics and to contribute to other goals, such as sustainable development and, more widely, to the aims of the network(s) to which they belong. Systematic documentation and, particularly, analysis of these reporting processes and their implementation is limited, despite calls for comparative review of these processes which could, *inter alia*, lead to increased harmonisation (especially valuable when sites are in more than one network), improved sharing of information, and more efficient management of information at the national level (Harrison, 2002; CBD, 2003). Only the draft report prepared by Corcoran et al. (2003) provides a reasonable, though somewhat outdated, overview. For Ramsar sites, the Contracting Parties file and prepare national reports for each Conference of the Parties; these

take place every three years. For World Heritage Sites, there is a six-year rolling programme of national reporting, region by region. For sites within the GGN, continued membership is subject to a ‘periodical review’ within four years (<http://www.globalgeopark.org/publish/portal1/tab121/info616.htm>). Within Europe, the authorities responsible for ‘European Diploma’ sites have to prepare an annual report, and renewal – every five years – depends on a field visit (Bauer, 2002). EU Member States are responsible for producing national reports on their Natura 2000 sites every six years (Simpson, 2002). For European Geoparks, a revalidation process is under development (Mc Keever, personal communication), and for Pan Parks, annual reports are required, with a reverification process every five to six years (Vancura, 2008).

The focus of this paper is on the periodic review of biosphere reserves, a process that began in 1996. Such a process is particularly important for the WNBR because, in contrast to other internationally designated networks, there have been significant changes in the fundamental concept, and thus the criteria for designation. The paper summarises the evolution of the concept and the realities of biosphere reserves; describes the introduction of the Statutory Framework for the WNBR, which formalised the concept and introduced the periodic review process to provide oversight of its implementation; evaluates the extent to which this process has been successful in achieving its aims; discusses changes which have been proposed and implemented; and provides suggestions for future action.

2. Biosphere reserves: concept, realities, and the introduction of the periodic review

The biosphere reserve concept was initially formalised in meetings in 1973 and 1974, leading to the designation of the first biosphere reserves in 1976 (Robertson Vernhes, 1989). The concept and its related network therefore originated in a similar era to Ramsar and World Heritage Sites. However, from the start, biosphere reserves were meant to be different from these other international designations, including a series of zones of which only the ‘core zone(s)’ had to be ‘strictly protected’ nationally designated protected areas. According to this early version of the concept, outside the core zone(s) were one or more buffer zones. While what would now be called biodiversity conservation was one objective, there were two others: the provision of areas for ecological and environmental research (‘logistic role’) and of facilities for education and training (‘development role’: UNESCO, 1974). By 1981, UNESCO had designated 208 biosphere reserves in 54 countries. However, the reality did not always match the concept (Price, 1996). Most biosphere reserves had been superimposed on nationally designated protected areas, and buffer zones were few. This mismatch between concept and reality was a key theme at the First International Biosphere Reserve Congress in 1983; another was the potential for biosphere reserves to “link conservation with human activities and rural development” (Batisse, 1984, p. x), a theme that had recently been stressed by the influential World Conservation Strategy (IUCN/UNEP/WWF, 1980).

Following the 1983 Congress, the International Coordinating Council (ICC) of the MAB programme established a

Scientific Advisory Panel. This redefined the concept so that, while conservation remained a primary concern, “biosphere reserves should be demonstration sites of harmonious, long-lasting relationships between man and the natural environment” (UNESCO, 1986, p. 69). The Panel also renamed the outer buffer zone as a ‘transition area’ or ‘zone of cooperation’, and stressed the need for cooperation between “researchers, managers, and the local population, with a view to ensuring appropriate planning and sustainable resource development” (UNESCO, 1986, p. 73). Nevertheless, by 1995, with 324 biosphere reserves in 82 countries, “approximately 50 per cent of biosphere reserves consist(ed) of a national park with an additional buffer or transition zone” (IUCN, 1995, p. 2), with “no built-in way of evaluating performance and no standardised measure with which to evaluate the economic, social, and ecological progress made. Consequently, it [was] difficult to identify what constitutes ‘successful’ implementation throughout the Network as a whole” (IUCN, 1995, p. i).

This continued mismatch between concept and reality was one reason behind the establishment of an Advisory Committee on Biosphere Reserves in 1992 and was again a major topic at the International Conference on Biosphere Reserves in 1995. This led to two major documents which remain fundamental for the WNBR and were adopted later that year, first by the ICC and then by the General Conference of UNESCO. The first was the Seville Strategy (UNESCO, 1995a), placing a strong emphasis on the importance of biosphere reserves for sustainable development and conservation, with research largely in a supporting role. The second was the Statutory Framework of the WNBR (UNESCO, 1995b); its Article 3 states that “biosphere reserves should strive to be sites of excellence to explore and demonstrate approaches to conservation and sustainable development at a regional scale” and lists three functions: conservation, development, and logistic support. Article 4 states the “General criteria for an area to be qualified for designation as a biosphere reserve”, relating to its ecological characteristics, significance for biodiversity conservation, opportunities for sustainable development, appropriate size and zonation (including one or more core and buffer zones and a transition area), arrangements for involving stakeholders in implementation, and provisions for management, “a management policy or plan for the area as a biosphere reserve”, a “designated authority or mechanism” to implement this, and “programmes for research, monitoring, education and training” (UNESCO, 1995b, pp. 16–17).

Article 9 established a periodic review process to evaluate the status of biosphere reserves towards achieving the overall goal for biosphere reserves with reference to the criteria in Article 4. The normal procedure, to take place every ten years, consists of the following stages:

- The concerned authority (i.e., government or national MAB Committee) submits a report to the MAB Secretariat with regard to the criteria in Article 4;
- The Advisory Committee on Biosphere Reserves considers the report and makes a recommendation to the ICC;
- The ICC examines the report and either a) formally recognises the satisfactory status or management of the biosphere reserve or b) recommends measures to be taken to ensure conformity with the provisions of Article 4. The ICC

may also indicate to the Secretariat “actions that it should take to assist the State concerned in the implementation of such measures”.

Furthermore, if, after a “reasonable period”, the ICC finds that a biosphere reserve still does not satisfy the Article 4 criteria, it can notify the Director-General of UNESCO that this area will be longer be referred to as “a biosphere reserve which is part of the network”. Alternatively, as specified in paragraph 8 of Article 9, if a State recognises that a biosphere reserve under its jurisdiction does not have the potential to satisfy these criteria, it can remove it from the WNBR and notify the MAB Secretariat (UNESCO, 1995b, p. 18).

Soon after the 1995 Congress, the MAB Secretariat designed a form for periodic reviews and, in 1996, sent a letter to MAB National Committees in all countries with biosphere reserves designated before 1986, reminding them of their responsibility to undertake the periodic review. In subsequent years, the Secretariat has sent similar reminder letters to all concerned authorities either on the tenth anniversaries of the designation of their respective biosphere reserves or ten years after a previous periodic review report had been submitted.

In 2008, the periodic review process was widely discussed at the 3rd World Congress of Biosphere Reserves. The resulting 2008-13 Madrid Action Plan (MAP: UNESCO, 2008) notes that nearly all sites designated since 1995 conform to the criteria in Article 4 of the Statutory Framework. However, for sites designated from 1976 to 1984, only 23 per cent have the required three zones; for sites designated from 1985 to 1985, the proportion is 65 per cent. The MAP also states that the periodic review process “has resulted in many pre-1995 biosphere reserves being revised with respect to their zonation schemes and other essential features” and that “Experience in the application of the ... periodic review process will be assessed and this process will be further refined for use in tracking changes in the performance of biosphere reserves in contributing to sustainable development outcomes” (UNESCO, 2008, p. 9). However, the MAP includes no specific action regarding assessment of the process, though it is referred to in Action 1.4 – to “Update the nomination and periodic review forms for BRs” – and Target 9: “All biosphere reserves undertake periodic review and related actions to update zonation, management and other changes to meet Seville and MAP requirements and recommendations”; i.e., to conform to the Statutory Framework.

3. Evaluation of the periodic review process

To evaluate the extent to which the periodic review process has been successful in achieving its aims, research was conducted in two complementary stages. The first was to obtain an overview of the submission of periodic reviews until 2010. The second was to examine how the process has influenced the implementation of the biosphere reserve concept, such as extensions or changes in the zonation of biosphere reserves, and withdrawal from the WNBR.

The primary source of information and data was the MAB Secretariat. The study included document review and secondary data analysis of reports prepared by the MAB Secretariat

Table 1 – Countries with biosphere reserves designated before 2000, for which no periodic review report has been submitted (as of June 2010).

Countries	Number of biosphere reserves per country that were designated before 2000
Cambodia, Denmark, Honduras, Jordan, Kyrgyzstan, Latvia, Madagascar, Netherlands, Portugal, Rwanda, Venezuela	1
Brazil, Central African Republic, Congo, Ireland, Philippines, Tanzania	2
Bulgaria	16
United States of America	47

(2003) (Delgado Pugley, 2008), final reports of the Advisory Committee meetings from 1996 to 2010, and correspondence with concerned authorities in certain States. The final reports of the Advisory Committee meetings include sections about biosphere reserve nominations, extensions, changes in zonation, and the periodic review. The latter section contains recommendations for further improvement with regard to each site for which a periodic review report has been submitted. The correspondence examined included notification letters concerning withdrawal of biosphere reserves, covering letters received with periodic review reports, and letters from the Secretariat to concerned authorities. In addition, as part of the second stage of the research, in July 2009, the contact point of each of the 66 States which had submitted a periodic review was contacted by e-mail to ask for an estimate of the cost of undertaking the periodic review of the biosphere reserves in his/her country; and whether any biosphere reserve(s) had been extended, or had its zonation significantly changed as a result of the periodic review.

3.1. Periodic review implementation

Up and until the Advisory Committee meeting in 2010, 229 periodic review reports were submitted for biosphere reserves in 67 countries. For eight biosphere reserves (two in Canada, one in each of Cote d'Ivoire, Croatia, Germany, Peru, Sri Lanka and Ukraine), two successive reports were submitted. However, over this period, according to the requirement in the Statutory Framework that periodic review reports should be submitted every ten years (and also for all the biosphere reserves designated before 1995), such reports should have been submitted for a further 130 biosphere reserves designated before 2000. One fifth of the countries with biosphere reserves have never submitted a periodic review report (Table 1).

Some countries listed in Table 1 may have been conducting a periodic review or planned to do so at the time of this study; and a workshop was held in Bulgaria in 1998, but no report has yet been submitted to UNESCO. However, while most of the concerned biosphere reserves were designated before 1986, there are no apparent commonalities between these countries in terms of their socio-political stability or economic circumstances which could have affected their decision whether to conduct a periodic review. More important factors could be whether countries are sufficiently committed to the WNBR and/or have an effective national institution to express such commitment. One should also recognise that the cost of preparing these reports can be considerable, as shown in Table 2, based on e-mail responses received from 12 countries with a total of 103 biosphere reserves designated by 1999. While the processes undertaken in these very different countries are not necessarily comparable, they have resulted in periodic review reports; it should be noted that this is the first time that the costs of such processes, for any type of internationally designated site, have been quantified.

By May 2010, 55 countries had provided information, usually within one to three years after receiving recommendations, about measures taken to apply the MAB Secretariat's recommendations regarding their capacity, or plans for implementation (UNESCO, 2010). As noted by the Advisory Committee in 1999, the follow-up information provided through these responses tended not to be comprehensive, but opened opportunities to check any progress and difficulties, and to offer support when necessary.

3.2. Withdrawal from the World Network of Biosphere Reserves

Six States – Australia, Bulgaria, Germany, Norway, Sweden and the United Kingdom (UK) – have withdrawn a total of ten

Table 2 – Estimated costs (US\$) of preparing periodic review reports.

Cost of preparing report for one biosphere reserve Comment		
Canada	2200–2400	Travel and associated costs only, time donated by national experts
China	14–20,000	
France	28–43,000	National evaluation and submission to UNESCO by National Committee only
Germany	4300	
Spain	23,000	
Sudan	3–5000	Total cost of US\$ 30,000 for initial phase for five sites
Ukraine	10,000	
UK	6000	

Table 3 – Sites withdrawn from the World Network of Biosphere Reserves.

Country	Biosphere reserve	Year of withdrawal	Periodic review
Norway	North-east Svalbard	1997	Conducted but not submitted
UK	Caerlawaerock, Claish Moss, Rum, St. Kilda	2002	Conducted but not formally submitted
Bulgaria	Maritchini Ezera	2002	NA
Australia	Southwest	2002	NA
Germany	Bayerischer Wald	2007	Submitted in 2002
UK	Taynish	2010	Conducted but not formally submitted
Sweden	Lake Torne	2010	NA

biosphere reserves from the WNBR (Table 3). As a result of the periodic review process, the Norwegian National MAB Committee withdrew North-east Svalbard Biosphere Reserve in 1997. The main reason was the lack of a resident human population, so that the ‘development’ function – “foster economic and human development which is socio-culturally and ecologically sustainable” – required under Article 3 of the Statutory Framework was not possible. For the UK, the withdrawal of four biosphere reserves in 2002 resulted from a national review process undertaken in response to the request from the MAB Secretariat for a periodic review of all existing biosphere reserves. At two sites, there was no resident human population; for the other two, Scottish Natural Heritage, the conservation agency for Scotland, concluded that the sites did not have the potential to fulfil the criteria in the Statutory Framework (Price, 2002). Similarly, Taynish Biosphere Reserve was withdrawn in 2010 after a second national review (Hambrey Consulting, 2009) concluded that it did not have the potential to fulfil these criteria. In 2007, Germany withdrew the Bayerischer Wald Biosphere Reserve. A periodic review report for this site was examined in 2002 by the Advisory Committee, which recommended the clarification of the transition area and an overall expansion. However, as it was difficult to obtain the consent of local institutions and people to become part of the biosphere reserve, it was withdrawn. In 2010, Lake Torne BR in Sweden was withdrawn by the Swedish authorities, which informed the ICC that, despite efforts, it was not possible for this site to meet the Statutory Framework criteria. The periodic review process clearly played a significant role in the withdrawal of these sites and, therefore, contributed to the strengthening the implementation of the biosphere reserve concept.

Withdrawal has not always resulted from periodic review processes. For instance, Bulgaria withdrew Maritchini Ezera Biosphere Reserve without a periodic review. In response to the notification letter, the MAB Secretariat pointed out the significance of the periodic review, advised that this should be undertaken, and offered support to do so. In Australia, one reason for withdrawing the Southwest Biosphere Reserve was associated with the periodic review: recognition that the site consisted only of a core area and that other conservation mechanisms existed. In his letter to the MAB Secretariat, the Tasmania Minister for Primary Industries, Water and Environment questioned the necessity of periodic review for the objective of conservation: “I believe that the efforts devoted to preparing status reports for the Biosphere Reserve would be better directed to implementing conservation programmes within the National Park.” This remark recognises, as corroborated by Table 2, that periodic reviews require

considerable resources and that this site, like many biosphere reserves designated in the early years of the MAB programme – such as the five sites withdrawn by the UK authorities, which continue to function effectively as National Nature Reserves – has a management focus on conservation, rather than on linking conservation and sustainable development, as required under the current biosphere reserve concept.

3.3. Extension and zonation change

A biosphere reserve may be extended under three possible situations:

- Result of a periodic review: a need for extension is recognised by a State during periodic review;
- Advisory Committee Recommendation: a need for extension is not identified during the periodic review, but the Advisory Committee recommends it;
- Independent proposal: extension is proposed separately from a periodic review.

By 2010, the ICC had approved extensions to 34 biosphere reserves. Two biosphere reserves in the UK, three in France, and one in Switzerland identified the need for extension during periodic review processes. Two other biosphere reserves, in France and Poland, were extended as a result of the Advisory Committee’s recommendations following a periodic review (Table 4). Considering that only five of 34 extensions were in relation to the formal periodic review process, one could conclude that this was not widely used as a mechanism to extend biosphere reserves. However, the reality is not so clear-cut. For instance, nominations from the UK for two expanded biosphere reserves, with the full complement of zones, followed a national review process resulting in a report (Price et al., 1999) which was never formally submitted to the MAB Secretariat, rather than being a response to a recommendation from the Advisory Committee or the Secretariat.

In terms of changes in zonation, the Advisory Committee, after examining periodic review reports, has made 97 recommendations, usually with respect to the (lack of a) transition area. Again, relatively few of these recommendations have been acted on: changes in zonation are more likely to appear in proposals for significantly enlarged biosphere reserves in the same area, usually with new names that reflect their greater extent. Thus, as with extensions, the periodic review process has not been widely used as a mechanism to revise zonation. Nevertheless, the process has provided the Advisory Committee with information that has enabled them to advise States to bring biosphere reserves in line with the

Table 4 – Biosphere reserve extension in relation to periodic review.

Country	Biosphere reserve	Designation year	Periodic review submission	Extension year	Type of extension
France	Commune de Fakarava	1977	1998	2006	Direct result of periodic review
France	Camargue	1977	1999	2006	Advisory Committee recommendation
Poland	Babia Gora	1976	1999	2001	Advisory Committee recommendation
UK	Braunton Burrows	1976	No formal submission	2002	Indirect result of periodic review
UK	Dyfi	1976	No formal submission	2009	Indirect result of periodic review
France	Luberon	1997	2009	2010	Direct result of periodic review
France	Fontainebleau	1998	2009	2010	Direct result of periodic review
Switzerland	Swiss National Park	1979	2010	2010	Direct result of periodic review

criteria in the Statutory Framework through extension and revision of zonation; in some cases, States have done this unilaterally.

4. Potential improvements to the periodic review process

Given that the MAB programme is an inter-governmental programme, its Secretariat plays a key role in the periodic review process. As noted above, it designed, and is currently redesigning, a form to be used for periodic reviews, and corresponds with MAB National Committees (or, where these do not exist, UNESCO National Commissions) as the ‘concerned authorities’ responsible for undertaking periodic reviews and transmitting them to the Secretariat. It also acts as a mediator between the concerned authorities and the Advisory Committee and the ICC, both of which meet – in sequence – annually. The Advisory Committee also plays a significant role in the process, and has considered that its ultimate objective is to improve the functioning of biosphere reserves by taking appropriate measures to mitigate situations identified through self-assessment. Therefore, as early as 1998, and again in 2005, the Advisory Committee acknowledged the potential of the process to foster the credibility of the WNBR; perhaps a response to criticisms such as those voiced at a workshop on ‘Biosphere Reserves – Myth or Reality’ at the World Conservation Congress in 1996; though this also concluded that “biosphere reserves is a concept whose time has come” (IUCN, 1998, p. 47). The Advisory Committee has also recognised the needs for improvements in the submission of periodic review reports and for follow-up mechanisms to make the process more effective and, as early as in 1997, suggested ways to increase the numbers of reports: for the MAB Secretariat to ask the Permanent Delegations to UNESCO to collaborate to ensure that their respective countries reply to the Secretariat, and to mobilise UNESCO Regional and National Offices; and for Advisory Committee members to provide their support through missions, meetings and personal contacts. In 1998, the Advisory Committee also suggested the implementation of a follow-up mechanism and that the MAB Secretariat should monitor measures taken to respond to the Committee’s recommendations. The Committee made similar suggestions at its subsequent meetings in 1999, 2001 and 2005. In 2010, the ICC requested the MAB Secretariat to undertake a survey to analyse the issues linked

to the relatively low level of responses from countries to recommendations and their follow-up, as well as to make suggestions for improving the follow-up of these recommendations. The results of this survey will be examined by the ICC in 2011.

A related issue is the need to improve the quality and functionality of the process, which would also respond to the expectation for UN agencies to undertake results-based management, with effective performance monitoring systems, and effective and timely use of evaluation findings (Ortiz et al., 2004). In 2005, the Advisory Committee expressed the need to revise the periodic review process to incorporate indicators that can enable changes to be tracked over time. This issue is being considered by a working group established in 2010 by the ICC to update both the periodic review and the nomination forms.

A further area in which it has been recognised that the periodic review process could be improved relates to the involvement of stakeholders. In 1998, after examining the first periodic review reports, the Advisory Committee stated that the process should be a cooperative exercise involving the different stakeholders of a biosphere reserve through workshops and field reviews. This is a logical extension of the requirement for the involvement of stakeholders in “carrying out the functions of a biosphere reserve” in Article 4 of the Statutory Framework, though stakeholder involvement is not mentioned in Article 9 with respect to periodic reviews. In recent years, emphasis has been given in MAB documents (Bouamrane, 2006, 2007) to the periodic review as a collective learning process. This message appears to have been amply conveyed to States over time, and the involvement of local stakeholders is emphasised many times in the MAP and in other publications about biosphere reserves (e.g., Francis, 2004; Matysek et al., 2006; Stoll-Kleemann and Welp, 2008; Jungmeier et al., 2009), some specifically with regard to periodic review processes (e.g., Etienne et al., 2007; Yi, 2007). It should be emphasised that these publications all refer to experiences in countries with active national MAB committees which have been able to obtain the human and/or financial resources necessary to ensure stakeholder involvement.

The periodic review process has now been running for over a decade, and has resulted in the compilation of much valuable information – but not from all sites, considering the significant number for which no report has yet been submitted. It has also achieved one implicit goal, in that a few States

have withdrawn sites which did not meet the criteria of Article 4. However, the extent to which the process has been effective in encouraging extension and changes in zonation to improve the implementation of the biosphere reserve concept remains unclear – particularly because States have often submitted separate proposals for extension or changes in zonation rather than periodic review reports. Another factor affecting the efficiency of the process is embedded in the ten-year period between reviews specified in the Statutory Framework. This is significantly longer than for any other international network of sites; though, given the considerable cost of conducting reviews and the often complex processes involved, ten years may be a more realistic timeframe and, in some cases, could provide opportunities to improve biosphere reserves to meet the criteria. However, this timescale might be too long to effectively monitor changes occurring in biosphere reserves or actions taken to respond to recommendations. Such points were made during the 2009 meeting of the ICC, which decided that the time between periodic reviews should be decreased to five years. To date, the Statutory Framework has not been revised to reflect this decision; in 2010, the ICC decided that the working group responsible for updating the periodic review form will also consider the timeframe and make a recommendation to the ICC in 2011.

Despite certain statements by the Advisory Committee, it is difficult to say that the current periodic review process is an effective mechanism for 'quality control'. As noted in the MAP, a significant proportion of sites designated before 1985 still do not have three zones; these include many sites for which no report has yet been submitted to the MAB Secretariat. One key conclusion is that, though States may respond to the 'carrot' of the ICC recognising that a site meets the Article 4 criteria and that a periodic review report is of high quality, the ICC has never used any 'sticks' to encourage submission of reports, so that the Advisory Committee, and then the ICC, have not been able to assess compliance with Article 4 when States do not fulfil their responsibility to submit reports. In addition, the lack of a formal follow-up process has meant that, even when it has been recognised that sites do not meet the criteria, the ICC has not followed up on recommendations. To remedy this situation, it could, first, make substantive statements about the failure of countries to submit periodic review reports in due time or to respond to recommendations "in a reasonable period" and, second, be more stringent in applying the final stages of the periodic review process as defined in the Statutory Framework and, through the Director-General of UNESCO, informing States that sites which do not satisfy the criteria in Article 4 are no longer members of the WNBR. While this has never been done for a biosphere reserve, in 2010, the Advisory Committee recommended that Taimyrskiy Biosphere Reserve in Russia, for which two periodic review reports had been submitted in 2008 and 2010, should be withdrawn from the WNBR because these reports made it clear that the site was managed only for conservation purposes. The decision of the ICC in this regard was to wait for another report, to be examined in 2011, as the Russian Federation indicated that, further to the recommendation received, the Ministry of Natural Resources has decided to implement major changes at this site to fulfil the criteria of the Statutory Framework.

There are comparable precedents among other international networks. For many, including Ramsar, World Heritage, Natura 2000 and European Diploma sites, sites 'in danger' can be formally identified. Furthermore, two sites have been removed from the World Heritage List, and the *Ramsar Convention Secretariat (2005)* has developed a procedure to do so. The European Diploma, Geoparks and Pan Parks networks all have procedures for renewal/reverification – though the latter two networks are too new to judge whether these processes will achieve the anticipated 'quality control' which, as with biosphere reserves, is linked to sustainable development as well as conservation. More generally, sharing of good practice in reporting between the various international networks could lead to increased harmonisation of reporting procedures (Ortiz et al., 2004).

To conclude, there is growing recognition that the periodic review of biosphere reserves should be used as a collective learning process between key stakeholders at both national and international levels. In some cases, this may result in sites, usually designated in the 1970s or early 1980s when conservation was the primary focus of the biosphere reserve concept, being withdrawn from the WNBR, leaving the network strengthened. Most importantly, States, through their national MAB Committees, need to provide the resources necessary to conduct regular reviews involving key stakeholders. The widening of the membership of these committees, recommended in the MAP, should assist in this regard. Current initiatives to improve the process, such as revision of the periodic review form and a reduction in the time between reviews from ten to five years, should lead to the periodic review becoming a more effective mechanism for quality control; and this needs to be supported by effective means of communication between States and the MAB Secretariat. All of these actions should be seen as key contributions to the overall goal for all members of the WNBR to be 'sites of excellence'.

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