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Nordic Biosphere Reserves

Experiences and Co-operation

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Nordic Environmental Co-operation

The Nordic Environmental Action Plan 2005-2008 forms the framework for the Nordic countries' environmental co-operation both within the Nordic region and in relation to the adjacent areas, the Arctic, the EU and other international forums. The programme aims for results that will consolidate the position of the Nordic region as the leader in the environmental field. One of the overall goals is to create a healthier living environment for the Nordic people.

Nordic co-operation

Nordic co-operation, one of the oldest and most wide-ranging regional partnerships in the world, involves Denmark, Finland, Iceland, Norway, Sweden, the Faroe Islands, Greenland and Åland. Co-operation reinforces the sense of Nordic community while respecting national differences and similarities, makes it possible to uphold Nordic interests in the world at large and promotes positive relations between neighbouring peoples.

Co-operation was formalised in 1952 when *the Nordic Council* was set up as a forum for parliamentarians and governments. The Helsinki Treaty of 1962 has formed the framework for Nordic partnership ever since. The *Nordic Council of Ministers* was set up in 1971 as the formal forum for co-operation between the governments of the Nordic countries and the political leadership of the autonomous areas, i.e. the Faroe Islands, Greenland and Åland.

Content

Preface

During 2004, the Nordic Council of Ministers financed the NordMAB Project bringing together professionals and volunteers working with the biosphere reserve concept from Greenland, Norway, Sweden, Finland, Estonia, Latvia and western Russia.

The aim of the project was twofold: to share experience and to look for possibilities for cooperation. The lasting outcomes were to connecting people by arranging a conference and to gather the shared experience in this report.

In October 2004, the North Vidzeme Biosphere Reserve in Latvia hosted the NordMAB Conference. The conference gathered 60 individuals that were involved in biosphere reserves and the MAB programme from local to international level. The International MAB Secretariat at UNESCO was represented and so was the Canadian Biosphere Reserve Association as well as representatives from local and national Latvian authorities.

Prior to the conference, each participating country produced a report on the experience and status of biosphere reserves. The reports together with a selection of the conference results have been put together to form this project report.

The NordMAB project has enabled sharing of experience and closer cooperation within the Nordic Region. One important result is the formalisation of a network of people engaged in biosphere reserve work in the Nordic Region; the NordMAB network.

With this report the NordMAB network wishes to thank North Vidzeme Biosphere Reserve and Latvia for excellent arrangements and generosity during the NordMAB Conference 2004. The NordMAB network also would like to express its gratitude to the Nordic Council of Ministers for funding and support during the project.

Olof Olsson
Project Manager, NordMAB Steering Group
May 2005

Summary

In the Nordic and Baltic countries and north-western Russia, there are six biosphere reserves, covering Artic environments, boreal and boreonemoral forest landscapes, agricultural landscapes, and costal environments. Since the establishment of the first Nordic biosphere reserves experience about the concept have accumulated. Today there is a growing interest for biosphere reserves in the region and new biosphere reserves may be established.

In October 2004, a NordMAB conference about biosphere reserves was arranged in North Vidzeme Biosphere Reserve, Latvia. The overall objectives of the conference were to gather experience about the biosphere reserve concept and find out if there was a need for a Nordic MAB network. The conference gathered professionals from local to international level, representing seven countries. Prior to the conference each participating country prepared an evaluation of the present status of their biosphere reserve(s) and national MAB programme.

The country reports and the conference shows that biosphere reserves and the MAB programme contribute to the development of conservation and sustainable development in the Nordic region. The biosphere reserve concept serves as a uniting tool for professionals, politicians and volunteers to find solutions for local development in combination with preservation of cultural heritage, biodiversity and recreation possibilities.

The conference agreed that a network for people working with biosphere reserves or otherwise involved in the MAB-programme in the Nordic region is highly desirable. The network shall be named “NordMAB” and it shall complement the work of the MAB National Committees and focal points. Several tasks for the network were identified, for instance 1) support and coordinate mentorship for biosphere reserve candidate areas when preparing application, 2) assist in promoting the MAB

and biosphere reserve concept towards national authorities and governments in the different countries, and 3) initiate applications for common research funding on the biosphere reserve concept. The Nordic Council of Ministers has been the main sponsor for the conference and this report.

1. Biosphere reserves in the Nordic Region – experience and co-operation

The United Nations General Assembly has decided that 2005 – 2014 shall be a decade for education on sustainable development. Biosphere reserves are example on how learning and acting for a sustainable development can be implemented on a locale scale by combining conservation, job creation and education.

In October 2004 the UNESCO Man and Biosphere Programme (MAB) held a conference concerning gained experience and co-operation possibilities between biosphere reserves in the Nordic countries, west Russia and the Baltic countries, hereafter the NordMAB region.

In this report the status of the MAB-programme in the NordMAB region is discussed. NordMAB is presented from an international perspective and as well as the status of the MAB-programme from each participating country. The report present results from the conference, drawing conclusions based on the country reports and the conference, suggesting recommendations for the future of NordMAB and Nordic biosphere reserves.

2. NordMAB from an international perspective

Jane Robertson, Senior Programme Specialist, UNESCO Division of Ecological Sciences

2.1 UNESCO´s MAB Programme

UNESCO is the UN agency responsible for scientific co-operation. In 1968, due to the increasing global awareness of the negative impacts of human activities on the natural environment, UNESCO called a scientific conference to determine what should be done collectively by governments to address this growing issue. This "Biosphere Conference" gave rise to the launching in 1970 of the Man and the Biosphere Programme, known as MAB. It was the first governmental efforts to lay the scientific basis for improving people's relationships with nature (UNESCO, 1970). It is now over 30 years old, has accumulated a vast experience, and has been emulated by many other programmes nationally and internationally. It is implemented in some 140 countries through action coordinated by MAB National Committees or MAB Focal Points.

One of the "inventions" of MAB is the "biosphere reserve" concept: this was designed as a tool for MAB work, where the "M" – people – were the central actors. The term "biosphere reserve" was coined at the time as part of the "branding process" of the MAB Programme to gain international recognition (UNESCO, 2002). The name itself is however a misnomer, since the "reserve" term is not meant to imply restrictions or setting aside areas away from human activities. In fact, it is the opposite!

Today, biosphere reserves are defined by MAB as "areas of terrestrial and coastal-marine ecosystems which are internationally recognised for promoting and demonstrating a balanced relationship between people and nature" (UNESCO, 1996a).

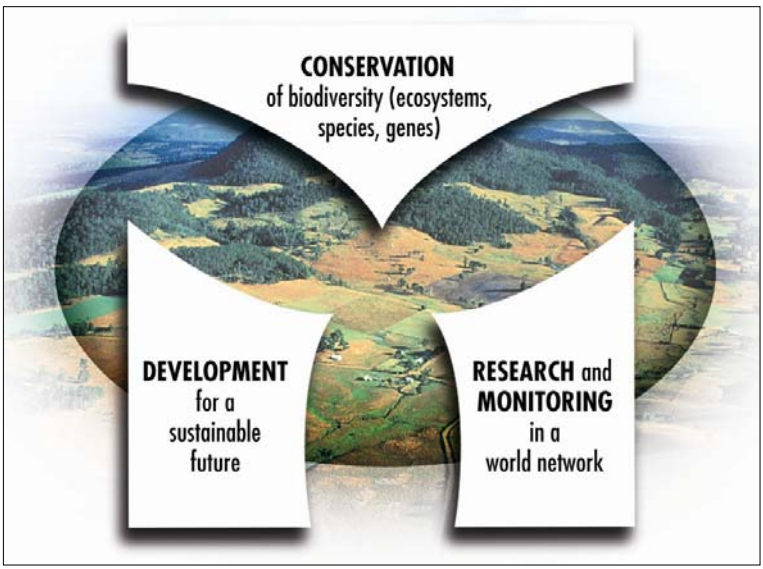
The functions and the zoning system that were designed for biosphere reserves have been refined with time. The functions and the principles of the zoning systems that are the basic elements of the biosphere reserves concept are presented in Boxes 1 and 2.

A biosphere reserve has three functions:

- a conservation function, contributing to the conservation of landscapes, ecosystems, species and genetic variation;
- a development function, fostering economic development which is ecologically and culturally sustainable;
- a logistic support function for research, monitoring, training and education related to local, regional and global conservation and development issues.

It is the synergetic combination of these three functions that characterises the biosphere reserve.

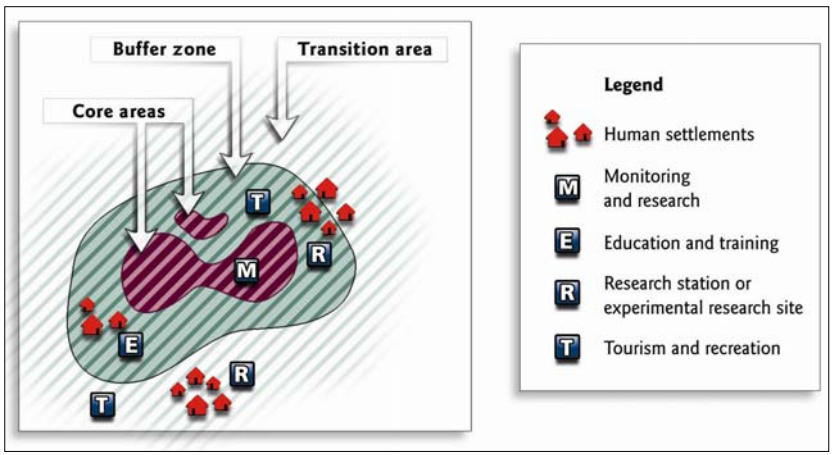
Box 1 - Biosphere reserve functions (UNESCO, 1996a)



Biosphere reserves are organised into 3 inter-related zones in order to enable them to carry out the different activities involved. This zoning was conceived to be flexible enough to be adapted to very different ecological and socio-economic situations around the world.

- A core area which is legally established to ensure long-term protection and which should be large enough to meet defined conservation objectives. There is minimal human activity.
- A buffer zone around or next to the core. This can be an area for experimental research to use the natural resources sustainable and in an economically viable way. It is the area for ecosystem restoration. It can accommodate education, training as well as carefully designed tourism and recreation facilities.
- An outer transition area or area of co-operation whose limits are not fixed. It is here that the local communities, nature conservation agencies, scientists, cultural groups, private enterprises and other stakeholders should agree to work together to manage and develop the area's resources for the benefit of the people who live and work there.

Box 2 - Biosphere reserve zoning (UNESCO, 1996a)



2.2 The Seville Conference on Biosphere Reserves

The first biosphere reserves were designated under the MAB Programme in 1976. In March 1995, the International Conference on Biosphere Reserves held in Seville, Spain, reviewed the progress made in putting the biosphere reserve into practice and sought to determine the role that biosphere reserves could play in the light of the 1992 Rio Conference on Environment and Development, and in particular in serving to implement the Convention on Biological Diversity and meet the concerns of Agenda 21. It was obvious that although the concept is attractive, it is very difficult to put into practice. This is probably due to the ingrained sectoral character of institutions in most countries. Interdisciplinary programmes such as MAB and field projects such as biosphere reserves do not fit comfortably with the establishment. In spite of this reality, the Seville Conference did demonstrate biosphere reserve concept has been applied with considerable success in very different parts of the world. (UNESCO, 1996 b)

The Seville Conference gave rise to the Seville Strategy for Biosphere Reserves and the Statutory Framework for the World Network, both of which were subsequently adopted by the UNESCO General Conference in November 1995.

The Seville Strategy sets out goals and objectives for biosphere reserves at the site level, the national level and the regional and international levels. It thus sets the course for action for the next ten or so years. In particular, it gives a “vision” for biosphere reserves in the 21st century. This “vision” breaks new ground in stating that a biosphere reserves is “more than a protected area” but rather a “pact” between the local community and society as a whole. Management should be open, evolving and adaptive. Such as approach is signalled to ensure that biosphere reserves - and their inhabitants - are better placed to respond to external political, economic and social pressures. This “vision” has now been taken up in the “new paradigm” for all protected areas advocated by IUCN: all protected areas serve not just to protect biodiversity but have social dimensions in improving livelihoods and sharing of information and benefits. This convergence is an indicator that the ideas behind biosphere reserves are sound and are shared by the wider conservation community.

The Statutory Framework sets out the rules for governing the functioning of the World Network of Biosphere Reserves, giving a formal definition, a set of functions and criteria and a designation procedure. In particular, it sets out a periodic review of biosphere reserves designated over ten years ago, with a view to bringing them up to the revised standards and criteria.

As of late October 2004, there are 459 biosphere reserves designated in 97 countries. According to the Seville Strategy, they have new role as:

- living laboratories for testing and demonstrating approaches to sustainable development (UNCED - Agenda 21, and the WSSD);
- concrete sites for meeting the WEHAB focus areas (water, energy, health agriculture and biodiversity and land degradation) and also Millennium Development Goals, and WSSD and in particular those on environmental sustainability, and significantly reducing the loss of biological diversity by 2010;
- Pilot sites for implementing the Convention on Biological Diversity (CBD), and especially the Ecosystem Approach, and also the CBD's thematic programmes of work.

2.3 Evolution of the MAB Programme

In the early part of the MAB Programme in the 1970s, there were 14 main research projects combining the natural and the social sciences. Most of these were geographically focused, for example MAB Project 6 on mountains and tundra, or MAB Project 11 on urban systems. Special task forces of specialists were convened by MAB to outline a programme of research that was conducted by scientists in groups of interested countries. In the 1980s, a MAB Scientific Advisory Panel gave four new "orientations" to these research themes, with a new emphasis on ecology and economics. As an increasing number of other organisations were becoming involved in MAB type of work (and not the least, ICSU with the International Geosphere Biosphere Programme), partnerships were formed for certain topics. One example was the "People and Plants" initiative on traditional uses of plants undertaken jointly by MAB, the Royal Botanic Gardens at Kew (UK) and WWF International. However, as work was not focused in biosphere reserves, MAB did not always have full visibility

and durability in such collaborative efforts. In the 1990s, following the UN Conference on Environment and Development, MAB promoted action to help implement Agenda 21 and the new environmental agreements and conventions. One example is the Convention on Biological Diversity (CBD), ratified by almost all countries of the world except the United States of America. Biosphere reserves provide a tool to implement this Convention and its "ecosystem approach" (UNESCO, 2003), and also to promote the CBD's programme of work on communication, education and public awareness. For the UN Convention on Combating Desertification, UNESCO-MAB has prepared educational kits, tested out through the UNESCO Associated Schools.

As the MAB Programme has evolved over the years, there has been a tendency towards less integrated research projects conducted by groups of countries. One exception to this is the recently launched Project on Global Change in Mountain Biosphere Reserves (GLOCHAMORE) conducted by MAB and a consortium of research NGOs known as the Mountain Research initiative. This being said, the World Network of Biosphere Reserves continues to improve in quantity and quality, functioning through a number of regional and sub-regional networks. On 25 – 29 October 2004, the governing body of MAB, the International Coordinating Council, will hold meet for its 18th session and will be invited to renew the MAB research agenda. This is outlined in document SC-04/ CONF.204/3 located on http://www.unesco.org/mab/mabicc/2004/eng /docs.htm . This document points to existing partnerships which will need to be revitalised or strengthened, starting within UNESCO with the World Heritage Convention, the Decade of Education for Sustainable Development (2005 – 2014) and the International Hydrological Programme. Other partnerships concern NGOs such as ICSU, IUBS and IUCN, the multilateral donors and the private sector, various Conventions and regional bodies such as SADCC and the European Commission (for example in relation to Natura 2000 and the Pan-European Ecological Networks. The ICC and all countries participating in MAB are invited to examine the possibilities of new MAB work under topics such as: reviewing the changes in perception on human-environmental relations (ethical dimensions); focusing on research which meets directly appropriate Millennium Development Goals (for example No 7 on environmental sustainability); applying the best conservation sciences knowledge and practice for the

management and protection of the trilogy of "UNESCO sites" (biosphere reserves, natural World Heritage sites, and Ramsar Wetlands); and promoting education in field ecology, natural history and awareness of biodiversity (linking thus with the CBD and the Decade for Education for Sustainable Development).

However, the future MAB research agenda must continue existing efforts and will focus on biosphere reserves with activities such as:

- implementing the UNESCO priority for the natural sciences for 2004 – 2006 on "water and associated ecosystems", for example in Europe on the Volga and the Caspian Sea, and establishing a transboundary biosphere reserve in the Polesie region between Belarus, Poland and Ukraine;
- promoting the development of "quality economies" in biosphere reserves, guided by a task force, with activities such as experimenting in labelling biosphere reserve products or applying the CBD ecotourism guidelines;
- applying the biosphere reserve concept to urban areas and their hinterlands;
- implementing the Biosphere Reserve Integrated Monitoring (BRIM) programme;
- training and research into conflict prevention and management (following the success of training courses for biosphere reserve coordinators in France in the Vosges du Nord in 2002 and the Cevennes in 2003;
- working with ICSU-SCOPE to understand better the "emerging ecosystems", that is ecosystems consenting of new assemblies of degraded habitats, exotics species, non-traditional inhabitants, etc;
- working with UNEP to explore the inter-relationships between cultural and biological diversity.

2.4 Contribution of NordMAB to the renewed MAB research agenda

NordMAB should be seen as a part of the wider EuroMAB network set up in 1997 which includes all European countries and North America, covering a very wide ecological, social and political diversity. It is normal that in operational terms, smaller groupings of countries are forming and working together (this is the case already for South East Europe). The high latitude countries of the EuroMAB already have a good history of collaborative research through the MAB Northern Science Network (e.g. on northern birch studies, the International Tundra Experiment) but admittedly it has been difficult to keep the momentum going due to lack of funding.

Looking at the coverage of biosphere reserves in the NordMAB region, one can see that participation is uneven and could be improved. In Norway, Svalbard – a "first generation" site that could not conform to the Seville biosphere reserve criteria – was withdrawn, serving as a good example for other countries. However, to date, Norway has not established other biosphere reserves. The Lake Torne Biosphere Reserve in northern Sweden is in the process of revision, to improve the development function, this is also the case of the Greenland Biosphere Reserve. There is potential for a biosphere reserve in Denmark, possibly focusing on the Waddensea, creating a transboundary biosphere reserve with Germany and the Netherlands. Finland has two excellent biosphere reserves in the southern part of the country only. In the Baltic countries, there are Estonian Archipelago, and the North Vidzeme Biosphere Reserve in Latvia, but none yet in Lithuania. Sites in North West Russia include the Laplandsky Biosphere Reserve, Vodlozersky Biosphere Reserve and the new Kenozersky Biosphere Reserve. Transboundary biosphere reserves could possibly be envisaged across the Swedish-Norwegian border at Lake Torne, or across the Finnish-Russian border in Northern Karelia. There is also the WWF idea of a Fenno-Scandanavian Green Belt, a sort of ecological network, which could perhaps be also a large-scale "bioregional" biosphere reserve, with one or more cores designated as World Heritage sites.

It would thus seem advisable for a future NordMAB network to:

- consolidate what exist already, and making a operational network with the existing and biosphere reserves. In this connection, note should be made of the EuroMAB coordinators' meeting planned to take place in Austria in late 2005: news on this will be published on the MABNet (www.unesco.org/mab) under the "regional networks";
- fill the "gaps" in biosphere reserve coverage of the NordMAB countries, not only to ensure good biogeographical representativeness but using the biosphere reserve as a tool to help integrate conservation concerns in an overall rural development context;
- create transboundary biosphere reserves to promote peaceful co-operation among neighbouring countries. UNESCO-MAB recommendations exist for this and the central European experience has recently been complied for sharing with others (UNESCO, 2003).
- explore developing scientific cooperative projects within the EU 6th Framework. One possibility lies with the ALTER-Net, a long term biodiversity, ecosystem and awareness research "Network of Excellence" with 24 scientific institutions in 17 countries in Europe. UNESCO-MAB has been invited to be part of the Network Advisory Committee. An effort in this direction could help to "operationalise" BRIM in the NordMAB and other European countries. (see http:// www.cemagref.fr/English/seven/images/ALTER-NetflyerJan04 _V2.pdf)
- promote the project currently being started on coupling the European coastal and marine biosphere reserves with the EU Marine Research Sites (MARS) to better apply scientific research results (Martin Öhman of Finland is contact person for EuroMAB work on coastal and marine biosphere reserves).

In conclusion, the new European integration offers new opportunities to consolidate and expand MAB work in the NordMAB countries and should be taken up with vigour. The UNESCO Secretariat will continue to encourage and support these efforts.

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3. The West Estonian Archipelago Biosphere Reserve

Toomas Kokovkin, Chairman of The Biosphere Reserve Foundation

3.1 Physical characteristics of the biosphere reserve

The West Estonian Archipelago Biosphere Reserve is situated in the eastern part of the Baltic Sea and comprises the islands of Saaremaa (2673 km^2), Hiiumaa (989 km^2), Muhu (200 km^2) and Vormsi (93 km^2), as well as numerous islets and extensive parts of the coastal sea.

The West-Estonian archipelago biosphere reserve belongs to the mixed forests zone of the world`s northern temperate zone. First and foremost the archipelago represents the ecosystems that have been formed on the costal formations of different developmental phases of the Baltic Sea in the last ten thousand years.

The distinctive features and diversity of nature in the West Estonian islands is mainly influenced by the geographical position, young age of the area, lime-richness of soils and centuries of human activity. Long coastal line where we can find both low and dune beaches, low bays with small islets and holms and thousands of years of land use has formed the structure of the islands` forests, meadows, arable land and pastures, the result of which is a mosaic landscape and diverse nature of the islands.

The biogeographical region is Temperate mixed woodlands / coastal marine zone.

The land surface is rather flat, with maximum of only 68 meters above sea level. The sea depths within the limits of the biosphere reserve do not exceed 50m.

Landforms of the archipelago are formed under conditions of glacial and post-glacial processes, as well as the coastal dynamics of the retreating Baltic Sea. Typical landforms are the accumulative marine plains; abrasional limestone plains; glacial and glaciofluvial hummocks and ridges; coastal terraces and ridges; dunes.

Prevailing types of landscapes are glacio-lacustrine plains, marine plains and abraded moraine plains. Glacio-lacustrine plains are horizontal even plains dissected by shallow river valleys, which lower areas are paludified. Prevailing are plains formed on varved clay, with scarse low plateaus of bedrock elevations, low eskers or beach ridges.

The biosphere reserve occupies in whole two administrative units: the counties of Hiiumaa and Saaremaa. From the county of Läänemaa, the biosphere reserve occupies the municipality of Vormsi. There are discussions to enlarge the biosphere reserve into the county of Pärnumaa, namely to the Muhuväina marine park (see the following figure).

3.2 Habitats and characteristic species

The West Estonian archipelago is located in the southern part of the boreal forest zone of the Northern hemisphere, where the south-taiga forest subzone changes into spruce-hardwood subzone. Phytogeographically, Estonia belongs to the Euro-Siberian region of the Holarctic realm.

The characteristic species of animals, level of their rarity, and status of protection are presented in the following table.

Figure 1: Administrative unites (counties of West Estonia)

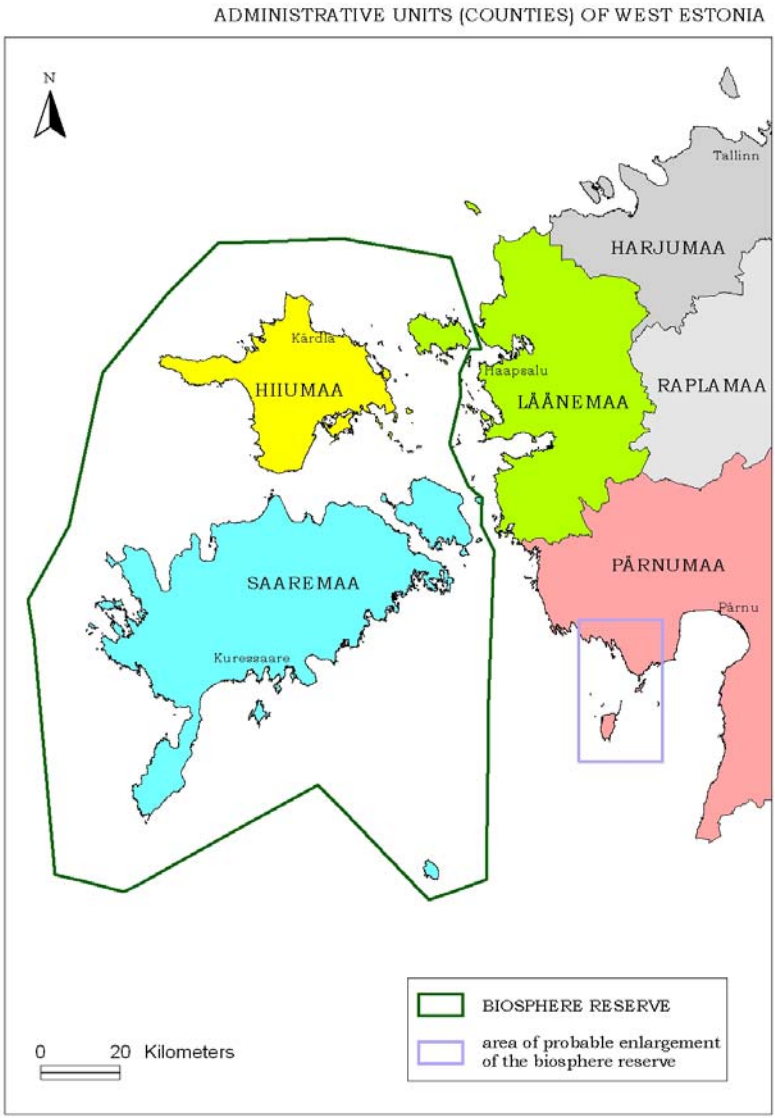


Figure 2: Overview of the West Estonian archipelago

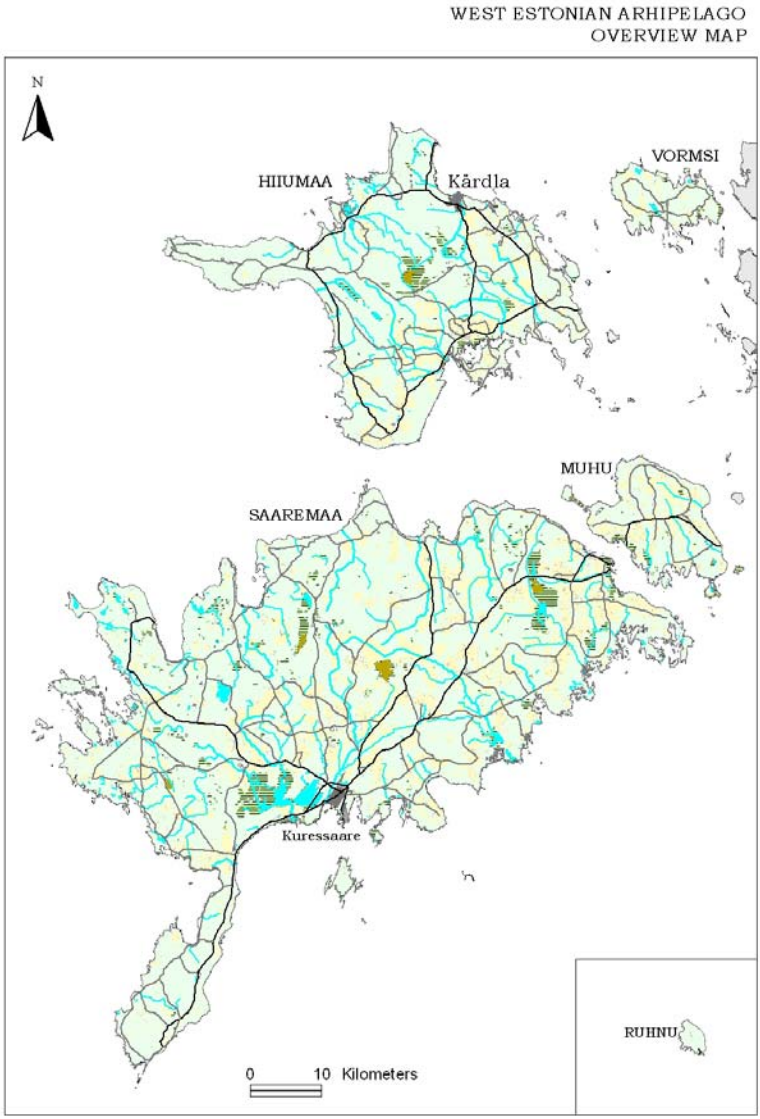


Table 1: The characteristic species of animals, level of their rarity, and status of protection are presented in the following table.

Species	Protection Category in Estonia	International Protection Status		Number in 2003 or estimation – common, rare, occasional
		Bern Convention	Habitats Directive 92/43/EEC	Hiiumaa
Insectivores (Insectivora)				
Western Hedgehog (Erinaceus europaeus)		Annex III		rare
Common Shrew (Sorex araneus)		Annex III		common
Pygmy Shrew (Sorex minutus)		Annex III		-
Water Shrew (Neomys fodiens)		Annex III		common
Bats (Chiroptera)				
Northern Bat (Eptesicus nilssonii)	II	Annex II	Annex IV	rare
Brown Long-Eared Bat (Plecotus auritus)	II	Annex II	Annex IV	rare
Daubenton`s Bat (Myotis daubentonii)	II	Annex II	Annex IV	rare
Whiskered Bat (Myotis mystacinus)	II	Annex II	Annex IV	occasional
Brandt`s Bat (Myotis brandtii)	II	Annex II	Annex IV	-
Pond Bat (Myotis dasycneme)	II	Annex II	Annex II, IV	-
Rodents (Rodentia)				
Red squirrel (Sciurus vulgaris)		Annex III		common
European beaver (Castor fiber)		Annex III	Annex II, IV[1]	4
Bank vole (Clethrionomys glareolus)				common
Northern Water vole (Arvicola terrestris)				common
Field vole (Microtus agrestis)				common
Common vole (Microtus arvalis)				common
Harvest mouse (Micromys minutus)				-
Yellow-necked Mouse (Apodemus flavicollis)				common
Striped field Mouse (Apodemus agrarius)				-
House Mouse (Mus musculus)				common

Norway Rat (Rattus norvegicus)				common
Hares (Lagomorpha)				
Brown Hare (Lepus europaeus)		Annex III	Annex V	common
Mountain Hare (Lepus timidus)		Annex III	Annex V	common
Carnivores (Carnivora)				
Red Fox (Vulpes vulpes)				common
Raccoon Dog (Nyctereutes procyonoides)				common
Wolf (Canis lupus)		Annex II	Annex II, IV[2]	1
Stoat (Mustela erminea)		Annex III		common
Weasel (Mustela nivalis)		Annex III		common
European mink (Mustela lutreola)	I	Annex II	Annex II*, IV	rare[3]
American mink (Mustela vison)				-[4]
Western Polecat (Mustela putorius)		Annex III	Annex V	-
Pine Marten (Martes martes)		Annex III	Annex V	common
Eurasian Badger (Meles meles)		Annex III		-
Otter (Lutra lutra)	III	Annex II	Annex II, IV	5-7[5]
Lynx (Felis lynx)		Annex II	Annex II, IV[6]	38
Seals (Pinnipedia)				
Ringed Seal (Phoca hispida)	II	Annex III	Annex II	579±101[7]
Grey Seal (Haliochoerus grypus)	II	Annex III	Annex II, V	2675-2785[8]
Hoofed animals (Artiodactyla)				
Wild boar (Sus scrofa)		Annex III		600
Red deer (Cervus elaphus)		Annex III		400
Elk (Alces alces)		Annex III		360
Roe deer (Capreolus capreolus)		Annex III		1.100

[1] Annex V since 1th of May 2004
[2] Annex V since 1th of May 2004
[3] On-going recovery project since 2000
[4] Population removed between 1998 and 1999
[5] Maran, 2000
[6] Annex V since 1th of May 2004
[7] Total number of Estonian population (Liivi Bay only) in 2003
[8] Total number of Estonian population (Soome Bay included) in 2003

3.3 Zoning

Zoning of the WEBR was worked out in the late 1980s, during the extensive preparation for the establishment of the biosphere reserve. This zoning took into consideration all the broad data, which was available in the Estonian archipelago, and which was based on thorough scientific research. This initial zoning reflected the Soviet era approach in the nature conservation with its *zapovedniks* system and large areas of state-owned land.

Nature preservation in the West Estonian archipelago has been conducted pursuant to regular development since the first large-scale regulations in 1962. Every previous action has provided a base to the next one. Zoning and planning of the territory have complemented each other. This is also the sole solution as the island along with its natural resources and inhabitants is a single entity.

The initial selection of areas for the biosphere reserve in 1989 was very general. Later on a necessity emerged to highlight the core areas with specific value, which resulted in the formation of cluster-type biosphere reserve.

More than 50 core areas were specified. Core areas had very different sizes from a few dozen hectares to over thousand hectares. Each one of them serves a specific preservation purpose: for example, protection of areas delicate to treading, protection of natural habitats of orchids, protection of moors as areas of recreation for water supplies and wild animals, protection of avifauna.

The selected territories can be provisionally divided into rare (e.g. calcareous spring bogs, heath bogs etc.) and typical (heath pine-forest dune landscape, shingle coasts). It is vital to give consideration to the aspect of landscape diversity, which derives from the evolution of different-aged coastal formations.

However, the processes in the Estonian society in 1990s, which were related to political independence, private land ownership and establishment of democratic governing, caused considerable changes in the organisation of protected areas. The old zoning of the biosphere reserve did not fit into new circumstances any more. At the same time, accession with the European Union caused additional changes, mainly related to the system of protected areas under the Birds and Habitat Directives, which is known as Natura 2000.

The idea of the renovated zoning of the biosphere reserve is to match the terminology of UNESCO MAB zoning (core areas, buffer areas, transition area) with the legal framework of the nature conservation areas in Estonia, as follows:

Core areas: the areas of conservation or strictly controlled maintenance; in the Estonian legislation, the strict reserves (*reservaat*) and special protection areas (*sihtkaitsevöönd*).

Buffer zone: the areas of limited nature management; in the Estonian legislation, the limited management areas (*piiranguvöönd*). Also, the newly designated Natura 2000 areas belong to the buffer zone.

Development zone (or transition zone): remaining areas of the biosphere reserve, where no specific restrictions apply. It is the area of sustainable nature use.

Figure 3: Official zoning of the West Estonian archipelago biosphere reserve

3.3.1 Core areas

Forests

The forest areas of core areas have primeval and natural forests with high-valued nature preservation features. Due to the fact that the islands` forest areas are expansive and the bog areas between the drift lines that

emerged centuries ago are inaccessible, then nearly one third of Estonian forests that are unaffected by human activity have been preserved in the island of Hiiumaa.

Bogs

The bogs of the islands are mostly hidden between the woodlands and form a common representative landscape with the surrounding forests. The bogs of West Estonian islands are quite different depending on their developmental levels: calcareous spring fens, small fens, developing transition mires and moors. The best solution for the protection of bogs for both the diversity of nature as well as the preservation of the island's water reserves is to leave them grow naturally and avoid or minimise human activity.

Semi-natural areas

Semi-natural habitats have been formed together with traditional land use and in order to preserve them, we must continue land use that has been formed during the history. Woodlands, coastal meadows and alvars are preserved only thanks to constant human activity: cutting, mowing and pasturage. These are areas of rich biota, where each of the species has its own place and even the slightest breach (e.g. not mowing) can break this balance. Semi-natural areas are areas of high natural value that require regular human activity. As a rule, these areas would belong to a buffer zone but pursuant to the preservation purpose of the natural values, it might become necessary to form core areas of semi-natural communities.

Wooded meadows with small groups of trees have been formed as a result of traditional land use. Due to their diversity these are one of the richest colonies in Estonia with regards to species. Different humidity and light conditions under the trees and on clearings enable many species to meet and live together here.

Alvars are limestone areas with very thin cover of topsoil, which is the habitat for calcicole plants that can endure extreme humidity conditions, lots of rare species can be found amongst them. Historically the alvars have been used for sheep faming, at present the land use has been reduced or stopped completely and the alvars are now facing a threat of being grown over by junipers and pines.

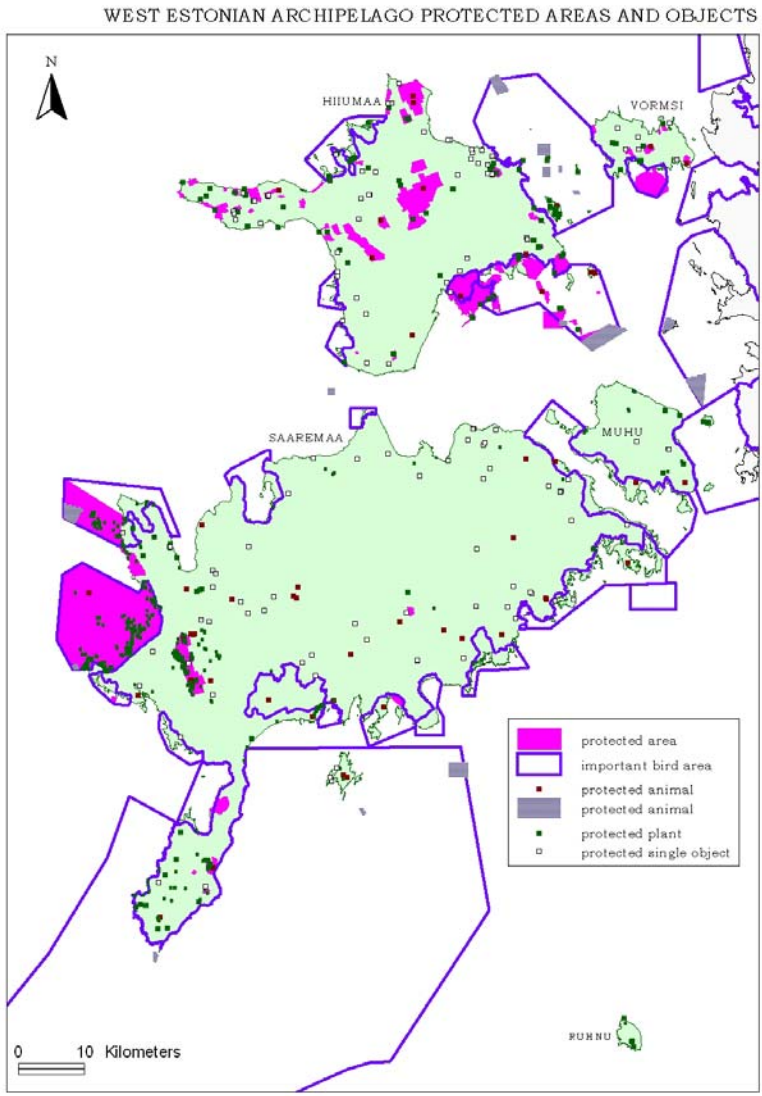
Coastal meadows are meadows that can be found on low coasts in the areas influenced by sea, which have historically been used for bovine farming. The low grass coastal areas with unique species and plant colonies are preserved thanks to pasturage. Coastal meadows are important feeding and halting areas for migratory birds. The present lack of livestock causes the growing over and reeding of coastal meadows.

3.3.2 Buffer zone

Buffer zones or nature reserves form a coherent area, which has the task of forming a protective belt through restrictions on use. The buffer zone forests are mainly the protected forests in the state forest areas, which are managed by improvement cutting or small-scale clear cutting. These forests are quite natural in their essence. Plant communities as such are preserved, the habitats of species are preserved and green corridors are not cut off.

Traditional forest farm management, where the cutting or preservation of every tree is done carefully, could sometimes be found also in private forests today. Age-old families who have lived in the same place for several generations are taking good care of the forest and land as their ancestors did.

Figure 4: West Estonian archipelago protected areas and objects



3.3.3 Development zone

Development zone is a space for living and active operation. These areas include agricultural lands, profit yielding forests, densely populated areas, ports and small industry areas. The development zoned in the Estonian

biosphere reserve is an area, which has not been designated as a core or buffer area, but which still belongs to the biosphere reserve area (either land of sea).

It should be emphasized that the development zones include the majority of the island's forests. Profit yielding forests are managed by improvement felling and clear cutting, the cutting areas are forested in order to have the cutting circle as short as possible and the next forest generation would grow with a high consuming value of timber.

Regardless of the fact that all the "normal" or "ordinary" legal acts of Estonia on nature and environment are implemented on the development zone, there exists an extra demand under conditions of the biosphere reserve - it is to preserve and promote traditional and nature balanced activities in the area such as organic farming, stable forest management etc.

3.3.4 Natura 2000 – Network of European reserves

Significant changes have taken place in Estonia's development by the year 2003. Estonia has new environment and nature preservation-related responsibilities due to the accession into the European Union.

The state of Estonia has assumed a responsibility to make a selection of areas of endangered or rare plant or animal species and their habitats into a common network of European reserves *Natura 2000* by spring 2004.

This includes top priority areas such as the coastal meadows, woodlands, alvars and meadowlands, bogs, sand dune areas, old coniferous and mixed forests, grove forests, woodland pastures, wet peat land forests, as well as islets and small islands and bog-pool benches.

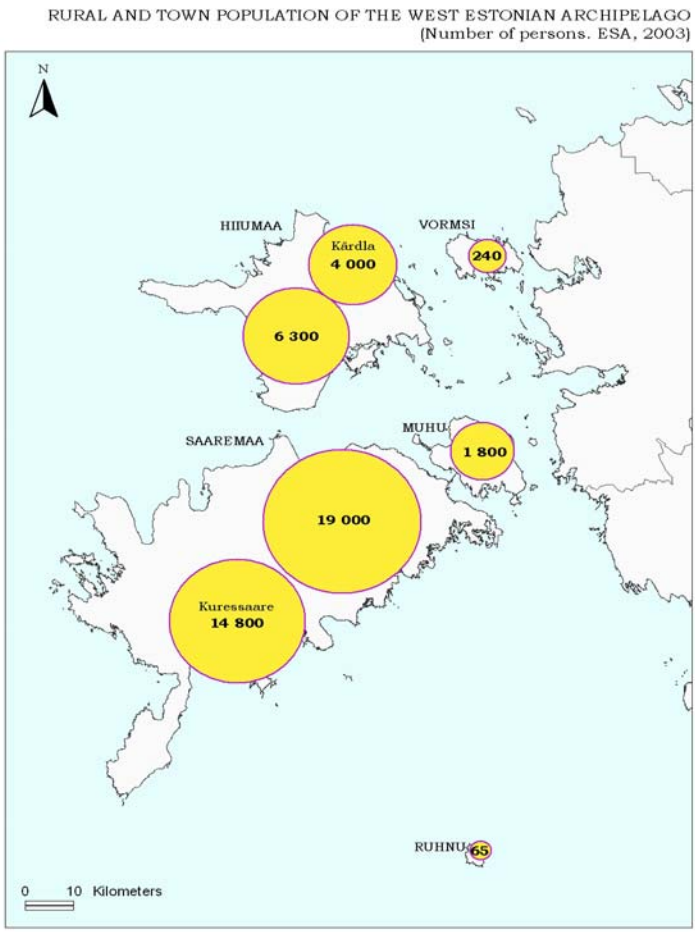
Natura preliminary selection areas include the majority of current reserves and their extensions. From the point of view of the biosphere reserve the zoning would need renewal and inclusion of the *Natura* framework. The new stage could focus the activities of the biosphere reserve to local people and their sustainable economic activity.

3.4 Human activities

3.4.1 Population living in the biosphere reserve

According to the Estonian Statistics Board data (ESA, 2003) the total of approximately 46 300 inhabitants live in the biosphere reserve area of West-Estonia, which makes up 3,4% of the population of Estonia: 35 665 inhabitants in Saaremaa (incl. Muhu island 1 853, Ruhnu island 65), 10 367 in Hiiumaa and 247 in Vormsi. The population in the islands has been steadily decreasing over the past decade (-12%) due to negative natural birth rate as well as migration balance.

Figure 5: Rural and town population of the West Estonian archipelago



The two towns on the islands, namely Kuressaare and Kärdla, have the total population of 18 700 inhabitants, which makes 41% of the entire population of the islands.

3.4.2 Use of resources by local population

Key land-uses include extensive agriculture, fishing, forestry, hunting and tourism. The main aims of the biosphere reserve are to maintain the insular and coastal landscapes as well as the cultural and socio-economic features of the area.

The total area of arable land on the islands is about 57 000 hectares, which accounts for over a hectare per every islander, whereas there is over 4 ha of forest per every islander. A considerable decrease in plant cultivation and livestock farming has taken place in agriculture on the islands just like in Estonia in general over the last decade.

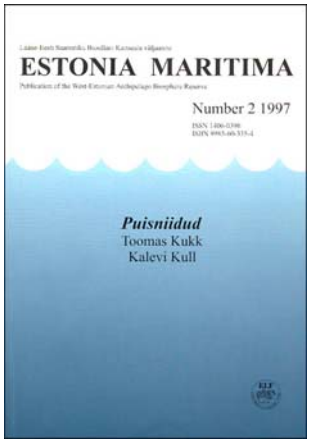
At the same time the natural grasslands are becoming more and more overgrown, which also includes the fields becoming overgrown. The characteristic semi-natural formations of the islands such as alvars and woodlands are becoming extinct. The cutting of forests, especially primeval forests, has become very intensive and not enough attention is paid to renewing those forests.

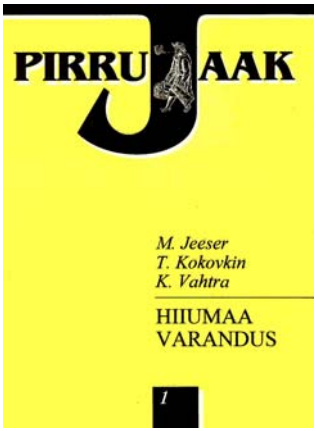
3.5 Research and Monitoring Programmes

During the existence of the biosphere reserve in Estonia, considerably broad spectrum of research activities was carried out on the islands. However it should be mentioned that only small portion of this research has been specifically biosphere reserve oriented. On an average, the research and monitoring is carried out by external institutions and universities, which are not necessarily taking into account the approach of the Man and the Biosphere programme.

Research results, achieved since early 1990s, have been published in three different series, namely “Pirrujaak”, “Estonia Maritima” and “Environmental atlas of Hiiumaa”. These first two had 5 issues each, and the latter one had 4 issues (see the bibliographic list below).

Figure 6: Research results, achieved since early 1990s, have been published in three different series, namely "Pirrujaak", "Estonia Maritima" and " Environmental atlas of Hiiumaa".





Apart from ecological and environmental research (such as rare species, sustainable forestry, geology, coastal processes etc), the biosphere reserve has carried out socio-economic research as well. The most outstanding examples are the sociological studies that were made twice, in 1996 and 1999. This comprehensive research compares attitudes of people towards nature, traditions, local economies, neighbourhoods and global issues. This research may be considered as a very substantial and methodologically correct basis for social monitoring of the biosphere reserve.

3.5.1 Monitoring

The national authorities under the Estonian National Environmental Monitoring Programme mainly carry out environmental monitoring in the West Estonian Archipelago, and in the surrounding sea.

Monitoring of biological diversity and landscapes provides the following outputs:

- Timely submission of reporting data in the required format, for fulfilling the obligations undertaken under international agreements.
- Monitoring and prognostication of the status of habitat types, habitats of species and populations of species that have been classified as rare and/or endangered at the national level.
- Monitoring and prognostication of the status of indicators of the indigenous biological diversity.
- Identification of the present structure of the landscapes and the main trends of changes therein.

The general objective of sea monitoring is to determine the impact of human activities on the marine environment and biota of the Baltic Sea, and to determine the range of influence of these activities in the context of natural changes, including qualitative and quantitative assessment of the effectiveness of the measures applied. It provides outputs in four subprogrammes such as:

- Monitoring of seawater eutrophication.
- Monitoring of phytobenthos in the coastal sea.
- Monitoring of hazardous matters in the coastal sea.
- Monitoring of coasts.

The West Estonian Archipelago Biosphere Reserve has carried out the detailed monitoring of ground water on the island of Hiiumaa in mid-1990s.

One specific programme of research and monitoring is re-introduction of the European mink to the Estonian islands. It is a EU Life Project 2001 – 2004 “Recovery of *Mustela lutreola* in Estonia: Captive and island populations”. The project is run by non-profit nature conservation foun-

dation “Lutreola” and by two partners: Tallinn Zoo and Hiiumaa Protected Areas Administration.

3.5.2 GIS database

The GIS database of the West Estonian Archipelago biosphere reserve was initiated by the Saaremaa centre in 1996. Nowadays, the Research Centre Arhipelaag, based in Hiiumaa island, is taking care of this database. The list of thematic layers of the database includes:

- Zoning
- Protected areas
- Land use
- Geology
- Coastal typology
- Vegetation
- Protected flora and fauna
- Waters
- Top soils
- Roads and other infrastructures
- Cultural heritage objects
- Natural and cultural monuments
- Waste treatment
- etc

3.6 Public awareness and participation

In response to the political and economical changes of 1990s, the Biosphere Reserve started to take a new direction, focusing its development on becoming a model region for sustainable development. This has required a more integrated approach, to balance conservation goals with economic and social needs of the people living on the islands. The new direction means focusing more attention on collaboration with local communities, engaging in communication and education activities, and developing community-based policies through participatory planning.

Since the late 1990s, as part of this new approach, the Biosphere Reserve initiated various collaborative projects for management of the reserve.

The biosphere reserve was very active in rising awareness of both children and adults. There was a number of seminars, radio- and TV programmes, art contests and newspaper articles each year. One most prominent was the newspaper "Kaitseala Teataja" ("Newsletter of the reserve"), which was published in 1994 – 1998 and 2000.

Internet was very efficiently used. Today there are several articles and other information available at http://www.bka.hiiuloodus.ee/.

3.6.1 Hiiumaa Green Label - environmentally sound service

A simple labelling technique was introduced in tourism services of the island of Hiiumaa (Estonia) in 1996. Hiiumaa Green Label marks an accommodation or catering enterprise that is managing on a sustainable way i.e. doing its best not to add to the load of Hiiumaa's clean nature.

3.6.2 The Väinameri project

One particular project has been making a considerable impact in terms of farm diversification and integrated rural development, namely the "Väinameri project", which is run by a large network of partners in Estonia and Sweden including WWF Sweden, the Research Centre Arhipelaag, the Swedish Aid Agency SIDA and the Estonian government. The Centre Arhipelaag is one of the four members of the Biosphere Reserve Foundation.

The Väinameri project seeks to contribute to the restoration and maintenance of the biodiversity and scenic qualities of coastal landscapes using both native and quality-breed animals and specific patterns of grazing. Furthermore, it is helping to create economic opportunities for people working in agriculture in sparsely populated areas of the Biosphere Reserve, not only through income from high quality meat but also from a more diverse range of related local products and farm services.

The project has three main components:

- Management of naturally unfertilised grasslands to maintain the biological value of these areas.

- Local handicraft production using basic materials obtained through the sustainable management of natural resources.
- The development of small-scale farm tourism that adds to the earning potential of local inhabitants.

As part of the support provided, farmers have been assisted in purchasing pedigree stock and provided with maintenance equipment.

Educational elements of the project include demonstration pastures which illustrate the environmental benefits of this form of grazing on site, and simple outdoor auditoria providing information about the scheme for farmers, conservationists, school groups and tourists. Lookouts, boardwalks and nature trails facilitate field observation.

Awareness for the value of this product is being raised by events such as a "Green meat dinner" in 2002 at an exclusive restaurant, cooked by famous Estonian chefs. 60 guests including nature conservationists, farmers, merchants, representatives of government authorities and journalists were able to sample the high-quality beef grazed within the project. Such activities are helping to make the connection between the production of high-quality meat in valuable natural areas and the conscious consuming of this.

In terms of local tourism development, the visitor to the region benefits from unique activities that are different to those provided on typical tourist farms, and from the successful coordination of activities, which ensures that a full range of services can be provided. By making use of these services and purchasing the local products on offer, such as honey, herbs an handicrafts, the visitors too are making an active contribution to maintenance of the landscape and to the livelihoods of local people.

3.7 Institutional aspects

Before discussing the institutional aspects of the WEBR we should emphasize that the BR has undergone a very thorough reform in 2002 – 2004, which is not still yet completed. The essence of this reform is shift of the BR management from the governmental institution to the non-governmental sphere.

3.7.1 Genesis of the biosphere reserve in Estonia

The history of the West Estonian Archipelago biosphere has quite precisely followed the logic of the biosphere reserves development worldwide. The idea of setting up a biosphere reserve was initiated by Estonian scientists with the launch of the MAB programme in Estonia at the end of the 1970s. The biosphere reserve was one of the eleven topics that the national committee of MAB in Estonia decided to engage in. The idea of setting up a biosphere reserve was presented to the public in the beginning of the 1980s. The principal supporting idea was the necessity to create reserves representing different types of ecosystems in the world to explore and preserve the primitive nature. Evidently, this idea represented the biosphere reserves of the first generation, which focused on and had the objective to implement stricter preservation and scientific research. According to H. Trass (1983), a biosphere reserve must:

- represent a certain type of ecosystem, which is characteristic of the
- given bio-geographical province, unaffected or affected as little as
- possible by human activity;
- be the base for long-term and complex scientific research;
- be big enough to implement the necessary zoning;
- be equipped with scientific staff and modern research tools, participate
- in research programmes;
- be attainable, easily accessible, to organise open seminars and
- symposiums.

In the middle of the 1980s new issues were included in the discussion of biosphere reserves in Estonia, namely:

- participation in regional planning, explanation of stable and balanced use of natural resources, employing nature-friendly solutions of traditional economy;
- involvement of local inhabitants in the management of biosphere reserves and fulfilment of assignments, development of ecological industry, support to traditional nature conservation, farming and cultural traditions.

By this time the Western Estonian archipelago had become a region, where the biosphere reserve had been decided to be established. The reasons behind this decision were as follows (Trass 1988):

- the nature preservation and environmental protection condition in the Western Estonian archipelago was quite critical at places. Individual measures were not enough anymore, the only thing to make any difference would be the fundamental re-organisation of socio-economic development and nature preservation on the islands and islets;
- our islands are rich in species and representative, the nature of the islands is rich in relics and endemics;
- there is a diverse network of reserves, which enables to transform the Western Estonian archipelago into a reference area of nature preservation with international importance;
- there is a reliable set of scientific information regarding the Western Estonian islands;
- the Western Estonian islands are suitable to conduct zoning of the biosphere reserve.

On the 6th of December in 1988 the Supreme Soviet of the Estonian SSR adopted a resolution stating that "in order to protect the Western Estonian archipelago from irreversible detrimental consequences of economic activity, approve the proposal … to set up a biosphere reserve of the Western Estonian archipelago."

This was the initial basis for the preparation of documentation on the Western Estonian biosphere reserve and an application for approval of the biosphere reserve was sent to UNESCO. Pursuant to the regulation of the government of the Estonian SSR on the 27th of December in 1989, Western Estonian Archipelago Biosphere Reserve was set up from the 1st of January 1990, with the total area of 1,560,078 ha (including the core areas protected by special regime 123,000 ha). The certificate was presented to the Chairman of the Supreme Council of the Republic of Estonia Arnold Rüütel on the 7th of June in 1990.

Since 1990, the biosphere reserve was originally managed by three administration units under the Ministry of the Environment, each of which had a regional Biosphere Reserve Centre. This structure reflects

the spatial isolation and historic development of the different island communities.

3.7.2 Three biosphere reserve centres in 1990-2002

Three local biosphere reserve centres were established from 1990 to 1991. A centre was established in each involved county: Saaremaa Centre in the town of Kuressaare, Hiiumaa Centre in the town of Kärdla and Läänemaa Centre in the town of Haapsalu; the latter centre was mainly active on the island of Vormsi though. Due to the sizes of the areas, the centres were very different and this gave rise to their different approaches. A rural municipality with the population of 300 inhabitants and the area of 93 square kilometres became the area for the Vormsi Centre. An area of 1,000 square kilometres, 10,000 inhabitants, four rural municipalities and one small town became the "playground" of the Hiiumaa Centre. The Saaremaa Centre had to operate on approximately 3,000 square kilometres of several populated islands (Saaremaa, Muhu, Ruhnu, Vilsandi, Abruka), which inhabited 40,000 people and contained 15 rural municipalities and one town.

The three centres began operating under the county governments. In order to make coordination easier, in 1994 the centres were transferred under the jurisdiction of the Ministry of the Environment, thereby also ensuring a more stable financing. In the same year, the government also approved the Statutes of the Biosphere Protection Area.

The Statutes is a document, which was completed as a result of the cooperation of the parties and included almost everything presumed by the management of a modern biosphere reserve. The Statutes declared that the task of the biosphere reserve is to preserve natural complexes by aiming at sustainable and conservative use of nature and by adhering to scientific research and innovation in the field of nature conservation, environmental monitoring, regional planning, education, and training (Government of the Republic of Estonia, 1994). It was decided that the regional centres should perform the following tasks in their region:

- Participate in the development of the plans for the management of the conservation of the nature and natural resources of the West-Estonian archipelago;

- Manage the protection of the core areas and natural features of the biosphere reserves;
- Develop a programme for the environmental monitoring and coordinate its implementation;
- Participate in regional planning;
- Develop nature-related education;
- Distribute information about nature conservation and environmental protection;
- Regulate tourism on the basis of the tolerance limits of the nature;
- Involve the local population in the performance of the tasks of a biosphere reserve; promote traditional ways of management, develop standards for the use of nature and nature conservation, which take into consideration the distinctive character and the limits of tolerance of the islands, and submit proposals to competent institutions with regard to the implementation of the said standards.

Such comprehensive scope of activities enabled several interpretations and this is why two different visions emerged; these visions could be conditionally titled as a "rigid Saaremaa style" and a "soft Hiiumaa style". The former supported a stricter, more conservation-centred and centralised approach to the management of biosphere reserve, presumed a development of a substantial material base, and was in awe of the national authorities. This approach might also be called a top-down approach. The second approach, the Hiiumaa approach adopted a slogan of local co-operation, operated through flexible projects, introduced innovative ideas from the world, but often forgot its duties as a state authority. This could be called a bottom-up approach. The approach of the Vormsi Centre was more down-to-earth because in addition to performing its tasks concerning the biosphere reserve, the centre also had to deal with the issues of environmental protection of the rural municipality.

Little by little, it became apparent that the structure of the management of biosphere reserves did not correspond to its function. A necessity emerged to reorganise the management forms. In early 2000s, the Ministry of the Environment was inclined to allocate several public tasks to be performed by the private sector and the non-profit sphere in the form of "services". This is how an idea emerged to establish a separate foundation for biosphere reserves and this idea was likewise supported by the county

governments. In 2001, the Minister of the Environment made a proposal to terminate and reorganise the activities of the biosphere reserve centres and this proposal was implemented in April 2002.

What were the internal reasons, which lead to the need to reform the management structure completely? We would like to point out three main reasons:

It was not possible to keep the protection of a unified biosphere reserve together on the basis of three local centres since there was no common coordinating centre.

Biosphere reserve did not have a place in the national nature conservation system. Although the name referred that the area should fall under the regulation of the Law on Protected Natural Objects, the efforts to provide a legal definition of the essence of a biosphere reserve failed.

There was confusion with regard to two concepts: a biosphere reserve as a region and a biosphere reserve as an institution. Such approach may be understandable in the case of nature conservation areas where the administration governs its territory; however, in the case of a biosphere reserve, it gave rise to a contradiction.

Simultaneously to the termination of the activities of the centres, a new foundation was being established and that turned out to be a beginning of a new phase.

3.7.3 Co-ordination by the "Biosphere Programme Foundation"

In 2001/2002 this set-up was changed in favour of a non-governmental management structure, and the NGO 'Biosphere Programme Foundation' created for this purpose. Four non-governmental associations from Hiiumaa, Saaremaa, Vormsi and Pärnumaa counties formed this new foundation. The foundation described its objectives in a memorandum of common intentions as follows:

The objective is to preserve the diversity and characteristics of Western Estonian landscape, biology and culture through directing the regional development to sustainable development model within the programme "Man and Biosphere" (UNESCO MAB).

The objectives of the foundation are:

- Preparation of sustainable development programmes, development and implementation of practical models to execute them.
- Adjustment of social, cultural and economic needs to the conditions of biological diversity and the sustainable use of natural resources.
- Keeping records of environmental and human activity and making the data accessible.
- Deepening of environmental awareness and integration of environmental thinking with economic programmes.

The foundation is organising necessary activities for this purpose, more specifically:

- Initiates and implements development projects related to objectives, organises research projects, informs the public.
- Collaborates with the County Governments of Hiiu, Lääne, Pärnu and Saare Counties, relevant local governments, environmental agencies and interested organisations. Private sector, non-profit sphere and academic societies are included in the co-operation.
- Collaborates with the worldwide network of biosphere reserves and helps to implement the networks and development programmes of regional environment or nature preservation.
- Engages in providing environmental education to the people, organises and intermediates the availability of environmental information.
- Pays attention to the issues related to local sustainable development in smaller islands and tries to find solutions to strengthen the regional centres of the future foundation on smaller islands in addition to problems related to preparing and developing extensive regional programmes.

Therefore, a foundation has been laid for the continuation of biosphere reserve in a large-scale national collaboration form. The pre-requisite for successful operations is local interest, which is the participation of societies, movements and people, whereas, quite a lot depends on the work of the members of the foundation. Having a non-governmental foundation

provides an opportunity to implement the principles of a biosphere reserve and helps to apply direct action on the spot.

The Council of the Biosphere Reserve Foundation consists of five members. Four of them represent the above-mentioned regional NGO-s, and one seat is for the representative of the Ministry of Environment.

The address of the Biosphere Reserve Foundation is:
Sihtasutus Biosfääri Programm. Vabrikuväljak 1. Kärdla 92411 ESTONIA.

3.7.4 MAB in Estonia

There is currently no MAB committee in Estonia. The one, which existed since 1978, was discontinued in mid-1990s. Since then, virtually no scientific support was given to the biosphere reserve. The Biosphere Reserve Foundation has identified the need to establish the scientific council for the biosphere reserve.

3.8 Implementation indicators

We shall list the indicators, which are the basis for assessing the operation of biosphere reserve on the Estonian national level and on local level (Seville strategy…, 1996). We will also mark each of the indicators after listing it at the same time: whether the requirement had been fulfilled on the Western Estonian archipelago's biosphere reserve by the year 2002 when its structure was altered.

Indicators on the Estonian national level:

1. *Bio-geographical analysis prepared.* Yes, the bio-geographical condition of the Western Estonian archipelago is known and well documented.
2. *Analysis of need for new or extended biosphere reserves is completed.* No, this is probably not even planned.
3. *Biosphere reserves included in national strategies and other responses to the Convention on Biological Diversity and other conventions.* Yes.

4. *Links developed between biosphere reserves.* Since there is only one biosphere reserve in Estonia, then this requirement has been fulfilled in another way – both through international co-operation and mutual co-operation between the reserves. Therefore, yes.
5. *In situ conservation plans for genetic resources in biosphere reserves.* No, this has only been discussed.
6. *Biosphere reserves incorporated into sustainable development plans.* Yes, on county level as well as the national level.
7. *Biosphere reserves developed or strengthened to include traditional life styles and in areas of critical people-environment interactions.* Yes, on some levels. If we consider the life-style of the archipelago traditional and the modern use of nature focused on consumption as critical.
8. *Conservation and sustainable use activities identified and promoted.* Yes, an appointed authority executes nature preservation. Several projects related to sustainable management.
9. *Effective management plans or policies in place at all reserves.* No. Our biosphere reserve does not have a management programme or clearly expressed policies.
10. *Mechanisms developed for identifying incompatibilities between conservation and sustainable use functions and to insure an appropriate balance between these functions.* No, such mechanisms have not been developed for the biosphere reserve.
11. *Biosphere reserves included in regional development and land-use planning projects.* Yes, generally, the employees of the biosphere reserve were engaged in the preparation of such plans.
12. *Land-use sectors near biosphere reserves are encouraged to adopt sustainable practices.* Yes and no. No specific encouragement is provided in the Western Estonian archipelago in comparison to other areas.
13. *Biosphere reserves are integrated into national and regional research programmes that are linked to conservation and development policies.* Yes, to a certain extent, for example, research of landscapes, coastal sea and species under protection, village and rural municipality development programmes.
14. *Biosphere reserves are integrated into national monitoring programmes and are linked to similar monitoring sites and networks.* Yes, for example, the monitoring of rare plant species and currents.

15. *Principles of conservation and sustainable use, as practiced in biosphere reserves, integrated into school programmes*. Yes, to a certain extent, especially in the extra curricular work and in hobby groups.
16. *Biosphere reserves participate in international education networks and programmes.* Yes, for example the GLOBE programme.
17. *Model training programmes for biosphere reserve managers are developed*. No, there are no such programmes.
18. *Mechanisms developed to review national strategies and action plans for biosphere reserves*. No. And there could not have been because there was no strategy for the biosphere reserve itself.
19. *Mechanisms developed for information exchange among reserve managers*. No, one of the biggest problems was that the information was not exchanged between the biosphere reserves situated on our islands.
20. *Statutory Framework of the World Network of Biosphere Reserves is implemented at the national level.* Yes and no. The structure of the biosphere reserve was in compliance with the general principles but some requirements, e.g. participation of local people, were not fulfilled.
21. *National-level mechanism developed to advise and coordinate biosphere reserves.* Rather not. Until the national MAB committee existed, it did not engage enough in the biosphere reserve after it was set up.
22. *Interactions developed between biosphere reserves and similar managed areas and organizations with congruent goals*. Yes, profound co-operation with the Estonian Association of Reserves.
23. *Mechanisms developed to foster twinning between biosphere reserves*. No, because we only have one biosphere reserve.
24. *Information and promotional materials developed for the Biosphere Reserve Network.* No, not on a national level. However, there are of course lots of materials, which the reserve has published itself in print, media and Internet.
25. *Strategies developed for including biosphere reserves in bilateral and multilateral aid projects.* No. This is probably a requirement, which is based on the worldwide UNESCO spirit and which was not on the Estonian agenda.

26. *Strategies developed for mobilizing funds from businesses, NGOs and foundations*. No, not on a national level.
27. *Mechanisms developed for monitoring and assessing the implementation of the Seville Strategy*. No, there was no written strategy.

In conclusion, it can be stated that taking into account the mentioned indicators, the biosphere reserve had its own place and operational mechanism on a national level but it was lacking the necessary strategies and action plans.

Local level indicators of biosphere reserve:

1. *Survey made of stakeholders interests*. Yes, at least in Hiiumaa, where two thorough social surveys had been conducted.
2. *Factors leading to environmental degradation and unsustainable use are identified.* Yes and no. All in all there was an overview but it was not clearly defined.
3. *Survey made of the natural products and services of the biosphere reserve.* Yes and no. There was no specific research but relevant information and contacts existed.
4. *Incentives identified for sustainable use by local populations.* No. Even the principles of sustainable development were not clear enough.
5. *Plan prepared for equitable sharing of benefits*. No, there were no such plans. However, there was a need for it, for example when the equal access to natural values for the people was repealed.
6. *Mechanisms developed to manage, coordinate and integrate the reserves programs and activities.* No, because there were no programmes or projects.
7. *Local consultative framework implemented.* Yes, this role was borne by the local biosphere reserve centres.
8. *Regional demonstration sites developed*. Yes, to a certain extent every island had its own expositions and outdoor demonstration sites.
9. *Coordinated research and monitoring plan implemented*. Yes, both research and monitoring existed and were operational.
10. *Functional data management system implemented*. Yes, the GIS database was set up on the biosphere reserve, which was used for different applications.

11. *Reserve is used for developing and testing of monitoring methods*. Yes, for both biological and environmental chemistry methods.
12. *Reserve is used for developing indicators of sustainability relevant to local populations.* Yes, there were several surveys on sustainable development and local population.
13. *Local stakeholders are included in education, training, research and monitoring programs*. Yes, to a certain extent, especially pupils.
14. *Information for visitors to the reserve developed.* Yes, although the system was clearly insufficient and incomplete.
15. *Ecology field centre developed at the reserve*. Yes, this role was borne by the local centres as well as the outdoor base on the island of Vormsi.
16. *Reserve is used for on-site training activities.* Yes, organisation of courses and seminars.
17. *A local educational and training programme is in place.* Yes, for example, launching the environmental protection programme at the Suuremõisa Vocational School.
18. *Different zones of biosphere reserves identified and mapped.* Yes.
19. *Buffer and transitions reformulated to promote sustainable development and preserve the core area*. Yes.
20. *Local community involved in planning and managing reserve*. No, unfortunately not. There was no clear way of including local people, although the informal ties were strong enough.
21. *Private-sector initiatives to establish and maintain environmentally and socially sustainable activities are encouraged.* Yes, to certain extent. One of the brightest examples – the development of Hiiumaa Green Badge.
22. *Information and promotional materials developed for the Biosphere Reserve Network.* Yes.
23. *Strategies developed for mobilizing funds from businesses, NGOs and foundations*. Yes. There was no strategy but the additional funding from the within-named sources was acquired.
24. *Mechanisms developed for monitoring and assessing the implementation of the Seville Strategy.* Yes, it was engaged in on some levels.

Thus, we can conclude that local centres engaged in all-round work in the spheres of research, monitoring, economy and education on the local

level of the biosphere reserve. We can make reproaches in two areas: the lacking of different action plans and insufficient inclusion of local population in the decision-making process at the biosphere reserve.

Conclusions

The Biosphere Reserve was established prior to Estonian independence, and with objectives that focused mainly on nature conservation through the implementation of legally established core zones. Since then, the Biosphere Reserve has been affected by similar problems to those experienced in other countries in transition, including falls in agricultural production and processes of land reform which have led to smaller farms with weaker economies, and the breakdown of totalitarian structures necessitating a move away from "top-down" management approaches to more participatory models of management.

In response to these changes, the Biosphere Reserve started to take a new direction, focusing its development on becoming a model region for sustainable development. This has required a more integrated approach, to balance conservation goals with economic and social needs of the people living on the islands. The new direction means focusing more attention on collaboration with local communities, engaging in communication and education activities, and developing community-based policies through participatory planning.

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4. UNESCO´s MAB programme and biosphere reserves in Finland

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Summary

The two Finnish biosphere reserves were established in the beginning of 1990s. Activities have been developed with very small state funding and unofficial status, but the idea was kept alive with help of various EU funds and regional efforts. In 2003 the BR's were included in the state budget and the development got new impetus. At present both Finnish BR's are creating themselves a new place in the society – in their own ways - in the real spirit of the MAB-programme, with all basic BR functions active (research, development, logistics).

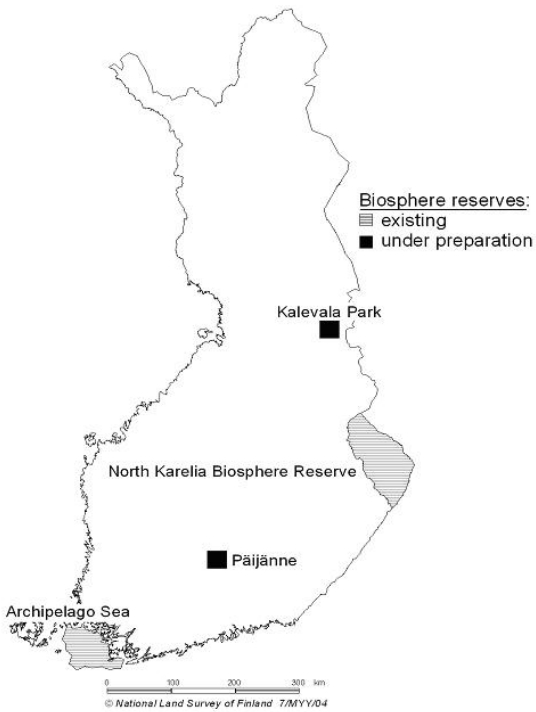
Introduction

The world network of biosphere reserves was established in then early 1970s. Finland was a member of MAB, but Finnish MAB activities focused on research through Nordic Sciences Network (established in 1983). The Northern Sciences Network is not a funding body, but a catalytic agent, a "starter" for projects that are then carried out as part of na-

tional or international programmes, and it serves as a focus for information and contacts. This form of activities is applicable also for biosphere reserve network – it is not a funding body but a catalyst.

The two Finnish biosphere reserves (North Karelia and Archipelago Sea) were established in the early 1990s after a thorough examination started in the mid 1980s. The focus in the Finnish MAB-activities has since then been on developing the activities and administration in the biosphere reserves. The emphasis in the biosphere reserves has been on development projects with the aim to connect nature protection and environment with local development. The co-operation with local actors has been important. Especially in North Karelia research and monitoring, often in transboundary context with Russia has also played an important role. In both biosphere reserves EU-funding has been significant for the activities since 1995.

Figure 7: Map of Finland with existing and proposed biosphere reserves. Map compiled by Jukka Nykänen, North Karelia Regional Environment Centre/North Karelia Biosphere Reserve 2004.



Along the years interests has been shown to establish new biosphere reserves to Finland. A coastal biosphere reserve in the Finnish Gulf near the Russian border has been mentioned as one option, and some planning was done (J-P. Flander, pers. comm.). In the Southern Päijänne Lake -area there has also been discussions about establishing a biosphere reserve of the big lakes. Transboundary Kalevala Parks area in Kainuu has also been interested in the option to develop a biosphere reserve.

During the last few years while having small resources for biosphere reserve development, local processes have been perceived more important than the national. However, the increasing local interest is now met by an increasing national interest, and this year both local and national processes are running parallel. This can be seen, e.g., in willingness to clarify the options to establish biosphere reserves along the Finnish – Russian border, or to use the BR co-operation model for making a functioning combination of development and nature conservation.

4.1 Organisation and administration

4.1.1 National level

The responsibility for the MAB-activities in Finland has been divided between the Ministry of Education (Academy of Finland) and the Ministry of the Environment (biosphere reserves). The Academy of Science has appointed a MAB-workgroup (four members) which functions within "The Finnish Global Change Research Support Group" (FIGSU). The MAB-workgroup also informs the Finnish UNESCO commission about the MAB-activities in Finland. The official contacts between Finland and UNESCO´s MAB-office are handled through the Finnish Academy of Science.

The Ministry of the Environment is in charge of the Finnish biosphere reserves. Until 2003 the organisation and financing of the biosphere reserve administration were built on temporary solutions. In September 2003 the biosphere reserve activities in Finland reached a milestone when the Ministry of the Environment confirmed that the responsibility for the activities in the two Finnish biosphere reserves lies at the Regional Envi-

ronment Centres of North Karelia and Southwest Finland. A basic financing of 50,000 euro per year and area was granted in the state budget.

4.1.2 Regional level - North Karelia biosphere reserve

The number of possible biosphere reserve actors in North Karelia is low. The BR has been originally nominated to almost uninhabited area near the border, in the area where the population density, in general, is low. So, the responsibility of BR activities has so far been in the North Karelia Regional Environment Centre, where the co-ordinator's office is situated. The other main actors have been University of Joensuu with its researchers, University of Joensuu Mekrijärvi Research station (www.joensuu.fi /mekri), Metsähallitus (www.metsa.fi) and Municipality of Ilomantsi. The permanent, full-time personnel of the BR has been only 1-2 persons, but the number of temporary employees has been even 30-40.

Research and development projects have, however, attracted attention and interest on BR activities and now, while the periodical review of the BR is being finished; also a BR enlargement application to UNESCO is to be sent. The new delineation will include more people and population centres. Simultaneously a new concept of co-ordinating the activities will be established to include more regional actors. Still, the financing of the activities will be based on project money, which will maintain a certain level of opportunism in creating the activities. However, University of Joensuu recently got a status of a UNESCO university and this line falls very well together with biosphere reserve, and will most probably lead to tighter co-operation within the field of sustainable development.

4.1.3 Regional level – Archipelago Sea biosphere reserve

In the Archipelago Sea the organisation of the biosphere reserve activities has since the beginning of year 2004 been directly connected to regional development. The Southwest Finland Regional Environment Centre has made on agreement with the "Region Åboland"-organisation, which has been given the practical responsibility to carry out the administration and activities of the biosphere reserve. Region Åboland is a common development unit for eight archipelago municipalities, which also steers and prioritises the use of the regional EU-funding (Goal2, Interreg) in the

archipelago area. Region Åboland has employed a full time coordinator to carry out the activities in the biosphere reserve.

The steering functions of the Archipelago Sea biosphere reserve (established 1994) activities are handled on two levels: (1) The Regional Environment centre has appointed a five-person co-operation group for the biosphere reserve activities. The organisations represented in the co-operation group are: Southwest Finland Regional Environment Centre (chair), Region Åboland (2 pers.), Åbo Akademi University and Finnish Forest and Park Service/Archipelago Sea national park. (2) As a larger reference group for the biosphere reserve activities Region Åboland has appointed a "Delegation for the Outer Archipelago" with 13 members representing the five outer archipelago municipalities, regional authorities, the two regional universities (Finnish- and Swedish speaking) and a NGO representing the villages in the biosphere reserve. The biosphere reserve activities and planned and executed in co-operation with these organisations and financed externally, mainly through different EU-programmes.

During the whole active period of the Archipelago Sea biosphere reserve (except 1999-2000) the personnel has consisted of one fulltime coordinator.

4.2 National legislation

The MAB –programme and the biosphere reserves are not mentioned in the Finnish legislation. From administration point of view the lacking legal status is a bit of a problem. The biosphere reserve with no legal background is a bit faceless, and it requires time to have it understood and accepted as an eligible co-operation companion. In all cases, even without proper legislation, the activities need to have "an administrational home" to be accepted and also to have the needed continuity. A biosphere reserve is not a project it's a process.

From activities point of view this situation of a *tabula rasa* is not a problem, because in case of universal rules the solutions created can be widely and easily applied. This situation has made it possible – an obligatory - to quite flexibly seek and test the best possible forms of administration and co-operation. The process is still going on, and the different

ways things have developed in the two Finnish biosphere reserves clearly shows that there is not a single "right" model for organising biosphere reserve activities. Each BR can – within the framework of the general requirements of a BR set by UNESCO - develop an organisation fitting in the special characters and challenges of its own area and actors.

4.3 Zoning

The zoning concept of the BR is not properly developed in the Finnish biosphere reserves. In theory both Finnish BRs have their core-, buffer and transition/co-operation zones but this has not been operationalised systematically. Biosphere reserves' core and buffer zone are both included in the national parks and other protected areas (normally owned by state). There are no external buffer zones. The parks are divided into buffer zones and core areas – the strictly protected areas are cores and the recreation areas are buffer zones. Transition area has been defined on the map but there exists no administrative status.

In the future, the zoning concept of the BR's need to be more effectively adopted as a local tool for making the BR known and getting the various actors co-operating. This type of zoning, however, does not overrule the provincial and municipal plans of land-use having the legal power. The BR approach can be considered as an addition to those and the most important thing seems to be the co-operative approach in thinking the land-use and setting common goals.

4.3.1 North Karelia Biosphere Reserve

North Karelia BR is under the process of extension. In this process especially the zone of co-operation (transition zone) will be enlarged.

The state (National Board of Forestry, Metsähallitus) owns about half of the land area in the present North Karelia BR. Metsähallitus has created so called landscape ecological plans for its land, and this approach is very near the real core – buffer – transition zone thinking of a BR. Also some forestry companies are using the same type of methodology for their lands. Buffering the reserves from external influences is also in-

cluded in the Natura 2000 sites. All this information can be used for the benefit of the BR's, too.

4.3.2 Archipelago Sea biosphere reserve

In the Archipelago Sea biosphere reserve the core and buffer zones consist of the land- and water areas included in the Archipelago Sea National Park (founded 1983). The transition zone consist of the private owned land and water areas in Houtskär municipality and the peripheries (outer archipelago) parts of Korpo, Nagu and Dragsfjärd municipalities. The zoning in the Archipelago Sea biosphere reserve can today be classified as non-functional and must be analytically discussed for example in addition to the 10 year review of the biosphere reserve (2005).

4.4 Local and regional acceptance and involvement in biosphere reserve activities

4.4.1 North Karelia Biosphere Reserve

North Karelia biosphere reserve as a name and an impartial co-operation partner has been established within the 12 years of existence. There has been numerous projects, seminars, theses etc. making familiar the name and the co-operative way of activity. Projects have been created from the point of view of the local people and municipalities to show that the BR is what people do and need in their everyday life. There always has been the link to nature conservation or sustainable use of it.

The politics of small steps has led to a situation where the BR is constantly being asked to take part into actions, create new projects etc. Also finding funding for actions has become easier.

The new Leader + programme in Vaara-Karjala and North Karelian development programme POKAT 2006 (North Karelia Regional Council 2005) are good examples of acceptance of the BR ideas. The leader programme is partly based on BR ideology and Ilomantsi & Tuupovaara municipalities have adopted sustainable development as the basis of development. BR activities have been mentioned as one of the core elements in the region. Also the BR cross-border co-operation with Russia

has been considered as one of the national approaches for the next six years.

4.4.2 Archipelago Sea BR

The acceptance and understanding of the biosphere reserve have been a long and still ongoing process in the Archipelago Sea. Initially the decision makers in the four municipalities where the biosphere reserve is located were quite sceptical to the establishment of a biosphere. The biosphere reserve was seen as a new protection program additional to the quite recently funded Archipelago national park. The complexity of the biosphere reserve concept also made it very difficult to explain to the local politicians what the funding of a biosphere reserve really would lead to in practice. This feeling of uncertainty on the local level was one reason to that the main islands of Korpo and Nagu municipalities were excluded from the biosphere reserve.

During the last 10 years the biosphere reserve activities have been carried out in close co-operation with the municipalities and villages in the biosphere reserve. The actions have strongly been oriented to developing the local communities and nature related economies especially in the small villages in the outer archipelago. The local acceptance of the biosphere reserve can today be said to be acceptable. The willingness in the municipalities to integrate the biosphere reserve activities in the other regional development efforts proofs this. What still remains a problem is that only a small core group on the local level are aware of the real goals and contents of the biosphere reserve activities. It has shown to be very difficult to explain the biosphere reserve concept and its goals to “ordinary” people in the area. The biosphere reserve (or concept) is still seen as something vague and on the field there still circulates a lot of misunderstandings about the biosphere reserve. A major problem to profile the biosphere reserve has been the lack of an independent administrative status and financial resources for the biosphere reserve. Most of the activities planned within the frames of the biosphere reserve concept have been carried out through the biosphere reserve partners, and in the mind of the public hereby firstly connected to these organisations.

4.5 Research

Research and monitoring are essential parts of biosphere reserve activities, but there is no specific funding for biosphere reserve research and monitoring. The main way to trigger research has been using Ministry of Environment sporadic funding (usually minor projects). Independent research groups have effectively used The Academy of Finland funding, which is very highly competed. The BR point of view is hard to follow, because it's not considered a specific extra for funding.

4.5.1 North Karelia Biosphere Reserve

University of Joensuu Mekrijärvi Research Station is the most important research institution in the BR. Research Station also gives a good link to the University. There also exists a Finnish Game and Fisheries Institute research Station in the reserve, and North Karelia Regional Environment Centre is having many-sided research activities. Biosphere reserve has been triggering and funding a number of masters theses. External projects have produced several Ph.D. dissertations on the area.

Ministry of the Employment funding has been used for employing assisting personnel, and this is one of the ways to offer good research opportunities also in the future. Border area co-operation has been considered among the main approaches – the varying nature and different economic systems have created an excellent setup for research and development of BR.

Most probably there will not be specific BR research funding available in the near future, so the only reasonable way is to offer good research possibilities and invite research groups to make research on important questions concerning the BR area. There, however, is a great difference in biosphere reserve studies (i.e., studies oriented by the BR thinking) and studies just performed in the area. Both are needed, but there should be more emphasis on biosphere reserve studies. Seed money for these would be very useful.

There have been specific BR studies in the Finnish BR's, and some of them have been in co-operation (e.g., Nordic Council of Ministers). Financing seems to be easier, e.g., from different EU funds, if research and development activities are combined in the projects.

4.5.2 Archipelago Sea biosphere reserve

The research and monitoring activities in the Archipelago Sea biosphere reserve can be divided in 1) research in the biosphere reserve and 2) research related to the biosphere reserve concept.

Research in the biosphere reserve

The basic research and monitoring activities, which basically also support the biosphere reserve activities, are carried out mainly through the regional universities Turun yliopisto (http://www.utu.fi) and Åbo Akademi University (http://www.abo.fi). Turku University has also a research station within the biosphere reserve (http://www.utu.fi/erill/saarmeri/en/). Åbo Akademy University has recently put up a research support unit in Korposström. Many other governmental authorities and other universities also do research and monitoring in the biosphere reserve area. The basic resources and research competence can today be said to be good in the Archipelago Sea. More financing would however be needed especially for research and monitoring to follow up the effects of the strong eutrophication of the sea environment.

Biosphere reserve related research

The research within the frames of the biosphere reserve concept has in the Archipelago Sea been quite limited. Two larger research projects, where the biosphere reserve formed a frame for the problems addressed, have been carried out by Åbo Akademi University. Both projects were financed through the Finnish biodiversity research programme (FIBRE) (http://fibre.utu.fi) in the late 1990s. One of the projects focused on the changes in the marine environment (http://www.abo.fi/fak/mnf/biol/eco/environmental_and_marine_biology1.htm) and the other one the cultural and sociological factors relation to the environment in the archipelago (http://www.abo.fi/fak/hf/relvet/engindex.htm).

Within the frames of the Nordic Council of Ministers funding the Archipelago Sea biosphere reserve has coordinated a study of the changes in use of nature resources and its impact on the environment in some model villages on Hiiumaa in Estonia, the Tolvajärvi-area in Russian Karelia and the North Karelian and Archipelago Sea Biosphere reserves in Finland.

In the project "Scenarios for the future of Åboland" (2002) (http://www.tukkk.fi/tutu/skargard/default.htm) the Archipelago Sea biosphere reserve took the initiative and built up a co-operation group for a research that aimed to build up alternative scenarios for the Archipelago Sea region and its communities. The research has formed a foundation for different more specified planning activities and strategic thinking.

In the autumn 2004 a biosphere reserve initiated a small-scale research project that aims to clarify the reasons for peoples movement to and from the archipelago municipalities, which often have a problematic demographic development and structure. The Department of Public Administration at Åbo Akademi University carries out the research.

4.6 Economic development and job creation

The real influence of biosphere reserve projects on economy and number of jobs is very difficult to identify. There have been drastic changes in the society recently, e.g., the great recession in the beginning of 1990's and Finland's joining to EU in 1995. The influence of BR's, stepping on the stage amidst the societal turbulence, has not been monitored consistently. In fact there is no reasonable way to do it, before the Finnish BR's will comply with the statistical units (as municipalities). There have, of course, been a great number of temporary jobs created in the area, and lots of new activities started. However, the development function – as well as research – is depending on external funding only and keeping a firm BR course in the activities is difficult without specific money.

EU has plenty of development funds and the BR principles are good for applying these funds. This line might be good to follow both within and between countries. Tourism and cross-border co-operation are, in general, considered important.

4.6.1 North Karelia Biosphere Reserve

North Karelia biosphere reserve has been involved in plenty of projects. There have been development projects making the BR known; there have been improvement of local environment, development of ecotourism etc. These projects have mainly been funded with EU money (Interreg, Tacis,

Leader etc.). BR's role in the projects has varied from the main partner and leader to a mere steering group member.

At the moment there is a tendency to create projects for implementers and include BR thinking into them.

4.6.2 Archipelago Sea biosphere reserve

Since 1996 the Archipelago Sea biosphere reserve has been initiating and participating in 17 development and research projects. In eleven of these projects the biosphere reserve organisation has played a crucial role. Besides this the biosphere reserve has arranged and co-arranged two larger international meetings (EuroMAB) which also have created incomes for the local entrepreneurs. The total budget of all these efforts is approximately 280,000 euros. The projects have created approximately 35 years work, of which roughly 50% have been carried out directly in the biosphere reserve municipalities. The themes in the projects have been varied, but the main focus has so far been on the development of nature tourism, which also in the future will be one of the main tasks for the biosphere reserve. One other more and more important thematic is going to be to develop the co-operation between management of cultural landscapes (biotopes) and local entrepreneurs.

One important result of the biosphere reserve projects has been a closer co-operation between the small villages in the outer archipelago, which in 1999 established an own co-operation organisation "Pro Åbolands utskär". This NGO is today represented also in the biosphere reserve co-operation group and in the Outer archipelago delegation.

4.7 Education and communication

Biosphere reserves are places for creating and delivering information. A more well-known and recognised status for BRs would be good to perform this task. The main routes to deliver information are (i) projects and project information dissemination efforts and (ii) via Regional Environment Centres. The different understanding of the BR in North Karelia and in Southwestern Finland without an official status and task led to very different working concept. In North Karelia the BR activities was consid-

ered as a strength and have been used accordingly, while in SW Finland the situation has been more complicated.

4.7.1 North Karelia Biosphere Reserve

North Karelia BR has been active in developing nature schools. There will be a provincial nature school – "Karelian nature school" – the headquarters of which is situated outside the BR but which is a collaborator and adopts the BR working principles. The school is co-operating with other schools, university etc. in the area and thus also bringing new ideas to the BR.

A network of sustainable development areas, businesses, factories etc has been created (www.kestavakehitys.info) and, e.g., about 50 largest factories are within it. The network can be reached through Internet, and the participants also take visitors. Schools use this networks, e.g..

4.7.2 Archipelago Sea biosphere reserve

The main partner and actor in nature related education has been the Archipelago Nature School (www.naturskolan.com) which offers nature related program and activities especially to children in the age of 10-12. In arranging seminars and education the biosphere reserve has cooperated with different schools in and close to the biosphere reserve.

4.8 Biosphere reserves as model areas for conservation and sustainable development

At present the BRs are not good model areas in Finland. For individuals, villages and, e.g., businesses, there is a limited number of examples to work with, but for, e.g., municipalities there are not, because not a single municipality is totally included in the BR in North Karelia.

North Karelia BR is extending the area to get several municipalities included. The greater size will allow better analyses and better visibility. Also, co-operation with University of Joensuu will be more beneficial. The aim is to catch the whole chain of forest industry from abroad (Rus-

sian Federation) to pulp mill and sawmills. Forestry is the greatest single factor affecting nature in the area.

The aim is also to show the advantages of BRs by producing information for more wide use.

In 1997-1998 the Archipelago Sea biosphere reserve (Southwest Finland Regional Environment Centre) coordinated and administrated a common Agenda 21–project (EU Leader II–program) for the Archipelago Sea municipalities. The project supported the work in local municipal Agenda 21–workgroups. The best results were received in Västanfjärd municipality (http://www.vastanfjard.fi/vastanfjard/svenska), which has become an environmental model society especially concerning reducing outlets of wastewater.

4.9 Nordic co-operation

Striving for more intensive co-operation with Nordic and Baltic countries has been prioritised several years in BR quarters in Finland. Co-operation within the entire BR network is important, but activities with close neighbours and countries with largely similar society are easier to start with. There were several meetings where Nordic MAB co-operation was discussed in private (e.g., Uppsala meeting in Sweden, BR coordinators' meeting in Finland 1998 and Pamplona meeting in 2000, and MAB Rome in 2002). These discussions were then substantiated into the first Nord-MAB meeting in Helsinki, May 2003, invited by Finnish MAB/The Academy of Finland. Swedish MAB then took the main position in finishing the application to Nordic Council of Ministers for funding Nord-MAB. The experiences so far have been encouraging: there are lots of things in common and much can be done together, but it is difficult to make this happen without people concentrating in the co-operation. Nordic co-operation is a good track to follow, but a structure for co-operation is needed. Latvia meeting is an important step towards more intensive and productive co-operation.

Conclusions

The biosphere reserve concept is today quite functional on the regional and local level. The "biosphere reserve" is a model for co-operation that can bring together partners and stakeholders, which traditionally have not been used or able to co-operate and compromise. The connection of the biosphere reserve concept and activities to the actual biosphere reserve and its zones is not very well developed and will be one of the important matters to be considered during the next years. The use and implementation of the experiences of the work in the biosphere reserves has not yet been systematically used on the national level in Finland. On the other hand the Finnish biosphere reserves have been given the chance to be quite active in the international network, especially in the EuroMAB – context. The co-operation in NordMAB will provide the Finnish biosphere reserves a close co-operation network with areas with similar conditions and issues to handle.

5. Status of the Danish MAB Programme and its Greenlandic Biosphere Reserve

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Introduction

Up until today the only activity connected to the MAB programme in Denmark/Greenland has been the Biosphere reserve (BR) in North and East Greenland. This is one of the old BRs established with the aim to promote continuous research and nature conservation. Since this area of Greenland is sparsely inhabited, and has been administered mainly by Danish institutions and the Danish Military, the idea of the biosphere concept has never been fully evoked and has until recently never been a part of the local agenda.

5.1 Organisation and administration

5.1.1 National level

The Kingdom of Denmark entered the MAB programme, and the National Park of Northeast Greenland was designated a Biosphere reserve in 1977. A scientific board under the UNESCO National Commission assumed responsibility for MAB affairs and MAB related issues. A MAB National Committee was established in 1987, but the Greenlandic BR has

up until now been the only activity of the National Committee. Hence the national MAB activity has focused on information regarding the activities and questions related to the BR in Greenland.

Home Rule was introduced in Greenland in 1979, after which the various areas of responsibility were gradually transferred to Greenland. Since the beginning of 1981 the Home Rule Government has had full jurisdiction over the National Park, whereas the biosphere reserve remained within the administrative competence of the Danish Ministry for Research and Education. Unfortunately the Greenland Home Rule Government was not informed of the BR-status until 1986.

Until 1991 there were no initiatives concerning the administration and management of the area as a biosphere reserve. The area was managed as a national park only. But in 1991 the Danish National MAB Committee appointed the first manager of the BR and a management plan was proposed. The plan was never endorsed, and up until 2000 only a few attempts have been made to activate it.

Since the mid 1990s, the National MAB Committee has in reality consisted of one person, who represented Denmark/Greenland in relation to the MAB programme. Up until 2000 the Greenland Home Rule Government did not attempt to establish an effective attitude to the MAB programme, neither was the BR concept implemented in any legislation and no information was disseminated locally.

Then in 2001 a thorough 'status report' on the National Park/BR was presented, and this will serve as the foundation for future development. In the autumn of 2001 the Ministers of Environment from Denmark and Greenland concluded the 'Zackenberg-agreement', which commits both countries to focus on the development of the BR area in terms of research and local participation. In April 2002 the Greenland Ministry of Environment and Nature presented its Plan of Strategy for the National Park/BR to the political levels in Denmark and Greenland for further discussion and endorsement. The Zackenberg-agreement and the Plan of Strategy will be the foundation for a development that optimises the prospects for research, logistics, and local participation in the management connected with this area. A part of the Plan of Strategy is to consider the requirements for BRs in the new legislation and management plan for the National Park in North and East Greenland. This legislation then must include a zone division of the National Park/BR.

In 2003 a 'North-East Greenland BR working group' was established as a de facto National Committee, accepted by the UNESCO National Science Board. The working group consists of representatives from the Danish institutions with relation to the MAB programme, the Greenland Ministry of Environment, the Ministry of Industry, the Ministry of Culture and the local municipality. Since then the group has begun outlining the possibilities for making the BR functional.

5.1.2 Local level: Ittoqqortoormiit Municipality

The present-day size of the North East Greenland BR is 972,000 sq. km. Most of it is part of the ice cap, the rest a composite fiord landscape, topographically ranging from desert-like plains and gentle slopes to piercing mountain ranges. Even though the area of the BR is 972,000 sq. km., there is no permanent settlement. The only people living in the area all year round are found at the scientific stations on the ice cap, at three military outposts and at a weather station. A military unit, the sledge patrol "SIRIUS", guards the coast all year round. The "SIRIUS" crew operates as police authority and park rangers within the BR.

The nearest local settlement is Ittoqqortoormiit just south of the BR border. This town has approx. 550 inhabitants and depends totally on natural resources for its subsistence. The inhabitants of the town use the area of the National Park/BR as a hunting ground where they hunt musk oxen, small game and marine mammals. They are permitted to hunt polar bears on traditional hunting trips with dog sledges into the National Park. The local authorities aim at developing tourism, more specifically tourism related to the National Park/BR.

Figure 8: Map of Greenland with the Northeast Greenland Biosphere Reserve

Figure 9: Map of Greenland in The Arctic

As of today the North East Greenland Biosphere Reserve lacks a coordinator, a specific organisation and funding. The contacts to the Biosphere Reserve are established through the Ministry of Environment and the Zackenberg Scientific Station.

5.2 National legislation

There is no specific legislation for biosphere reserves. Hence, the existing legislation for the National Park applies.

5.3 Zone Division

5.3.1 The North East Greenland Biosphere Reserve

In order to fulfil the requirements put forward in the Seville Strategy, the BR needs a local community as well as a zone division into three different zones. The BR in North and East Greenland has neither of these. Up until now there have been no attempts at fulfilling the requirements of the Seville Strategy - because no local community exists within the BR. But should the Strategy Plan establish that it should be attempted to fulfil the requirements of the Seville Strategy, an extension of the area of the biosphere is a possibility. And then hopefully the North East Greenland BR can benefit from an extension to include the town of Ittoqqortoormiit, so that the zone division can be properly applied. The most natural measures would be to retain the present protected area as a national park, to include the area as far south as Ittoqqortoormiit as a buffer zone, and the town itself as a transition area. The issue of extension and zone division is, however, a matter for both local and national authorities and it will take some time to complete.

5.4 Local and regional acceptance and involvement in biosphere reserves

As stated above the first 10 years' management was purely a Danish matter of responsibility, and the activities were completely devoted to research and monitoring. Suggestions were put forward but no attempts were made to involve the local level until 2000.

5.4.1 The North East Greenland Biosphere Reserve

Managing a BR in the Arctic is quite a different matter than it is for BRs in e.g. Europe. However, a large number of the indigenous people in Greenland live as hunters. Traditionally the indigenous people in Greenland are widely spread over huge areas, and each hunter uses the living resources in an area of several hundred sq. km. The town of Ittoqqortoormiit is a remote hunter society relying on living resources, and at first glance the possibilities for creating economic and human development are small. Small-scale eco-tourism is being developed in the area as well, but since the area is one of the most remote and therefore most expensive places to visit on the planet, there is no possibility for developing large-scale tourism.

But a cornerstone in the Plan of Strategy for the National Park/BR is to establish local involvement and participation and thus benefit the area. Locally the inhabitants are very interested in discovering how the biosphere concept may assist in placing the town and the area on the world map as a place of special interest. So far the National Park/BR has been administered at places far from the local level while giving neither influence nor offering any income opportunities for the town. It is absolutely necessary that this be changed if the BR concept is to have any meaning and if a local understanding of the connection between protection and exploitation is to be developed.

5.5 Research

The Scientific Committee has formulated no national strategy for MAB-research so far. For the national park as such, there is a strategy for research in the actual national park.

5.5.1 The North East Greenland Biosphere Reserve

Since the recognition of the BR in Greenland, a permanent research station called Zackenberg has been established. During the field season, from late May to early September, the station is staffed with 5-8 people. Approximately 50 researchers and a number of guests visit Zackenberg Station every year. The research facilities are assigned for research only, and generally no admittance for tourists is allowed in order to keep disturbances at a minimum. The long-term monitoring program, called Zackenberg Basic, started in 1995. It is designed to provide long-term time series of background ecosystem data from a High Arctic area.

- ClimateBasis (monitoring climate and river water discharge)
- BioBasis (monitoring the dynamics of selected biotic ecosystem parameters)
- GeoBasis (monitoring the dynamics of the abiotic environment that are not covered by ClimateBasis)
- MarineBasis (monitoring the dynamics of selected parameters in the marine environment)

The biosphere reserve is part of the International Tundra Experiment (ITEX), which was initiated within the framework of the MAB Northern Sciences Network in 1990. It is a contributing research site to observe and measure responses of selected arctic plants to changing environmental conditions, such as temperature or duration of snow cover. Each year, since 1998, two students have had the opportunity to study the high arctic ecosystem at Zackenberg.

On the ice cap in the National Park comprehensive research in the natural sciences is taking place. Two international field camps placed on the ice cap act as the base for hundreds of researchers every year. But this research is not related to the MAB programme or the BR so far.

Figure 10: Summit Research Campon the Inland Ice

Figure 11: Zackenberg Research Station

5.6 Economic development and job creation

5.6.1 North East Greenland Biosphere Reserve

The municipal authorities of Ittoqqortoormiit have expressed their strong wish to be a part of the administration of the National Park and to be more closely connected to the area through the BR concept. The local tourism entrepreneurs have expressed their support for the BR as another impetus for tourists to visit not only the National Park but the nearby area of Ittoqqortoormiit as well.

5.7 Education and communication

Until now no further training has been established in relation to the North East Greenland BR, except in relation to the Zackenberg research station.

5.8 Biosphere reserves as model areas for conservation and sustainable development

So far no system or strategy on how to use biosphere reserves as model areas for improving conservation or enforcing a sustainable development in Denmark/Greenland has been established. There are no formal links to the Convention on Biological Diversity, nor to the European Landscape Convention. However, a project has just been established, which will cover Greenland's activities in relation to the CBD, and produce a plan of action on how to connect the different initiatives already taking place. In addition the municipal authorities have expressed their wish for educational material for the schools on the MAB programme, the BR concept and its significance for the local community. This is one of the first tasks for the working group – to have selected material translated into Greenlandic.

5.9 Nordic co-operation

The National Committee has been taking part in Nordic co-operation in various ways over the years. But as there has been a lack of interest during some periods, the effect has not been optimal at all. But the Greenland Ministry of Environment sees Nordic co-operation as an important way into establishing the North East Greenland BR as a 'true BR'. In small administrations, which lack experience, it is essential to draw on any network available.

Conclusions

The 'North East Greenland BR working group' believes that biosphere reserves can be a lever for local participation in the administration of the National Park and for promoting the sustainability of the areas in relation to tourism. The BR concept can be an important tool to change attitudes and ways of thinking, where the use of conservation becomes clearer to local stakeholders. But the old BRs need guidance and support to change the old purpose of promoting continuous research and nature protection to a multi-purpose of human development, conservation and logistics. This is the great challenge for the Man and the Biosphere Programme in the future and especially for the old BRs. A challenge that must be taken up if we do not want more biosphere reserves to withdraw.

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6. UNESCO's MAB Programme and North Vidzeme Biosphere Reserve in Latvia

Andris Urtans, Deputy Director, and Andris Soms, Ecologist; North Vidzeme Biosphere Reserve

Introduction

North Vidzeme Biosphere Reserve was established in 1997, but the very idea of the BR concept was developed on the basis of North Vidzeme Regional Nature Protection Complex since the beginning of 1990s. Up till recent time activities have been developed with very small state funding and mainly due to enthusiastic input of local specialists and experts.

At present North Vidzeme Biosphere Reserve in the real spirit of the MAB-programme more and more is becoming uniting link between science, sustainable development and raise of social awareness within the area covering 6% of the territory of Latvia.

6.1 General characteristics of the Biosphere Reserve

North Vidzeme Biosphere Reserve (NVBR) belongs to the mixed forest zone of the world's northern temperate zone with temperate and subpolar broadleaf forests and woodland, mire and riverine systems.

The North Vidzeme Biosphere Reserve is located in the northwestern part of the country. The boundaries of the Reserve lie within the Limbazi, Valka, and part of the Valmiera administrative districts. The NVBR abuts Latvia's border with Estonia, sharing important wetland areas with neighbouring Estonian districts which both are designated as RAMSAR sites.

The NVBR includes approximately 80,000 people in 41 municipalities, with about half of them residing in nine urban centres. The rest live in smaller rural centres and on farms throughout the territory.

The present landscape, formed at the end of the last glacial period approximately 10,000 years ago, is characterized by forests, moraines, drumlins, rivers, wetlands, raised bogs, semi-natural grasslands, coastal meadows and agricultural lands. Forests cover more than 45% and wetlands about 10% of the Biosphere Reserve. The highest elevation in the Reserve is 127 m above sea level.

The Reserve embraces the Salaca River basin, which includes the Salaca River and Lake Burtnieki along with their tributaries, as well as a marine area to a depth of 10 m. The Reserve's total terrestrial area is 457,697 ha, and 116,000 ha of marine area.

Of 63 biotopes found in Latvia that are important at the European Union level, 37 are represented in the NVBR. The Biosphere Reserve is home to a number of rare and threatened species of fauna included in the *Bern Convention* and *EU Directives*. Of 61 *EU Bird Directive* species nesting in Latvia, 48 do so in the NVBR. Altogether 6 areas are included in the List of Important Bird Areas (IBAs) prepared by BirdLife International. Territory of "Northern Mires" is approved as a Ramsar site (2002), but 2 additional areas are included in Ramsar "shadow list" for Latvia. International Baltic Sea Fishery Commission (IBSFC) has announced R.Salaca as the forth biggest wild salmon spawning river in the whole Baltic.

6.2 Organisation and administration

The responsibility for the MAB-activities in Latvia has formally been divided between the Ministry of the Environment (biosphere reserve administration) and Ministry of Education and Science (Academy of Science of Latvia).

Under Latvian legislation, the *Ministry of Environment* **(**MoE) designs and implements policies related to natural resource conservation and management. The MoE is responsible for the supervision and management of all Specially Protected Areas (SPAs). The MoE is also responsible for supervising the *Regional Environmental Boards*. Regional Envi-

ronmental Boards implement national environmental protection policy and are responsible for its supervision and enforcement at the local and regional levels. The Regional Environmental Boards have regulatory functions that overlap those of the North Vidzeme BR Administration.

The *North Vidzeme Biosphere Reserve Administration* is subordinated to the MoE and oversees a significant range of functions within the Reserve. Generally, it administers regulations related to the protection of specific objects (core areas, coastal zones and other designated areas) in the Reserve. It also oversees some forestry functions in Specially Protected Areas (SPAs). The Administration also manages binding regulations of towns and local rural municipalities (parishes) relevant to a "buffer zone" in the coastal area. Of note is that the scope and diversity of functions to be performed by the Administration of North Vidzeme BR are spread over more than twenty normative documents dealing with nature protection. The permanent, full-time personnel of the North Vidzeme Biosphere Reserve Administration is 8 persons; of them Director of BR Administration, 1 State Environmental protection inspector, 3 experts in geology, forestry, aquatic ecosystems, 1 expert on public awareness & environmental education, 2 administration officers.

According to the existing legislation the Reserve's funding sources includes fixed budgetary allocations, assets allocated by the municipalities within the Reserve, donations and grants, and revenues generated through the provision of chargeable services and projects.

Latvian National MAB committee is organized under the UNESCO Latvian National Commission Science Programme Council (MAB LNC) under the Academy of Science of Latvia. Origin of the Latvian National MAB committee stretches back to 1976 when it was founded as a branch of former USSR MAB Committee. The activities were renewed in 1995, when it was officially admitted in UNESCO MAB as an Associate member.

Only since the year 2000, representative of the North Vidzeme BR Administration was involved in MAB LNC activities which now are becoming more and more active and resulted in close co-operation with other UNESCO Programmes, such as International Hydrological Programme (IHP).

6.3 National legislation

It must be underlined that the MAB programme and the biosphere reserves concept is well embedded in the Latvian legislation. The law "On the North Vidzeme Biosphere Reserve" was adopted in 1997. According to the above law, the NVBR is an internationally significant protected nature territory that is under special protection of the State. It is managed by its own Administration, and is supervised by the Ministry of Environment. The main legal tasks of the Reserve are to:

- Ensure the preservation of the territory's landscapes, ecosystems, species and genetic diversity;
- Promote the territory's sustainable social and economical development;
- Ensure information exchange on environmental research, monitoring and education in relation to nature protection and regional development in the territory;
- Promote understanding in regard to environmental protection and sustainable development within the Reserve; and,
- Promote the restoration of degraded ecosystems in the Reserve.

To ensure coordination on matters pertaining to environmental protection and sustainable social and economic development within the Reserve, the legislation also established the Biosphere Reserve Advisory Council, whose membership is approved by the Cabinet of Ministers of Latvia.

It should be noted that the Latvian legal framework is currently undergoing considerable reforms to tune prerequisites of European Union. Therefore, the legislative base is comprehensive and the main areas requiring improvement to enable better management of the NVBR are related to the following issues:

- Revision of legislation governing NVBR so that it does not impose the restrictive demands of a protected areas to the entire BR area, even in the transition zones; Defining and improving appropriate management regime for the core (nature protection), buffer (landscape protection zone) and transition (neutral) zones; Clarifying functions and

responsibilities between the NVBR Administration and those of other institutions charged with environmental protection; and,

- Revising the role of the NVBR Administration to de-emphasize control and regulation and emphasize coordination, facilitation, conflict resolution and mediation, innovation, education and research.

6.4 Zoning

The Biosphere Reserve zoning concept is well embedded in existing legislation (Regulations of the Cabinet of Ministers No 415 "On use and protection of particularly protected nature areas") and provides delineation of the NVBR's territory into three functional zones: the protected nature area (core zone), landscape protection area (buffer zone) and transition area (neutral zone). The Reserve includes three core areas (Augstroze, Vidusburtnieks and Northern bogs).

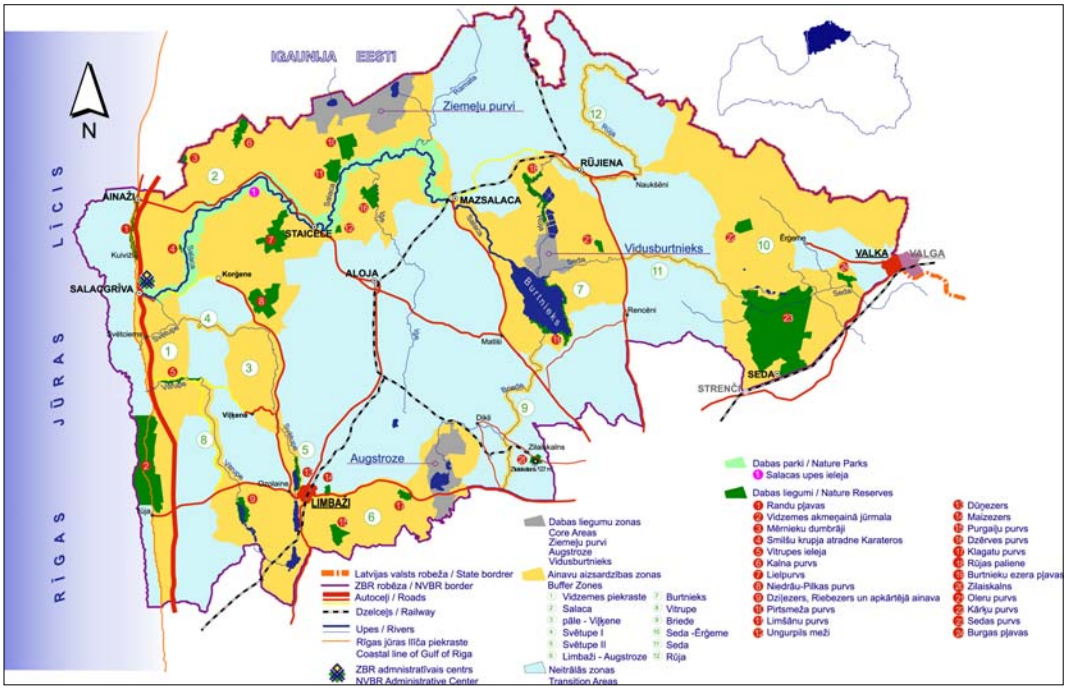
In addition to the core areas the NVBR currently encompasses 17 established Nature Reserves, 19 Nature Monuments and a Nature Park. Those territories, except R. Salaca Valley Nature Park, are relatively small sites designed to protect important or unique features of the region.

Altogether Core areas covers 3,715.7 hectares (2,1%), buffer zones 116,775.1 ha (25,5%), transition area (Neutral zone) 331,206.2 ha (72, 4%) of the North Vidzeme Biosphere Reserve.

However, because the entire North Vidzeme BR has "protected area" status according to the legislation governing the Reserve, even the transition areas present some restrictions on economic activities, and tensions in forestry sector are arising.

This type of zoning has legal binding and must be followed in provincial and municipal land-use plans. However, in many cases it becomes rather formal due to fact that management plans for protected areas and provincial/municipal development plans are developed by different institutions (the latter by private consultant firms not always having appropriate knowledge and capacity). Therefore in the future, the zoning concept of the BR's need to be more effectively adopted as a local tool for making the BR known and getting the various actors co-operating.

Figure 12: North Vidzeme Biosphere Reserve



6.5 Local and regional acceptance and involvement in biosphere reserve activities

The acceptance and understanding of the biosphere reserve has been a long and is still ongoing process in the North Vidzeme BR. One of obstacles for smooth development of BR concept in NVBR was the coincidence of two factors – establishment of BR in a ”top – down” manner with rather scarce capacity (and knowledge) to reach all municipalities and explain the advantages of the inclusion into BR. Another hindrance was the fact that in 1992 North Vidzeme Regional nature Protection Complex was announced as a protected territory with aim to establish a Biosphere Reserve with not existent legislation for BR. In the same time Land reform and opening of free land market took place. All those factors from the very first moment put the very BR idea in eyes of local actors as a possible hindrance in achieving their goals.

The ”Top – down” approach sequences were smoothed after those days Committee of Environmental Protection was redesigned into Ministry of Environmental Protection and Regional Development. Rural development function was crucial point for further acceptance and fixed the need for BR in eyes of local actors. From that moment we ”stepped out of the ring of ignorance” and suddenly our experts and data basis became needed for at least closest municipalities. But still many unsolved issues remained especially dealing with issues of cultural heritage, education, sustainable use of agricultural and forest areas, all of them supervised by different Ministries. It lead to situation that with lacking legislation and limited capacity as well due to the location of NVBR headquarters within coastal area of Limbazi District, first undertakings were related to the involvement of local actors in Limbazi district. Planning skills and area competence allowed us to become involved in various local as well transboundary projects like “Tampere-Helsinki-Tallinn-Riga (THTR) Spatial development plan”.

Nowadays NVBR specialists are involved in several municipality as well as District level planning projects. The highest acceptance level has been received from School as well NGO sector. Evidently it is related to the environmental education and public awareness activities carried by or through the North Vidzeme BR.

6.6 Research and monitoring

Research and monitoring are essential parts of biosphere reserve activities, but there is no specific funding dedicated specifically for the needs of North Vidzeme BR. Nevertheless migratory fish monitoring has the data records for more then 20 years period, hydrobiological and hydrochemical monitoring of R.Salaca and Northern bog territory has records since the start of nineties and are financed as the State monitoring programmes. The main way to promote research and obtain data have been using experts from the University of Latvia, as well independent research groups, mainly from the Latvian Fund for Nature, WWF Latvia, Latvian Ornithological Society, ”Nature Treasure Fund”, which were financed through different projects. Close co-operation has developed with Univer-

sity of Latvia and several B.Sc. and M.Sc. thesis were elaborated using North Vidzeme BR expert expertise as well data stored in NVBR.

University of Latvia has Hydrobiological Research Station in Vecsalaca, as well several permanent-monitoring plots for different forest invertebrate groups add significantly to the understanding of the integrated ecosystem functioning in the BR.

Two North Vidzeme BR specialists have their permanent research themes and one researcher is currently elaborating his Ph.D. thesis.

Different research activities are carried out through several projects in the territory of North Vidzeme BR.

Life-Nature Project *"Protection and Management of Coastal Habitats in Latvia"* has balanced research and practical implementation of the research results via development of soft tourism infrastructure to divert or lessen anthropogenic impact to the most fragile habitats.

PIN-MATRA Project *"Integrated Wetland and Forest Management in the Transborder Area of North Livonia, Estonia-Latvia"* is most likely a link between research and preparation of grounded project proposal for the sustainable development of border area.

Nevertheless still research and monitoring programmes are rather offered from outside neither is a consequence of North Vidzeme BR own Research Strategy.

Only few of research and monitoring programmes up till now are looked by local society as really practical – for example, fish monitoring defining amount of fish catch licences, as well botanical surveys to define naturally biodiverse meadows within the BR having direct financial feedback through direct payments from EU.

6.7 Economic development and job creation

The real influence of biosphere reserve projects on economy and number of jobs is rather tricky to identify due to fact that the NVBR is largely a non-urbanized territory. The largest centre in NVBR is Limbazi with a population of approximately 9,200 inhabitants. Since Latvia's re-independence, the population in NVBR has remained relatively constant at around 80,000. Ethnically, the majority of NVBR's population is Lat-

vian (82.9%), with the remainder being of Russian (10.2%), Byelorussian, Ukrainian and other descent.

According to official statistics in 2003, 56% of NVBR's population was of working age, 23% was retired, and 21% was of school age or younger. The average monthly salary in NVBR is approximately 120 LVL (US$ 210). Approximately 15% of the NVBR workforce is unemployed. More than one half of the people work in the private sector, mostly in farming, forestry, retail and real estate. Only about 7% of NVBR residents have post-secondary education. Nearly 20% of households have more than 5 people. Most of the households in NVBR have electricity but less than half of the households in the rural parts of NVBR have centralised water supply. Overall, it can be said that a large part of the rural population in the NVBR is beneath the statistical average threshold.

In the last year period the role of BR through our policy of openness to each sustainable undertaking has led to a situation where the BR is constantly being asked to take part into actions, create new projects etc. BR more and more serves as an umbrella for local inhabitants, providing them with basic information and endorsement letters promoting different sustainable rural development diversification activities through State and EU (International) funds. Unfortunately BR capacity cannot embrace the whole BR territory.

New challenge to fulfil those tasks is seen through the start of Global Environmental Facility (GEF) funded project "Biodiversity Protection in North Vidzeme Biosphere Reserve" with total funding of 2,660500 USD. The given project will create approximately 30 man work years. Due to fact that GEF funding has no European origin, it can be used as co-financing tool for EU raised projects and thus can attract additional funds and employment to the BR territory.

Project "Integrated Wetland and Forest Management in the Transborder Area of North Livonia, Estonia-Latvia" funded through PIN-MATRA is seeking to promote diversification of rural employment through the sustainable use forest resources as well development of joint ecotourism scheme for the Estonian-Latvian border area.

6.8 Education and communication

Environmental education and raise of public awareness is seen as one of the highest priorities of North Vidzeme BR. NVBR has developed a draft for the Strategy of Environmental education and communication. There is one person in BR Administration permanently involved in execution of interpretation services/activities. For other specialists interpretation services are mentioned in their duty description as additional tasks (but not the main).

BR Administration has developed the Environment Library that is free of charge and is one of the biggest of such kind in the Region. There are technical basis for future development of Nature/Environmental Centre under the Environment Library.

NVBR Nature/Environmental Centre and Environment Library contain materials related to environmental, science and natural history education. There are possibility to rent field guides, equipment kits and video movie for water quality investigation elaborated by the NVBR specialists, as well guidelines for air quality mapping using lichens as indicators. Annually there are several excursions with participants guided by NVBR experts. NVBR specialists are involved in UNESCO Associated School Project ”The Baltic Sea Project” as experts of water quality and are regularly involved in different training courses in Latvia and outside it. For local schools NVBR offers a set of lectures dealing with different environmental issues.

NVBR specialists have developed interactive exhibition ”In Water & In Air” dealing with explanation of river ecology through the eyes of Caddisflies (*Ephemeroptera*). The given exhibition up till now has been displayed in 7 towns in different regions of Latvia with more than 10.000 visitors and is seen as one of most successive interactive exhibitions in Latvia.

Communication with the whole BR community is rather complicated due to location of the BR within 3 different Districts. The best situation has been developed in Limbazi District where local newspaper regularly at least once a week informs the citizens about ongoing activities in BR. Co-operation with Regional TV and Radio broadcasting station is on irregular basis, but at least once per month there are TV or radio programmes dealing with acute BR issues.

Consultative Board of North Vidzeme Biosphere Reserve, established in accordance with Regulations of the Cabinet of Ministers of Latvia, must define priorities for BR activities according to the legislation. Unfortunately the real impact of the given Advisory Board is rather weak due to formal approach of representatives from the central institutions, which still underestimate the potential of BR.

6.9 North Vidzeme Biosphere reserve as model area for conservation and sustainable development

At present the North Vidzeme BR can be appreciated as a good model area in Latvia especially due to well embedded legislation which allows us to introduce basics of BR concept in local municipal planning. In the same time insufficient BR staff capacity to cover 41 municipality divided between three Districts and two Planning Regions makes it problematic. Good option now is seen through the presence of GEF Project "Biodiversity Protection in North Vidzeme Biosphere Reserve" with total funding of 2,660500 USD. Project is aimed to raise BRs capacity.

The project has eight primary outputs: (i) Improved information on the NVBR and its biodiversity, as well as the information's management and use in decision-making; (ii) Strengthened institutional capacity and multisectoral and participatory mechanisms for governance and management of the Reserve; (iii) Identification of desirable reforms to existing policies, legislation and incentive/regulatory frameworks for resource use, with the aim of stimulating or supporting biodiversity-friendly behaviour; (iv) Integrated ecological landscape planning for the NVBR; (v) Demonstration of alternative biodiversity-supporting economic development activities for local communities in forestry, agriculture and tourism; (vi) Increased awareness of and support for biodiversity conservation and sustainable development among all stakeholders; (vii) Habitat restoration at selected sites to maintain and enhance globally significant biodiversity; and (viii) Systematic identification and dissemination of lessons learned and best practices through ministerial and NGO channels throughout Latvia.

As one can see from the project summary, new financially grounded impetus is given for the future development of Biosphere Reserve concept in Latvia.

Conclusions

The biosphere reserve concept today becomes more and more accepted and quite functional on the regional and local level as a definite legally defined possibility for (sustainable) development. The "biosphere reserve" becomes a real umbrella for co-operation across the formal municipality and District borders and can bring together partners and stakeholders which traditionally have not been used to communicate, cooperate and compromise.

Like in other BRs around the Baltic, connection of the biosphere reserve concept and real activities to the actual biosphere reserve and its zones is not very well developed and will be one of the important matters to be solved during the next years.

Co-operation, joint activities and exchange of "best practices" with other Nordic Biosphere Reserves must become a good basis for future functioning improvement of the North Vidzeme Biosphere Reserve.

7. MAB in Norway

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7.1 A brief history

Norway joined the UNESCO MAB Programme in 1975, and the ”first Norwegian MAB phase” lasted 10 years, until 1984. The activities was organised as a national research programme with a governing board, and the research was largely concentrated to Svalbard. The years shortly after 1984 there were no MAB activities in Norway.

“The second MAB phase” in Norway started in 1989. The Norwegian UNESCO Commission requested the national research council to initiate new MAB activities, and a new programme was launched and a new national MAB committee appointed. This programme focussed on man-nature interactions in northern Norway, mainly using Finnmarksvidda as the study area. As a MAB programme the activities was terminated in 1992, as was also the national MAB committee.

After 1992 there was no explicit MAB activities in Norway until the Norwegian UNESCO Commission in 2001 decided to promote new MAB activities in Norway, in particular the establishment of biosphere reserves on mainland in Norway. (In the 1980’s a biosphere reserve was established on northern Svalbard, but it was removed from the list around the turn of the century, due to the fact that no people live there). During the last three years considerable effort has been made to establish new MAB activities in Norway. Focus has mainly been on the establishment of biosphere reserves.

Norway was elected member of the MAB Intergovernmental Council in 2002, and has since then also taken part in EuroMAB and NordMAB meetings.

7.2 Status and analysis

Until now, the Norwegian UNESCO Commission has not succeeded to stimulate the establishment of new national MAB activities, neither a new scientific programme nor biosphere reserves. There are several explanations for this situation. The Commission is organised under the Ministry of Education and Research that verbally supports to give priority to national MAB activities. However, funding of programmes is the responsibility of the Norwegian Research Council, and the Council is so far not ready to give priority to a new MAB programme. Among other things they point at the fact that many ongoing programmes include activities that are MAB-relevant.

The Ministry of Environment is responsible for the establishment of protected areas in Norway, nature reserves, national parks, landscape areas and cultural heritage areas. The predominant view in the Ministry is that priority must be given to cultural heritage areas, rather than biosphere reserves. Further, the Ministry allocates a lot of resources to implement a new plan for national parks in Norway, and as long as this work is going on, the Ministry is very hesitating to start processes aiming at the establishment of biosphere reserves.

The above-mentioned viewpoints are predominating in the bureaucracy of the Ministry of environment and underlying bodies. On the other hand, there is a strong political will in Norway to promote the sustainable use of natural resources in rural and mountain areas in Norway, to contribute to value and job creation, for instance ecotourism in regions where agriculture is being restructured.

Thus, the concept of biosphere reserves seems very relevant with respect to the political goals, but there are constraints in the administration at different levels until the National Park Plan is implemented.

As a consequence of this, one obvious conclusion is that success regarding the establishment of biosphere reserves in Norway in the near future requires that the ministers involved become convinced that the

reserves may serve as important tools to realise political goals regarding value and job creation in "District Norway". This means, in turn, that the Norwegian UNESCO Commission to a larger degree must focus on contact with the political authorities in this question.

It should be mentioned that a couple of local initiatives has been taken in the last years to establish biosphere reserves, none of which have succeeded so far.

8. Biosphere reserve development in Sweden

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Summary

The interest and knowledge about the MAB-programme and biosphere reserves has been low in Sweden, although in 1986, Lake Tone Area, Sweden's first biosphere reserve was established.

During the 1990s the interest for MAB and biosphere reserves in Sweden increased. A local initiative in Kristianstad municipality was inspired by the biosphere reserve concept for wetland restoration and started to adapt it to its local circumstances. At that time, only a few people were acquainted with MAB and the biosphere reserve concept at national level.

Since the end of the 1990s, the national MAB-committee has promoted the MAB-programme and the biosphere reserve concept both locally and nationally, experiencing an increased interest, and the Swedish Environmental Protection Agency became involved and started to financially support the development of biosphere reserves. In 2001, the national government pointed out biosphere reserves as an interesting complement to traditional conservation instruments. During 2001-2004, several research projects were funded by the MAB-committee to study important aspects of the biosphere reserve concept in Kristianstads Vattenrike, and in Nationalstadsparken in Stockholm.

Currently, biosphere reserves are being development in Sweden. A revision by UNESCO of Lake Torne Area found that the BR lacked proper zoning, and had too few inhabitants. The Swedish MAB-committee has tried to find local support to upgrade the reserve and it is now likely that Torneträsk BR will become upgraded by local initiatives. There are also several ongoing local initiatives to establish biosphere reserves. In 2005, Kristianstads Vattenrike will apply to UNESCO to become a biosphere reserve and Nedre Dalälven and Kinnekulle/Vänerland are about to start preparatory studies. In order to meet the increasing local interest, activities on the national level have increased and are now running parallel to local initiatives. A national strategy is under preparation, and discussions how to permanently fund biosphere reserves and the national work of the MAB-programme have begun.

8.1 The organisation, administration and funding of Swedish MAB and its biosphere reserves

8.1.1 National level

The last years the national organisation of the MAB-programme has changed due to a reorganisation of the governmental research councils, and due to an investigation of the UNESCO-programmes. During the years 2000-2003 the national MAB-committee had an interim situation as an independent committee. Since 2004, the MAB-programme and its national committee are administrated by the Swedish Research Council, an agency under the Ministry for Education.

The national MAB-committee is an independent committee under the national UNESCO scientific committee that governs the UNESCO programmes in Sweden since 2004. Most members in the MAB-committee have a PhD, some of them have continued as scientists, and the others are officers at national agencies. Throughout the reorganisation, the former chairperson has stayed, safeguarding continuity.

When the MAB-programme was administered by The Swedish Council for Planning and Co-ordination of Research, it mainly focused on research and funding was given to support mainly social science, with the aim to develop a stronger environmental profile in social science. Re-

search was funded both in Lake Torne Area and Kristianstads Vattenrike. There were also possibilities to fund PhD-students to make shorter study visits and take part in international conferences. In 2003, the budget was 1.5 million SEK (approximately 161,000 Euro).

From 2004, the national MAB-committee has no special funds for MAB-research. However, the Swedish Environmental Protection Agency (EPA) has begun to fund biosphere reserves development, locally and nationally. The last years, Kristianstads Vattenrike has received funding from the EPA to support their application process. At national level, the Swedish EPA funds a national coordinator for biosphere reserve development.

The national MAB-committee believes that biosphere reserves in Sweden should have close connections with the municipal(ities) and county administration(s) where they are located due to legal and financial matters. For instance, municipalities have a planning monopoly in Sweden, and county administrations are in charge of the establishment and management of state reserves and internationally recognised natural areas such as Natura 2000. County administrations are also able to channel governmental funding to municipalities, for instance for conservation projects or sustainable development projects. Apart from legal and funding matters, the connection is beneficial for the biosphere reserve to be able to function as a model area. If closely connected with municipalities and county administrations they have natural links to all municipalities and county administrations in Sweden. The policy of the MAB committee has been that local initiatives should guide the development of biosphere reserves and no specific organisation structure has been developed how to locally govern Swedish biosphere reserves.

There is a trend to develop new biosphere reserves, and local initiatives are interested in the biosphere reserve concept. In this paper we present the current state of the Lake Torne Biosphere Reserve, and of the Biosphere Reserve Candidate Kristianstads Vattenrike. Two other areas, Nedre Dalälven and Kinnekulle/ Vänerland, are about the make preparatory studies to decide if they should continue the process of establishing a biosphere reserve (Figure 13).

Figure 13: Sweden has one biosphere reserve, Lake Torne BR, and in 2005 Kristianstads Vattenrike will apply to be acknowledged as a biosphere reserve. Nedre Dalälven and Kinnekulle/ Vänerland are in the phase of doing preparatory studies.

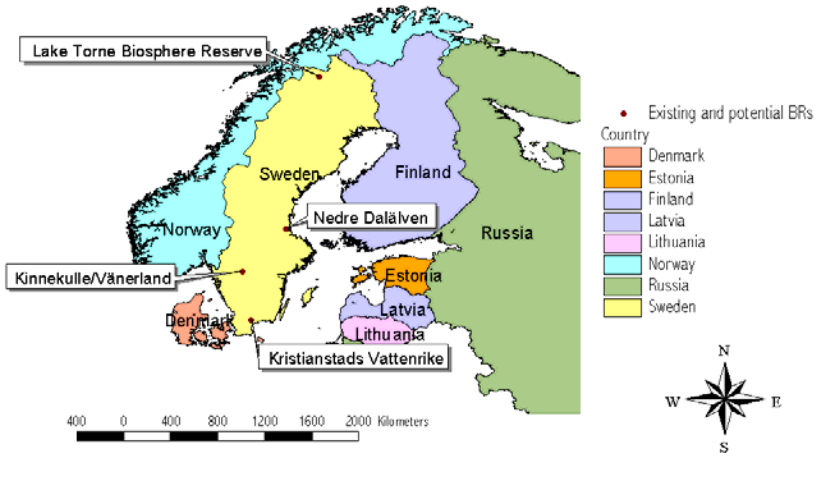
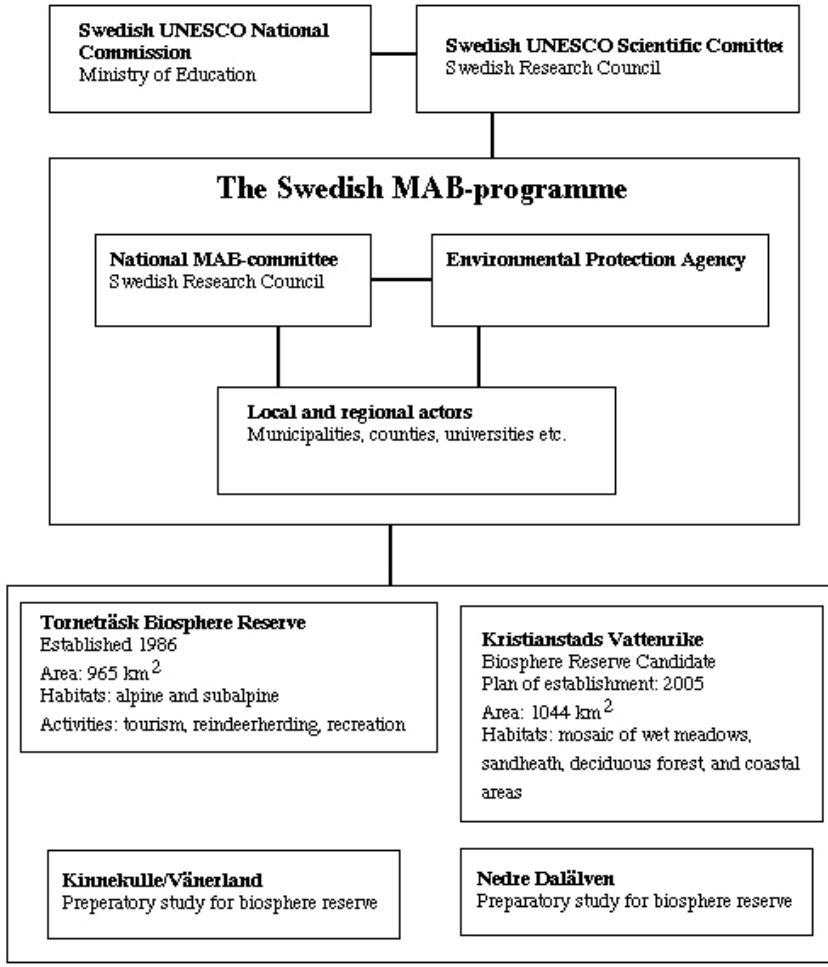


Figure 14: An overview of the Swedish MAB-programme (2004), with its connection to the Swedish UNESCO Commission and the Swedish UNESCO Scientific Committee.



8.1.2 Lake Torne Area

Lake Torne Area was established in 1986, before the Rio Conference (1992) and the implementation of the Sevilla strategy (1995). The establishment was largely due to the presence of activities at Abisko Scientific Research Station, which has been located in the area since 1912. The reserve consists of core areas made up by national parks and nature reserves surrounded by almost unpopulated areas.

Lake Torne Area has for many years without a permanent organisation, administration, funding and coordinator. In the end of the 1990s and beginning of 2000s, the national MAB-committee made an effort to activate the area, and funded a part-time coordinator. The coordinator's main task was to make research information from Abisko Scientific Station available for locals, trying to make them interested in becoming active themselves. Contacts were taken with Sami villages and others to make the biosphere reserve concept known. Both the local municipality and Norrbotten County Administration became positive. During 2003 the area lacked a coordinator, but Kiruna municipality decided in the end of 2003 to investigate the possibilities to upgrade Lake Torne Area. The first part of the investigation is ready. Kiruna municipality is willing to continue, and there is support from the Abisko Scientific Research Station, Norrbotten County Administration, the Swedish EPA and the national MAB-committee. Since this year two officers work part-time to upgrade Lake Torne Area, financed by Kiruna municipality, of which one of the officers was the coordinator of TT BO 1999 – 2002.

8.1.3 Kristianstads Vattenrike

Kristianstads Vattenrike (KVR) has been inspired by the biosphere reserve concept since 1989. KVR has used the concept and adapted it to the local situation. The last years (2002-2004) KVR has prepared an application to become accepted as a biosphere reserve. The future organisation of the biosphere reserve will to some extent be similar as the current organisation, which is a complex, interwoven structure with many partners. Kristianstad municipality runs the core and permanent organisation, partly together with Skåne County Administration (Länsstyrelsen Skåne län). In addition, other actors often fund projects and short-term activities, for example local landowners, Region Skåne, The Swedish Environmental Protection Agency, WWF and the national MAB-committee.

During 2002 to 2004 Kristianstad municipality has been the main funder, supported by the Skåne County Administration (establishment and management of nature reserves), The Swedish Environmental Protection Agency (the application phase), Region Skåne and WWF (conservation projects), the national MAB-committee (research funding), Stockholm University, and Kristianstad University. The budget varies from year to

year. In 2003, which was a representative year for Kristianstads Vattenrike, the budget was approximately 605,000 Euro. The municipality covered a major part of the costs (62%), while the County Administration and the EPA together covered 22 %, Skåne Region 3%, Kristianstad University 1%, WWF 12% and the Swedish Research Council (via the national MAB-committee) 0,2%.

Kristianstads Vattenrike has its own office, adjacent to the core of the proposed Biosphere Reserve. In 2003, Kristianstads Vattenrike had 22 persons employed, of which 6 full-time staff and 16 part-time staff. The office and its staff act as initiator and facilitator, inviting partners from the area to take part in the activities of Kristianstads Vattenrike. So far the main activities have focused on the wetlands with nature conservation and cultural heritage projects, and information with e.g. an ecomuseum (consisting of 13 places to visit along the 35 km long wetland area) and nature studies for school children.

The future organisation of the BR Kristianstads Vattenrike is proposed to be similar to the current organisation, adding a coordinator and staff that work with information, ecology and nature conservation. The funding of the biosphere reserve, and its coordinator is subject to negotiations between the municipality and the Swedish Environmental Protection Agency. A short-term solution is prepared for 2005, and a permanent solution for the coming years, when hopefully the area has been approved as a BR.

8.2 National legislation

There is no specific legislation for biosphere reserves or for zoning in biosphere reserves. One of the most important starting points for the establishment of a biosphere reserve in Kristianstads Vattenrike has been the unanimity with the local representatives that a biosphere reserve should not imply new specific legislation, but use existing legislation. The existing legislation connected to the Code of Environment is the basis for zoning in the biosphere reserve. For practical reasons, it may be needed to incorporate the biosphere reserve concept into legislation, for instance when allocating resources to activities/ projects/ management etc. in a biosphere reserve.

8.3 Zoning

8.3.1 National level

There is no national standard developed for zoning Swedish biosphere reserves. Instead, it is the opinion of the Swedish MAB-committee that Kristianstads Vattenrike is the pilot project for developing zoning in Swedish biosphere reserves.

8.3.2 Lake Torne Area

Lake Torne Area would benefit of an expansion to include more people so that zoning can be properly applied. In UNESCO´s periodic review of biosphere reserves 1999 (UNESCO reference SC/ECO/5865.8.37), UNESCO recommends the Swedish authorities to consider the expansion of the transition area to include more populated areas, and to provide a clear map of the zoning. In 2003, the Swedish MAB-committee suggested either to include Abisko village with 300 inhabitants into the BR or to expand the BR to include Kiruna municipality. The issue of expansion and zoning is a local issue and cannot be decided by the national committee, and Kiruna is now considering the proposals of the national MAB-committee.

8.3.3 Kristianstads Vattenrike

During the application phase, Kristianstads Vattenrike has developed a proposal for zoning biosphere reserves in Sweden. Previous classifications of natural values and established protected areas were used, and the zoning is connected to the physical planning of Kristianstad municipality. The zoning system is perceived as a dynamic tool to give priority to financial and human resources. Those who live and work in the biosphere reserve should thus not feel that they are subject to specific restrictions or more restricting legislation.

The proposal for BR Kristianstads Vattenrike suggests 6% to become core area, 23% buffer zone, and 71% transition zone. This will change when recently established Natura 2000 are added. The zoning system will successively be complemented with new reserves, Natura 2000-areas etc.

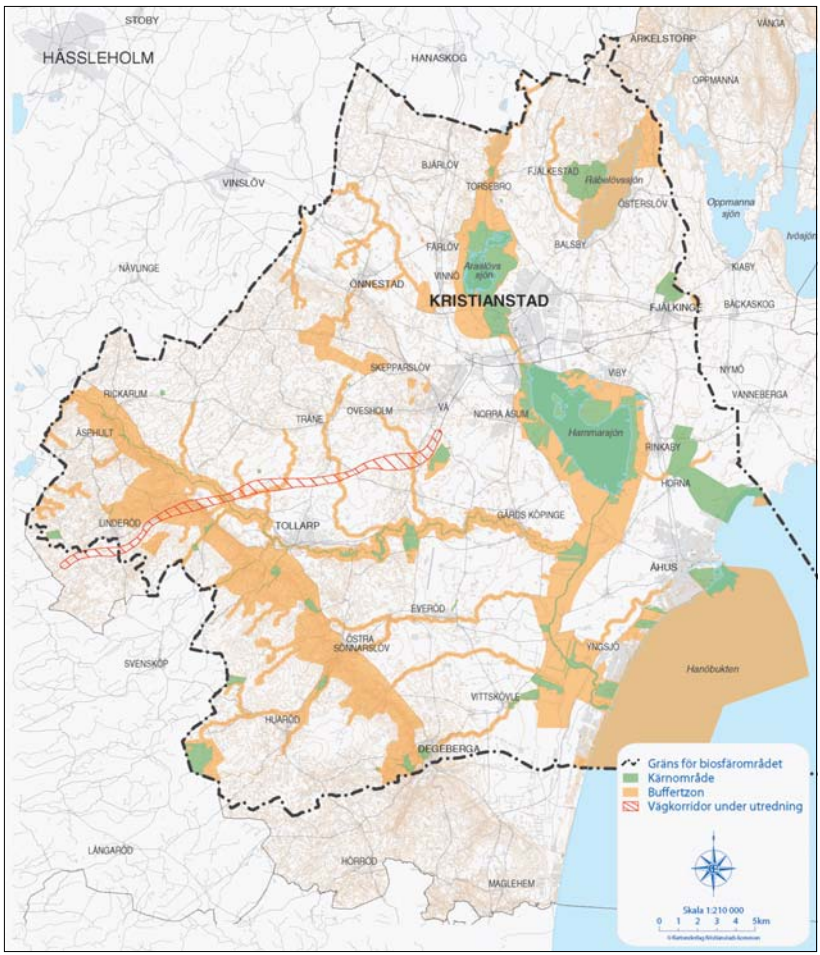
The intention is to secure that the zoning system is ecologically functioning. How often the actual maps at MAB/ UNESCO should be revised needs to be discussed.

Table 2: Zoning system proposed for Biosphere Reserve Kristianstads Vattenrike

Zone	No. of permanent inhabitants	Type of national area
Core areas	14	Nature reserves Nature conservation areas Natura 2000-areas
Buffer zone	1959	Ramsar - site[1] Area of national interest for conservation[1] Riverine buffer zones (strandskydd) Legal habitat protection areas (Skogliga biotopskydd) Municipal voluntarily set aside areas for conservation State owned land to become nature reserves in the near future[2]
Transition zone	66366	Other land and water areas

[1] Only the area that is not nature reserve, nature conservation area or Natura 2000 – area is classified as buffer zone.
[2] This part of the buffer zone is dynamic. When a nature reserve is established in this category, the area automatically

Figure 15: The zoning system proposed for Biosphere Reserve Kristianstads Vattenrike. Gräns för biosfärområde = boundary for biosphere reserve, kärnområde = core area, buffertzon = buffer zone.



8.4 Local and regional acceptance and involvement

8.4.1 Lake Torne Area

During the last years, talks between the national MAB-committee and Abisko Scientific Research Station, Kiruna municipality and Norrbotten County Administration regarding UNESCO´s periodic review and the work of the former coordinators have increased the awareness and accep-

tance for the biosphere reserve concept in Kiruna municipality. In 2004, the municipality prepared the upgrading of Lake Torne Area, putting the biosphere reserve into the local context.

8.3.3 Kristianstads Vattenrike

Kristianstads Vattenrike is a local initiative. Activities started in 1989 and from the start there was strong regional and national support. Although the activities during the first 10 years were mostly connected to the concept of an ecomuseum, a broad approach was applied, aiming at connecting the conservation and preservation of natural values with a sustainable use of these resources.

National and international contacts were consulted to get information about the possibilities to establish a biosphere reserve in the future. In the end of the 1990s, the national MAB-committee became more active. This change made it possible to seriously consider the possibilities to establish a biosphere reserve. Almost from the beginning, local political support for projects in the urban wetland areas in Kristianstad (Kristianstads Vattenrike) has been strong. In 2001, Kristianstad municipality proposed to establish a biosphere reserve in the municipality, and in 2002, the Kristianstads Vattenrike Biosphere Reserve Candidate Office was established. Kristianstad municipality, The Swedish Environmental Protection Agency, Skåne County Administration, and Region Skåne finance the office. During 2002 to 2004, the mission of the candidate office has been to prepare an application to make Kristianstads Vattenrike officially recognized as a biosphere reserve. Also farmers and other local actors have over the years become familiar with the concept, and have been involved in the activities of Kristianstads Vattenrike. As the work with the proposed biosphere reserve proceeds, more and more people are involved in the activities, and so become acquainted with the concept of biosphere reserve.

8.5 Research

8.5.1 National level

The MAB-programme needs the geographical arenas of biosphere reserves to find focus for its research. In 1997, the national MAB-committee funded its first project directly linked to the biosphere reserve concept and one of its main criteria, the zoning system of biosphere reserves. However, this project did use neither Lake Torne Area nor Kristianstads Vattenrike as study area. In the year 2000, the national MAB-committee supported projects in Lake Torne Area and in areas interested in the biosphere reserve concept, such as Kristianstads Vattenrike, Nationalstadsparken in Stockholm, and Finnskogen in Värmland.

One important result of this research funding is a paper recently published by Olsson et al. (2004) that presents social processes and mechanisms behind the adoption of a flexible and collaborative management of wetland ecosystems in Kristianstads Vattenrike. Another important result of the granted research is that there now are a number of scientists in Sweden who are familiar with the MAB-programme and the biosphere reserve concept.

The coming years the national MAB-committee has the ambition to further strengthen the link between the ecosystem approach in the Convention of Biological Diversity and the research in Swedish biosphere reserves. However, the Swedish MAB-programme lacks its own funding possibility since 2004 and must rely on research councils to give priority to MAB-projects. This makes the research component in the progressing biosphere reserves uncertain.

8.5.2 Lake Torne Area

In Lake Torne Area the research is so far fully concentrated to the activities taking place at the Abisko Scientific Research Station. The station, which is open all year, can host up to 100 visiting scientist at the time. During the last years, the number of visiting scientists has been between 400 and 500. The bulk of the research in the biosphere reserve is carried out within natural science, in particular plant ecology, geomorphology and climatology.

The natural landscapes and its temporal and spatial variations of the biosphere reserve are well documented and described in more then 2700 scientific publications from the surrounding area. There are also research activities within tourism, land-use and landscape management.

The station is further involved in a number of international projects and networks. SCANNET (Scandinavian/North European Network of Terrestrial Field Bases) consists of about ten terrestrial field research stations, all situated in the northern Europe. This network, coordinated from the Abisko station, aims at creating an overall understanding on how future changes in climate and land-use will affect flora and fauna.

ACIA (Arctic Climate Impact Assessment), where the station is one of the leading parts, aims at evaluating and synthesising knowledge on climate variability, climate change and increased UV-B radiation and its consequences for nature and humans.

The station is also playing a major role within the CEON (Circumarctic Environmental Observatories Network). CEON aims to promote environmental observations in the Arctic and dissemination of these to arctic researchers whilst encompassing and building on the strengths of existing networks in the Arctic.

The Abisko Scientific Research Station is also participating in leading the International Geographical Union Commission, Cold Region Environments, aiming at studying environmental changes in periglacial areas with focus not only on physical dimensions, but also incorporating social, economic and environmental aspects.

Beside pure research carried out by the in house researchers and visiting scientists, the Abisko Scientific Research Station is also running a monitoring programme of the environment, with some areas of continuous monitoring since 1912. Thanks to of the monitoring activities, the Lake Torne Area is since 2003 one of the participants in the UNESCO initiative Global Change Research in Mountain Biosphere Reserves. (Jonasson 2004)

8.5.3 Kristianstads Vattenrike

The research in Kristianstads Vattenrike is described in the application to UNESCO. Research within the proposed biosphere reserve has been conducted in several different fields over a long period of time and with vary-

ing degrees of intensity. Previous research projects from the late nineteenth century up to 2003 have generally been pursued independently of each other even within the same field, but it seems likely that the establishment of a biosphere reserve will facilitate co-ordination and promote collaboration within and between different disciplines. Kristianstad University will play an important role in this process. As a first step towards establishing a future research organisation linked to the biosphere reserve, the university has assigned a member of staff to be responsible for compiling a synthesis of previous and current research to support this application.

Some of the on-going research projects are:

- Tracing of leachate pollutants at treatment plants as a base for development of treatment and water quality control systems (LAQUA).
- Waterfowl population and community ecology.
- Integrating ecosystem function into river quality assessment and management.
- The Helge å River Valley. Landscape in a Long-term perspective: Man and Biosphere.
- Students view of learning and ecosystem understanding.
- Local-scale assessment and management for building resilience (Resilience Alliance Case Study).
- Ecosystem Management and Social-Ecological Resilience in Kristianstads Vattenrike and River Helge å catchment (Millennium Ecosystem Assessment).
- Biological diversity and public opinion.

8.6 Economic development and job creation

8.6.1 Lake Torne Area

The Saami people, traditionally living on reindeer herding, have been in this area for thousands of years and have had domesticated reindeers for several hundred of years. Even if the number of Saami people that are active in reindeer herding today is quite small, the herding is in many

ways important for the area. The landscape is highly affected by the grazing and trampling of the reindeers. Without the reindeers one should expect a lower biodiversity in the area.

Tourism became important already in the beginning of the 20th century. At that time the railroad between Kiruna and the Norwegian coast was constructed. At about the same time the first national parks in the surroundings were established. Today, tourism is one of the most important economic factors in the whole region, and certainly the economic activity that grows fastest. The tourist hotels within and close to the Biosphere Reserve host about 100,000 tourists every year. Tourism is mainly concentrated to two periods, late summer and spring. In the summer, tourists are walking, fishing etc., during wintertime they are driving snowmobiles, fishing and skiing, both downhill and cross-country. During the autumn there is also an increasing hunting tourism.

The Abisko Scientific Research Station is today one of the major employers in the region and the biggest one within the biosphere reserve. Today about 20 people are working permanently at the station. Other economically important activities are trade and transport. An extremely big store (at least from a north Swedish point-of-view) is situated in Abisko, a small village just outside the reserve area with 160 inhabitants. The explanation is the distance to the outer European Union border and more than 90% of the stores turnover is due to Norwegian visitors. Further local jobs are in road and railroad maintenance, which require some tens of people all over the year.

8.6.2 Kristianstads Vattenrike

No figures are available for the financial income generated by tourism within the proposed biosphere reserve. However, there are tourism reports for the municipality of Kristianstad (the major part of which is inside the proposed biosphere reserve).

The latest figures are for 2001 and show that the travel and tourism industry in the municipality generated income slightly more than 500 million SEKand employed some 455 people.

Some other examples of new commercial initiatives linked to water/nature/the environment.

The following are among the examples of activities that have been started in recent years and which are linked to the area's natural values or to work to improve the environment:

- The River Helge å Fishery Conservation Area generates SEK 350,000 annually through the sale of fishing permits.
- The Wetland Boatsightseeing company has operated regular boat excursions on the River Helge å since 1994 and carries 4,000 to 8,000 visitors each year.
- At least 10 new permanent jobs in areas such as biogas management, district heating, the production of fuel straw for district heating plants, and wetland haymaking have been created as spin-offs from the municipality's environmental initiatives.

This highlights the potential for generating revenue within the framework of the proposed biosphere reserve and the municipality's strategy to position the area as a centre for food and food production (based on the role of water and Kristianstad's reputation as a centre for trade and commerce throughout history) by making full use of the natural prerequisites of the area in such a way that the natural values can be both enjoyed and conserved.

8.7 Education and communication

The national MAB-committee has focused its work on starting processes to establish biosphere reserves and funding research in areas interested in the biosphere reserve concept. Education and communication has so far had low priority but will become more important.

8.7.1 Lake Torne Area

Within Lake Torne Area there are numerous of student groups participating in excursions, field studies as well as university courses. During 2004, the BR was visited by student groups from Germany, Spain, Britain, and Switzerland. Swedish students have had access to five separate courses in (amongst other) plant ecology, botany, climatology, geo-ecology, geo-

sciences, geography, and system ecology. Beside the national and international university contacts, school pupils also regularly visit the BR. In 2004 the BR had formal co-operation with several high schools (gymnasium) in northern Sweden. Scientists working in the BR are frequently holding lecturers for the general public as well as for visiting groups. There is a Lake Torne Area homepage as well as a new popular science homepage under construction, aiming at attracting school children.

8.7.2 Kristianstad Vattenrike

Kristianstads Vattenrike Ecomuseum

Public access to the proposed biosphere reserve is facilitated through the Ecomuseum concept, which was established in 1989. According to an international model, both the surrounding landscape and selected buildings and flora form the Ecomuseum. The various Ecomuseum sites dotted across the wetlands describe the links between the surrounding nature and the region's culture and history, at the same time as they also demonstrate local natural values and the threats that exist to those values. The theme of the Ecomuseum in Kristianstads Vattenrike is water. The museum comprises 40 interesting sites in the rich wetlands of Kristianstad, all in some way linked to water: bird observation towers, boardwalks, a river excursion boat and 13 visitor sites with information in the form of outdoor museums or informative displays on boards. The Ecomuseum in Kristianstads Vattenrike is a member of the International Council of Museums (ICOM).

The Ecomuseum has great importance for public health and general education in that approximately 150,000 people visit the sites annually. These visitors include many school classes, researchers and foreign visitors, but the bulk of visitors are local residents. A large number of factual booklets have been produced to complement the information available at the Ecomuseum visitor sites, and there is also a comprehensive website with maps, pictures and texts as well as meteorological data online.

The Ecomobile, Kristianstad Nature School

The Nature School, also established in 1989, acts as an extension of the Ecomuseum in schools. The Nature School's target group is teachers at schools and nursery schools and pupils in compulsory school and upper

secondary school. The Nature School has two specially trained teachers and a minibus equipped with basic field equipment. Working in the immediate vicinity of local schools, the aim is to get teachers and schoolchildren to use the outdoor environment as a classroom. The keywords for this project are "Experience – Discover – Study".

As a complement to the schoolchildren's visits to natural environments close to the schools they attend, the Nature School has also produced boxes of teaching materials which are available at five locations in Kristianstads Vattenrike. These educational materials enable a large number of teachers to study nature and culture on site in the proposed biosphere reserve together with their pupils. One example is the teaching materials box at the popular *Canal House Outdoor Museum*, which contains field equipment for studying life under the surface of the water in the River Helge å. It is used annually by about 30 classes, together totalling almost 1,000 pupils. Since 1996 the Nature School has expanded its activities in accordance with the maxim "First Outdoors, then IT". The basis for the programme is first-hand experience of nature outdoors, but interest is stimulated and maintained by the use of a digital camera, homepages and the opportunity of reporting, for example "signs of spring" interactively on Kristianstads Vattenrike's homepage from the classroom.

In August 2002 the Nature School opened its first outdoor classroom in Kristianstads Vattenrike at Näsby fält. A second classroom opened in the autumn of 2003 at Balsberget Hill. The outdoor classrooms act as a forum for nature studies to which classes come to work with the Nature School on everything from ringing birds and learning about natural plant dyes to practical nature conservation work.

Another aspect of the comprehensive work of the Nature School is to supervise the environmental work of schools and nursery schools, together with Agenda 21. Thanks to these efforts, the Green Flag certification programme has been very successful. Of a total of almost 100 schools and nursery schools in the municipality 43 are currently working towards Green Flag certification.

8.8 Traditional knowledge and cultural values

8.8.1 Lake Torne Area

The traditional Saami knowledge based on reindeer herding and the use of plants and animals is a rich source of knowledge. There have been several contacts with the indigenous Saami people during the last years. There have also been attempts to initiate research projects based on combinations of indigenous knowledge and natural science. Within the planning of the International Polar Year in 2007 – 2008 The Abisko Scientific Research Station has proposed several activities dealing with indigenous knowledge:

- The Saami community would be invited to host members of the indigenous peoples from around the Arctic to discuss environmental issues.
- Joint meetings of the scientists working in the field, computer modellers and indigenous peoples would be arranged for cross-fertilisation and collaboration on environmental monitoring and assessment and projection of environmental change and its impacts.
- Visiting scientists and indigenous peoples would be offered opportunities of comparative studies in other northern regions of Fennoscandia through SCANNET (SCANdinavian/North European NETwork of terrestrial field bases) member facilities.

8.8.2 Kristianstads Vattenrike

So far, there has been no survey of traditional knowledge in the proposed biosphere reserve. One can expect different types of traditional knowledge associated with the selected habitats for conservation activities, for example the wetlands, the forest, and the dry sandy arable lands and the coastal areas adjacent to Hanöbukten. Living examples of traditional knowledge are the management of coastal meadows, dry sandy habitats, fresh water fisheries and eelfishing.

8.9 Model areas for conservation and sustainable development - links to the Convention on Biodiversity and the European Landscape Convention

There is so far no system or strategy for how to use biosphere reserves as model areas for improving conservation or enforcing sustainable development. There are neither any formal links to the Convention on Biological Diversity, nor to the European Landscape Convention. However, Kristianstads Vattenrike is often used as an example for progressive conservation in Sweden and internationally. The initiators, Sven-Erik Magnusson and Hans Cronert have received a prestigious conservation award by Artdatabanken (the Swedish Species Protection Unit) in 2001, for their conservation work with Kristianstads Vattenrike. During the autumn 2004 the MAB-programme and the Environmental Protection Agency, will develop a national strategy for biosphere reserve development. As part of this process the EPA will have a seminar in October to further discuss this issue.

8.10 Nordic co-operation

The national MAB-committee views the Nordic co-operation as an important tool for the current biosphere reserve development in Sweden. Sweden has taken part in Nordic co-operation on biosphere reserves since the 1980s. In 1997, a Nordic workshop on sustainable management of biological resources was held in Uppsala with participants from Denmark, Finland, Norway, and Sweden. In Rome 2002, at the meeting of EuroMAB, a first proposal from the Finnish, Swedish, and Norwegian participants was presented, wishing to establish the subunit of NordMAB within the EuroMAB network. Through the different networks at Abisko Scientific Research Station, the Lake Torne Area has access to several Nordic networks.

Conclusion

In general, the status of the MAB-programme and the development of biosphere reserves are good and promising. The example of Kristianstads Vattenrike studied by Olsson et al. (2004) shows that the biosphere reserve concept has had an important role in changing the attitudes in the area towards its wetlands, looking at them as something enriching the landscape rather than being a problem.

Table 3: An overview of the status and development of Swedish biosphere reserves.

Variabel	Status	Development
Organisation, administration and funding	Weak	Is positive
National legislation	Accepabel	May be needed
Zoning	Good starting point	May be needed
National legislation regarding zoning in BRs	Not existing	Not necessary
National legislation specifically for BR	Not existing	May be needed
Local and regional acceptance and involvement	Good	Can be further developed
Research: until 2004	Good staring point	
2004 and onwards	Weak	Urgently needed
Economic development and job creation	Poorly known	Needs to be investigated
Education and communication	Nationally weak	Is needed
	Strong in KVR	Can be further developed
Formal links to the Convention on biodiversity and the European Landscape Convention	None	Is welcome
Model areas for conservation and sustainable development	Nationally weak	Is positive
	Strong in KVR	Strong
	Non existing in TT BO	Needs to be developed
Nordic cooperation	Exists	Useful and welcome

The strength of the Swedish MAB-programme and biosphere reserve processes, in 2004, is the substantial network of persons and organisations acquainted with the concept, and taking part in the process. If the current trend for the MAB-programme and biosphere reserves continues, it is probable that Sweden could have several biosphere reserves within a decade. However, experience from the MAB-programme shows that it is important that the involved partners know the biosphere reserve concept

well, and search for their role and interact with the other partners to provide a constructive working climate.

One important task for the Swedish MAB-programme is to find out how to organise and finance the coordination of, and research in its biosphere reserves.

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9. Workshops and plenary discussion

At the conference in North Vidzeme Biosphere Reserve in October 2004 workshops were held. The workshops addressed issues on how to organise biosphere reserves and how co-operation between biosphere reserves could be organised. Some of the discussions are presented here. Later at the conference there was a plenary discussion that is also presented here.

9.1 Administration, organisation, funding and zoning

Martin Öhman, Finland (chairman) and *Timo J. Hokkanen,* Finland (rapporteur)

9.1.1 Discussion: organizing biosphere reserve activities

Eleven persons took part in the workshop.

Legislation, zoning and role of the biosphere reserve

New specific national legislation concerning biosphere reserves (BRs) was not, in general, seen necessary nor desirable. On local level legislation is easily associated with restrictions in, e.g., land use, and the examples from Canada show strong resistance against biosphere reserves. The establishment of a new reserve can be stopped or delayed. The zones of the BR can usually be defined using existing legislation or other rules. However, a BR law usually guarantees funding by state. In some cases the law for the establishment of a BR has been important, as in Latvia.

The national governments apply for the nomination of a BR from UNESCO and designate them after approval. Thus, national legislation (or rules) concerning recognition and tasks of BR is always needed (cf zoning) to guarantee the existence and working conditions. In summary, the need for BR legislation must be defined based on the conditions and

needs of each country. This is evident in the different ways of organizing the BR in the Nordic countries.

Nordic experiences also show that a lot of energy and work should initially be put in to define and clarify the BR concept in relation to the local conditions. What does zoning mean in practice? How will the BR influence on, or support the local life? What is the role of research and monitoring? A bottom up approach is crucial. It is also important that those introducing the ideas and working as coordinators are locally accepted.

How to understand BRs as model areas: could it lead to special funding or subsidies in the future? This was seen an ideal situation, but the special status and funding are bound to national policy. However, BRs always are tools for development, a forum bringing people and various stakeholders together and catalysing processes. BRs also bring biodiversity issues in and this makes the difference between BRs and most other development programs. BRs can also be used a tool for land use planning, they pile up information and expertise. These positive effects need to be pointed out and shown to local people. BRs are tools for defining sustainable development on local level.

How to run a BR: administration, organization, funding

In an ideal situation the biosphere reserve is a cross-sectoral unit involving activities and responsibilities from several ministries. In practice this can be difficult, because the responsibilities can be diffuse and more bureaucracy is needed.

The minimum personnel to run a BR on regional and local level, and guarantee the continuity of the actions, are a full-time coordinator plus a substitute. *Kristianstads Vattenrike (Sweden) presented a nice and working model with a core staff of 4-5 persons having also other tasks than BR activities.* The municipality is involved in organising the BR by participating in the funding of the core staff. Also related work done in different partner organizations should be directly connected with BR. It is important that the BR organization is not isolated from the surrounding society and its actors.

If it is considered important the BR having “own” activities and applying for funding, it has to have an independent juridical status. This also raises the visibility of the BR, but leads to more bureaucracy and requires a relatively extensive office. The independent status of BR or-

ganization is in direct relationship with acceptance and integration of the BR in the regional and local administration and activities: an accepted and recognized BR takes care of many required actions (e.g., research, monitoring) through specialized organisations as research stations. The more isolated the BR is, the greater "independent" budget it needs. However, the coordinator should be devoted to BR only, and the financing needs to be permanent (not on project basis).

The visibility of BR requires the BR always being mentioned (and sometimes more thoroughly explained) in the publications, brochures, press releases, project presentations etc where BR related activities are presented. This brings the BR more concrete among local people. Also involving local people and organisations effectively raises the visibility of the BRs.

A steering committee with regular meetings is a qualification of a BR. It should preferably make recommendations, not strict regulations nor requirements. The committee is also a forum for information dissemination, and it raises important issues to local awareness. The size and composition of the committee should be adjusted to the local conditions (area, population, stakeholders, financing organisations) and needs of the area.

In funding BR activities the workgroup pointed out that the BRs could cooperate more efficiently in raising EU-funding.

9.1.2 How can NordMAB be used to promote/help the BRs?

NordMAB´s future possible role in the issues discussed:

- The zoning needs clarification in most biosphere reserves. This could be a task for NordMAB – a special project, workshop, discussion forum etc.
- The NordMAB –network could arrange exchange of personnel/other BR-actors between the biosphere reserves in NordMAB, to spread information and best practices.
- By involving the universities the NordMAB biosphere reserves could arrange common education courses for all NordMAB-members.
- NordMAB could take the role to coordinate and support the production of information and information material about and for the NordMAB biosphere reserves. The forms for this could for example

be to handle a “article factory”, produce common brochures, maintain listservers and a webpage (with good examples of activities in the NordMAB biosphere reserves).
- NordMAB could raise the visibility of the biosphere reserves on a national level in the different countries by having meetings in various areas.
- NordMAB could also give recommendations and build up contacts to Nordic influential people – biosphere reserve Godfathers.
- NordMAB is a loose unit dealing with an extensive area in the north. The common concerns or ideas could be formulated to suggestions/recommendations in order to influence environmental policies in the area.
- Sharing experience: Use of NordMAB as a communication tool/meeting place for people who run the biosphere reserves – a forum for discussions and presenting examples. This is needed because there are so few reserves in the north with the same history/culture, climate and society.

9.2 BRs as model areas for conservation and sustainable development, economic development and job creating

Definition of model areas

- targeted solutions both short/long term, that promote stability, sustainability and development,
- solutions that can be used in other areas, and
- creating an identity – both for branding and for society.

Criteria for model areas

- interdisciplinary research is needed (BR research),
- evaluation must be possible (agreement on parameters), and
- sustainability in short and long run.

Specific Assets of BRs as model areas

- funding due to umbrella-effect and international recognition,
- conflict mediator on land management and land use,
- tool for conservation of *both* nature and cultural assets,
- Economical, sustainable and social value added to the area, and
- zoning-concept is unique and can take pressure off the core area.

Ways of economic development

- creating new job opportunities by using resources differently,
- enabling societies to share resources and to agree on development strategies, and
- facilitate possibilities for dwindling societies (rural areas).

Job creation

- creating jobs directly in management of BR (Karelia rural management) and
- creating jobs as spin-off (Estonia camping network-canoeing).

NordMAB

- facilitate capacity building,
- forum for local politician/stakeholders due to neighbour-effect,
- enhance interdisciplinary research, and
- practical co-operation on brochures and general information.

Needed: BR-logo and definition of BR Nordic identity.

9.3 Links to international programmes and conventions

Chair: *Jane Robertson*
Reporters: *Maria Mozgovaya* and *Jane Robertson*

Nine persons took part in this workshop, covering a span of competences, with representatives of several biosphere reserves, MAB Focal Points, representatives of research institutions and individual scientists.

9.3.1 Model Forests

This concept originated in Canada and was now being expanded internationally, with a first model forest set up in Sweden in 2004. The concept had some similarities with biosphere reserves in that it provided for a mix of sustainable use of resources and biodiversity protection, plus the maintenance and valuation of ecosystems functions. No additional legal protection was required to set up a "model forest", and such sites could encompass areas under State, provincial or private ownership. A major similarity with biosphere reserves was the role of model forests as experimental sites for learning.

The Workshop noted that interest in collaboration with biosphere reserves had been shown by the proponents of model forests in the early 1990s. The workshop concluded that it would be advisable to seek more information. For this, Olof Olsson indicated that he would be visiting Canada soon and could report back. Jane Robertson also indicated that she would research this and report back. (Since the time of the workshop, a specialist of the Canadian Model Forest initiative has announced a visit to UNESCO on 10 November 2004: the results of this will be reported back to the NordMAB Steering Committee).

9.3.2 Contribution of NordMAB biosphere reserve to international scientific research and monitoring programmes

Workshop participants recognised that the biosphere reserves in the NordMAB countries cover a great variety of geographical and economic settings but were ideal sites for conducting collaborative research and monitoring in both the natural and the social sciences. One example

quoted here was the comparative study on the application of the CBD Ecosystem Approach in two candidate biosphere reserves in Southern Sweden. In particular, biosphere reserves offer the possibility of unification and harmonisation of research methods and data management: the BRIM is useful in providing protocols for monitoring biotic, abiotic and social parameters (manuals on these to be published end 2004 by UNESCO). Generally speaking, research in biosphere reserves should be tailored to meet local needs but at the same time should be used to contribute to global studies such as the Millennium Ecosystem Assessment. The workshop concluded that:

- NordMAB biosphere reserve coordinators should check and continually use the MABnet directory of biosphere reserves and enrich it with up to date information on ongoing research and monitoring projects (http://www2.unesco.org/mab/bios1-2.htm). Hyperlinks between the MABnet and the web sites of individual biosphere reserves should be encouraged.
- The methodologies and protocols established under BRIM should be adopted and used whenever possible.
- A survey of key research needs of NordMAB biosphere reserves should be conducted to help identify possibilities for future NordMAB collaboration.
- NordMAB should explore the possibility of setting up a mechanism to couple the supply of university students wanting good research projects with the demand for research on specific topics within biosphere reserves, following the example of Canada.
- The above tasks imply a longer-term coordination function of NordMAB to become operational, and this should be examined by the NordMAB steering committee.

9.3.4 Links with other conventions

Biosphere reserves and the CBD Ecosystem Approach

The CBD advocates that countries use the “Ecosystem approach” to implement its provisions. The Ecosystem approach is an integrated strategy for land and water management that takes a holistic view of the interconnectivity of ecosystems. It advocates a participatory approach (that is,

working with local communities as much as possible) and the principle of subsidiarity (that is, management decisions and practices at the lowest appropriate level). Twelve principles and five points of operational guidance for the ecosystem approach have been elaborated. UNESCO MAB recognises that in many biosphere reserves are the embodiment of this ecosystem approach (see the publication "Solving the puzzle: the ecosystem approach an biosphere reserves" by UNESCO MAB on http:// unesdoc.unesco.org/images/0011/001197/119790eb.pdf).

Workshop participants recognised that biosphere reserves can indeed help countries to implement the rather abstract ideas of the ecosystem approach. In particular:

- the biosphere reserve allows to think of undertaking conservation action beyond Red Book species and protected areas - it promotes conservation and sustainable use of biodiversity in the wider landscape;
- the zoning pattern of biosphere reserves and the co-operation plans aligning the policies and actions of the different actors in a biosphere reserve enable the sharing of responsibility and costs of meeting the CBD and ecosystem approach requirements among central governments and the different land owners and land users. This is a powerful argument in favour of biosphere reserves;
- the principle above also applies for the European Union Directives in relation to the designation and protection of Natura 2000 sites and Special Conservation Areas.
- biosphere reserves allow one to learn how to apply the ecosystem approach.

Biosphere reserves and conventions, etc

Workshop participants recognised that the relations between biosphere reserves, World Heritage sites, Ramsar Wetlands, Natura 2000 and the Pan-European Ecological Networks of the Pan-European Biological and Landscape Diversity Strategy are not clear or widely understood. The North Vidzeme Biosphere Reserve in Latvia gave however an excellent example to other countries of how many of these initiatives have been integrated in a complementary manner.

The workshop concluded that a publication or web page be prepared under NordMAB explaining these relations, taking the Latvian example.

9.4 Strategy for biosphere reserves in the Nordic countries

Chairman *Mette-Astrid L. Jessen*, Rapporteur *Simon Jonegård*

Chairman Mette-Astrid L. Jessen introduced the hearing by reminding everyone that this would be the last chance to make a statement during this conference. Each of the participants of the hearing thereafter made a short presentation of the topics they thought most important concerning biosphere reserves in Nordic countries.

Vija Busa started by telling that she's got a lot of new ideas through the prior discussions. Strong law may not be the very best way to make changes in biosphere reserves; to work in a softer manner might instead be a better strategy. It's also important to sell the idea about biosphere reserves to local people. By showing that they will have various benefits living in a biosphere reserve, one could raise public awareness.

Brian Craig gave some good advices to the NordMAB-network through examples from the formation of the Canadian Biosphere Reserve Association. Bringing people together and having a co-ordinated effort when approaching different levels of government as well as NGOs and foundations for funding, has been a strategic move that have opened up a lot of doors. Brian also concluded that since many of the people involved in biosphere reserves are volunteers, it's a key to include a lot of elements of fun in the meetings.

Jane Robertson briefly expressed her enthusiasm, but also her concern for the future of the NordMAB-network. Before making a strategy there's a need to have an action plan to now where to go. From the discussions of the workshops there could be seen several elements of an action plan – research, model areas, education, zoning, development – that needs to be put together. The strategy then is to build on the strengths and keep the process simple but operational. Jane also asked the meeting to think about how to coordinate the network, and stressed that there is a need to have at least one person that works part- or fulltime with this function.

Hans Skotte Möller gave the perspective of the Nordic Council of Ministers (NMR), by presenting their environmental action program that will run from 2005-2008. This program will highlight four main objectives: i) environment and health, ii) the sea, iii) nature, culture environment and outdoor recreation, and iv) sustainable use and production. Biosphere reserves have the framework for dealing with all these aspects in the Nordic environment. From the NMR's point of view it's very welcome with co-operation between Nordic and Baltic countries, as well as with northwest Russia – which seems to be prioritised during the next years.

Timo J. Hokkanen emphasised that biosphere reserves are not a goal in itself, but a tool. To get the real benefits out of biosphere reserves one need to learn how to use this tool. It's when the biosphere reserves start to get established that the work really begin. The actions need to be very straightforward and simple for the NordMAB-network to succeed, and they also need to be done together.

The open discussion was then focused on more concrete questions concerning the future of MAB-activities in the Nordic countries. Following compilation gives a short presentation of some of the topics that were discussed, together with suggested actions:

Promotion: To promote the Nordic biosphere reserves the biggest obstacle seems to be how to put forward what's special about the concept and how it differs from other tools. Politicians as well as people in general, often don't know about biosphere reserves and the work that's made in them. It's therefore very important to demonstrate the biosphere reserve concept to be able to get support and raise funding. A common NordMAB-website can be published on UNESCO:s homepage, by assistance from their webmaster. Production of common information materials – for example a guide of the added values that exist in biosphere reserves – could be a task for the Steering Group.

Research: The starting point towards a co-ordinated research program is to find out what activities are going on in the Nordic biosphere reserves and what kind of research that needs to be done. There are obvious links between the research priorities of Alternet and what kind of research that's needed in biosphere reserves. For example was research regarding the biosphere concept and zoning suggested during the hearing.

Mentorship: There could in this meeting be seen relations between Canadian and Nordic biosphere reserves that look promising regarding

future co-operation. The Advisory Committee of Biosphere Reserves can also give guidance of individual mentorship sites. In the process of consolidating biosphere reserves it's very valuable with groups of "grass-root people" which can help each other.

Branding: During the MAB Council meeting in October 2004, a proposal for a framework of branding will be discussed by the MAB Task Force on the Development of Quality Economies in Biosphere Reserves. The information of that meeting will be communicated to the Steering Group so that the NordMAB-network can build on the experiences and ideas presented there. A common NordMAB-logo was though considered as important to produce.

The Steering Committee was suggested to be given an open mandate to formulate priorities and to organize the continuity of the NordMAB-network. Different persons or national MAB-committees could however be responsible for some of the activities in the region. Furthermore, it was proposed that the Steering Group may well include representatives from Russia and seek to raise funding for the next years.

10. Recommendations from the conference

One important goal with the conference was to find out if there is a need for a MAB-network in the Nordic region (including the Baltic countries and parts of Russia connecting to Norway, Finland and the Baltic countries; hereafter called the "Nordic region") and if so, what should be the main objectives for such a network. Another goal was to define the level of organization of the network.

The conference recommended the following:

- *A network* for people working in biosphere reserves or otherwise involved in the MAB-program in the Nordic region *is highly desirable*.
- The network should be named "*NordMAB*".
- The organisation status of the network should be: "*A network of expertise on Biosphere Reserves in the Nordic region*" (i.e. the network is not governmental but complements the work of the MAB National Committees and focal points).
- A *steering committee* with representatives from all included countries shall bring the recommendation from the conference to further action.

The *tasks for the network* should be (the 14 identified tasks presented below are not listed in order of prioritising; the steering committee will prioritise among these):

- Provide a NordMAB coordination mechanism (NordMAB will be complementary to national MAB Committees and Focal Points).

- Raise money for common tasks and projects (from EU, Nordic Council of Ministers etc.).
- Help with and coordinate mentorship (e.g. established Biosphere Reserves guide candidate areas when preparing for the application).
- Organize inspiring meetings (make people who are working locally in different countries feel that they belong to the NordMAB family).
- Exchange management practices (e.g. wetland meadows, forestry).
- Establish and look after a common web site (under www.unesco.org/mab).
- Investigate relationships and possible co-operation with other concepts (e.g. UNESCO's World Heritages, Ramsar sites).
- Investigate interest and possibilities for arranging forum for local entrepreneurs ("MAB-fair"), for local politicians etc.
- Investigate interest and possibilities for common monitoring initiatives.
- Assist in promoting the MAB and biosphere reserve concept towards national authorities and governments in the different countries.
- Investigate interest and possibilities for common branding (e.g. products).
- Support exchange of research activities and results; initiate applications for common research funding (e.g. on the BR concept).
- Produce common information material about biosphere reserves specific for Nordic conditions (also for children).
- Assist in exchange of education experiences, and in production of common education materials (e.g. for children).

The recommendation from the conference was identified through the following processes and was agreed on *in plenum* by the conference participants:

- plenary presentations,
- workshops,
- interviews with the different national delegations, and
- plenary discussions.

Sammanfattning

I nordvästra Ryssland, de nordiska och de baltiska länderna finns det sex biosfärsområden. Dessa inkluderar artiska miljöer, boreala och boreonemorala skogsområden, jordbruksområden och kustmiljöer. Sedan det första biosfärsområdet etablerades i Norden har erfarenheter om konceptet ackumulerats. Idag finns det ett ökande intresse för biosfärsområden i regionen och ett flertal nya biosfärsområden kan komma att etableras.

I oktober 2004 arrangerades en NordMAB konferens om biosfärområden i Norra Vidzeme biosfärsområde, Lettland. De övergripande syftena med konferensen var att samla erfarenheter om hur konceptet biosfärsområden tillämpas i de olika länderna, och utröna om det finns ett behov av ett nordiskt MAB-nätverk. Före konferensen hade varje deltagande land föreberett en utvärdering av statusen på deras biosfärsområden och nationella MAB-program, s.k. landrapporter.

Landrapporterna och konferensen visar att biosfärsområden och MAB-programmen bidrar till utveckling av naturvård och hållbar utveckling i de aktuella länderna. Konceptet med biosfärsområden fungerar som ett verktyg för att få yrkesverksamma, politiker och ideellt arbetande att gemensamt söka lösningar på lokala problem inom dessa områden.

Konferensen enades om att ett nätverk för de som arbetar med biosfärsområden eller på annat sätt är inblandade i MAB-programmet i den nordiska regionen är högst önskvärt. Nätverket ska heta ”NordMAB” och ska komplettera arbetet som bedrivs i de nationella MAB-kommittéerna. Flertalet uppgifter identifierades för nätverket, till exempel 1) stödja och koordinera mentorskap för områden som är intresserade av att bli biosfärområden, 2) hjälpa till att marknadsföra MAB och biosfärsområdskonceptet hos nationella myndigheter och regeringar i de

deltagande länderna och 3) initiera ansökningar för gemensam forskningsfinansiering, bl.a. om konceptet biosfärsområden. Konferensen och den här rapporten har till största del finansierats av Nordiska Ministerrådet.

Appendix

The participants of the conference were

Name	Position	Organisation	E-mail	Web site	Country
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Hans Skotte Møller	Secretary	Nordic Minister's Council	hsm@sns.dk	www.norden.org	Denmark
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Monica Aaltonen	Tourism Etrepeneur				Finland
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Martin Munch	Local Representantive	Ittoqqortoormiit Municipality			Greenland (DK)

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