Planning and Management of a Biosphere Reserve

Reference Book for Practitioners and Managers
Based upon experience of the
North Vidzeme Biosphere Reserve,
Latvia

The authors are responsible for the choice and presentation of the viewpoints and information contained and for opinion expressed in the reference book based upon their experience establishing, administrating and managing the work of the North Vidzeme Biosphere Reserve in Latvia and therefore which are not necessarily those of UNESCO and do not commit the Organisation.

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Based upon experience of the
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Compiled by A.V.Urtans and V.Seilis

Salacgriva 2009

Foreword

Extremes of rainy summer with occasional lasting draught periods and snowless winters inevitably correct our personal experience of „how things must be". Worldwide environmental shifts like climate change and water shortage starts to affect everybody, irrespective of the geographic location or development stage of each particular country or the social status of each individual citizen. Additionally, accelerated loss of biological and cultural diversity creates unexpected consequences impacting the ability of ecosystems to continue to provide services critical for human well-being.

In those conditions it is vitally important that the world society finds a track, how to mitigate and adapt emerging changes. The UNESCO Man and Biosphere Programme has developed the concept of Biosphere reserves as model regions for sustainable development aiming to find such solutions. As for 2009 there are 553 Biosphere reserves in 107 countries united in the World Biosphere Reserve Network testing and improving innovative management practises so to bring a variety of knowledge, scientific investigations and experiences together in order to link biodiversity conservation and socio-economic development for human well-being and peaceful living together.

Biosphere reserves have proved to apply a flexible, responsive and adaptable approach to very different ecological and socio-economic situations around the world. Each Biosphere reserve and the establishment of new ones create local success stories therefore enabling integrated, inclusive and balanced development to become a reality which brings us closer to succeeding the global goals for a sustainable world!

During the 18 years of its existence, the North Vidzeme Biosphere Reserve in Latvia, through of its successes and challenges has developed its model upon which improvement is made constantly. We hope that the experience of our Biosphere Reserve will help others through motivated and educated citizens to make the surrounding world more sustainable, united and knowledgeable! We trust this reference book will become your friend and guide for the establishment, enhancement and everlasting further development of the biosphere reserves in your own country!

Dagnija Baltiņa
General Secretary,
Latvian National Commission for UNESCO



About the authors



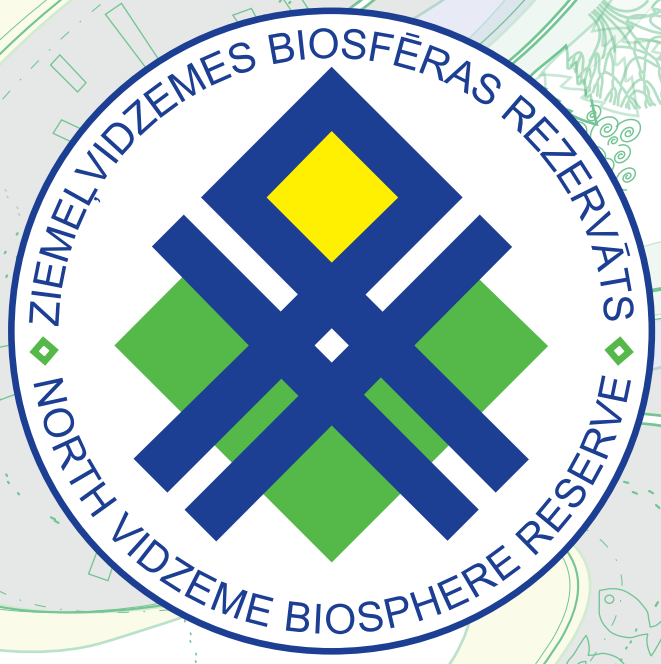
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“Pure waters
embedded
in green forests
and blessed by
the Sun”

The logo of the
North Vidzeme Biosphere
Reserve is composed of
ancient etnographic symbols, and
visualizes the
Biosphere Reserve concept to
unite environmental,
cultural and
human aspects to
achieve balance
worldwide in our
daily activities.



About the North Vidzeme Biosphere Reserve

The North Vidzeme Biosphere Reserve (NVBR), which constitutes 6% of the territory of the Republic of Latvia, is located in the north-western part of the country. Coastal plains and an undulated forest dominated inland are typical features of North Vidzeme. The highest point in the NVBR is Zilaiskalns with an elevation of 127 meters. Out of 63 important European biotopes (EU Directive 92/43/EEC) found in Latvia, 37 are represented in the NVBR. Temperate and sub-polar broad-leaf forests and woodlands cover about 45% of the area of the NVBR while wetlands and inland waters cover approximately 10% of the Reserve. The coastal area is dominated by sandy beaches in the south, coastal meadows in the north and sandstone cliffs in the central region.

The NVBR abuts Latvia's border with Estonia, sharing important wetland areas. The territory of the "Northern Mires" is approved as a Ramsar site (2002), and as a Transboundary Ramsar site (2007). Out of 61 EU Bird Directive protected species nesting in Latvia, 48 do so in the NVBR. The International Baltic Sea Fishery Commission has declared the river Salaca which serves as a backbone for the NVBR as the 4th most productive wild salmon spawning river in the Baltic Sea catchment. There are 27 Natura 2000 sites within the biosphere reserve, of which 6 are included in the List of Important Bird Areas (IBAs) prepared by BirdLife International.

The NVBR is inhabited by approximately 78 000 people in 41 municipalities, which since 01.01.2009. have been merged in 10 counties, with about half of them residing in the territory's nine urban centres. The rest of the population live in smaller rural centers and on individual farms throughout the territory. The Reserve's total terrestrial area is 457 697 ha land and 116 000 ha marine area.

The most essential branches of the economy that are developed in the territory of the NVBR are: agriculture, timber industry, food processing, fish processing and construction works. The NVBR boasts not only medium-, small- and micro enterprises, but there are 19 large enterprises employing 13% of all the working population (Ecological Landscape Plan, 2007). The existing agricultural enterprises produce about 64% of production for their own consumption and thus, although agriculture plays an essential social role, only a minority of farms are market oriented. Barley, oats and rye are the main crops grown in the territory. There are 208 ecological farms, mainly involved in crop farming and dairy farming (Ecological Landscape Plan, 2007).

The last five years have demonstrated growth in the tourism industry – both in terms of tourist accommodation, the diversity of services provided and through the improvement and development of the tourism infrastructure. This has resulted in an increased number of tourists and people spending their time in the NVBR visiting museums and attending cultural and other community events. In 2007 there were 75 tourist accommodations in the territory of NVBR.

The NVBR is managed by its Administration. The Administration of the NVBR mainly functions and develops its work through State subsidies and various projects which both help to raise funds as well as mobilize the local society. The successes of the work done in the NVBR depend not only upon the enthusiasm and endeavors of its team but are also thanks to the wide cooperation with various national, international as well nongovernmental partners' support and advice.

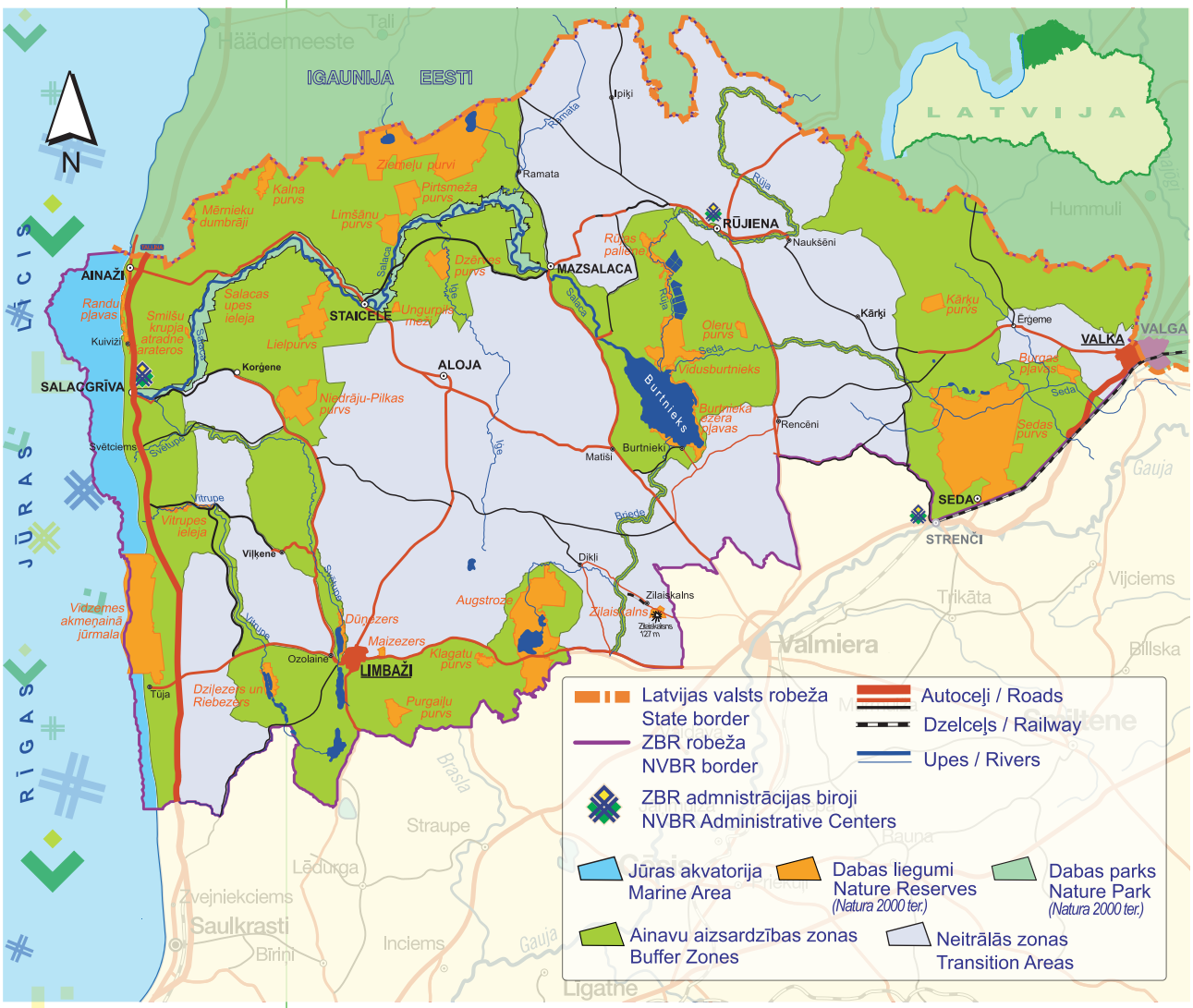
Where we are?



In Northern Europe



In Latvia



Structure of the North Vidzeme Biosphere reserve.

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How to use the Reference book

The given Reference book is based upon the experience of one specific Biosphere reserve – the North Vidzeme Biosphere Reserve in Latvia. It is intended that our experience gathered since 1990 serves as a pool of examples and ideas on how to develop a biosphere reserve and make it operational and successful in the post-Soviet region. Examples of different activities, photos and maps are added to highlight the steps undertaken and to illustrate the best practices.

By describing the activities and steps taken, we have made references to the Madrid Action Plan (MAP) which is the leading document for the implementation of the concept of Biosphere reserves into life all around the world within the UNESCO Man and Biosphere programme for the years 2008 - 2013. References to specific Madrid Action plan actions are cited at the beginning of each specific section and are intended to highlight the importance of the MAP. Therefore the success of each individual biosphere reserve and the overall implementation of the MAP lie within the ability of each individual biosphere reserve to achieve effectiveness, successful management and planning.

We have arranged the Reference book in 9 Chapters in order for it to contain all the necessary answers to your possible questions on how to enhance, establish, communicate, administrate, plan and develop difference activities, partnerships, projects or new trends in an already existing or planned biosphere reserve. Due to the integral character of biosphere reserves, all chapters are strongly interlinked.

The Chapter "The UNESCO "Man and Biosphere" Programme and Biosphere Reserve Concept" introduces the specific actions elaborated further in the book by discussing the basic definitions and the very concept of the Man and Biosphere idea. The Chapter "How to Begin" introduces consequent steps to be undertaken for the establishment of a biosphere reserve whereas the Chapter on the "Governance of a Biosphere Reserve" describes the basics and possible obstacles for the establishment and governance of biosphere reserves. The Chapter "Communication Strategies of a Biosphere Reserve" focuses on ways and methods how to bring the biosphere reserve idea to the society as a whole and to different stakeholders through various media, activities and aspects of society involvement. The Chapter "Area Management in a Biosphere Reserve" provides examples on stakeholder involvement, as well as tips on particular habitat management. The Chapter "Development Function for Local Communities" describes different undertakings to involve local stakeholders in diversifying local entrepreneurship and promoting sustainable area development. The Chapter on "Cooperation Possibilities" focuses on possibilities and ways, through national and transboundary partnership, to strengthen and expand the work of a biosphere reserve. The Chapter "Research and monitoring" underlines organisation patterns for conducting and maintaining research and monitoring programmes within the biosphere reserve. And in conclusion the Chapter "Sustainable development profile" describes the methodology of evaluating the efficiency of a biosphere reserve and includes the results from an evaluation conducted on the NVBR's efficiency.

At the very end of the book in the "Sources for Additional Reading" we have summarised and selected literature and internet sources for further reading as well as elaborated a "Glossary" of abbreviations, terms and organisations used and referred to in the text for convenient reading and for those willing to learn more about the international treaties, environmental organisations and professional terminology.

As this book is a Reference book for your success in your biosphere reserve, we invite you to feel free to add your own experience to it, update it, comment it or consult the authors of the book for further information or exchange of views!

Chapter 1

What are UNESCO Biosphere Reserves?



1.1 The UNESCO "Man and Biosphere" Programme and Biosphere Reserve Concept

The Man and the Biosphere (MAB) Program launched in 1970 promotes UNESCO's mission to foster peace and security through interdisciplinary and cross-sectoral collaboration, research and capacity building to stimulate local responses to global problems. The MAB Programme provides a platform for partnerships at the interface between science, policy and management for sustainable development. MAB interdisciplinary research, while rooted in ecological sciences, integrates knowledge from new and emerging disciplines, like ecological economics, socio-ecology and other areas of natural and social sciences and the humanities as well as traditional knowledge of indigenous and local communities. It serves to attain the Millennium Development Goals, and promotes sustainable development and human well-being through conservation of biological diversity, economic and social improvements and respect for cultural values (MAB Programme for Sustainable development, 2009).



Ankh, the Egyptian hieroglyphic character, meaning "life". From Wikipedia, the free encyclopedia.

The UNESCO "Man and Biosphere" programme is symbolised by a stylized „ankh" – the ancient Egyptian sign for life. In Egyptian hieroglyphics the ankh stands for „Eternal life", or simply „living", and forms part of such words as „health" and „happiness". Historians of religion specialists suggest that the shape of the symbol represents the circle of life, spreading outwards from the Origin and animating all co-existence. The shape may also be perceived as a knot binding together the elements to form one whole.



In 2000, the MAB logo was redesigned, the ankh being combined with a ribbon of colours representing the broad ecological divisions of the Earth.

- BLUE – for water, both salty and fresh, on land and sea
- GREEN – for forests, scrublands and grasslands
- WHITE – for snow-capped mountains, which hold water, slowly releasing it into other systems or back to the ocean,
- RED – for deserts and lands which need careful use of waters.

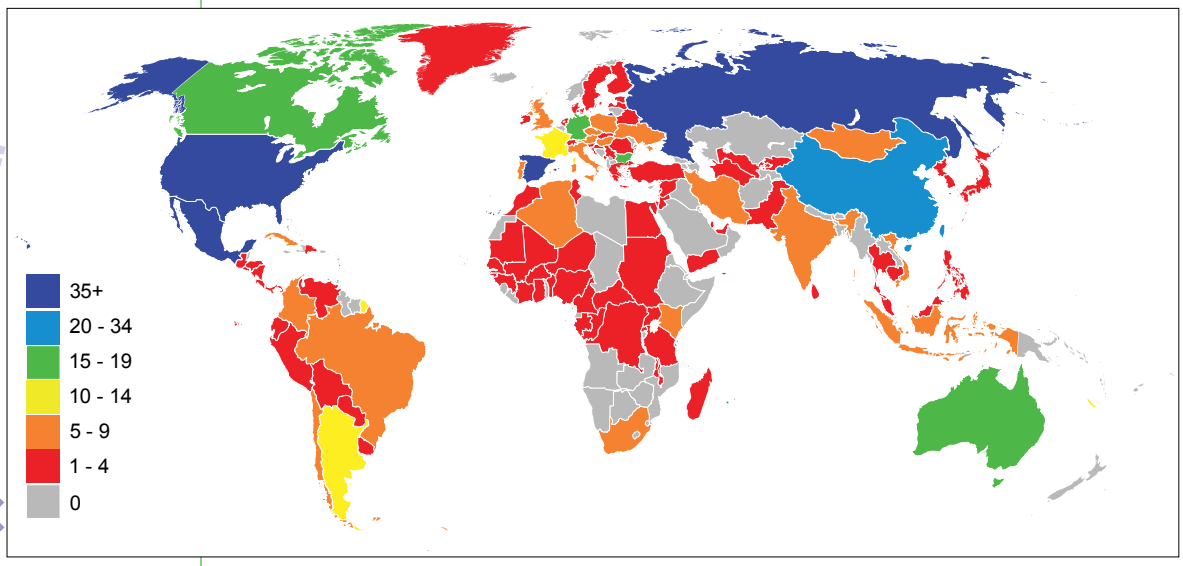
Excerpt from „Biosphere Reserves – special places for people and Nature", UNESCO, 2002.

Within each country UNESCO "Man and Biosphere" (MAB) programme is supervised by the National Commission for UNESCO or mandated to the MAB National Committee of each respective country. Its main tasks are: to promote research and education programmes, support information exchange and networking.

Latvian National MAB committee is organized under the Latvian National Commission for UNESCO and within its Science Programme Council. The origin of the Latvian National MAB Committee stretches back to 1976 when it was founded as a branch of the former USSR MAB Committee. The activities were renewed in 1995 when the Latvian National MAB Committee was officially incorporated into the UNESCO MAB Programme as an Associate member.

The concept of biosphere reserves was initiated by UNESCO "Man and the Biosphere" (MAB) Programme Task Force in 1974 to develop a scientific basis for improving relationships between people and nature. It was implemented by the promotion of establishing biosphere reserves in UNESCO member states. Consequently in 1976 the World Biosphere Reserve Network (WNBR) was launched and currently it has grown to include 553 reserves in 107 countries (as of July 2009). The World Network of Biosphere Reserves serves within the UNESCO MAB Programme as a tool to ensure knowledge-sharing, research and monitoring, education and training, participatory decision-making and sustainable local development.

Today biosphere reserves are defined by MAB as areas of terrestrial and coastal-marine ecosystems or a combination of thereof which are internationally recognised for promoting and demonstrating a balanced relationship between people and nature within the framework of UNESCOs MAB programme (UNESCO, 1996; Statutory framework, 1995).



Distribution of Biosphere reserves per countries (Wikipedia, Mehmet Karatay, 2009).

Each separate Biosphere reserve according to its activities can be interlinked with other biosphere reserves in regional (EuroMAB, NordMAB) or thematic (Coastal and Island biosphere reserves, Mountain Biosphere reserves etc.) networks worldwide.

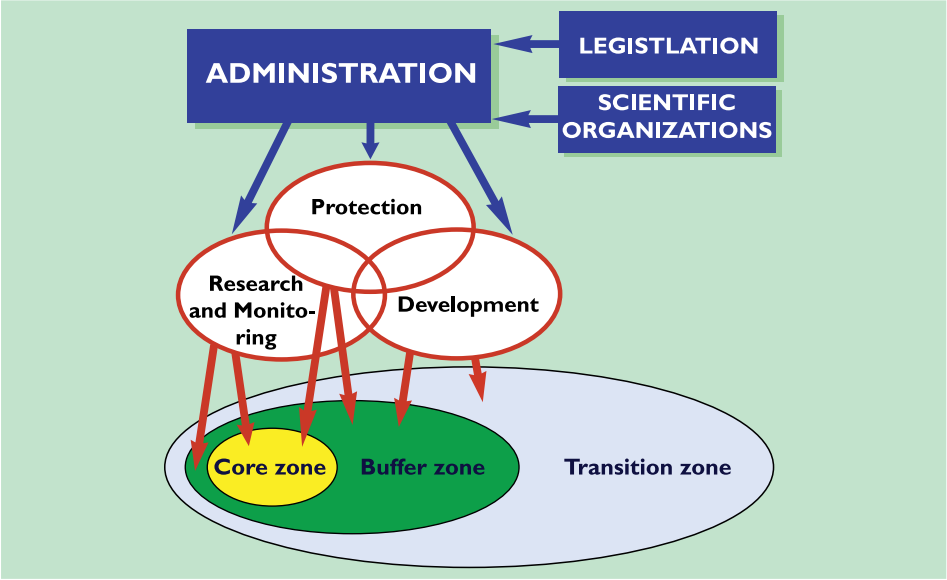
1.2 Functions and zoning of a biosphere reserve

The main difference setting biosphere reserves apart from other protected areas are the functions and the principles of the zoning system which also define the means of the management, communication and inclusion of local population, as well as integration of all different values in this area.

Each biosphere reserve has to fulfil three functions:

1. Conservation function contributing to the conservation of landscapes, ecosystems, species and genetic variation;
2. Development function, fostering economic development which is ecologically and culturally sustainable;
3. Logistic support function for research, monitoring, training and global conservation and development issues.

Time and resources spent to fulfil each of those functions in each biosphere reserve can vary.



Scheme of Biosphere reserve functions.

Tasks of a biosphere reserve:

- To ensure the protection of landscapes, species and the biological diversity of the territory;
- To promote sustainable economic and social development of the territory;
- To restore damaged ecosystems in the territory and
- To ensure information exchange on environmental and nature protection and sustainable development of the territory.

Biosphere reserves are organised into three interrelated zones in order to enable them to carry out the different functions:

- Core area which is legally established to ensure long term protection and which should be large enough to meet defined conservation objectives.
- Buffer zone around or next to the core zone. This can be an area for experimental research to use the natural resources sustainable and in economically viable way. It is the area for ecosystem restoration. It can accommodate education, training as well as carefully designated tourism and recreation facilities.
- Transition area or area of cooperation for testing out approaches to sustainable development.

1.3 International normative framework

On the international level the World Network of Biosphere Reserves are guided by three main documents:

1 & 2) The Seville Strategy and the Statutory Framework adopted in 1995 by the resolution of the 28th Session of the UNESCO General Conference;
3) Madrid Action plan, adopted by the 20th MAB ICC session and agreed by the 3rd World Congress of Biosphere Reserves in 2008 in Madrid.

The Statutory Framework

The Statutory Framework being approved by the UNESCO General Conference forms the legal basis for biosphere reserves, at the same time without being binding under international law.

Elements of the Statutory Framework:

- Definitions and criteria of biosphere reserve (articles 1 to 4);
- Designation procedure (article 5);
- Obligations of the individual states to promote their biosphere reserves (article 6), to participate in the World Network (article 7) and to participate in the regional and thematic sub-networks (article 8);
- Submission to periodic review, every 10 years (article 9);
- Secretariat functions (article 10).

The Seville Strategy

The Seville Strategy describes the goals to be reached in biosphere reserves in the field of conservation, development, research and education and gives a vision for biosphere reserves in the 21st century.

The strategy provides recommendations for developing effective biosphere reserves and for setting out the conditions for the appropriate functioning of the World Network of Biosphere Reserves.

Madrid Action Plan

The newly appearing trends like accelerated climate change, loss of biological and cultural diversity, all with unpredictable consequences for societies and ecosystems led to the elaboration of the Madrid Action Plan, 2008 – 2013 (MAP), which was endorsed at the 3rd World Congress of Biosphere Reserves, held in Madrid in February 2008. The MAP is built on the Seville Strategy and through a broad variety of knowledge, scientific investigations and experiences aims to link biodiversity conservation and socio-economic development for human well-being in the 21st century. The Madrid Action Plan articulates actions, targets, success indicators, partnership and other implementation strategies as well as an evaluation framework for the World Network of Biosphere Reserves for the period of 2008 -2013.

Based on the MAP the role of the biosphere reserves for the upcoming years is to focus on developing models for global, national and local sustainability, acting as learning sites for decision-makers, researchers, site managers and different stakeholder groups working together.

Biosphere reserves, as innovative demonstration areas, do not use only conventional methods to protect valuable ecosystems and habitats. From the very beginning of the establishment of the biosphere reserves, they are intended to pay equal attention to environment and to the sustainable development of local economies, to promote social development, and to maintain cultural values. Frequently those issues are mandated to different authorities, often operating in a separate mood from each other. Therefore the role of biosphere reserves, as innovative model territories is to achieve balance between humans and nature integrating in this relationship all four aspects of sustainable development. In spite the fact that sometimes the very name of "reserve" sometimes might be misleading.

Proper implementation of the Biosphere reserve concept is especially important in countries where for decades decisions were traditionally taken in a "top-down" manner without an initial dialogue with the local population, as was the case of North Vidzeme. Our way to the acceptance of the biosphere reserve concept in Latvia lasted for 19 years and the lessons learned and challenges faced are worth consideration for others in similar circumstances.

Chapter 2

Establishment of a Biosphere Reserve

2.1 How to begin?

Steps to begin with:

- Define natural, cultural and economical values and resources in the prospective area;
- Define a central axis of the area in order to determine the possible territory of the biosphere reserve;
- Define driving forces – both human and in terms of values;
- Discuss the possibilities of a legal framework for the biosphere reserve;
- Find partners and establish agreements with the local communities as well as with already existing institutions and initiatives in the area;
- Select the right moment for establishing the concepts of a biosphere reserve and the sustainable management of an area.

In the case of the NVBR a set of environmental, cultural and human resources available in the North-western part of Latvia was pointed out by scientists and later supported by the intelligentsia already at the end of the eighties. One of the driving forces was to safeguard the natural coastal area which was comparatively intact from the outburst of recreational developments and plans. Several meetings took place to discuss the shape of a new protected territory. From the very beginning, the river Salaca was looked at as the central axis of the territory. 95% of the basin of the river Salaca is within the territory of Latvia. The river basin approach was applied in determining the territory and the proposed area was expanded to include several smaller river basins, which empty into the Gulf of Riga. The river basin approach which had been applied in North Vidzeme already 15 years, later in 2002 with the adoption of the Water Directive turned out as a very progressive and important acquisition in developing River basin management plans (See: Chapter 3.4.1).

In order to agree upon the best protective measures of this area many discussions took place and finally led to the understanding that the existing types of protected areas do not cover all the environmental and cultural values recorded in this part of Latvia. From the scientific point of view, the Biosphere Reserve Concept was considered the most favourable model to safeguard environmental values within the area, which at the time was already inhabited by approximately 80 000 people. The general enthusiasm of the recently-regained independence made it possible without almost any lobbying or argumentation to adopt the "Regulation on the Establishment of North Vidzeme Regional Nature Protection Complex (NVRNPC)" in 1990.

This newly-established state institution was mandated responsibilities to define the physical borders, to elaborate area zoning, to cooperate with State authorities in elaborating amendments to legal acts and to prepare necessary documents to apply for the inclusion of the territory in the World Network of Biosphere Reserves. There were a lot of challenging tasks from the very beginning, such as:

- Evaluation the status of already existing 25 protected areas of national significance within the proposed biosphere reserve.
- Development of an agreement with the State Forestry Company in order to exclude segments of industrial forest growth from their operations, thus transforming them into intact areas of expanded protected areas.
- Development of written agreements of consent from each of local municipalities within the proposed territory to be included in the upcoming Biosphere reserve.

It is to be emphasised that these activities did not take place in an isolated manner, but in an area with emerging private business opportunities, in a country where a national land reform returned properties back to families, which had been deprived private ownership of their properties for more than 50 years. Three generations, many with little experience on the value of land and its sustainable management, became the partners for the NVRNPC Administration in this territory.

Role of a area manager

The Area manager must be proactive. An Area manager must approach potential partners and offer his/her professional knowledge which will be useful to them and especially to local municipalities. For example, offer to assist developing local development and land-use plans. Offer and involve staff in municipal working groups and project development.

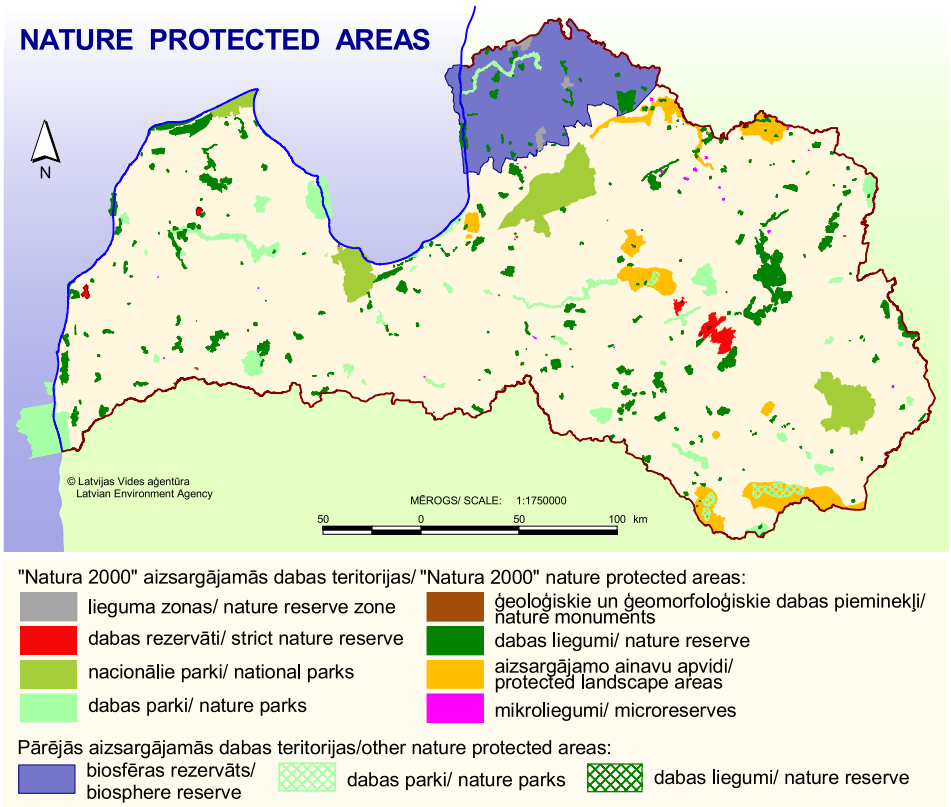
Even if in the first attempt this takes additional voluntary hours, remember that thus the Area manager comes into contact with more locally responsible people, and therefore in such a way may embody and transmit the idea of the biosphere reserve.

2.2 Implementation of the biosphere reserve idea

The main challenges in implementing a biosphere reserve concept:

- To consider and balance all deeds and needs in the territory;
- To establish a proper legal framework for a biosphere reserve;
- To involve inhabitants of the territory in the idea about a biosphere reserve.

The acceptance and implementation of the biosphere reserve concept is a long and ongoing process as it comprises different natural zones, different social and economical needs, different protective as well as usage measures but most of all the population with their own dreams and needs in the territory.



Location of the NVBR within Republic of Latvia.

In Latvia before establishing the NVBR, the North Vidzeme Regional Nature Protection Complex (NVRNPC) was created in a ”top – down” manner with a rather scarce capacity (and in those days also limited knowledge) to reach all municipalities, to explain the biosphere reserve concept and to convince local authorities to agree to cooperate.

Another problem during this period was the fact that, in 1990, the North Vidzeme Regional Nature Protection Complex was announced as a protected territory with the

aim to establish a Biosphere Reserve with no legislation existing explicitly for biosphere reserves. At the same time, a land reform and the opening of a free land market were taking place. All those factors, from the very first moment put the very biosphere reserve idea in the eyes of local actors as a possible hindrance in achieving their goals.

The turning point was when the Committee of Environmental Protection was redesigned into the Ministry of Environmental Protection and Regional Development and the rural development function became a decisive point for the further acceptance and determination of the need for a biosphere reserve in the eyes of local actors. From that moment, the NVRNPC "stepped out of the ring of ignorance" and suddenly the experts, the knowledge and data base of the NVRNPC became needed for at least the closest municipalities. Nonetheless, many issues remained unresolved, especially as concerns issues of cultural heritage, education, sustainable use of agricultural and different line ministries supervised forest areas, etc.

Despite the fact that pertinent legislation was lacking and limited capacity existed, due to the location of the NVBR headquarters within the coastal area of the Limbazi District, the first undertakings of the Administration took place and were related to the involvement of local actors within the Limbazi district. Also involvement of the Administration in various local and transboundary projects, such as the "Tampere-Helsinki-Tallinn-Riga (THTR) Spatial development plan", did help to root the biosphere reserve ideas at least in the territory. As a consequence still nowadays, the NVBR Administration is a close partner with its specialists in the elaboration of several municipality plans and in all territory district-level planning processes.

From the outset, the Administration has become a resource for development from within - by actively offering its knowledge it is gladly accepted in local schools and NGOs operating in the whole NVRNPC territory. Evidently this occurred based on the mutual interest and benefit of parties. Currently based on the active interest of school teachers, a circle of supporters has been established under the Administration.

2.3 Zoning

Ref.: Madrid Action Plan: Actions 13.1 – 13.5

The zoning of each biosphere reserve is the second important step in establishing a biosphere reserve, it is made in accordance with the biological, landscape, cultural and other significant values contained within the respective territory and is made in order to enhance these values and highlight them with proper management. It is important that the zonation of a biosphere reserve is organised already from the beginning in accordance with the biosphere reserve concept to safeguard the functioning of the representative ecosystems typical for the bio-geographical zone, infrastructure of the territory and its people.

Steps for zoning a territory designated for a biosphere reserve:

- Evaluate previously existing protected areas in this territory;
- Define sound values in the territory and the most beneficial methods for their management;
- Specify clear criteria for each zone.

According to Latvian legislation, the NVBR territory is delineated into three functional zones: restricted nature area, landscape protection area and a neutral zone. These classifications are comparable to the internationally-recognised biosphere reserve core areas, buffer and transition zones.

In the case of the NVBR, **the objectives for each zone** are defined in the Law "On The North Vidzeme Biosphere Reserve" (1997):

- The nature restricted zone is designated to protect natural ecosystems marginally affected by human activities, which is comprised of protected and endangered wild species (Paragraph 12.);

- The landscape protection zone is designated to preserve cultural and historical landscapes characteristic to North Vidzeme, to preserve tourism and recreation resources and to diminish antropogenic pressures on the restricted nature area, simultaneously promoting the sustainable development of the territory and the balanced use of resources (Paragraph 13);
- The neutral zone is designated to promote an intensive and sustainable nature economy. The neutral zone includes all towns and densely populated territories of the territory of the Biosphere Reserve (Paragraph 13).

However the zoning of a biosphere reserve must be seen in context with the previously existing protected territories and infrastructure. The NVRNPC formerly consisted of one complex nature park and 25 unevenly located protected areas of national significance, most of them concentrated in the northern part of the proposed biosphere reserve. Hence it was essential to mark out sound values and the most beneficial methods for their management.

Defining a core zone:

Next to the 25 protected areas of national significance, two already internationally-recognised wetland areas were established as the core areas, including broad-leave forest blocks on the periphery of the NVBR territory, as well as a forest massive with old age forest growth. To safeguard the connectivity of the representative areas, a new core area was proposed with an adjacent forest massive, part of which was previously designated as an Important bird area (Birdlife International).

Defining a buffer zone:

To clarify the significance of each zone, three principles were defined to designate the buffer zone criteria: High priority was placed on: 1) the relatively undisturbed forest massive; 2) wetlands and their complexes; 3) marine and coastal area. For sound management purposes, the borders of all border zones were drawn on the basis of distinctive landscape elements – roads, rivers, railway line. Despite the fact that this resulted in a theoretically possible loss of some biological values, leaving several protected areas outside the buffer zones, or inclusion in the buffer zone of some areas with rather low environmental values, at the same time, this made it possible to avoid long and unproductive debates later.

All other areas were defined as transition areas, where all activities are carried out in compliance with general environmental legislation.

The zoning was completed in accordance with the knowledge and data available at that time. Only later, while elaborating the Ecological Landscape Plan for the NVBR (See Chapter 3.4.2), were an expanded number of environmental and cultural elements taken into account and therefore the coverage of the most valuable zones were expanded significantly. At the same time it did show that within a biosphere reserve values are being preserved better even without a special status of protected areas. The main reason for this is that the implementation of the biosphere reserve concept and its management practice has an important marginal influence even on the transitional zones and other values located there.

As the NVBR is located next to the border, consultations with the Estonian regional environmental specialists took place to harmonize zones on both sides of the border in accordance with the Pan-European environmental corridor concept.

Currently, the NVBR embraces three core areas (Augstroze, Vidusburtnieks and the Northern bogs) totaling 18,440 ha, and constituting 4% of the entire biosphere reserve territory. The buffer zone covers 116 775 hectares (25,5% and, the transition area 331 206 hectares (72,4%) of the North Vidzeme Biosphere Reserve.

At the end it is important to emphasise that the zoning of a biosphere reserve is not only a tool for biosphere reserve management but an overall instrument for regional

planning. Clever and well-considered zoning therefore is a key to the success of the whole biosphere reserve concept.

2.4 National Legislation

Ref.: Madrid Action Plan: Action 11.1

Mainly it is true that the inclusion of biosphere reserve concept in national legislation only comes after the practical establishment of a biosphere reserve. Despite the fact that the establishment of a legal framework for a biosphere reserve is not an easy process and may take a long time, the existing biosphere reserve often may talk for itself and through its various supporters.

Steps for establishing national legislation for a biosphere reserve:

- Explaining the very concept of a biosphere reserve to all involved players;
- Providing evidence on the advantages and possibilities for nature protection and sustainable management;
- Specifying landmarks and key turning points in international environmental policy documents which serve the biosphere reserve concept;
- Nominate the area to join the World Network of Biosphere Reserves;
- Finalise these actions with a law on the biosphere reserve.

In the time of the establishment of the North Vidzeme Regional Nature Protection Complex (1990) no legal status defining any special role in line of the biosphere reserve concept for local authorities and stakeholders existed. The same was true in relation to the existing legal framework for a biosphere reserve in between protected areas at that time -- the biosphere reserve was not recognised as a separate category of protected areas.

Despite some supporters (mainly biologists or geographers by training) of this idea and possible benefits of applying the biosphere reserve approach even among several key positions in the newly-established Ministry of Environment, firstly there was a necessity to explain the very concept of the Biosphere Reserve both for local, as well as national-level actors. The best approach is often only through the presentation of actual achievements and factual information on the advantages and possibilities for nature protection and sustainable management.

This thereby puts the administration of a biosphere reserve to be in a controversial situation – in order to prove the viability and genuineness of the biosphere reserve concept they have to, in a way, neglect existing legal provisions. They also must put all their devotion and enthusiasm into this effort. This true necessity to be proactive and not to count hours spent in communicating and travelling from one point to another using public transport, is a slow and physically difficult start-up pattern but it also does serve to quickly filter the initial team, leaving only those very devoted.

It is necessary to follow up specific landmarks in the development of global environmental policy. For the NVBR the Rio Summit in 1992 where the United Nations declared sustainability as a general guiding principle for the 21st century, was a stepping stone for capturing the real situation and producing the message to act in a more integral way. The introduction and reflection of this new term "sustainability" in different programmes and therefore also better recognition of the biosphere reserve concept worldwide made it possible to legalise the biosphere reserve concept also in Latvia.

As a process for defining the biosphere reserve concept and explaining it served also the nomination file to join the World Network of biosphere reserve.

According to the law, the NVBR is defined as 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 tasks (Article 4) of the NVBR are to:

- Ensure conservation of landscapes, ecosystems, species and genetic diversity;
- Facilitate a sustainable social and economic development of the territory;
- Ensure information exchange in the area of environmental research, monitoring and environmental education regarding local, national and international protection of the environment, as well as tackling of regional development issues in the territory of the Biosphere Reserve;
- Enhance public awareness on issues of environmental protection and the sustainable development of the territory;
- Facilitate restoration of degraded ecosystems as close to their natural condition as possible.

Following this the Law "On Protected Areas" was amended with a new Article (1997), specifically defining a 'biosphere reserve' as a separate category of protected territory in Latvia. An additional amendment in Article 14 clarified that the biosphere reserve buffer zones are identified as the landscape protection areas, set as a separate class of protected area in Latvian legislation. Thus the concept of the biosphere reserve was legally included in Latvian legislation together with a clear description of each functional zone: the protected nature area (core zone), landscape protection area (buffer zone) and transition area (neutral zone).

Consequently the NVBR was established on the 11th of December 1997 when the Saeima (Parliament) adopted the Law "On the North Vidzeme Biosphere Reserve". Subsequently on the 15th of December 1997, the North Vidzeme Biosphere Reserve was recognized by the UNESCO "Man and the Biosphere" (MAB) Programme as a conservation area of international significance.

Other primary enabling national laws, and associated regulations and statutes for the NVBR include:

- Law on the North Vidzeme Biosphere Reserve, 1997 (amended in 2007);
- Regulation No 353 dated 10/10/2000 Protection and Use of the North Vidzeme Biosphere Reserve;
- Regulation No 389 dated 02/08.2005 On the Administration of the North Vidzeme Biosphere Reserve;
- Statute No 578 dated 02/08/2005 Statute of the Administration of the North Vidzeme Biosphere Reserve;
- Regulation No 118 dated 13/2/2007 Statute of the Consultative Council of the Northern Vidzeme Biosphere Reserve.

The Administration of the NVBR is broadly guided by the following key pieces of national legislation:

- Environmental Protection Law, 2006;
- Forest Law, 2000;
- Law on Fishing, 1995;
- Law on the Denationalization of Land in Specially Protected Nature Sites, 1995;
- Law on Protected Belts, 1997;
- Regulations of the Cabinet of Ministers No 415 "On the General Protection and Use of Specially Protected Nature Territories", 2003 ;
- Law on Water Management, 2002;
- Law on Hunting, 2003.

According to Latvian legislation, each protected area must have its individual Management Plan.

2.5 Organisation and Administration

Ref.: Madrid Action Plan: Action 10.2.

Things to consider when thinking of the best ways of administrating and organising a biosphere reserve:

- Definition of the responsible body for the administration of a biosphere reserve and its functions;
- Division of responsibilities within the Administration;
- Establishment of offices in strategically beneficial places;
- Accumulation of extra budgetary funds also in cooperation with local municipalities andNGOs.

As said before, the Government of Latvia established the NVBR by passing a Law in December, 1997 which defines that the NVBR is managed by its own Administration with a broad mandate for both biodiversity protection and the promotion of the socio-economic development for the entire area. From inception to June 2009, the Administration was subordinate to the Ministry of Environment, and as 'supervised institution' reported to the Department of Nature Protection in the Ministry of Environment. Since a reorganisation of the nature protection management institutions in Latvia in 2009, the North Vidzeme Biosphere Reserve Administration is subordinated to the Nature Protection Agency (which, in turn, is subordinated to the Ministry of Environment).

Generally, the tasks of the Administration are to:

- Administer regulations related to the protection of specific sites (core areas, coastal zones and other designated areas) in the Reserve, and oversees some forestry functions in Specially Protected Areas (SPAs);
- Entail the evaluation of construction possibilities and excavation of earth resources within biosphere reserve territory which is one of the most important responsibilities of the Administration. The NVBR staff is entitled to issue a ban on construction activities which are taken into account by the Regional authorities of the State Environmental Service that are responsible for issuing construction permits;
- Elaborate provisions for municipal land-use plans and regional spatial plans in accordance with the Planning Law and together with other institutions. Prepared land-use and spatial plans are reviewed by NVBR specialists.

The responsibilities of the Administration are divided between three departments: the Department of Nature Protection; the Department of Planning and Development, Department of Financial management and budgeting. The permanent, full-time personnel of the North Vidzeme Biosphere Reserve Administration comprises of 11 persons.

The responsibilities of the Department of Nature Protection are defined as:

- Ensure the conservation supervision and management of the diversity of landscapes, ecosystems, species and the genetic diversity of the site;
- Facilitate the preservation and reasonable use of biological diversity and protected areas;
- Support sustainable development of the natural environment for recreation purposes and to promote ecotourism.

The responsibilities of the Planning and Development Department are defined as:

- Promote sustainable social and economic development of the biosphere reserve;
- Coordinate and supervise monitoring programmes within the biosphere reserve;
- Promote and coordinate research within the biosphere reserve;
- Mobilize financial resources for area management;
- Encourage public participation in environmental protection;
- Provide timely and accurate information to the population about environmental quality and natural resources;

- Facilitate the development of environmental education, education for sustainable development and raise environmental awareness among the population;
- Ensure an information flow in the area of environmental research, monitoring and environmental education.

In many cases, in order to fulfil the responsibilities of the Administration, specialists are obliged to cover additional substantive fields of interest, such as geology or aquatic systems at the same time being deeply involved in issues related to environmental education or in lobbying with local authorities.

It is evident that the capacity of the Administration is still inadequate for the sound fulfilment of all mandated responsibilities.

Table 1: Structure of Administration and Departments (prior of the NVBR to June 2009).

Division	Post	Number	Functions
Director	Director Secretary	1 1	Strategic management Human resource management Performance reporting Liaison
Development and Research	Head of Department Public Relations Specialist Project Coordinator	1 1 2 1	Education and information Compilation and implementation of nature protection plans Coordination of research and monitoring projects Maintenance of the community involvement/ support system
Nature Protection	Head of Department State Inspector Senior Geologist Senior Expert	1 1 1 1	Compliance and enforcement Site inspections Issuing statements and coordinated decisions Assessment of municipal spatial planning Management of special conservation areas
Financial management and budgeting	Head of Department Accounting clerk	1 1	Annual budget Annual audit Financial management Procurement

Due to the necessity to maintain a presence within the territory to support the biosphere reserve concept, the central office of the Administration was established in Salacgrīva. Salacgriva has a good road connection to Riga, the capital city of Latvia, and is a good location in the context of the whole biosphere reserve territory. To improve accessibility of the Administration for the inhabitants throughout the supervised territory, two regional offices in Rūjiena and Strenči were established (in the years 2002 and 2005, respectively). Communication between the main and regional offices is managed through regular meetings, as well through internet and telephone communication.

Goals to be achieved by establishing biosphere reserve offices in the field:

- Information services to local people;
- Better visitors' coordination in the biosphere reserve;
- Improved visibility of biosphere reserve activities on the local level;
- Improved involvement of local specialists living in different parts of the biosphere reserve.

Due to the need for more effective implementation of nature protection and management policy in protected areas in 2009, the Ministry of Environment undertook a countrywide reorganisation of environmental services. The NVBR Administration became a structure of the Nature protection Agency. Again it might be needed to prove, that sustainable nature protection within the biosphere reserve concept under more independent Administration is fundamental for integral long term cooperation and area management among different actors.

According to the existing legislation, the NVBR's funding sources include:

- fixed allocations from the national budget;
- assets allocated by the municipalities within the Reserve;
- donations and grants;
- revenue generated through the provision of chargeable services and projects.

To improve fundraising, the NVBR promotes the strengthening of existing local NGOs and the development of new ones. Resource mobilization through the development of projects, also contributes to an increase in the NVBR budget income.

2.6 Consultative Board

Ref.: Madrid Action Plan: Action 10.2

The development and management of a wide area with many inhabitants as a model territory is possible only in close cooperation with local stakeholders. One way to ensure coordination on matters pertaining to environmental protection and sustainable social and economic development within the Reserve, and dealing with all the interests and stakeholders within the protected area is the establishment of a Consultative Board as an integral part of the Administration. It is important that the members of the Consultative Board are not only honorary members but are themselves devoted to fulfilling their task. The effectiveness of the Consultative Board therefore depends on the motivation of the representatives to see and act within the entire territory. This way presents challenges on successfully involving all the Board members as well as responding to their interests and ideas, and, if successful, this can become a powerful tool for the model territory.

The North Vidzeme Biosphere Reserve Consultative Board is established by the Law on the NVBR. The Consultative Board consists of three representatives from local municipalities, two representatives from the forest management company "State Forests", one representative from the members includes a representative from a local NGO nominated during the Local NGO Forum organized once every two years by the NVBR. In total it consists of 16 members who are nominated for a 2-year period and are endorsed by the Minister of Environment.

Chapter 3

Governance of a Biosphere Reserve

3.1 Administration Strategy

If mainly the establishment of a biosphere reserve is being pushed by enthusiasts the sound management of a biosphere reserve is based upon successful administration.

An **administration strategy** is a mid-term (5 years at most) planning document which sets developmental goals – what an administration is planning to achieve and defines strategies – how an administration is planning to achieve those plans. The development of a strategy requires an evaluation of what has been achieved so far by an administration, setting mid-term goals and defining strategic priorities. At the initial stage of a strategy development, it is critical to conduct an administration's capacity assessment to identify whether it is sufficient to achieve the defined goals and what may be opportunities and risks during the implementation of a strategy. One of the most important tasks when drafting a strategy is the development of a set of measurable and sustainable indicators to monitor annual progress and to evaluate the effectiveness of an administration.

In Latvia, the Cabinet of Ministers regulates development of strategies for governmental institutions and sets requirements for the content and the structure of the document, as well as specifies the process of evaluating and updating of strategies. A 'Strategy of the Actions of the North Vidzeme Biosphere Reserve Administration for 2007 – 2012' was drafted in 2006 with the support of the UNDP/GEF project. This strategy reflects the vision of the administration concerning the development of the biosphere reserve and is based on the tasks set for biosphere reserves by Latvian legal acts and international documents.

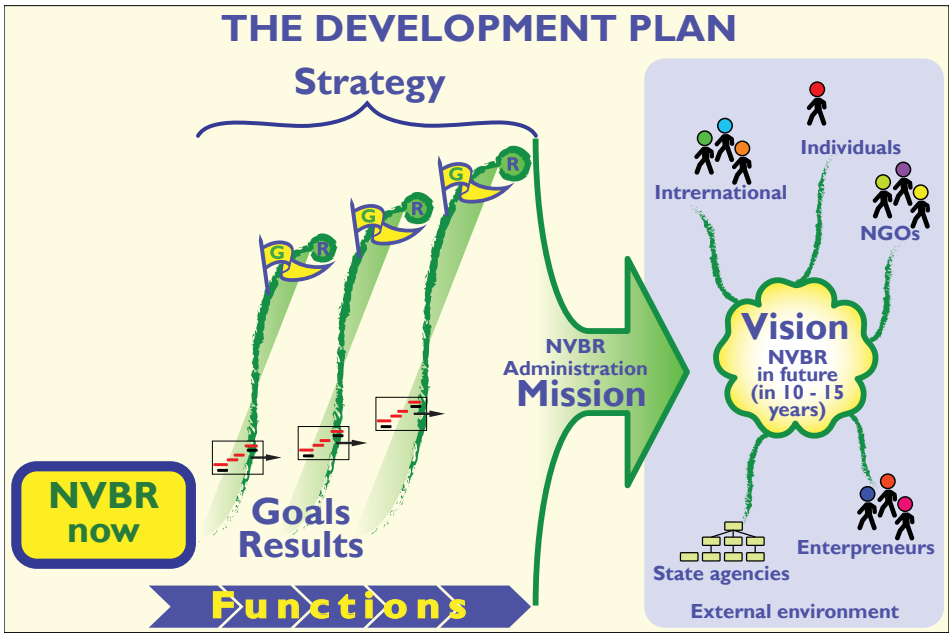


Figure 2: Model of strategic planning and development of the NVBR Administration.

A strategic document consists of the following parts:

- An administration's mission and the vision of the biosphere reserve;
- Overall description of an administration's activities (its mandate, functions);
- Mid-term strategic priorities, aims and objectives;
- Analysis of external and internal factors that may affect the effectiveness of an administration;
- Planned budget.

A **vision** describes how we want our biosphere reserve to be. A successfully defined vision might easily become a slogan of the biosphere reserve or a common feeling for all who are working, living or visiting the particular biosphere reserve. It is important that the vision of a biosphere reserve already embodies all the aspects of the biosphere reserve therefore underlining their interactivity.

The vision of the NVBR is:

- An area where all natural and cultural values are protected;
- An area characterized by biological diversity, efficient and environmentally friendly economic activity and socially responsible behavior.

Often the **mission** of a biosphere reserve administration may paraphrase the purpose of the biosphere reserve as reflected in national legislation. If the vision decribes how the NVBR administration envisions the biosphere reserve in the future, the mission states the administration's major strategic tasks in order to achieve the vision of the biosphere reserve.

The mission of the NVBR Administration is to achieve equilibrium in the conservation of biodiversity, promotion of economic activity and preservation of cultural values.

Out of the mission comes **the definition of the strategic priorities** that will guide the work of the administration during the period of the actual strategy. Each priority is further split into a set of management activities and, finally, effectiveness indicators are developed to measure the progress towards the defined goals.

It is crucial that an administration strategy is implemented by including the tasks defined by the planning document into the annual work plans and reporting. This also makes a clear base and understanding for continuity and permanence in work – therefore truly imbedding the sustainability in all the actions of a biosphere reserve.

Table 2: Example of a strategic planning grid from 'The Strategy of the Actions of the North Vidzeme Biosphere Reserve Administration for 2007 – 2012.

Strategic priorities	Management activities (examples)	Effectiveness indicators/annual (examples)
1. Ensure favourable protection status for the rare and protected species and biotopes (within Natura 2000 territories and beyond)	1.1. To ensure plan-based and scientifically supported nature conservation in the biosphere reserve territory and the North Vidzeme Nature Protection Region. 1.2. Promote and support environmentally friendly management activities in the NVBR and the North Vidzeme Nature Protection Region.	• Number of municipalities that integrate the NVBR Ecological Landscape Plan into their territorial planning; • Number of Nature Protection Plans developed and approved; • Number of protected areas managed according to the Nature Protection Plans; • Number of the degraded territories being restored.
2. Promote the sustainable development and economic growth of the Reserve	2.1 Develop and maintain understan-dings of sustainable entrepreneurship. 2.2 Support ecological tou-rism infrastructure development,	• Number of events promoting sustainable entrepreneurship; • Number of themes of demonstration projects; • Number of tourism trails (developed/ maintained); • Number of observation towers (platforms) developed/maintained,

Strategic priorities	Management activities (examples)	Effectiveness indicators/annual (examples)
3. Develop and nurture awareness of the natural and cultural significance of the Reserve, build environmental awareness in a wider public	3.1 Ensure the identity of the biosphere reserve territory by tourism infrastructure site and information signs development in collaboration with the local municipalities; 3.2 Disseminate information about natural , cultural and historical values of the biosphere reserve in secondary schools; 3.3 Develop and implement a research and monitoring program for the NVBR.	• Number of infrastructure sites and information signs; • Lectures/seminars/ excursions (hours); • Number of environmental guides prepared, etc. • Number of people participating in volunteer monitoring (EcoWatch) programme
4. Improve the capacity of the NVBR Administration to perform its functions and provide the necessary services for the NVBR inhabitants	4.1.Develop cooperation working agreements, management arrangements and operational procedures, with other public institutions to optimize operations and facilitate collaboration; 4.2.Ensure necessary resources to increase the Administration's capacity to prepare and submit conclusion and compliance documents on time.	• Number of the meetings organized by the NVBR Consultative Boards; • Percentage of employees using database for daily operations • Percentage of information updated

3.2 Capacity assessment

To ensure that strategic planning is realistic and consider all internal and external factors that may affect an administration's ability to implement its strategy, it may be recommended to conduct its capacity assessment. By capacity we mean abilities of organizations or people to perform some tasks. Capacity assessment may be done on the systemic, institutional (or organization) and individual levels.

Definition of Capacity

Capacity is a collection of specific abilities which are distributed at three levels:

- Individuals have personal abilities or attributes or competencies that contribute to the performance of the organization or system.
- Organizations have capabilities to do things such as manage stakeholders, facilitate community development, carry out resource assessments, manage financial resources, listen and learn, empower staff and so forth.
- The System tries to connect these competencies and capabilities into some coherent combination or system that allows organizations to perform.

Capacity assessment allows understanding the needs of administration for better functioning and completion of strategic goals and objectives of a biosphere reserve, such as a need, for example for more human resources or a need for allocation of extra funding from the state budget. It also allows us to clearly see all the constraints. Some typical examples of such constraints on the systemic level include insufficient legislation or lack of regulations that govern a biosphere reserve, overlapping of functions between different institutions that ensure management of a biosphere reserve territory. On the organization level, some of the capacity constraints may include dependency of a biosphere reserve administration on external donor funded projects, and low level of awareness among residents of the socially-economic benefits of living in a biosphere reserve area. On the individual level, an administration may experience lack of human resources with knowledge and skills necessary to perform their functions and contribute to the achievement the goals sets in the administration strategy. Capacity assessment is not limited to identification of all these constraints but also informs about existing opportunities inside and outside an administration that may increase overall administration capacity to perform its functions, for example, opportunities for partnerships or attracting additional funds, opportunities for professional development of staff, optimization of the use of the human resources, etc.

Capacity assessment is not much different from a research and uses the same methods: a review of documentation, individual and group interviews, surveys, etc. The main difference with a scientific research it that capacity assessment has very practical application and is supposed to help an administration plan and improve its performance.

Considering the fact, that various governmental and non-governmental organizations are usually involved in the management of a biosphere reserve, the best is to implement capacity assessment in close collaboration with all the stakeholders by using a participatory approach: self-assessment questionnaires; stakeholders' workshops; focus group meetings; informant interviews, etc.

A capacity assessment of the NVBR Administration was initiated in October 2007 by the UNDP-GEF Project Unit in order to assess the current capacity of the Administration to implement its main functions, and make recommendations for capacity development and strengthening.

Areas of assessment:

- assessment of the institutional framework (legal, policy, implementing agencies, funded projects and coordination) adequacy for the functioning of the NVBR Administration;
- assessment of the planning frameworks (regional planning, land use planning, strategic planning, annual planning, nature protection planning, etc.);
- assessment of the capacity gaps of the NVBR Administration in implementing

its Strategy of the Actions(2007-2012) and sustaining the UNDP/GEF project investments;
- assessment of the main stakeholders 'capacity (Nature Protection Board, State Forest Agency, Regional Environmental Boards and some others) in performing some functions that are close or overlap with the functions of the NVBR administration.

The main gains of conducting such a comprehensive capacity assessment are:
- identification of existing capacity strengths and weaknesses to implement the administration strategic priorities, and clarification of further capacity development needs; in a result, more realistic and measurable effectiveness indicators have been developed for the administration to monitor progress towards achieving the strategic goals;
- identification of the common problems for all partners increased the potential to attract attention to their solution by the policy makers; at the same time, awareness of the partners' capacity strengths and "best practices" stimulated inter-institutional cooperation and joint capacity development.

3.3 Information management system

Ref.: Madrid Action Plan: Action 16.2

To make decisions and to be able to perform its functions, every administration needs access to a wide range of information about different aspects of a biosphere reserve, such as a status of protected areas, a status of species, monitoring and research results, regional plans, demographic and economical data, etc. According to the Latvian legislation, the administration of a biosphere reserve is responsible for information exchange with other institutions involved into planning and management on the territory of the biosphere reserve. Adequate information flow and exchange as well as knowledge mobilisation is the ultimate pre-condition for sound management and decision-making at any level.

The primary goal of any information management system is to provide support for management and decision-making by creating reliable, timely collected and processed information for the needs of an administration.

Development of an information management system should be begin with
- identification of what kind of decisions an administration has to make when performing daily tasks or planning for the future;
- what kind of information is needed for that.

The better these information needs are defined, the more likely intended users of the information system will be eager to use it for their daily operations.

Development of an information management system also involves usually sufficient institutional and human capacity building, since an administration has to integrate a new culture of data-driven decision making and planning; and human resources have to acquire new technological skills (administration and use of databases, etc.). Typically, development of an information management system involves **elaboration of the following tasks**:
- appraisal of existing information needs in an administration and identification of key information gaps for effective management of a biosphere reserve or in other words - what information we have and what else we need;
- identification of data holders and carrying out an information gathering process - who has the information we need and how we can get access to that;
- establishing an administration database accessible for a biosphere reserve administration and stakeholders, as well as the broader public - where the information will be stored and updated and how administration and other users will be able to retrieve it..

In Latvia the first action was carried out as a preliminary analysis on information management during the preparation stage of the UNDP/GEF Project "Biodiversity Protection in the North Vidzeme Biosphere Reserve" in 2002. It clearly identified that, at the time, the information available at the NVBR Administration was not sufficient enough to ensure effective decision-making related to the NVBR functions' implementation. In addition, there was a strong need to improve how the information was organized and to prepare up-to-date information and make it readily available to decision makers and all stakeholders in a form that they could use.

It was agreed that there was a necessity to investigate and clarify what is the demand for information about the biosphere reserve and for what kind of information there is a need in order to serve decision-making, research, education or general interests of various stakeholders. To identify these information needs of the NVBR administration and other stakeholders, broad consultations were organized to survey various audiences. For example, a seminar was organized for 28 representatives of local stakeholders involved in the environmental protection and management of the NVBR territory; over 200 letters from the inhabitants to the NVBR administration were collected and analyzed.

It is critical to remember that an information management system is not only a set of databases but also an information management plan which includes data management processes (data collection, entry, deleting, etc.), as well as it indicates how an administration is planning to communicate their information management system to the stakeholders and to involve them into the system evaluation and further development. As soon as the information needs were identified for the NVBR administration and their stakeholders, and the data was collected and entered into database, several meetings and seminars for the main stakeholders were organized again: 1) to provide information about the possible uses of the NVBR administration database, 2) to train potential users, 3) to sign mutual agreements about information exchange and access to the stakeholders' databases.

The structure of a database for a biosphere reserve may vary and depends on the information needs of an administration. Currently, the NVBR administration holds the data that includes digital maps of various aspects of the territory, such as a status of species and biotopes, territorial planning, monitoring data; also different reports from projects; research reports and other materials about the biosphere reserve territory. Major target audiences, for whom these data are provided, include territorial planners, environmental specialists, research and academic staff, and inhabitants of the biosphere reserve.

3.4 Specific area management plans

Proper planning of appropriate actions is a decisive instrument for sustainable long-term management of a biosphere reserve territory. This is especially important in vast areas with many local municipalities and planning regions, each with their own priorities, which in many cases are oriented primarily towards only their own municipality. In such a context, a biosphere reserve can serve as the uniting institution giving a wider perspective on the development and management of the whole territory.

There is definite hierarchy of such Planning documents embracing State , Regional (District), Local (Municipality) as well specific local plans (i.e. Management Plan of specific Protected area).

General prescriptions for the sustainable development of the whole country are already defined in several national planning and strategic documents, setting objectives which conform to the biosphere reserve mandate as well, therefore it is important that these documents and their priorities are followed-up.

At the national level Latvia's National Development Plan (2007-2013), approved by the Cabinet of Ministers on 04.07.2006 with Regulation No. 564, sets the objectives for the development including sustainable aspects, environmental protection and education.

Aspects of the National Development Plan which are especially important to implementing the biosphere reserve concept:

- Facilitate the preservation and reasonable use of biological diversity and protected areas;
- Promote the inclusion of the protected areas in the economic development determining different prohibited zones of economic activities and substantiating the socio-economic decisions in their determination, as well as to attract financial resources for their management;
- Encourage public participation in environmental protection and preservation by providing timely and precise information to the population about environmental quality and natural resources;
- Facilitate the development of environmental education, as well as to foster education for sustainable development and to raise environmental awareness among the population;
- Support sustainable development of the natural environment for recreation purposes and to promote ecotourism;
- Facilitate evaluation, mitigation and monitoring of the risks to nature, including climate change and industrial risks.

Implementation of the biosphere reserve concept through the planning process can be achieved in several ways. The most effective and legally binding possibility is elaboration of prescriptions for local and district spatial plans. Instructions on directions for permitted area development and intensity are based on biosphere reserve data bases, as well as on investigation reports and other documents. As a result, these directions can be summarised in different maps, landscape plans or specific area management plans. The most important gain in such involved planning is that the biosphere reserve administration accordingly has a real impact on implementing the biosphere reserve concept in actual territories together with the respective stakeholders and municipalities. Invited to participate and become involved in the development of different plans is a true indication and sign of the acceptance of the biosphere reserve concept and the expertise that can be provided by its administration. Following examples will highlight how the biosphere reserve concept is incorporated in different level Planning documents.

3.4.1 River basin management plan, example of the river Salaca

The NVBR is built on the River basin approach, with 95% of it located within the biosphere reserve territory. As Latvia is a part of the European Community the EU water policy under the Water Framework Directive (WFD) 2000/60/EC establishes also a framework for the management of waters in NVBR. This framework ensures a continuous and consistent process to prevent further deterioration of water status, sustainable use of water resources and the improvement of their quality. The WFD will be the single most important factor controlling water management in European Member States over the next 25 years.

The WFD establishes new essential basic principles for water management in EU Member States, such as:

- All waters (surface waters, groundwater, marine water and coastal waters) should be viewed as integrated and interdependent,
- Water management should be organised on the basis of river basins, irrespective of the existing administrative-territorial borders,
- Public participation in the management of water resources should be increased. Integrated water management policy should be developed and elaborated, taking into account all interests of all stakeholders involved in water management and use.

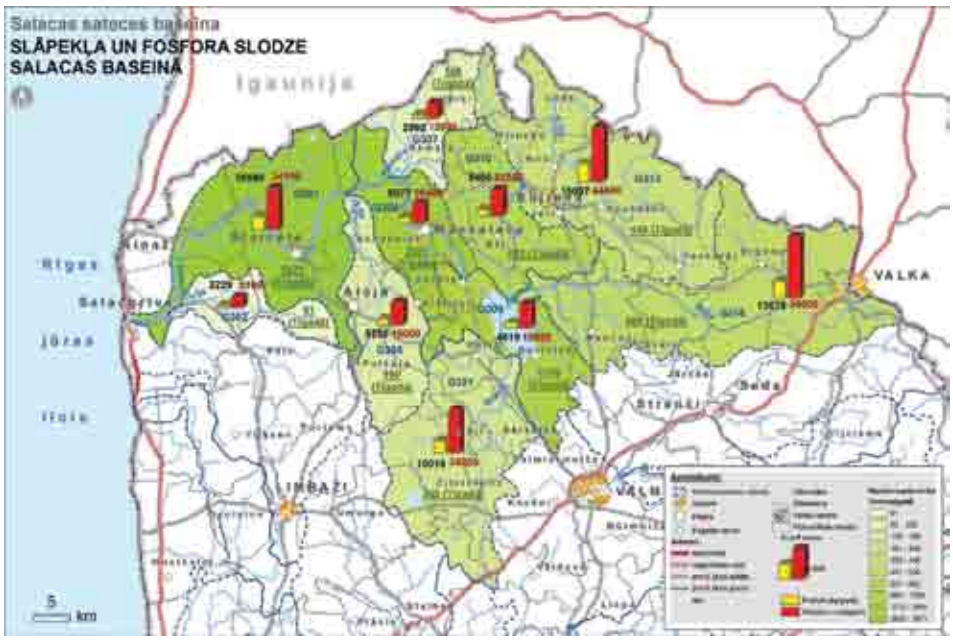
Numerous data sets on the River Salaca basin's physical, environmental as well economic properties developed by different institutions during two decades, collected and stored by the biosphere reserve was one of the prerequisites to choose the river Salaca basin as one of the first River Basin Management plans (the RBMP) to be elaborated for Latvia.

In order to develop the RBMP the following steps were taken:

- Definition and assessment of each water body within Salaca river basin in more detail,
- Development of environmental models assessing respective water bodies,
- Establishment of local stakeholder groups,
- Identification of options for necessary improvements within each water body,
- Evaluation of options for environmental benefit, cost and acceptability within each water body,
- Devision of optimum set of measures in each water body.

NVBR experts were involved from the very beginning in consultations during the development of the management plan. Having the NVBR Administration experts which took part in the elaboration of the RBMP and the corresponding data base in the respective field, the NVBR takes on several responsibilities and becomes a sort of river basin authority and one of the noteworthy actors in the implementation of the EU Water policy initiatives in Latvia. Thus, the WFD River Basin management plan produced new opportunities for the NVBR to interact with local authorities and planners in the sphere of nature protection and planning.

With the given River Salaca water Basin management plan now in its adaptation process NVBR representatives are included in the Consultative Board of the River Basin.



Nitrogen and Phosphorus load within the River Salaca basin.

The Water Framework Directive requires increased public participation in water resource management. This task is implemented through various activities. Voluntarily monitoring programme on River Water Quality assessment in this respect becomes an important tool raising awareness in society and providing further motivation for particular activities. It is worthwhile to mention that the River Quality assessment Protocol, elaborated within the framework of the Eco Watch programme, is developed in accordance with the Data matrix, which countries must report upon to the EU (more in Chapter 8). Thus people involved in River Water Quality assessment help the Latvian authorities in providing background field information. Consequently, through practical investigation of their own surroundings, people become more informed, involved and motivated.

The concept of the biosphere reserve as "testing areas for new initiatives" were fully taken into account, probably being one of the first places in the eastern part of EU, where the WFD principles were harmonized with those of the Biosphere Reserve concept. As a new initiative, the River Basin Management Plan (RBMP) still needs improvement in its implementation and clarification to the people living in the territory.

3.5 Ecological landscape plan

Ref.: Madrid Action Plan: Action 14.1

The overall objective of this innovative integral plan is to apply the principles of landscape ecology, conservation management and socio-economic development for the management of a biosphere reserve. The Plan is built on the assessment and integral tuning of landscape structures (forest, agriculture, lakes, etc.), biodiversity (animal and plant species), cultural heritage and socio-economic elements (agriculture, forestry, tourism and demographic data). This planning approach amalgamates together issues covered by the existing, sometimes separated, planning processes, such as the municipal spatial plans (focusing on land-use and socio-economic aspects), the nature protection plans (focusing on biodiversity) and the river basin management plan (focusing on water quality protection). As a result specific landscape spaces, core zones and corridors are defined and divided into respective categories of international, national and local importance. For each of those spaces, the dimensions of the permissible and supportive activities in forestry are described.

The ecological landscape plan contains the following parts:

1) Introduction;
2) Description of the landscape areas (called passports for each area);
3) Description of the elements of the landscape areas (called tables of the elements);
4) Graphic part, which includes two maps:
   - Ecological Landscape plan map 1:50,000 (includes 42 landscape areas of NVBR);
   - Map with the elements of the landscape areas 1:50,000.

In order to complete the document additional set of maps is elaborated:

The flow maps:

The main flows that are usually taken into account in most Ecological Landscape Plans (ELP) projects are biotic and wildlife flows. In order to identify wildlife flows, a major task of the analysis is the selection of an appropriate set of species, which can be monitored and could be good indicators of biological diversity. Therefore the map is developed, based on the flow description for key species prepared by different experts. The description of the interaction between key species and plant communities, landscape structure and flows are analysed and added in consequent tables and maps, flow maps for all key species are elaborated separately.Additionally the aesthetic evaluation map on valuable landscapes along the major roads and most important tourism routes and objects at a scale 1:50,000 is elaborated giving additional possibilities for the improvement of tourism flow. This approach was used in this project in NVBR as well.

Cultural heritage maps:

As cultural heritage is one of the most important landscape elements, it gives and additional strength to the whole ELP if the cultural heritage is mapped separately. During the development of the ELP, different maps regarding the cultural heritage can be produced: 1) map on the quality of manor houses; 2) map on the structure of manor houses; and 3) map on the concentration of sites of architectural and archaeological monuments. Further in the Overview schemes the socio-economic situation and trends in respective administrative units are analysed and displayed. These overview schemes include baseline socio-economic data on the communities living within a biosphere reserve; information on the status of national, regional and local level development planning relevant to the biosphere reserve; information about investments done by different institutions (government, municipalities, private companies, etc.). Parallel in dealing with environmental aspects in the biosphere reserve area, the historical and present-day use and extent of local community dependencies from local ecosystem services, as well a projection of trends were analysed and presented.

As part of the process to develop this ecological landscape plan, a survey about the landscape values was conducted in two municipalities. Finally, based on the review of three municipal spatial plans, the process included an elaboration of recommendations for three respective municipalities from the position of the Ecological Landscape Plan.

State Joint Stock Company "Latvian State Forests" agreed to elaborate ecological landscape plans for the BR core areas and several additional areas of international significance. Guidelines for the implementation of the ELP through the forest plans were elaborated and these guidelines can also be used for the forest areas outside the NVBR territory.

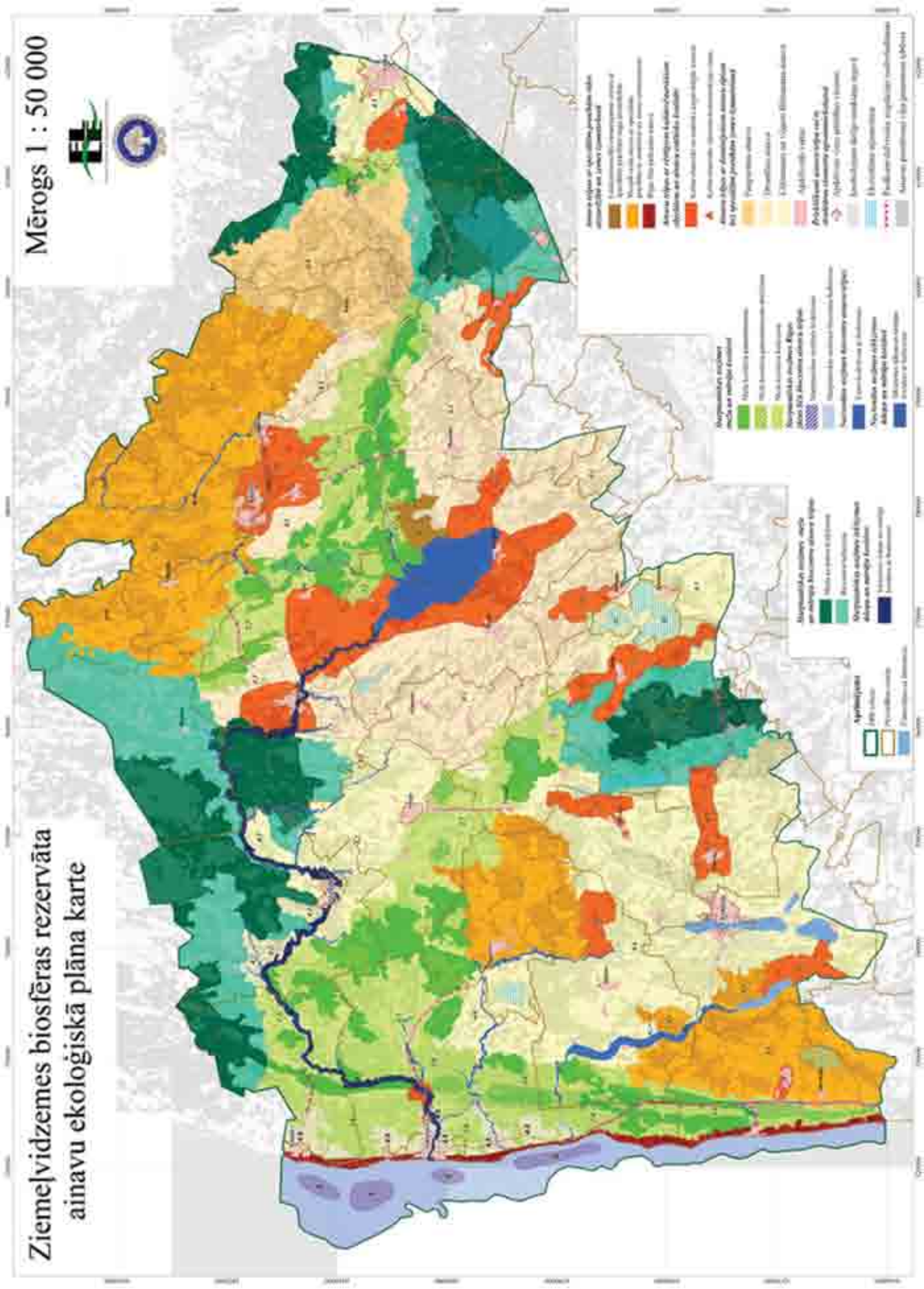
All the different themes were introduced into the data base. The database contains an introductory part, maps in the vector format, tables and schemes. The database is made with a Macromedia Flash program, which provides vector graphic files of a relatively small size. To the common user, it appears as a typical webpage and it can be accessed with any common internet browser program, which supports the Macromedia Flash format. It is easy to browse the database, due to easily understandable links from the main menu to any part of the ELP and from one map to another.

After elaborate discussions with environmental and landscape experts, a map of areas suitable for windpower energy - construction of Windmills was elaborated. Thus, the ELP gave a specific basis for planners and it is becoming an operational and important tool for both local authorities and the NVBR administration.

In order to introduce the Plan to local inhabitants and to make the Plan a mutually-accepted tool, a Poster with the description of the ELP goal was produced and spread in all local schools and libraries. This material approached the local communities to make them more aware and value the plan and motivated them to identify themselves with the Biosphere Reserve.

In conclusion, with the elaboration of the Landscape Ecological Plan, the NVBR has acquired a modern tool for area planning and management which already serves as a basis for communication with local people and the involvement of local people in activities.

As all new innovations Ecological Landscape Plan manifests its multifunctionality and opens new possibilities for the NVBR.



General wiev of the NVBR Landscape Ecological Map.

3.6 Transboundary protected areas

Ref.: Madrid Action Plan: Action 30.1.

Often biosphere reserves are located on different border zones either between regions but also between different countries with different cultures and languages. The border between Latvia and Estonia separates two different countries with different cultures and languages, however it does not separate nature. Due to its marginal location and subsequently not well developed infrastructure, the border area between these two countries represents one of the biggest raised bog complexes in the region (ca.8000 hectares), embedded in forest blocks with high biological diversity on both sides of the border. On the Estonian side, one of the bogs has been a protected area since 1957 as the Nigula State Reserve and has Ramsar site status since 1997. Adjacent parts of the bogs on the Latvian side are protected areas since 1977, having Ramsar site status since 2002 – at the same time, having no protection status on the Estonian side. Thus, unified management actions were extremely sought for in this area.

3.6.1 Example of the NVBR and the Nigula State Reserve Ramsar transboundary site



Logo of the Latvian-Estonian Transboundary cooperation area with a Wing silhouette of a White stork/Black stork which symbolizes the structure of the Transboundary area with the white stork attributed to the open man-made landscape and the black stork inhabiting remote and intact forest blocks.

In 1996, the Administration of the NVBR and the Nigula State Reserve signed an Agreement on Mutual Cooperation. It was a starting point for the regular exchange of information and experts. It was evident that a joint management plan is urgently needed, exceeding the scope of pure environmentally-oriented activities. After several unsuccessful efforts, a joint idea was accepted by the Dutch Government and a Project "Integrated Wetland and Forest Management in the North-Livonia as example of the transbondary cooperation between Estonia and Latvia" was launched in 2005 and was funded from The Netherlands (PIN/MATRA project no. 2002/014 in cooperation with International Agricultural Centre, Wageningen). The project area embraced a total area of about 600 km^2.

The project resulted in the elaboration of a Transboundary Master Plan aimed to support the protection and sustainable management of mire complexes, wet forests and semi-natural grasslands in the area jointly proclaimed by Latvian and Estonian authorities as "North-Livonia". The overall goal of the project was to support the maintenance and strengthening of the ecological integrity of the transboundary area, integrating socio-economic development and biodiversity conservation.

The Transboundary Master Plan:

- presents an integrated vision for the sustainable development of North Livonia including recommendations for strengthening the ecological and hydrological integrity of the transboundary wetland complex, and for the sustainable use of water resources, game animals, agricultural land and forests;
- a strategic document containing recommendations relevant for physical planning, various development plans (including tourism), planning of infrastructure, investment plans and policy development;

- has no legally binding status.

The given Transboundary Master Plan is not comparable with a traditional management plan for protected areas. Document contains an analysis of problems in transboundary biodiversity management and provides directions for harmonised development and management of the area. The document aims to support the development of future projects in the border area and to provide guidance to physical planning and rural development. The plan is intended for local municipalities, regional authorities, water managers, state forest managers and local NGOs.

The plan contains recommendations for:

- Water management
- Forestry
- Nature conservation and management
- Agriculture
- Tourism
- Hunting and game management
- Wetland restoration
- Safeguarding of the Estonian Native Cattle

In the preparation of the Master Plan various transboundary expert groups were established, thus including social, economic and cultural dimensions. Joint cooperation activities between two protected area managers served as a communication basis and triggered the signing of an Agreement between the ministries of environment of the Republics of Estonia and Latvia on cooperation in the field of the environment in a transboundary context (2000). A Joint Commission was established and members of both protected areas were included in this Commission.

As part of the project, two parallel nature management plans have been developed for two protected areas located on each side of the border between Latvia and Estonia. Looking at the two protected areas from a biological, hydrological and geological point



Map of Transboundary Project Area.

of view, Sookuninga and the Northern Bog constitute coherent bog and mire complexes with surrounding forests, but the area is separated by the border of the two countries with differences in nature protection traditions, in the requirements in each country (content, legal framework, procedures and requirements, public hearings, etc.) and in the zoning systems and traditions for habitat classification.

It is a challenge to address all the differences which exist when linking two areas on both sides of a political border and thus – different administrations. In the experience of the NVBR, the way to link these two areas was to apply for a Transboundary Ramsar site status for this particular nature complex of separate Ramsar sites was passed to the Ramsar Secretariat. In 2007, the Ramsar Secretariat proclaimed this area as the "North Livonian Transboundary Ramsar site". Chronologically, this is the fifth Transboundary Ramsar site in the world.

It is important that the initiated transboundary cooperation continues its own life after the end of a project, including the use of project logos and slogans among the border zone municipalities. Positive results of cooperation projects are dependent on the proactiveness of area managers, who become a driving force for various initiatives. It is important to support and keep direct and continuous communication between experts and area managers.



Border between Latvia and Estonia crosses vast wetlands.

Chapter 4

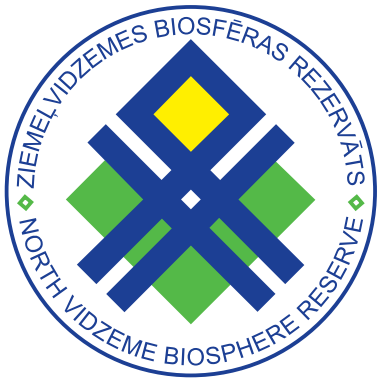
Communication Strategies of a Biosphere Reserve



Communication and co-operation are essential factors for the successful operation of a biosphere reserve. Communication and co-operation with various interest groups fulfil political functions (publicity, transparency, ownership), social and economic functions (socialisation, orientation, integration, economic gains) and, not least, legitimise the existence of a biosphere reserve (Full of life, 2005. German MAB National Committee, Bonn).

4.1 Visual identity

Due to the large territory and large population in a biosphere reserve, one of the main tasks in defining the Communication Strategy is to achieve a state of visual recognition of the reserve within the territory and outside it both through more permanent measures – information signs, posters etc, as well through communication in the media, such as through the organization of different events. An elaborated visual identity can serve to achieve this.



Visual identity is best embodied in a **logo**. When thinking of creating such a logo, parallel to using the already typical corporate identity elements, it is crucial to underline the essence of a biosphere reserve, basing it on the so-called ABC approach (A – abiotic; B – biotic; C – cultural and human) which then can be conveniently adapted to different needs and messages by modern design.

As mentioned already in the introduction of the NVBR, the logo of the NVBR unites three Latvian (universal) signs of the Sun, Forest, and River in the colours of green (land/ forest); blue (water) and yellow (sun).

The next step after designing a visual identity is to prepare **guidelines for the use and promotion of the visual identity** and introduce it throughout the biosphere reserve area. In NVBR a special "Handbook of the NVBR Visual Identity" was prepared for this purpose. The Handbook includes chapters explaining and defining the use of colours, font sizes, sequence of forms and their location in different applications. Further it can be supplemented with recommendations by giving technical drawings and design guidelines for posters, stands and towers. In order to make these guidelines most accessible, they are broadly distributed to all stakeholders including all municipalities and local libraries in the biosphere reserve through different media – CDs, internet and hard print.

The last step is **bringing the visual identity into life** so it is not only used and recognised by people working in a biosphere reserve but also by everyone living or working in and visiting the biosphere reserve. The visual identity thus is brought to life through different target groups. The most responsive target groups are local owners of boarding rooms and country tourist houses. For them it becomes evidently important to have a poster in front of their homes stating that these entrepreneurs belong to a larger entity – the biosphere reserve which at the same time serves as a quality sign as well as advertisement.

4.2 Mass media

Mass media plays a crucial role in disseminating messages dealing with a biosphere reserve's activities, especially in remote areas of a biosphere reserve. Communication with the whole biosphere reserve community is rather complicated due to the fact

that a biosphere reserve covers different districts and unites different municipalities which are both rural and urban. At this moment, district newspapers becomes very important means as mainly they are the only ones which regularly reach the inhabitants of a biosphere reserve and therefore can always keep them updated about relevant and ongoing activities in a biosphere. Moreover cooperation with local TV stations and radio broadcasting stations enhances the information exchange about a biosphere reserve's activities and also transmits it regionally and nationwide.

The local district newspaper is the main source of information for local people and this media is thoroughly studied. Therefore it is extremely important that the local journalists become not only reporters about activities in a biosphere reserve but also active advocates for its work. This is more important due to the fact that local journalists are also well known and well trusted among the locals. Accordingly, local journalists are invited to participate in practical activities of a biosphere reserve, such as bird counting. They are also regularly (at least once per a one- two week period) provided with information on activities undertaken by the biosphere reserve staff.

4.3 Virtual communication

Virtual methods are becoming more and more crucial in successful communication. Even in the most isolated areas, internet services are becoming a necessity and are becoming more available. Therefore in order to channel information and receive feedback an **elaborated webpage** both for administration and locals as well as visitors is developed. Such a webpage also becomes an important pool for information due to the management responsibilities of a biosphere reserve like dealing with permissions on building, land transformation, use of biotic and abiotic resources.

- Search
- Actual
  - News
  - News Archive
  - Press releases
  - Events calendar
  - Questionnaire
  - Actual question
  - Subscribe to media email alerts
  - Public hearings
- About Us
  - Functions
  - Structure
    - About Director
    - Stuff members
    - Consultative board
  - History
  - Biosphere reserve concept
  - Service
- Territory
  - NVBR Logo
  - NVBR visual identity
  - Overall characteristic
  - Zoning
  - Especially protected nature areas
  - Nature 2000 sites
  - Ecological landscape plan
- Contacts
- Public purchase
- Laws and regulations

- Publications
  - Annual Reports
  - Other publications
- Projects
- Information system
- Useful links
- Frequently asked questions
- Discussions (forum)
- Tourism issues
  - Tourism info
  - Places to go
  - Things to do
  - Maps
- Galleries
  - Photo galleries
  - Wallpapers

Site map of the NVBR webpage.

4.4 Cooperation with local libraries

Poor or underdeveloped infrastructure in the more isolated areas of a biosphere reserve mainly leads to generally low self assessment of local people, which in turn affects a low valuation of surroundings, both environmental and cultural. On the other hand, at least in the context of Europe, exactly these are the areas which contain relatively pristine natural ecosystems and agro-ecosystems that support critical biodiversity and opportunities for positive human interaction with nature. However exactly these people living in remote areas still have well preserved knowledge and know-how from previous generations about the nature. Their knowledge of collecting and wise application of plants for medicinal purposes, understanding and following phenological signs in their practical life (hay collection, tree felling, etc), as well craftsmanship experience and historical handicraft traditions are, similarly as the biological diversity, a vulnerable and quickly disappearing know-how which is still today useful for sustainable living.

In spite of the remoteness during the last century, libraries (presumably it is true for all former Soviet system countries) in the countryside have been developed and have played an important role in supporting the need of local people for culture and information, at the same time helping to preserve local traditions. Libraries in many cases were like islands of freedom where one could distance oneself from outer reality. Despite that times have changed, still nowadays national newspapers and magazines, financed through local governments are stored in the local libraries so providing additional appeal for those who cannot afford to buy these printed media themselves and thus coming to the libraries. As a consequence, the library has become a centre of information, meeting, learning and socialisation for local people either if they want to widen their world view or share their views or experiences or follow up on



Seminar for Vidzeme region librarians about the North Vidzeme Biosphere Reserve information system.

the local topics. Additionally new technologies have appeared and the libraries are also becoming equipped with the internet, which makes them able to become an even more important meeting place for people, including those, whose relatives have gone abroad to earn subsistence. The head of the library is the person, who can explain and introduce everybody both with the value of literature, basics of internet use as well as local news.

Libraries thus are one of most important local targets for the dissemination of information and communication with communities and as such should be used thoughtfully and actively. In Latvia libraries are used by the biosphere reserve administration actively to involve locals in biosphere reserve management – libraries are regularly provided with the newest publications by the NVBR Administration, information leaflets and posters forming in each library a decent collection of information materials related to issues of environment and sustainability as well as different methodologies e.g. Ecowatch. In the NVBR, annually conducted seminars and workshops for librarians on the achievements and undertakings in the biosphere reserve serve to maintain and upkeep the involvement as well as feeling of the belonging of the librarians and therefore also the libraries. Several librarians have also undergone Nature Guide training courses and have visited other biosphere reserves.

Additionally, the NVBR Administration has improved the use of its own collection of books and created a vast NVBR library with the help of local librarians which helped to organize the library in accordance to professional principles. Currently the library catalogue is available online for everyone's use as well as the library can be visited and the collection can be used by everybody interested upon request.

Librarians naturally become central players in the NVBR, and they have a key position in information exchange among inhabitants in the respective municipality and the biosphere reserve as a whole. Librarians are real local cornerstones for expanding the vision of biosphere reserves and, next to journalists, are one of the most important advocates and ambassadors of the concept of biosphere reserve.

4.5 Cooperation with schools

Ref.: Madrid Action Plan: Action 21.1.

Apart from businesses and local authorities, schools are another decisive partners of a biosphere reserve to achieve sustainability in the region. Children are a very active social group, especially taking into account, that school children will become real decision makers in 15-20 years. Despite scepticism, the experience witnessed by the NVBR Administration confirms that children do actively discuss environmental issues and problems of their nearest neighbourhood among themselves and with other family members. Thus, it is ultimately important to provide children with pertinent information so to raise their awareness and motivate them with concrete activities. If possible, children should be involved in even the smallest activity with a practical outcome. It is important to make them proud of their accomplishments and the results achieved.



Outdoor training in water quality assessment.

Children and students are looked at as the most encouraging and appreciative audience. Children need to be permitted to "have ownership" of a specific area or a biotic phenomenon which allows them to become a kind of responsible owners of such a maintained area. It has proved beneficial, that in such landscape/habitat improvement activities, children work side-by-side with their family members or relatives.

Part of a biosphere reserve mission is to teach children values of a biosphere reserve and to continually raise their interest and knowledge about them. It is important that children learn these values by doing and thus develop ownership of these values which in parallel serve as reasons to return to the region as adults after graduating universities to find good social and economical conditions here.

Activities with school children and youth should be based on positive emotions, on viable or measurable results e.g. number of nests or newly created riffle areas installed. Too much emphasis in environmental education on negative issues like pollution, reduction in environmental quality can make children passive and inert. On the contrary, positively oriented, children can play an important role for the dissemination of biosphere reserve ideas and, in some circumstances, for lobbying as well. Direct contact with representatives of biosphere reserve and joint work with pupils and students in the field provides solid promotion of the biosphere reserve concept.

Project weeks in schools when pupil have to develop their own research projects are both informative and beneficial and a biosphere reserve offers good ground for developing such projects by offering consultations and expertise for those looking to deal with environmental subjects. Also different other activities and programmes by a biosphere reserve like the Eco Watch program offer good possibilities to spot interested and talented children and help them to develop their talents and skills. For example, in 2009 a pupil from Vilkene school, Janis Mjasnikov won 3rd place in the European Biology Olympics in Turkey with his scientific work about Osmoderma eremita, a rare and protected beetle listed in the EU Species and Habitat Directive. The work consisted of the pupil's own description of his findings during the Eco Watch activities in the biosphere reserve, where the species was found in a previously unknown location.



Students acquaints Sand martin monitoring experience.

General educational activities succeed in motivating people in the area and, as a result, these active and knowledgeable people in remote areas can provide support in resolving existing problems and meeting the new or emerging challenges of a biosphere reserve.

4.6 Bridging Art and Science

Having an open and interested attitude towards surroundings, even a single bird silhouette or wind stroke can become a source of inspiration and can raise associations to be put on paper, expressed in music or simply exposed in someone's photo file. By encouraging and cooperating with those devoted and creative people it is possible to generate many positive feelings and new understanding through sounds, colors and rhytm, thus cultivating positive experience and provoking new knowledge and recognition of art or nature in its different expressions. It is important to acknowledge that such an emotional bridge not only enhances the dialogue within and about nature through different media but in a broader sense links art and science.

Artists and scientists have a lot in common. Both artists and scientists focus on how we

view and perceive the nature of reality. Artists, like scientists, study the world around them — nature, people, culture, history, religion, mythology — and seek to transform that information into something else. Both scientists and artists, each in their particular way, investigate the world around them, formulate theories about what is possible and then test out those theories, bringing action to notion, idea and concept: one on the stage or in the studio, the other in the laboratory or in field surveys.

4.6.1 Example of environmental education project "Nature Concert Hall"



Coming close to the wonders of aquatic life - Nature Concert Hall Hydropsyche instabilis, 2008.

Since 2006, in the framework of the UNDP/ GEF project „Biodiversity Protection in the North Vidzeme Biosphere Reserve (NVBR)" and in cooperation with musicians and scientists and supported by the Latvian Environmental Protection Fund, the Administration, local municipalities, small businesses and private sponsors, the Biosphere Reserve has begun to integrate a new and unique environmental education approach called the Nature Concert hall. The basic concept of the Nature Concert hall is to create a musical and scientific performance about a particular species typical for Latvian fauna - in 2006 the hero of the concert was a beetle Osmoderma eremita and the protection of old parks, for 2007 – it was the bird Phylloscopus collybita, in 2008 – the caddisfly Hydropsyche instabilis and issues on water quality and in 2009 the emphasis was on air quality through the species of lichens.

The overall goals of the Nature Concert hall include:

- To draw attention of the public to the diversity of surrounding habitats and species and to underline the importance of proper habitat management in order to protect each vulnerable species.
- To facilitate the public's support to nature protection activities and to promote environmental friendly management and tourism.

The Nature Concert hall performance consists of a combination of:

- musical part - ambient music, specially created each year, is performed by popular Latvian musicians with a special role for the Nature DJ. The Nature DJ creates mixes of sounds from nature to compliment the instruments and vocals;
- scientific part - dialogue on species and its habits. The scientific part of the concert is developed and performed by scientists and offers the public various activities to learn about the key species selected each year, like introducing the audience to invertebrates through microscopy, demonstration models, insect light trapping columns. Water quality assessment training and bird counting tours are available before the performance;
- poetry part - the professional poet is invited to write poems about various species and to tell people about the linguistic nature of



Out in Nature - Nature Concert Hall Hydropsyche instabilis, 2008.

the species used generations ago. Usually the poet performs some attractions for children, games and reciting of poems, therefore familiarizing them with nature characters and having them in a way personified.

- artistic part – professional artists encourage and help visitors to visualize and portray respective concert heroes by drawing, creating installations, jointly preparing souvenirs from natural materials etc.



Learning unknown values of lichenes - Nature Concerthall Graphis scripta, 2009.

The performance is created as an activity stimulating various senses. The information provided to people motivates them to live in harmony with nature as Nature is an inseparable part of human life. Over the past three years, the audiences have grown from about 400 to 2000 visitors per concert. The events are organized in various areas to highlight the species found in our common surroundings and are free of charge. There have been eight concerts since the first event in 2006.

The Nature Concerthall has established good cooperation with several non-governmental institutions in Latvia – the Latvian Ornithological Society and the Entomological Society of Latvia. Student volunteers from the University of Latvia, Faculty of Biology, as well from municipal schools in the NVBR territory. The integration of participants as volunteers in the development of the performances, adds to general involvement and personal presence in the concert.

Some encouraging facts:

- In 2007, the Nature Concert hall concept received the Latvian Environmental Science Award for an innovative way of presenting environmental science in Latvia.
- During 2008, the nature concerts devoted to Hydropsyche instabilis about 3000 visitors learned to use outdoor microscopy for identifying tiny creatures and was the biggest educational microscopy event of such kind in Latvia.
- In February 2009, the Nature Concert hall music from the Phylloscopus collybita concert received the Latvian Music Award for the best instrumental album in 2008.



Outdoor appeal of Ambient Music - Nature Concerthall Graphis scripta, 2009.

4.7 Exhibits

In order to introduce people to values of a biosphere reserve one is attempting to preserve it is important to make these values understandable and valuable for all people. For this reason exhibits belong to another type of communication tool. Experience shows that mobile interactive exhibits are a good way to engage the visitors' different senses and make the learning process more attractive. The mobility of these exhibits enables the message to reach distant places. Exhibitions in a way are a democratic way of communication as it does not require large investments; however it is good to have funds available.

4.7.1 Examples of exhibits organised by NVBR

- **The exhibit "In Water & In Air"**



Mosaic from Interactive Exhibition „In Water and in Air".

Funded through Danish-Latvian Project "Development of the Nature Guide Institution in Latvia" dealt with the explanation of the processes in and along a river through the eyes of caddis flies (Ephemeroptera). The exhibition was based on engaging different human senses and perception through increasing the dimensions – the visitor becoming one of the numerous water dwellers - and thus making the activities more personal. The exhibit was designed as a chain of various viewpoints from the eyes of the caddis fly which contained interactive elements supported by practical and scientific information. Different approaches were offered to different age groups – for the smallest ones the creation of their own water symbols turned out as a start for the children's self-association with water animals and their life cycle, which suddenly became very personal for the children involved.

This exhibition was displayed in the headquarters of the NVBR and in 11 towns in different regions of Latvia, including the Museum of Nature History in the capital city of Riga with more than 15,000 visitors in total. The given exhibition is seen as one of the first interactive exhibitions in Latvia, which was created by devoted biosphere reserve specialists without previous experience in developing such exhibitions. It is very encouraging to note that all interactive materials for this exhibit were made from local materials and things you can easily find nearby.

- **The exhibit "In Time Curves"**



Modern Technologies brings History closer.

A different approach was used in the exhibition "In Time Curves" dedicated to the past and present of nature, landscape and culture along the river Salaca. This exhibition was built on visual perception using old photos and combining those with photos from modern-day times taken from the same viewpoint. The informative part of the exhibit was programmed in CD and accessible through a touch-screen and was used together with an interactive part, which was devoted to the geological history of the corresponding area. This exhibition was displayed in the headquarters of the NVBR and was later exhibited in three local libraries in different parts of the biosphere reserve, as well in the Limbazi District Museum, therefore widely available for visits by local schools.

4.8 Training of nature guides

The song of the corncrake from a misty meadow interspersed by the nightingale from nearby bushes, a silhouette of a white stork next to the farmyard -- these are still common features of the Latvian countryside, but are sometimes astonishing for people coming from outside the countryside. In order to transmit and promote this richness of natural beauty and at the same time fight against the depletion of human resource in the rural areas and to support the growth of local initiative and entrepreneurship, and to

develop ecotourism, biosphere reserve can successfully involve the local population in its work for safeguarding as well as popularisation of the biosphere reserve by developing a network of educated nature guides.

Definition of ecotourism

The understanding of ecotourism based upon the definition by thew International Ecotourism Society (TIES), describes ecotourism as the "responsible travel to natural areas that conserves the environment and improves the well-being of local people" (The International Ecotourism Society,TIES, 2003).

The activities implemented within the understanding of being part of ecotourism should follow these principles:

- Minimize impact on nature and build environmental and cultural awareness and respect,
- Provide positive experiences for both visitors and hosts,
- Provide direct financial benefits for conservation,
- Provide financial benefits for and empowerment of the local people.

In terms of the biosphere reserve concept, these descriptive sentences state one simple truth – by becoming nature guides, local people can raise their own confidence about their knowledge and values, as well as they can provide information which can be evaluated and interesting for others. By meeting different visitors, nature guides make their own lives more active and interesting as the exchange of information goes both ways – sharing, listening, questioning, seeing.

In NVBR through the INTERREG Project "Coastsust" funds were raised to train a total of 40 local Nature guides. The training was conducted by NVBR Administration specialists; two of them had previously undergone a 2-year training course within the Danish-Latvian Program "Development of the Nature Guide Institution in Latvia" and had obtained the status of trainers. The training under the INTERREG project included an introduction to the concept of the Nature guide specifics in addressing different age groups, the development and testing of excursion topics within the trainees' neighborhood, video-training during which participants learned their "weak points" and received constructive feedback to improve their skills and to be proud about the values so naturally embedded in their everyday life.

Continuous communication with the nature guides

Despite that the training of local nature guides is mostly a project-based activity, continuous communication with trained people must not be ensured. As it is not always easy to find the appropriate funds to support and continue such activities, an option used in North Vidzeme for following-up the training and remaining in good contact with these people is the regular circulation to them of information on current biosphere reserve activities and personal invitations to participate in biosphereereserve events. This shows that the biosphere reserve administration is really interested in ongoing cooperation and information exchange with these individuals.

4.9 Cooperation with non-governmental organisations

In the rural part of Latvia, non-governmental organizations (NGOs) and groups of community interests are rather undeveloped. It is objectively grounded on the fact that in the countryside, like in the NVBR, half of the population is still living in single farms apart from each other. Not surprisingly, in conditions of a rather limited flow of information and remoteness, these people are more self-oriented with limited information and experience on how their own activities in forestry or agriculture impact the general surroundings, as well as how to improve their quality of life. However they do unite among their interests



NGO forum, 2009.

in local hunter or local fishermen groups. And thus it is ultimately important to make these groups feel that their opinion and experience is needed, give them place to meet other active people and other local groups and direct their activities to deal with wider challenges.

The NVBR took the initiative to unite all environment-related groups and NGOs through an NGO Forum planned within the territory of the biosphere reserve. The first NGO Forum was organized in 2005 with about 50 people from 20 local NGOs represented. During the first one day meeting, there was a mutual agreement to learn from one another and to acknowledge the skills needed and opportunities arising from living within the NVBR. The first NGO Forum resulted with agreements on further cooperation in organizing joint events like local clean-up activities, re-opening of ancient historical sites, re-creating landscapes and improving river quality. The second NGO Forum "Meeting People and Nature" was organized in 2007 as a two-day event with about 80 participants. During the first day, leading Latvian economists, lawyers and environmental experts were invited to introduce NGO representatives to the current situation in Latvia, as well as on challenges and possibilities arising from living within the NVBR. Part of the meeting included presentations of local NGOs on their activities and an excursion lead by nature guides trained by the NVBR. It is notable that during the second Forum, representatives from the NGOs themselves began to have discussions on territory development, the possibilities of nature tourism and the need for a regular exchange of information and to feel a part of the NGO family. The 3rd NGO Forum took place in the summer of 2009 and assembled more than 150 individuals.

The number of NGOs is increasing and the NVBR initiative to, through the NGO Forum and other activities, offer the biosphere reserve as a meeting place is regarded positively by the organizations and providing constructive response in the form of increased cooperation between the NGO sector and the biosphere reserve. In addition, during the past few years, local NGOs started to apply for support from the NVBR Administration in the form of letters of support to make more successful application for funding of projects to implement them in their surroundings. These projects initiated and implemented by NGOs and community groups provide additional support in the management of the NVBR as an innovative area. Biosphere reserve specialists, through personal contacts, are inviting NGOs to participate in voluntary management activities to maintain or restore different habitats. In many cases such joint management activities becomes a sort of further twinning and involvement of NGOs to reach the goals of the biosphere reserve.

4.10 Society Integration

Ref.: Madrid Action Plan: Action 30.

The story of maintaining biodiversity in many cases equally is a story of maintaining such human values as trust and confidence of living together.

Mediating role of a biosphere reserve

Generally, the involvement of local individuals in community-based activities has an increasingly positive impact but still must be looked rather as an exception in our society. There is evidence that the acceptance of the sense of belonging to the community makes people more devoted to think of others which, in turn, improvemes the social climate.
In such cases biosphere reserve specialists can play an important interlinkage and mediating role

It is essential to accept invitations from local communities and individuals to take part in meetings and discussions, even if these may be difficult discussions on topics not in the direct field of responsibility of the biosphere reserve. Presence in any meetings in the local community, provides an opportunity for the biosphere reserve to represent the central governing environmental body in the region and, upon clarification of responsibilities and the basic root of the issue at hand, it is possible to provide constructive input into resolving the issue from the viewpoint of environmental protection and sustainable development. By being involved in the community in such meetings and discussions and providing a positive, solution-oriented position, it is possible to assist in resolving the concrete issue, providing vital expertise for a constructive result and, in parallel, raising awareness on issues important to the biosphere reserve. In this respect, it is especially important for such communication in cases where part of population has joined the local community from a territory or area outside the biosphere reserve area.



NGO volunteers from the Latvian environmental protection club „VAK" recultivating R.Jaunupe.

4.10.1 The case of Seda township in NVBR

The Seda township is one of those smaller towns which arose suddenly after the Second World War from nowhere in the middle of amidst vast forest and bog massifs. People were brought to this town from areas devastated by World War II far away from Latvia, speaking different languages and having other traditions and mentality, unfamiliar to the local native people –living outside of the borders of this isolated peat extractor town. Newcomers to this place according to the ideology were told they are on the forefront of building a social paradise - a sort of Sun Republic described by Campanella. Thus often the people themselves in Seda township felt as prophets of Communism completing fair and hard daily work digging peat for a living and at the same time living all together in this isolated land.

When times changed and the Republic of Latvia regained its independence, life in the isolated town of Seda changed suddenly, as there was a sudden necessity to use a language other than Russian and a necessity to start communicating with the native inhabitants living outside this town. Through these changes it became evident that there is a need to develop communication along with strengthening individual humanity and the ability to establish and maintain mutual self-respect. In this situation nature was, and still is, a thread that unites without losing one's identity.

With active NVBR support new NGO was established, uniting people interested in the development of Nature tourism and local economy in Seda area. Thus from sporadic visits to the town and single lectures in school we have turned to real activities jointly with local inhabitants applying for funds and organizing practical activities to develop nature trails. The platform for dragonfly observation installed on wetland margin and created by mutual efforts of Seda citizens and biosphere reserve specialists is an example and the only of such type in Latvia. Thus environmental issues become points for uniting both sides. The story of the Seda town and its residents is an example on how to learn acceptance, maintain and estimate history and heritage of not always so easy acceptable past

Chapter 5

Management Activities in a Biosphere Reserve



In the last Millenium in Europe the landscape was mainly shaped by Man. Additionally, in last decades energy and nutrient transportation has reached a global scale. Therefore wise human interaction with the surrounding nature is objectively needed to maintain as diverse a number of habitats as possible under the given societal and economic conditions.

As a biosphere reserve, for the most part, is a large territory with different types of areas, in order to manage the area properly with the limited staff, it is necessary to develop different methods to achieve results which would conform to the biosphere reserve strategy and objectives. Property rights are also important and require a special management approach. The above said is especially important in rural areas with a decreasing population, where Nature's comeback in the form of shrub overgrowth is not a synonym to a resumption of biodiversity.

5.1 Management of invasive species

The world is interlocked and is a small area in regards to the scale of transnational movement of goods and people. The same can be said of plants and animals. Some species, when rooted in soils or inhabiting land other than that to which they are native, indicate traits not prevalent in their native surroundings but which, in other surroundings become adverse to their new neighbours, other plants, animals or even humans. To regulate and control invasive species is an important work to be done also in a biosphere reserve. And often this work includes not only nature management practices but also people information campaigns and mobilisation.

Definition of invasive species

Generally an "invasive species" is defined as a species that is:

- non-native (or alien) to the ecosystem under consideration; and
- whose introduction causes or is likely to cause economic or environmental harm or harm to human health.
- Invasive species can be plants, animals, and other organisms (e.g., microbes).

In NVBR the most aggressive invasive species is the giant **hogweed *Heracleum sosnowskyi*** which was introduced from Siberia as a fodder in 1948. Different from its original characteristics in Siberia, the giant hogweed in Latvia quickly spread along the roads and streams and is harmful to humans by giving ulcers after direct contact with growing plants. To combat them first they had to be located. To spot locations and numbers of this specimen in invaded areas, the Voluntary monitoring programme (see Chapter 8.3) with a handy survey matrix was developed with several tens of respondents involved. A map of invaded areas was produced through the information provided by the respondents. Training seminars for local inhabitants were organized, additionally inviting more experienced Estonian experts. Together with Estonian experts joint Project proposals for future activities to combat the spread of the species were elaborated. The information provided through the Voluntary monitoring programme on this species were transferred to the Ministry of Agriculture's relevant authority who used this pertinent information for a broader-nationwide programme on mapping and combating the species.



Halting Invasive Giant Hogweed spread in the area.





American Signal crayfish Pacifastacus leniusculus.

Another invasive species, which is rather invisible, but is ousting the local native noble crayfish Astacus astacus, is **the American Signal crayfish *Pacifastacus leniusculus***. The main management measures to localize the signal crayfish distribution were attempted through the introduction of licensed recreational crayfish fishing. In the years 2007 – 2009, about 7000 signal crayfish were caught each year. The Signal crayfish elimination activity had a wide reception in the local, as well as in the national and even international media For the further development of the given initiative, changes in legislation regulating crayfish commercial and recreational fishing is needed. The information of local people on signal crayfish impact on native crayfish stock abundance seems to be another one of the management measures. This activity had large support from local fishermen, local authorities, and simply local inhabitants who enjoyed the revival of an old pastime to taste crayfish sitting by the bonfire under the glittering night stars.



Catch – Eat Signal Crayfish/Help us come back – leaflet explaining aim of the activity.

5.2 Management in the waters

The increasing need for water resources is becoming more and more actual even in areas with sufficient water availability as urban, agricultural and industrial expansion escalate the competition for the same water supply. Water management therefore involves the anticipation and resolution of user conflicts in a manner that protects the sustainability of the surrounding environment. Sustainable water resource management maintains a balance between growing social and economic demands. Biosphere reserves as innovation areas can play significant role in developing regionally adaptable and replicable water management patterns.

5.2.1 Example of the Lake Burtnieks management

Lake Burtnieks (40 sq. km) is the fourth biggest lake in Latvia and forms the Salaca River Basin. The lake collects waters from three rivers entering the lake. Speaking in comparison – the Lake Burtnieks is like the lungs of the NVBR due to the ability of the lake to act as a sedimentation pool for turbid substances brought into the lake via entering rivers. The only outflow from the lake is the fourth biggest wild salmon river in the Baltics – the River Salaca, and thus it plays a crucial role in the ecosystem of the entire North Vidzeme Biosphere Reserve.



Lake Burtnieks birdlife.

In 1929 the water level of the lake lowered by 1 m after regulation measures of the River Salaca were conducted. This made the lake more shallow (3,2 m deepest, average 2,2m) and opened it up for quick eutrophication. Furthermore, as a consequence of intensive agriculture and the use of mineral fertilisers in the 1970s and 1980s, the overgrown part of the total area of the lake increased steadily from 5 % in 1952, to 15 % in 1975, and to 20-25% in 1992. Currently the harmful impact of the eutrophication of the lake has led to intensive blue-green algal blooms and occurrences of fish mortality. Macrophyte vegetation hampers the use of the lake leaving only few narrow beaches and entry points for fishermen and recreational needs.

To protect the remaining environmental values, two Natura 2000 sites were established as narrow strips embracing 2/3 of the coast of the lake and causing conflict situations between fishermen, recreational activities and nature protection.

Solution and activities undertaken

The NVBR set out to find measures to soften the impacts of eutrophication and to balance the need to keep the lake for nature protection with the need to keep it accessible for planned and sustainable recreation activities -- not harming biological values. Such measures were applied on a pilot basis in the lake and included macrophyte removal and reopening of the coastal zone to increase spawning areas for fish and



Removal of excessive macrophyte overgrowth.

to facilitate sediment mineralization. The last activity also supported recreation in open, wave-shaped sandy beaches. The littoral zone of the lake was mapped and priority areas were defined.

Results obtained

Using funds raised by the NVBR (UNDP/GEF Project) during the course of three years a total of 50 hectares overgrown with macrophytes were removed and two beach areas were reopened. The activity was too small concerning the whole coastline of the lake. Nevertheless, it showed a slight improvement of the lake's physical and ecological state, as well reopened areas for recreational activities. The results are challenging and provided the Lake's Management Board with sound evidence to conduct fundraising in order to make it possible to continue the activities. The NVBR was asked to become a member of the Lake's Management Board, which was recognition of the expertise and support the NVBR had and can offer. At the same time, there is concern that, after completion of the UNDP/GEF project, the activities pertinent to the lake's management may not continue.

5.3 Restoration of floodplain meadows

Floodplains are recognized as a very important element of biological diversity. They contain a number of habitats of EU importance (e.g. 6410 Molinia meadows on calcareous, peaty or clayey-siltladen soils, 6510 lowland hay meadows) as well as their existence is crucial for numerous endangered and priority species, such as the Corncrake Crex crex, Great Snipe Gallinago media and Lesser Spotted Eagle Aquila pomarina. All these species require open floodplain areas that are not overgrown with shrubs or trees and are therefore endangered by processes of land abandonment and overgrowth.

Thus one of the tasks of the biosphere reserve is to organise the management and restoration of these floodplain meadows. Next to environmental gains, these restoration activities are also a useful tool to prove that the environment is a possible avenue to obtain practical and economically viable results.

The restoration activities next to other may include: 1) initial mowing, 2) bush cutting, 3) controlled burning. Mainly this work is being done by contracting and involving the locals not only professionals from the biosphere reserve itself. However it has to be underlined that as it was observed in NVBR, local people tend initially to underestimate the difficulties of conducting restoration of these very difficult territories and they often agree to complete tasks related to the management of these territories which they are later not able to fulfil. Another issue to be taken into account is that often the completion of the planned restoration works takes more time than initially planned, especially in the final phase of restoration – the removal of bushes and hay.

Yet the gains are greater and long lasting that the difficulties starting this job. The floodplain restoration and management in Latvia proved this. The attitude of the general public was changed from looking at the protected floodplain as a useless piece of land with lots of restrictions, to seeing the floodplain as a rich natural area with economical value as well, which can be obtained through EU direct subsidies. The project demonstrated that protected areas may also bring income, not only restrictions. The activities stimulated local farmers to get more involved in networking and exchanging experiences, and triggered much wider application of EU support measures for sustainable management of grasslands. This was achieved by providing regular assistance to farmers in the application for Rural Development Funds and helping with advice on management methods.

The approach used – to involve landowners themselves in restoration activities – although more complicated than contracting external assistance, proved to be more sustainable in terms of ensuring the future management (beyond the project) of restored areas. The landowners, who restored their meadows themselves, are more inclined to continue the management of the restored areas. Additionally, the restoration contracts signed between the owners of the land and the Latvian Fund for Nature (the implementing

agency of the EU project) obliged them to continue management of restored areas for at least five years. One of the advantages of participation in the project was the possibility for farmers to visit similar areas in Finland and Sweden, and directly communicate and compare the achieved results.

5.3.1 Examples of combining restoration methods

- The Briede meadows can be used for the demonstration of a combination of two restoration methods – **bush cutting and initial mowing**. The removal of shrub was done manually, using motor saws. Cut bushes were piled and burned on site. Mechanical mowing with chopping of hay was done subsequently. The activity was limited to periods outside bird breeding season -- no restoration activities took place between 30 March and 15 July. The pictures below show the site before and after restoration.

- The Lukstinu meadows can be used for demonstrating the method of removal of fragmentation to a meadow - bushes along ditches. The removal of bushes was conducted manually, using motor saws. Cut bushes were removed from the site. Parts of the bushes cut were sold, thus increasing the economic attractiveness of this particular activity. The activity was limited to periods outside bird breeding season -- no restoration activities took place between 30 March and 15 July. Pictures below show the site before and after restoration.

5.4 River recultivation

Rivers are a permanent feature of a biosphere, shaping its landscape. At the same time rivers are important species migration and spreading routes, as well the cheapest and most efficient water purification plants. Therefore healthy rivers provides a priceless services both to humans as well to the ecosystem integrity.



Before and after



5.4.1 Example of the River Salaca recultivation

The River Salaca is the biggest wild salmon spawning river in the Eastern Baltic with a strong and self-sustained population of naturally spawning salmon. The Salaca is also an important spawning area for river lamprey Lampetra fluviatilis and Vimba vimba. Both rivers are home for approximately 300 invertebrates, some of them protected under the EU Species and Habitat Directive, Annex I. (i.e. Unio crassus, Cobitis taenia, Misgurnus fossilis, Cotus gobio, Lampetra fluviatilis, Salmo salar). According to the River survey, done by the specialists from the Academy of Sciences of Latvia, most of the River Salaca's length corresponds to the state of a slightly polluted river. As a consequence of wide-spread use of nutrients in local agriculture together with cease of free timber floating in the 1960ies (raking and destroying weed root system expansion), favourable conditions were created for the swift development of macrophytes. Thus, the overgrowth of some river stretches with macrophytes reach 30 -50% of its total surface.

Solution and activities undertaken

Certain river stretches were selected for recultivation according to the results of the River survey which included records on stream hydraulic and river bed substrate, degree of river overgrowth with macrophytes, as well benthic invertebrate and algal survey. In total, 57 areas suitable for spawning were recorded. Agreements with 61 landowners along the Salaca were signed to agree on weed deposition after their extraction from the river.

During the river recultivation activities, the NVBR Administration staff worked to articulate the less known facts about rivers as the most efficient natural waste water treatment plants for domestic and diffuse non-point source biogene leakage. Parallel activities on river banks made it possible to demonstrate methods to decrease nonpoint nutrient leakage into the rivers as well as riverside landscape management practices.

Results obtained

During the period 2006 – 2008 a total of about 30 hectares of formerly-affected riffle areas were recultivated in the rivers Salaca and Jaunupe. Monitoring in both rivers confirmed that both physical (oxygen saturation, increase of stream velocity) and environmental (appearance of reophiluous species) features of recultivated river stretches improved significantly. Fish monitoring confirmed up to six time increases of salmonid smolts in several recultivated river stretches

Through the management of the terrestrial part of the rivers, as well through the development of riffle areas and fish spawning grounds, leaking phosphorus and nitrogen is trapped and the river's self-purification capacity and stability against erosion processes is improved. This shows the contribution and importance of a biosphere reserve to the overall task for local climate change mitigation.



Stretch of river Salaca prior



and after the recultivation activities.

Successes and encouraging facts

- The experience obtained made it possible for the NVBR to use the recultivated sites as a training area to transfer the practical knowledge to other rivers in North Vidzeme, as well as in the rest of Latvia. In respect to sustainable river management, NVBR has become one of the leading actors in Latvia;
- Implementation of regionally-available, low-cost river recultivation activities resulted in increasing the involvement of local society, their recognition and additional publicity for the NVBR goals;
- It is well known that rivers are open systems receiving energy (and degradable matter) from the surrounding catchment and thus need on-going maintenance activities. Through the recultivation activities NVBR has developed a positive „ownership feeling" for recultivated river stretches which is expanding to other rivers as well. Thus, the forecast for further river management development is becoming more hopeful.
- Recultivation activities resulted in a changed riverscape and improved water flow. For many local people it was like „coming back to childhood, when a clear river bottom displayed crayfishes and fish silhouettes".
- The sound results of these activities and the fact that everyone was invited to take part and see the results of his/her own activities provided additional recognition to the biosphere reserve from the local people. Some of the volunteer groups are now willing to take on further responsiblities for the river stretch they had improved.

- The activity attracted wide recognition from the mass media, from the local community and the different NGOs from Latvia, as well as Estonia.



Volunteers from from the Latvian environmental protection club „VAK" removes excess macrophytes from the R.Jaunupe.



Results of volunteers work.

Chapter 6

Development Function for Local Communities



To fulfill the ambitious tasks of the biosphere reserve concept as qualitatively as possible, it is always necessary to obtain additional financial, technical, as well human resources. Mainly the administration of a biosphere reserve is a nationally-supervised and funded institution. At the same time the biosphere reserve concept includes responsibilities far beyond the responsibilities of a single ministry or national funding, and, again, it is local area manager who determines whether to take an active or formal approach on the implementation of the biosphere reserve concept in a specific area.

The funding obtained through various projects provides the opportunity to take the more active approach, however this is much more time consuming. Nonetheless, projects make it possible to improve the functioning of the biosphere reserve, to expand the circle of qualified and motivated professionals in the biosphere reserve. Each project and all cooperation provide additional knowledge and facilitate the achievement of better results not possible under a limited budget allocated from the national budget only.

One of the driving forces for mobilizing funds through a project is to consider the number of jobs which can be created and the amount of funds (from the national budget) that can be saved through the generation of extra-budgetary funds through projects. With extra-budgetary projects it is possible to double and triple the total budget of a biosphere reserve and therefore multiply activities taken and initiatives implemented.

However each project is different, complementing different benefits to the overall development of a biosphere reserve. The most important aspect is that all these new possibilities raise the cumulative possibilities for new actors - scientists, entrepreneurs, single farmers to find situation encouraging for them to become involved.

6.1 Small grants facilities

Definition of Small grant

Small grant money is not a loan and do not need to be paid back.

Each farmer and entrepreneur living close to nature has a dream on how to use this nature for his/her own needs, and sometimes even a small amount of finances is the obstacle which keeps these dreams from becoming a reality. A biosphere reserve, through the small grants facilities can easily became a partner and fundraiser, giving local people the possibility to make their dreams a reality. As a result, additional supporters and promoters of the biosphere reserve ideas around the biosphere reserve territory can be established thus also motivating other actors in the region to be motivated to adapt environmentally friendly entrepreneurial activities.

In NVBR, the Administration took good advantage of the UNDP-GEF Project Small Grant Programme (2006 – 2008) through which it was possible to increase the number of supporters of the biosphere reserve idea within the local population, by supporting the introduction of environmentally-friendly and biodiversity promoting economic activities for local entrepreneurs and farmers. The guidelines and criteria for selection of the activities to be supported were elaborated together with selected group of regional experts and included agriculture, forestry, aquaculture, nature tourism, as well as handicrafts. The minimum and maximum amount of the individual grants to be allocated were USD 1000 as the lowest grant and USD 5000 as the highest sum to be applied for. The grant could cover up to 25% of the total expenditures in the budget of the activities from each applicant. The remaining 75% of the total budget for the activities were to be covered through an in-kind contribution of the applicant (in terms of value of labour, materials, etc) or through other funding sources mobilized by the applicant. The calls for applications for the small grants (there were three rounds in a period of three years) were announced through the local mass media (printed press) and were followed up by informative seminars held in different places across the NVBR for interested farmers and entrepreneurs to receive consultations from the small grants facility manager. The visits to the proposed small grant areas and consultations gave additional confidence for local people.

All together, during Small Grant Programme 60 applications were submitted, 44 of them were supported, and 41 of them were fully implemented. UNDP/GEF invested USD 150,000, and the applicants contributed an additional sum equal to USD 450,000. The projects achieved through this Programme varied from ecological cattle breeding to nature tourism and handicrafts.

6.1.1 Examples of small grant activities

- **Biological farm "Dzintari"**



Applied for funding in purchasing a car to develop "door-to-door" service providing clients with milk, honey and meat. The car has both the logo of the Association of Biological farming and the NVBR logo. Active daily communication with different consumers and quality of provided products is the best trademark and publicity for the NVBR. This mobility made the products of the farm more broadly accessible to the consumers, thus increasing the market share in the region of ecologically farmed products.

- **Farm "Lejaskerzeni"**



This project aimed at collecting slips from few remained trees and planting a 1000 tree garden of an almost extinct local apple variety "Paradise apple". As a result this multi-purpose activity contributed to the preservation of a local apple genetic pool, maintenance of traditions and cultural heritage, maintenance of landscape and diversification of rural entrepreneurship.

- **Entrepreneur – weaver Rasa Ozoliņa**



This small grant supported the improvement of working conditions in the workshop thus allowing the whole weaving industry to flourish in the region. The wool for weaving is acquired from local neighbours, who farm sheep, which means the support to the weaver increases the economic sustainability of the neighbouring farm. Wool dyes are prepared from local plants, thus supporting production of local, naturally-grown goods. Outcomes of this grant has led to enhancement of local handicrafts and preservation of cultural heritage, diversification of the products produced in this area, support of local sheep owners, maintenance of the landscape and providing of additional income.

6.2 Demonstration projects for habitat management

One of the biosphere reserve tasks being a „Model territory" is to provide scientifical-ly-based solutions on the maintenance and protection of biodiversity, which in a lot of cases relate especially in addressing habitats of international importance. Habitat management demonstration projects can be designed to test and document the most appropriate management methods and their consequences in practice with their further replication in other parts of the given bio-geographical region. Such demonstration sites later can serve for the education and training of responsible managers and private landowners.

In the NVBR possibilities to support local initiatives for valuable habitat management were promoted through the UNDP/GEF project funding. In order to determine which issues could be the best dealt with developing demonstration projects in NVBR, a team of experts from academic institutions and research groups was established to analyze the impacts in specific habitats of the NVBR and to explore the possibilities to mitigate these impacts through direct human interference. Altogether 74 natural values recorded for the NVBR were examined and relevant habitats and biodiversity-related problems in the respective habitats were defined, analysed and assessed.

As a result of the discussions and analyses eight proposals to mitigate human impact in the respective habitats were approved by the group of experts:

- Removal of second level of trees and tall shrub tree layer in definite boreal forest blocks (9010* Western taiga);
- Removal of second floor trees and tall shrub tree layer in definite boreal forest blocks (91DO* Bog woodland);
- Pine tree removal in undisturbed raised bogs (7110* Active raised bogs);
- Removal of pine tree groups in coastal grey dunes (2130* Fixed coastal dunes with herbaceous vegetation);
- Meadow pastures and grass removal to maintain rare and protected meadow habitats;





Pine tree removal in undisturbed raised bogs (7110 Active raised bogs). Before and after.*

- Revival of old Parks and roadside tree alleys maintaining structures important for biodiversity;
- Coastal belt management along rivers and lakes to increase their terrestrial/aquatic ecotone functionality and scenic values further suitable for tourism promotion.

The establishment of small-scale demonstration sites with the prescribed activities in each of them were announced as a grant. A number of points of knowledge necessary for the applicant to have in order to carry out the activities to maintain good ecological state for the given habitat were set. The main criteria for the applicants were effectiveness of their proposed activities with less disturbing impact to the rest of the habitat and the possibility to undertake mitigation activities after the initial funding.

It is too early to make full scope evaluation of all activities undertaken and their long term consequencies. Nevertheless additional practical experience is already obtained. Preliminary guidance is prepared for the introduction of these acitivities in other places of Latvia.

6.3 Development of infrastructure for nature based tourism

Nature based tourism is one possible income source for local people; however, the development of a tourism infrastructure is a resource consuming process and not a priority for remote municipalities with limited resources. Many world biosphere reserves or parts of them can be classified as remote areas. Nonetheless it is exactly these remote places which have great potential for attracting nature tourism. Towards this goal a biosphere reserve can be a great partner and supporter. In cooperation with local stakeholders a biosphere reserve can seek for funds to undertake the initial investment in developing the appropriate tourism infrastructure with the least impact on nature and at "critical tourism points", later handing them over to local municipalities/ other stakeholders for joint management and further development and expansion of the infrastructure as a whole. Such an approach to concentrate on critical tourism points allows to introduce the visual identity of a biosphere reserve in those tourist areas and to make it operational for the rest of the biosphere reserve as well.

An additional challenge for a biosphere reserve as innovative areas is the recognition of people with special needs. This issue still is quite fragile in our society and not always considered. The first attempts are already made and positive response from both handicapped people as well as local society is obtained. It is foreseen, that the NVBR will further develop a set of adapted stands to make the stay for handicapped people longer in the NVBR and thus help integrate these people into society.

In total, over ten years in NVBR together with local entrepreneurs and municipalities we have developed six trails, each aimed to introduce a different ecosystem in order to develop a diverse offer to those visiting the NVBR territory. In cooperation with other stakeholders, a leaflet with maps and short descriptions "Nature Trails in North Vidzeme" was produced:

6.3.1 Examples of Nature tourism

- **Daugeni Trail**




12 km long modestly equipped walking trail along the River Salaca with scenic viewpoints meant for active walkers willing to explore nature in quiet surroundings. The trail is equipped with information stands designed in accordance with the NVBR Corporate identity. In the future, the trial is to be expanded along the length of the whole river (about 80 km).

- **Visraga Trail**




Located within a historical area dating back to the XIII century with ancient castle ruins and an old manor park, the trail commences at the Manor Park "Silver Gates" trail and leads visitors along the coast of the Lake Burtnieki introducing them to the environmental, historical and cultural values of the site. The trail leads to a bird watching tower, located amidst a meadow, lake and forest.

- **Randu meadows**




Randu meadows are the biggest coastal meadow complex in Latvia. 300 hectares of coastal meadows holds one third of all plant species in Latvia. Some of these species (i.e. halophytic) have their distribution only in the meadow of this complex. The trail is located on the bird flyway. The trail has a bird watching tower and is located on the border between a meadow, forest and sea. Diverse birdlife can be observed here. The tower won 1st place in the annual National Bird watching tower competition in 2007 with the highest number of bird species ever observed in Latvia during the 24-hour bird watching.

- **Niedraju-Pilkas bog trail**




This raised bog ecosystem observation trail is built using an abandoned railway trail dam crossing the wetland. It is a unique possibility to use a car and to suddenly find oneself amidst low and crooked pine trees and Sphagnum barrows. The circular trail leads to an observation tower hidden next to the bog pool. It is an inviting location to spend a night amidst the sounds and smells of a wetland at night.

- **Seda peat extraction site observation stand**




Sometimes even degraded areas can sustain high biological diversity, such as in the former Seda bog, where, after the cease of peat extraction, water starts to fill the former extraction sites and creates shallow and warm lakes suitable for different dragonfly species. The NVBR have developed the only observation platform and information stand in Latvia devoted to dragonfly observation. With respect to the local people, texts are as well in Russian. This is an example on how the word "degraded" loses its negative meaning.

- **Janisu-Dainas bog trail**




This trail is adapted for people with sight problems. The Educational Trail is only 400 meters long with five viewpoints explaining interaction between the bog and forest, as well as the functioning of a wetland. The trail is supported with written information in Brail transcription suitable for people with sight problems.

Chapter 7

Cooperation possibilities



The biosphere reserve concept is built on the development of networks to solve specific tasks. Only through real cooperation and exchange of results and best solutions can the very idea of a biosphere reserve be implemented. Of no less importance is the joint feeling of common region. Even during the age of the internet, direct contact with other biosphere reserve managers and specialists are the most productive and inspiring occasions.

7.1 International cooperation

Ref.: Madrid Action Plan: Action 28

International cooperation is not only a source for inner development of a biosphere reserve but it is also very important in order to find and be with institutions and organisations which are working and thinking similarly. International cooperation means finding common grounds with colleagues all around the world from both similar as well as different regions of the world to acquire and implement best practices for sustainable development which have been invented and tested in other areas. Experience has proven that mainly one common activity or meeting is followed-up by another thus multiplying the results of the common work and widening the cooperation network and circle of partners. International cooperation is also important to increase the recognition of a biosphere reserve both on national and on international level.

7.1.1 Networks among different biosphere reserves

In the Nordic and Baltic countries, as well as north-western Russia, up until now there are eight biosphere reserves, covering arctic environments, boreal and boreonemoral forest landscapes, agricultural landscapes and coastal environments, having similar problems to solve and challenges to face.

For the NVBR, this network began with a short informational e-mail from the Swedish MAB requesting data for a joint understanding of the biosphere reserve and MAB issues in Latvia to be presented in the Nordic Council seminar in 2004. Further exchange of information revealed that the Nordic Council funding comparing with those days Latvian prices is sufficient to arrange a broader meeting in Latvia with the involvement of representatives from the NordMAB Region. The NVBR proposed and got acceptance to become coorganiser and provide the venue for the given meeting. This became the NVBR's "Entrance ticket" to the biosphere reserve family.



Social event – NordMAB specialists joining in dance.

The meeting was organised in 2004 in Salacgriva with about 60 participants from nine countries. The MAB Headquarters were represented by the MAB Lead specialist at the time, Jane Robertson, which added a Global biosphere reserve perspective to the meeting by stating priorities and current state of Biosphere Reserves worldwide. The active and diverse discussions on different issues and joint understanding of the problems – this meeting was starting point for acceptance of the NVBR in regional activities.

During the meeting, the NVBR were "checked" and accepted by Finnish biosphere reserve representatives, and resulted in a proposal to become a partner in the INTERREG Project "Coastal sustainability as a challenge" uniting one national park and four biosphere reserves around the Baltic Sea Region. The INTERREG Project gave the NVBR a possibility to learn about other biosphere reserves through direct contacts and organize joint seminars on nature protection and planning in coastal areas, involvement of local people in biosphere reserve activities and safeguarding of joint cultural heritage. The Project provided expert and even NVBR supporter exchange visits to East Estonia Archipelago Biosphere Reserve (Estonia), Waddensee Biosphere Reserve (Germany), Archipelago Biosphere Reserve (Finland), Curonian Spit National Park (Lithuania). Such exchanges with no doubt give additional value for cooperation, as well as enhance personal attitude and understanding on how issues can be solved.

In 2004 the NVBR met Canadian expert Brian Craig (Niagara Escarpement Biosphere Reserve/LongPoint Biosphere Reserve, Environment Canada). This meeting was a starting point for fruitful cooperation between the NVBR and Canadian biosphere reserves. Consequently it lead to four NVBR specialist training visit to Canadian biosphere reserves as well as involvement of Canadian biosphere reserves managers, researchers and academic representatives (University of Waterloo) in the organisation of international conferences in North Vidzeme.

7.1.2 Promotion of biosphere reserve experience to the former Soviet Republics

Living together in the former Soviet Union has left definite marks on the structure of public administration, nature protection, as well as in the minds of people living in their now independent countries. In some of these countries, the concept of biosphere reserves is well established (Russia, Belarus), while others are reviewing how to establish a biosphere reserve.

The NVBR, in close cooperation with the Latvian National Commission for UNESCO and UNESCO Moscow Office launched a joint initiative to invite biosphere reserve managers and practitioners from Azerbaijan, Armenia, Georgia, Moldova, Belarus, Estonia, Lithuania and Russia to share Latvian experience on the establishment and management of a biosphere reserve. The workshop on biosphere reserve management for biosphere reserve managers and experts took place in the NVBR Administration's premises from September 16 - 19. 2009 and gathered 36 experts. It developed into an intensive platform evaluating development possibilities for biosphere reserves in the light of the Madrid Action Plan and generating new ideas for further cooperation.

With the opportunity to freely use two working languages – English and Russian – to ensure full mutual understanding among participants, workshop succeeded to involve all the participants, transmit the knowledge, learn other experiences as well as agree upon follow-up. Additionally, due to the own skills of participants, musical evenings with playing piano and singing opened doors to cultural dimension and melted all participants in an active and warm hearted nucleus.

7.1.3 Transboundary and bilateral cooperation

Joint previous cooperation experience with Estonian colleagues on the management of transboundary wetlands (See Chapter 3.6) served as a pre-condition for the Europarc Federation uniting more than 500 protected areas in Europe to propose the organisation of the first TansParcNet meeting in Estonia, Lepanina, with further visit to the NVBR in 2009. In total 29 representatives from 12 countries and 13 Transboundary Protected

areas participated in this visit. Through cooperation with the Estonian partner it was possible to articulate the role of biosphere reserves to act as innovative and model territories achieving sustainability in environmental, social and economic development, which produced added publicity for the biosphere reserve concept.

7.2 Networking with different projects and programmes

Ref.: Madrid Action Plan: Action 25.2

Seeing the biosphere reserve in all its complexity allows us to see many possibilities for cooperation and networking based on different grounds – different habitats, borders, similar regions, etc. Each of these contacts and involvement broaden understanding and provide the biosphere reserve with additional experience on how to develop one or another idea. Through active cooperation it is also possible for the biosphere reserve specialists to share their own expertise and best practises in environmental and sustainable management and development.

7.2.1 Network of UNESCO Associated Schools

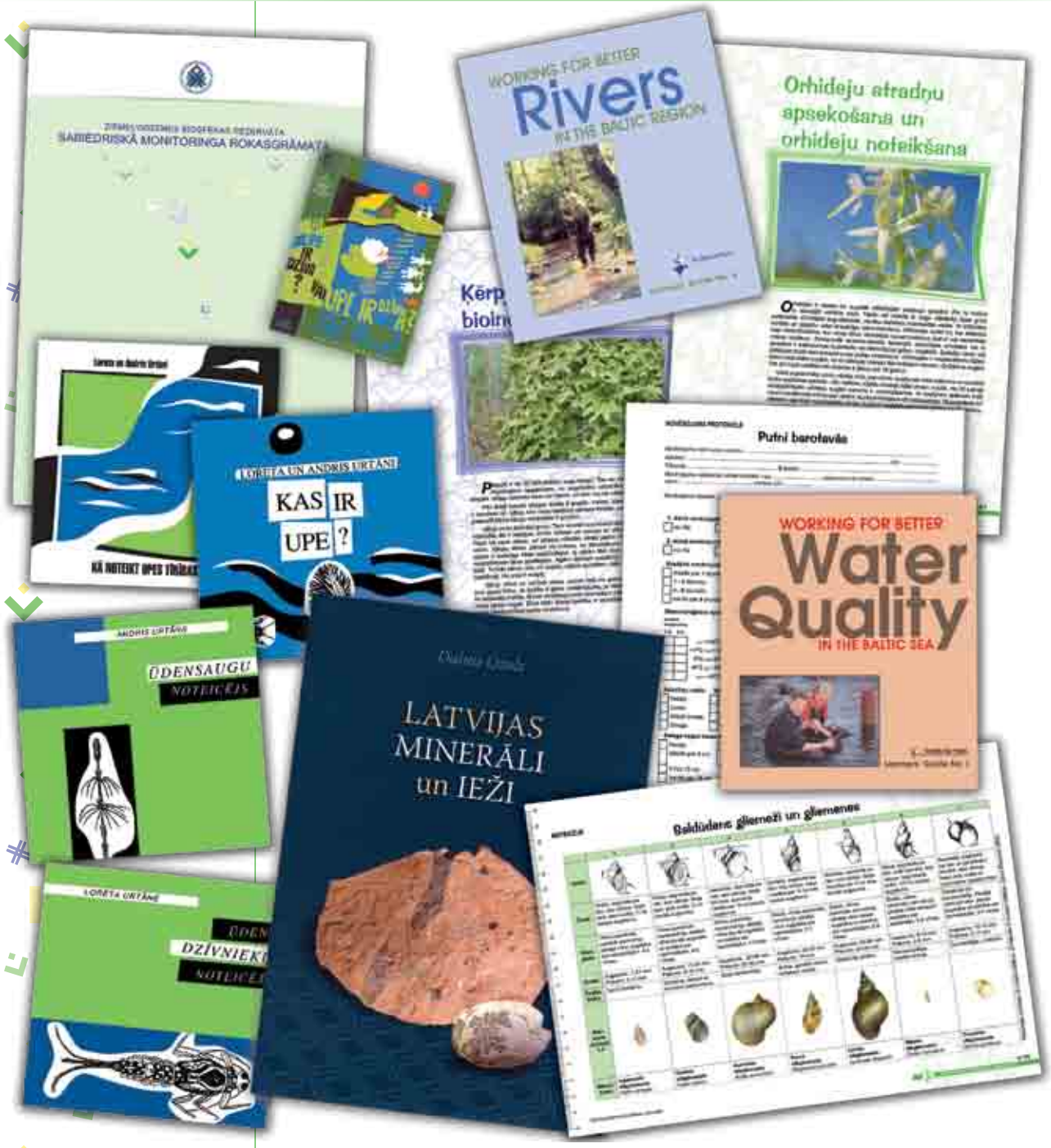
Representing one global intergovernmental organisation a lot of partners for a biosphere reserve can be found within UNESCO networks and other UNESCO programmes. One of the most important partners in this aspect especially for educational purposes is the network of UNESCO Associated Schools. This network allows mobilising for monitoring, information gathering, communication and learning highly committed, responsible and willing schools outside the biosphere reserve. Additionally UNESCO Associated Schools often initiate their own projects and programmes within the line of the work carried out in a biosphere reserve and thus – cooperating with a biosphere reserve as a true platform for learning.

One such a project is the **"Baltic Sea Project" (BSP)**. This initiative was started at the beginning of nineties in Finland with an aim to raise the awareness of the students about the environmental problems in the Baltic Sea area and to give them an understanding





BSP Teacher and student training in the NVBR.



Photos of produced materials.

of the scientific, social and cultural aspects of the interdependence between people and nature, as well as to develop the ability of the students to study changes in the environment and thus encouraging them to participate in developing a sustainable future. Currently the BSP Project involves around 300 schools around the Baltic Sea.

Objectives of the Baltic Sea Project are very close to that of the biosphere reserve concept, thus the NVBR has been a strong supporter of this initiative by organising different courses and trainings for teachers and students about different issues concerning environmental problems in the Baltic Sea area, giving them an understanding of the scientific, social and cultural aspects of the interdependence between people and nature, involving them in a practical projects for air and river quality assessment in the Baltic Sea region.

7.2.2 Cooperation with environmental agencies

Water-related issues become an urgent and visible problem in industrially-developed regions. The Water Framework Directive is designed to cope with the given challenge in an integral way in Europe. In Latvia, in general water quality and availability is still rather good and people still do not consider water as a possible problem and value. Nonetheless, through contact with representatives of other countries one can identify problem areas that could become vital issues in the future.

In the beginning during the visit of French representatives of Artois Picardie Water Agency and the Canche local community syndicate for the implementation of the local river management plan to Latvia, their visit to North Vidzeme had an informative character. During presentations a joint understanding on many issues were established and possibilities for cooperation were noted. Further communication brought to the signing of an agreement on cooperation in water related issues with the above mentioned river basin management authority on biodiversity protection and management as well as in environmental education. As a result, activities among school students and specialists are ongoing. Schools are becoming active and exchanges of children between NVBR schools (Viestura secondary school) with French counterparts in Hesdin are actively developing. The cooperation is also positively recognised from the Centre of French Culture in Riga, making NVBR people as local ambassadors of information and cultural exchange between two countries.



Learning sustainable water management in Canche area, France.



Opening ceremony of Biodiversity Exhibition in cooperation with France Culture Center in Salacgriva, 2009.

Chapter 8

Research and Monitoring



Nonetheless, in many cases these segments are doubted or even neglected by local planners, decision makers and stakeholders. At the same time, the scientific study of the social, economic and cultural aspects of biodiversity conservation is essential for determining possible changes and defining options to implement solutions ensuring biodiversity conservation and sustainable economic development.

Biosphere reserves as model territories and innovative areas generally are attractive for research due to their focus on applied research, their interdisciplinary data and information pools. Of no less importance is logistical support available to the researcher from the outside with maps, data bases, general knowledge of local conditions, as well as with possibilities for accommodation and transportation - in many cases so crucial to undertake research activities in remote areas. Researchers can play an important role, not only providing the biosphere reserve with data, important for long-term monitoring goals, but also as ambassadors for lobbying and decision-making with local stakeholders.

There is no specific funding dedicated specifically for the research and monitoring needs of the NVBR. The main way to promote research and obtain data is based on close cooperation with researchers from the Academy of Sciences of Latvia, from different Latvian universities and independent researchers. Funding for these research initiatives mainly are Project-based and therefore not lasting. The University of Latvia has a Hydrobiological Research Station in Vecsalaca with more than 20 years data series adding significantly to the understanding of the aquatic ecosystem functioning in the biosphere reserve.

8.1 International and national monitoring programs

Ref.: Madrid Action Plan: Actions 16.3, 18.1.

In accordance with the biosphere reserve concept, biosphere reserve as a representative area must be included in the international network to exchange information and knowledge on the state and trends of environment in the respective bio-geographical zone.

Latvian National Long-term Ecological Research (LTER) is a part of the International National Long-term Ecological Research Network and is associated with the International Biosphere Reserve Integrated Monitoring System (BRIM). The National LTER Network of Latvia is supported by the Latvian Council of Sciences (LCS). At present from five LTER sites, three are located within the NVBR territory with the following monitoring directions:

- Changes in species diversity in the background of fluctuations in climate and antropogenic factors;
- Impact of environmental changes on the development of freshwater communities and quality of ecosystems;
- Variability of climate in Latvia and its impact on freshwater ecosystems;
- Structure, interaction and transformation of boreal and nemoral plant communities in Latvia under the influence of climate warming and environmental pollution.

8.1.1 Examples of international monitoring programs

- **Long-term studies on terrestrial ecosystems**

Long-term studies on terrestrial ecosystems were started in 1990 by the Laboratory of Bioindication, Academy of Sciences of Latvia. In 1992, Scots pine forests near the town of Mazsalaca were selected for studies on climate change and soil pollution effects on forest ecosystems. More than 30 parameters characterizing forest tree stands, forest floor vegetation, lichens, fungi and soil fauna are studied. Since 1996, long-term dynamics of plant and invertebrate communities are studied in the marine coastal meadows "Randu plavas".

- **Migratory fish monitoring**



Monitoring salmonid smolts.

The river Salaca is the fourth most productive wild Baltic salmon Salmo salar L. spawning river in the main basin of the Baltic Sea (Baltic proper) with about 25,000 salmon smolts annually descending to the Baltic Sea. According to the International Baltic Sea Fishery Commission (IBSFC), the river Salaca is the biggest wild salmon spawning river in the Eastern Baltic with strong and self-sustained population of naturally spawning salmon. River is also an important spawning area for river lamprey Lampetra fluviatilis and Vimba vimba. Monitoring activities executed by the Latvian Fishery Agency in the River Salaca began in 1961 and the obtained data set is one of the longest of such kind in the Baltic. The River Salaca is nominated as an indicative river for Latvia for the reporting state of wild Baltic salmon to the EU. According to the monitoring data, country limits for salmon sea catching are calculated. Thus monitoring is directly connected with economic interests and represents the applied pattern of the definite monitoring program.



Results "on hand".

- **Hydrobiological monitoring of river Salaca**

The monitoring program began in the eighties and, together with the migrating fish monitoring program, gives insight into the functioning of the river ecosystem. Together with data sets on changes in agriculture, forestry and local infrastructure, comparative maps on 20-year trends in river overgrowth with macrophytes provides important information on eutrophication and on possible climate change processes. Together with the long-term trends of migrating salmon smolt, monitoring data justified the necessity to improve the spawning success for the salmonids as well as for other valuable (not only in economic terms) fish and invertebrate species through recultivation of possible spawning areas within the river Salaca and its tributaries.

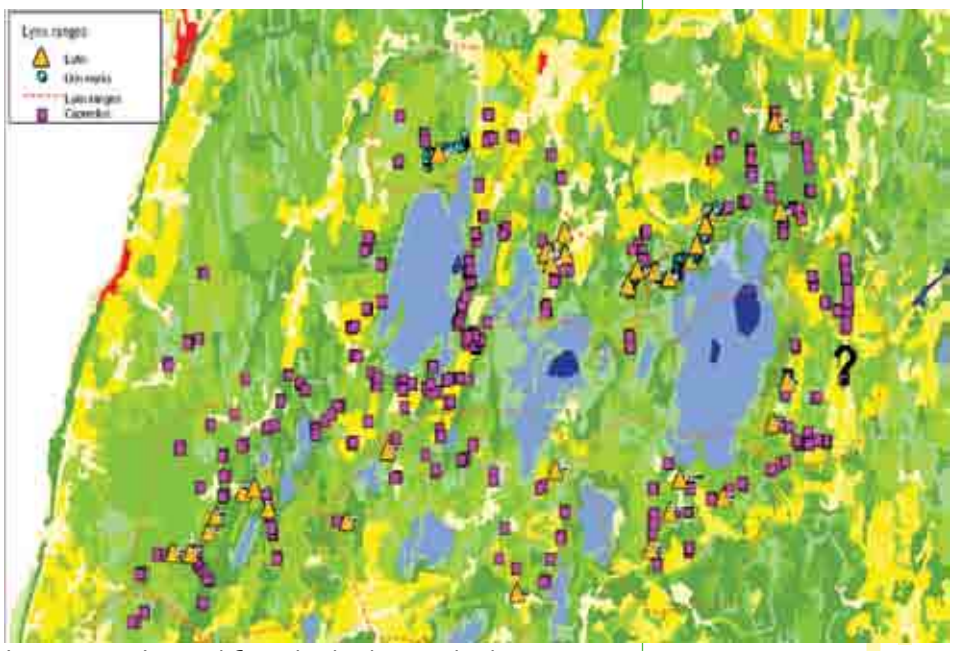
- **NVBR as an international research site**



Finnish and Polish experts searching for Red algae origin centers in Europe. R.Vitrupe, 2008.

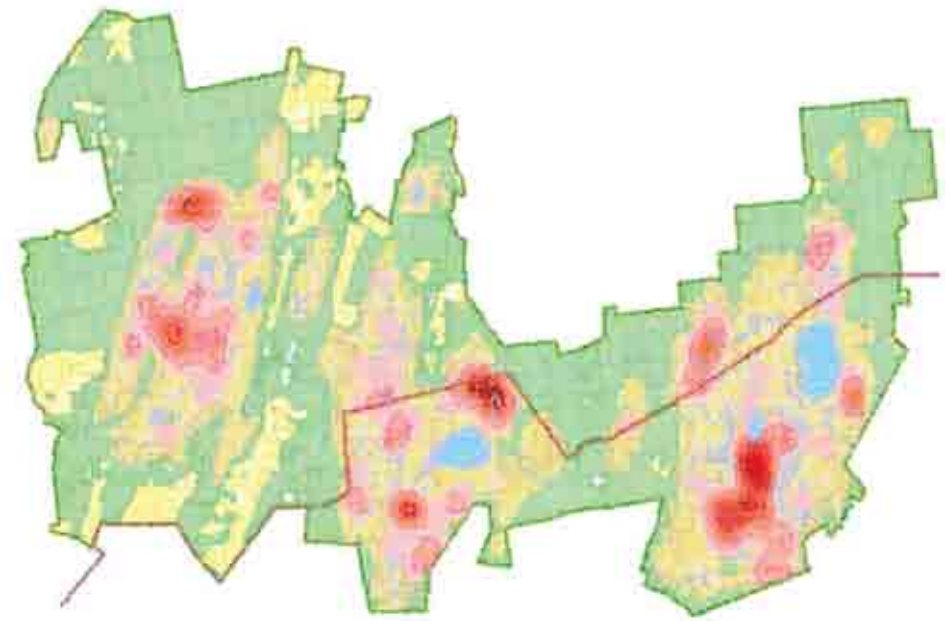
Existing data sets and local knowledge makes the NVBR a captivating place also for local and international research. In many cases, research is project-based. One of the most respective research carried out in NVBR was surveys on Pearl mussel Margarita margaritifera, conducted by a special group of expert divers from the Zoological museum of Helsinki, leading group of respective specialists, trying to establish former Pearl mussel populations in former pearl rivers. Another survey was on the history and emerging points of red algae Rhodophyta in Europe undertaken by Polish and Finnish experts. NVBR has also been involved in investigating the relationship of the local society to protected areas and their involvement in decision making in such areas around the Baltic under the INTERREG IIIA Project "Coastal Sustainability as a challenge". In total project involved inquires of 1000 respondents in four biosphere reserves (Waddensee Biosphere Reserve in Germany, West-Estonian Archipelago Biosphere Reserve in Estonia, Archipelago Biosphere Reserve in Finland and NVBR in Latvia) and one National Park (Curonian spit in Lithuania).

- **Research in Transboundary context**



Joint survey on Lynx and Capreolus distribution in border area.

Investigations on wetlands between Estonia and Latvia as a separate research programmes with different intensity on both sides were carried out for several decades. Nonetheless, only during the PIN-MATRA Project "Integrated Wetland management in transboundary area of International significance" joint complex research project was undertaken, including research in wetland hydrology, wetland and forest habitat integrity, as well as dealing with the state of game and bird populations. In addition, an investigation of joint cultural heritage aspects was carried out. As a result of separate international expert group investi-gations, a joint asterplan for the given transboundary area, including transboundary Ramsar site was elaborated.



Distribution of suitable habitats for Tringa glareola – indicator of undisturbed transitional mire ecosystem in transboundary territory of Latvia – Estonia, ArcGIS I Spatial Analyst , 2005.

- **National Monitoring Programe**

Besides the River Salaca migrating fish and ecological state monitoring devised under the National Monitoring Program, NVBR specialists are also involved in the National monitoring of globally threatened species – the Lesser spotted eagle. One of four Latvian monitoring places is located within the NVBR area and NVBR specialists have undergone special training to monitor the given species.

- **Specific research**

NVBR specialists are themselves involved in different research programs, giving cumulative value and data for proper management and decision-making. As for the model territory, it is important to show local possibilities to diversify the local economy and introduce alternative landscape management forms. As one such example is the experiment with aurock and wild horse Polski konik integration in area management in the enclosed 80 hectare territory and supervised by a NVBR expert. This project aims at testing efficiency of natural grazing scheme in biodiversity maintenance and landscape management. This experience seems to be promising as the herd is increasing and a formerly overgrown area is reshaped into a more open one. Additionally, the experiment attracts visitors and gives some small but significant support to local people also financially.



NVBR specialists mapping unknown sandstone outcrops.

- **Seda mire – example of the restoration of degraded ecosystems**

One of the NVBR mandate refers to the input for the restoration of degraded ecosystems. The Seda mire represents an area of 70 km2 of excavated raised bogs, now undergoing specific multi-varied regeneration process and creating new types of wetlands. 500 hectares are still under excavation thus causing an extraordinary possibility to implement the best findings on wetland recovery and making the area an internationally unique pilot area for the implementation of best practises for wetland restoration. The scale of the Seda wetland gives it international significance. The area is included in the Shadow list of Latvian Ramsar sites.



Nature comes back to the extracted peat fields in Seda marsh.

In close cooperation with the UNESCO International Hydrology Program and using the UNESCO Participation Programme sources in cooperation with the Latvian University of Agriculture, the Institute of Water Management and Land Science, a hydrological model for the Seda mire was elaborated. This produced a picture of foreseen hydrological processes and their impacts on the local landscape, ecological values and possible strategies for economic development. This data was later included in the local municipal land-use plans.

8.2 Field Courses

Ref.: Madrid Action Plan: Action 16.1

Referring to biosphere reserves as interdisciplinary training areas, it is offering its territory and premises for field courses and praxis, where students from different universities and colleges can receive insight into problems and solutions in a specific area. Site visits and direct discussions with the biosphere reserve experts and university professors provide students participating in such field courses an additional aspect of testing and comparing theory with practise. Such a pattern of direct communication is favourable for students and new researchers to choose an area for their future bachelor, master's or even PhD studies. Regular cooperation with national universities raises the interest in, credibility and prestige of a biosphere reserve. This also gives additional proof to invest in research tools and to jointly maintain existing monitoring premises in the biosphere reserve.



Student field course in Seda marsh, 2008.

Due to its synergetic combination of conservation, development and research functions biosphere reserves can become particular areas for evaluation of human impact on the surroundings. Each historical period leaves its specific marks in the landscape – including the latest, Soviet period. Therefore, to understand the phenomenon of the urban planning of fifties, in 2008, in cooperation with the Latvian University of Agriculture, a field course on the Seda town as a survived artefact of the Soviet period landscape planning involved students from the Tartu University (Estonia). These students, jointly with their Latvian counterparts, assisted an international team of landscape specialists in their field work to understand and document the urban planning methods of that period.

8.3 Voluntary monitoring

Ref.: Madrid Action Plan: Actions 3.1.; 10.1.; 16.3., 19.1.; 20.2.

The involvement of local inhabitants through their own motivation to learn, understand and act in their own surroundings to maintain biodiversity is a crucial point for the continuous management of a biosphere reserve and as such is put in the concept of the Eco-watch programme. The Eco-watch programme is aimed at investigating still unknown values or even threats of a biosphere reserve and monitors the changes. The initiative is mainly based on volunteers living in the area.

The Eco-watch approach, using volunteers, has been implemented around the world. Nevertheless, each situation is unique. Finding uniting points of interest between area managers and inhabitants voluntary monitoring becomes an important tool to raise general public awareness and involvement in each individual case. It has been proven that the initiative has very strong feedback and this process has the potential to become the main mechanism to monitor biodiversity in the vast territory of the North Vidzeme Biosphere reserve.

The voluntary monitoring program plays an increasingly important role as a new innovative measure, giving added value to the improvement of data bases. This program cannot replace scientific monitoring programs; however it provides a broad influx of background information. In many cases it has not only an illustrative pattern, but also serves as a basis for more profound research. Data are collected according to protocols and sent to the biosphere reserve administration to be added into the publicly accessible database. In order to ensure some quality standards, annual meetings with scientists, who provide training and feedback to the volunteers on standard methods for collecting, reporting, managing and analysing data, are organised.

In NVBR, before initiating voluntary monitoring program, respective experts were addressed to elaborate or adapt 19 monitoring programme methodologies dealing with different environment aspects. Programmes included easy making detection tools and mapping of local big dimension old trees, orchids, bats, dragonflies, several bird species, as well as water quality of small rivers, locations of invasive giant hogweed, sometimes contradictory beaver dams and their flooded areas. All monitoring programmes are assembled in a Voluntary monitoring Handbook, which describes each Programme in a step-by-step manner. All materials are available in NVBR webpage; as well paper copies are disseminated in each local school and local library. Thus, elderly people and those who are not familiar with modern logistics are addressed and can get involved. Currently, the voluntary monitoring in NVBR embraces a group of around 750 volunteers having extremely diverse backgrounds in education, occupation as well as age structure. General interest is growing and an agreement is achieved to link the NVBR Voluntary monitoring programme with the national initiative "Learn and inform" is currently sponsored by SwedBank and run by the Latvian Fund for Nature.



Monitoring Air quality using Lichenes as a bioindicators.

Voluntary monitoring of weather conditions

Studies of weather conditions can become a valuable source of information. Since the 1960s, Mr. Ampermanis has been making daily observation of temperature, wind, cloudiness as well phenological observations of plant life and bird migration simply for his own interest.

Data was noted in six note books. Numerous comments on page margins dealing with events in the social and economic life of the Karki parish and the whole country, gives especially interesting local phenology inscription not only of scientific value, but as well as a Karki parish chronicle. This example promoted many other private diaries and involved additional respondents to the voluntary monitoring programme Eco-Watch.

8.4 Scientific advisory group

Ref.: Madrid Action Plan: Action 20.1.

From the very beginning, it is important that the biosphere reserve develops in close cooperation with different scientists, and thus new research projects are being initiated, organized and coordinated adding value to the biosphere reserve and its data base, which becomes more interdisciplinary and more attractive for new researchers.

To develop a joint view on research priorities of the NVBR, the Administration organized a joint meeting of all Latvian academic and science institutions already operating or interested in research activities within NVBR. A Scientific Advisory Group was established to cooperate with the NVBR Administration in setting priorities for future research and investigation.

Together, the Scientific Advisory Group members identified relevant research topics, which could provide the foundation to establish operational Research Program. Agreed priorities were later presented to the Consultative Board of the NVBR.

8.5 Scientific conferences

Spreading findings from research studies in biosphere reserves as model territories for environmental, social, economic and cultural sustainability are essential not only for academic society, but even more for local decision makers and stakeholders to grasp new options and implement proposed solutions.



Brian Craigh, Biosphere Reserve expert from Canada.

As the biosphere reserve is mainly a more administrative and coordinating institution, local colleges and universities can be of great assistance in carrying out local scientific initiatives also on an international scale. The **benefits of scientific cooperation** are:

- strengthening of the role of science in the region,
- promotion of cooperation among higher educational institutes and different administrative institutions in the region,
- popularisation of the goals of the biosphere reserve in the region through scientific activities.

Due to the presence of the regional leading education institute, the Vidzeme University of Applied Sciences, in very close proximity to the NVBR territory, the NVBR initiative to act jointly in bringing together national and international scientists in the disciplines of economics, tourism, biodiversity conservation, human and physical geography, social

learning and environmental education was eagerly accepted and turned out as mutually beneficial undertaking. Until now proposed cooperation succeeded in jointly organising two scientific conferences of regional importance as an international meeting point for scientists.

The first Scientific Conference under this newly-established cooperation between the University and the NVBR was entitled "Economic, Social and Cultural Aspects in Biodiversity Conservation" in 2006. The Conference hosted about 100 representatives from five countries, including such distant countries as Japan and Canada. In total 25 reports, both posters and oral presentations were presented. The second Scientific Conference „Sustainable Planning Instruments and Biodiversity Conservation" was held in 2008 with more than 40 scientists from 9 countries, including Japan, Canada and Georgia.

The increased interest which developed from the first to the second conference from local scientists, students and the mass media showed that the biosphere reserve as interpreter and disseminator of the results of scientific projects and research occupies an increasingly more notable position in the region and at the same time, fulfils the tasks set by the biosphere reserve concept as expressed in the Madrid Action Plan.



The second Scientific Conference „Sustainable Planning Instruments and Biodiversity Conservation", Valmiera, 13-14 November, 2008.

Chapter 9

Sustainable Development Profile



Definition of sustainable development profile

A sustainable development profile is a tool to determine the quality of biosphere reserve governance. A sustainable development profile for any protected area or a biosphere reserve consists of a set of indicators that measure or evaluate the success of its administration to ensure the sustainable development of the particular territory.

Sustainable development profile evaluates the situation for each individual area from four major aspects: environmental, social, economic and institutional and there is no unified system of indicators that may be used to compare the situation with sustainable development between all biosphere reserves, since there are significant differences between these territories. Sustainable development profile describes opportunities for the development of a specific territory in the above mentioned aspects. The evaluation of a sustainable development profile allows to assess the current situation and to predict the future development scenarios.

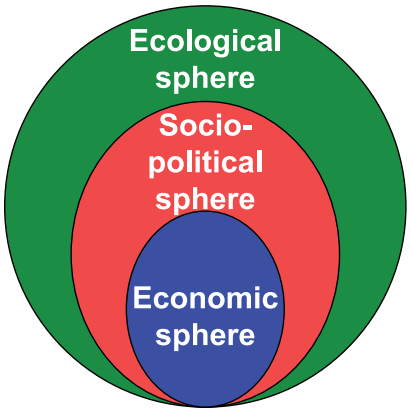
Benefits of developing a sustainable development profile:

- Provides a description of the current (ecological, social, economicl, institutional) situation in the area;
- Builds public awareness about the society's attitude towards biodiversity and its protection and, related to that, social welfare issues;
- Allows the monitoring of progress in the defined areas over time;
- Helps to identify problems and weaknesses;
- Informs society on their participation;
- Can impact the decision-making processes.

It is of utmost importance to understand the social and economic baseline of a territory and to understand the possible development patterns within it. This is especially in case of the biosphere reserve, when historically the biosphere reserve team consists primarily of environmental specialists. Understanding can be achieved through different tools and new partnerships. In such cases local academic institutions can become decisive partners which can offer training specialists in IT, tourism business, as well as in leading small- and medium-sized enterprises.

The selection of the aspects reflects the complexity of the sustainable development concept. The process of sustainable development is multi-dimensional and includes economic, social, cultural, political, geographic and ecological aspects, which means that the definition of sustainable development depends on the situation when it is used and what is defined as a target(s) of sustainability. One of the most frequently used models of sustainable development that reflects close interaction of different spheres with the ecological sphere.

Most biosphere reserves use sustainable development indicators developed by different international organizations for different purposes and target audiences. For example, in 1991, some methodological tools were developed under the UNESCO "Man and Biosphere" program in order to start the integrated monitoring of World Biosphere Reserves (Biosphere Reserve Integrated Monitoring, BRIM 1991). The methodology was developed to guide environmental monitoring, as well as socio-economic monitoring systems' development; however, the selection of indicators remains under the competence of the biosphere reserves. Thus the unified system of indicators that may be used to compare the situation with sustainable development between all biosphere reserves does not exist, since there are significant differences between these territories. Thus, the development of specific indicators by biosphere reserves



Hattingh model of sustainable development (2002).

administrations is critical to identify these unique characteristics with the purpose to sustain them or approach as a problem to be solved over time. However, some basic principles exist for sustainable development indicator development and most biosphere reserves follow these principles by developing indicators for monitoring within three or four basic aspects (ecological, social, economic, and /or institutional).

With financial support from the UNDP/GEF Project specialists and the Vidzeme University of Applied Sciences gave important input in elaborating the sustainable development profile for the NVBR area. Inquiry matrixes were elaborated and a general poll of the people living within NVBR territory was carried out. In total, 1043 respondents provided their evaluation on the social, economical and environmental state of the NVBR.

Based on the integrated monitoring program for the NVBR, the sustainable development profile was created to describe the current situation and future development using a set of 20 indicators. 35% of the indicators describe the environmental aspect, and the social and economic aspect indicators constitute 20 % each. After having assessed the NVBR mission and its specific goals and also the specific characteristics that make the biosphere reserve different from other protected areas, the forth category of sustainable indicators was developed that describe the impact of the institutional aspect on the sustainable development in the NVBR. These indicators were given 25 % weight of all indicators after the research committed for the NVBR administration by the Vidzeme University of Applied Sciences (2008) demonstrated that the institutional aspect, on the one hand, has a significant impact on this territory's sustainable development, however, on the other hand, it is the weakest of all sustainable development aspects.

Table 3: The NVBR Sustainable development evaluation grid (sample) and their baseline evaluation as in 2007. (A.Livina, I.Druva-Druvaskalne, 2008.)

Sustainable development categories	Indicators	Current situation evaluation	Tendencies
Ecological domain (7)			
Biological diversity protection	Population of the indicator species Salmo salar		
	Population of the indicator species Canis lupus		
	Population of the indicator species Lynx lynx		
	Population of the indicator species Gallinago media		
	The area of natural forest biotopes		
	Field bird index	Integrated data not available	
Landscape changes	Joint area payment		
Social domain (4)			
Inhabitants demography	Inhabitants natural growth		

Sustainable development categories	Indicators	Current situation evaluation	Tendencies
Employments	Demographical load indicator: able to work number per 1000 inhabitants		
Social life in the NVBR	Public events organized by the NVBR administration in the biosphere reserve during one year		
Biological farming development	Agriculture Support Agency payments to biological farming economy; the number of biological farming economies a year		
Economic domain (4)			
Economical welfare of inhabitants	The amount of inhabitant income taxes per 1 inhabitant of a municipality a year		
Business environment	The number of non-liquidated businesses per 1000 inhabitants		
Contraction	The number of permissions issued by the NVBR administration for construction in the NVBR territory		
Tourism business	The number of tourist lodgings and sleeping places in the NVBR, the number of „green certificate" tourist lodgings		
Institutional domain (5)			
Inhabitants cooperation and participation	The number participating in the public monitoring programme "Eco-Watch", the number of submitted observation protocols, the number of the areas monitored		
Inhabitants and guests awareness of the NVBR	The number of visitors to the Latvian language version of www.biosfera.gov.lv webpage a year	Data not available	
The NVBR territory sustainable development	The integration of the Landscape Ecological Landscape Plan into the NVBR municipalities' planning		
Waste management	The number of signed contracts with the waste treatment providers in the NVBR territory		
The allocated for the NVBR administration state budget	The changes in the amount of the NVBR administration budget and the number of employees		

Note:

 *Positive tendency, some progress in achieving the goals*

 *Some positive development tendencies, but not sufficient in achieving the goals. Need for improvement, changes.*

 *Negative tendency, the situation development does not consider sustainable development principles.*

Annexes

Glossary

Antropogenic - created by man or originating or changing under his influence

Biodiversity – diversity of ecosystems, biotic communities, species and genetic variation within a species

Ecosystem – a dynamic complex of plant, animal and microorganism communities and their non-living environment interacting as a a functional unit

GEF – The Global Environmental facility is a global partnership among 178 countries, international institutions, non-governmental organizations (NGOs), and the private sector to address global environmental issues while supporting national sustainable development initiatives.

Life – since 1992, EC finance instrument for pilot projects in the field of environment, nature and third countries IBA – Important bird areas is an international network of sites that provide essential habitat for bird populations

IUCN – The World Conservation Union; formerly; International Union for Conservation of Nature and Natural resources

IUCN Protected Area categories – division of worldwide protected areas into (value-free) categories depending on main goal of protection: Strict Nature reserve/ Wilderness Area (Ia), Wilderness Area (I b), National Park (II), Natural Monument (III), Habitat, Species Protection Area (IV), Protected Landscape/protected Sea area (V), and Resource Protection Area (VI)

Eutrophication – accumulation of nutrients, that lead to changes in an ecosystem or parts thereof

Habitats – location, where an animal or plant species regularly occurs

MAP – Madrid Action Plan for Biosphere reserves managing developing models for global, national and local sustainability

Monitoring – long term, regularly repeated and targeted surveys along of permanent observation with statements on the state of and change to nature and landscape

Planning procedures – legally binding procedure in which all interests are to be weighed up in order to grant permission to build/develop the definite area

Ramsar Convention – agreement on wetlands, in particular as a habitat for wading and water birds, of international importance

Red Lists – lists of endangered species, species communities and biotopes at national, European or international or international level state

Resources – stocks of material and ideal nature that are usually available only to a limited extent

UNESCO – United Nations Educational, Scientific and Cultural Organization

Sources for additional reading

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