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Towards a CONTINENTAL AQUATIC ECOSYSTEMS MAB Network

CONTINENTAL AQUATIC ECOSYSTEMS NETWORK

Best practices from nine EuroMAB Biosphere Reserves

PHOTO CREDITS

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For the Middle Volga Integrated Biosphere Reserve
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For the Mura Drava Danube Biosphere Reserve
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For the Po Delta Biosphere Reserve
Ente di Gestione per i Parchi e la Biodiversità - Delta del Po

TOWARDS A CONTINENTAL AQUATIC ECOSYSTEMS MAB NETWORK
Best practices from nine EuroMAB Biosphere Reserves
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EDITORIAL STAFF

The booklet was produced in relation to the Continental Aquatic Ecosystems MAB network project for distribution to participants at the EuroMAB 2019 meeting hosted by Ireland in the Dublin Bay Biosphere Reserve.

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Biosphere reserves contributors
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SUMMARY

INTRODUCTION

All the main typologies of the globe are represented in the World Network of Biosphere Reserves (WMRB), from polar zones to intertropical zones, from coastal territories to mountainous regions, from sparsely populated zones to large agglomerations. This unique network promotes collaboration between the different application sites of the Man and Biosphere Programme (MAB), and is a tool for dynamic and interactive cooperation focusing on sustainable development and the conservation of biodiversity.

In order to promote the exchange of information and reinforce collaborations between Biosphere Reserves with similar ecosystems and/or jointly managed actions, the stakeholders of the MAB programme have been encouraged to form regional and thematic networks (Seville strategy, Lima strategy).

Today, the World Network of Biosphere Reserves includes several ecosystem networks and themes devoted to mountains, tropical forests, insular and coastal zones, savannas, arid zones or urban zones.

The international scientific community is unanimous in saying that water and watercourses present a major ecological challenge for the future of humanity. Our aim is to build up a network dedicated to watercourses and aquatic environments as part of the MAB programme.

This seems important to us as many Biosphere Reserves are concerned by and involved in the management of fluvial ecosystems. These Reserves take action in a wide diversity of contexts, but they are often faced with the same problems and concerns. On each territory, they experiment with different solutions and look for effective responses to the numerous problems linked to water, from different perspectives: resource conservation (pollution problems), the use of water (distribution between different types of use) and risks generated by the disruption of the water cycle (drought, flooding...), often aggravated by climate change.

The network of continental aquatic ecosystems aims to facilitate cooperation and exchanges between Biosphere Reserves. It will lead to the sharing of ideas, knowledge, experience, innovations and good practices linked to the many issues raised by the large water cycle and will encourage participants to work together on approaches and actions promoting sustainable and harmonious socio-hydrological relations.

This project also provides the opportunity to support the implementation of the 17 international objectives for sustainable development, in particular objective number six, which aims to “ensure the sustainable management of water resources”.

OBJECTIVES

First working group

During EuroMAB 2017 in Sarlat (France), a first workshop on continental aquatic ecosystems took place, with 40 representatives and partners from European and North American Biosphere Reserves. The aim of this working group was to develop networking between BR concerned by rivers and their management. The working group has produced a "Declaration of principles" which formalises the objectives of the Continental Aquatic Ecosystems Network (CAE-MAB).

To date, 130 people representing more than 70 biosphere reserves in 41 countries have shown interest in such a network (scientists, public authorities, project managers, biosphere coordinators...)

Main objectives of the CAE MAB network

- To contribute to international reflections on the future of aquatic ecosystems
- To organise regular meetings to share scientific knowledge and positive experiences
- To implement an online platform to support the exchange of information and best practices among biosphere reserves (scientific knowledge, positive experiences and exemplary actions, project proposals...)
- To develop joint communication (Edit a CAE-MAB publication ...)
- To implement joint actions to improve recognition of the MAB programmes and biosphere reserves by the different decision -making authorities
- To organise and carry out study tours with a training objective
- To favour and promote intercultural exchanges

Some concerns and initiatives that we share

How can we promote and implement balanced, concerted and sustainable water resource management in the biosphere reserves at the scale of the watershed? How can we promote management methods in favour of the natural dynamics of rivers? How can we better anticipate and manage the effects of climate change on aquatic environments and biodiversity? Here are some examples of the questions that members of the continental aquatic ecosystems network could work on.

Some key figures from the United Nations (2015)

- In the world, more than 80 per cent of wastewater resulting from human activities is discharged into rivers or sea without any pollution removal
- In the world, approximately 70 per cent of all water taken from rivers, lakes and aquifers is used for irrigation
- On a global scale, floods and other water-related disasters account for 70 per cent of all deaths related to natural disasters
- Water scarcity affects more than 40 per cent of the global population and is projected to rise. Over 1.7 billion people are currently living in river basins where water use exceeds recharge

DECLARATION OF PRINCIPLES

EUROMAB 2017 - SARLAT (FRANCE)

CONTINENTAL AQUATIC ECOSYSTEMS WORKSHOP

WORLD NETWORK OF BIOSPHERE RESERVES
euromab 2017
building a sustainable future together

Whereas global water challenges as well the links between good water management, the health of aquatic ecosystems and the happiness of human societies have been highlighted in international meetings such as the World Water Forum;

Whereas Biosphere Reserves recognize that these linkages are present in each of their territories, in a wide variety of contexts, and reaffirm the importance to human populations of having available water resources in sufficient quantity and quality while conserving healthy aquatic ecosystems;

Whereas Biosphere Reserves respect the close links between water management, the health of aquatic ecosystems, land uses and practices, and management of water uses;

Whereas Biosphere Reserves have a mandate to promote - and to exchange information and experiences concerning - the development of sustainable interactions between social and ecological systems, including aquatic ecosystems;

Whereas the Biosphere Reserves represent a unique opportunity to test interdisciplinary approaches and to develop and exchange scientific and managerial information to promote sustainable social-hydrological relations;

The Biosphere Reserves represented at EuroMAB 2017 meeting in Sarlat (France) on April 5, 2017,

Having identified several common problems and concerns, including

- pollution of water (eutrophication, toxic substances)
- morphological deterioration of river beds
- biodiversity loss
- loss of flooding areas
- hydropower impacts
- conflicts in water and land use
- invasive species
- disappearing of river related cultural heritages (knowledge, identity...);

Having developed certain approaches and solutions to these problems which they hold to be promising, including

- promotion of dialogue and coordination
- restoration works (wetlands, oxbows...)
- research and monitoring
- use of the UNESCO-BR designation to gain means for action;

Having identified common obstacles to fully implementing these approaches and solutions, such as

- conflict with economic interests and influence of the lobbies
- capacity to influence problems coming from outside the UNESCO-BR
- international status of transboundary watersheds
- low recognition of UNESCO-BR in programs concerning water
- confusion caused by multi environmental designations;

Wish to contribute to international reflections on the future of the aquatic ecosystems.

For this reason,

wish to bring to the forefront their concerns about continental aquatic ecosystems and to take concrete steps to exchange information and to collaborate on approaches and actions that favour sustainable and harmonious social-hydrological relations, including:

- the development of a network connecting the UNESCO-BR concerned by continental aquatic ecosystems (regular meetings)
- the implementation of an online platform to support the exchange of information and best practices among biosphere reserve (scientific knowledge, positive experiences and exemplary actions, projects proposals, ...)
- the development of joint communications
- the implementation of joint actions to improve recognition of the MAB and RB programs by the different decision-making authorities
- the organization of study tours
- the connection of biosphere reserves to promote intercultural exchanges.

BEST PRACTICES
FROM EUROPEAN BRs

MAP

Dordogne Basin
Elbe
Gorges du Gardon
Julian Alps
Middle Volga Integrated
Mura Drava Danube
Po Delta
Terres de l'Ebre
Volga Akhtuba Floodplain

DORDOGNE BASIN

Coordinating structure / Administrative authority
Etablissement Public Territorial du bassin de la Dordogne (EPIDOR)

Contact information
Raphaël MICHAU (biosphere reserve coordinator)
r.michau@eptb-dordogne.fr

Main features and specificities

The longest estuary in Europe.

The middle part of the Dordogne basin is a large karst area, one of the longest underground networks in the world.

The last refuge of the eight major diadromous migrating fish in Western Europe (Atlantic salmon, European sturgeon, eel, shad species, lamprey species).

The Upper Dordogne Basin hosts one of France's largest dam chains.

Several areas and sites recognised on the List of UNESCO World Heritage Sites (Prehistoric sites of the Vézère Valley, Juridiction of Saint-Emilion...).

Cultural and social particularities linked to rivers

One of the main European sites for freshwater recreational activities.

The Dordogne was a historically important water shipping way.

Professional fishing.

Main problems and concerns

- water pollution (eutrophication, toxic substances)
- morphological deterioration of river beds
- biodiversity loss
- loss of flooding areas
- hydropower impacts
- conflicts between water and land use
- invasive species
- disappearing of river-related cultural heritages (knowledge, identity...)

Main know-how, skills and specialties

- Dialogue and Governance at a watershed scale
- Migratory fish
- Integration of hydropower activity
- River restoration

Current scientific research topics and actions

- Climate change
- Hydromorphology of water courses
- "Territorial knowledge"

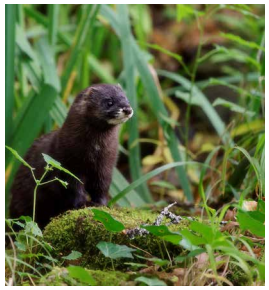
Feedback

Ecological restoration of the former gravel pit in Veyrignac

The Dordogne basin Biosphere Reserve is characterised by major dam chains on the Dordogne River and its tributaries. To reduce the impact of the numerous dams on aquatic habitats and water uses, a non-profit organisation was founded in 2013 by EDF and EPIDOR (IBD or Dordogne Biosphere Initiative). IBD is active throughout the biosphere reserve, providing support for studies, ecological monitoring, research efforts and renaturation operations and land acquisition along the river.

Work to rehabilitate a former gravel pit has been undertaken, over 20 years after mining operations ceased.
Renaturation of this 16-hectare alluvial area is one of the flagship projects of the IBD programme.

The assessment completed beforehand showed that the extraction of gravel over several decades caused long- term disruption to the river, in particular by deepening the riverbed. Natural habitats experienced degradation processes, in particular with vegetation closing in. After the machinery and equipment had been removed, the site's topography was completely redesigned so it could once again express its biological potential. This work included the creation of a two-hectare oxbow lake. To limit the number of invasive species taking hold, the land was also replanted. The renaturation project was made possible through the acquisition of the former gravel pit in Veyrignac by the Communauté de Communes du Pays de Fénélon, with the help of IBD and the water agency.



More information
https://biosphere-bassin-dordogne.fr/renaturation-de-lancienne-graviere-de-veyrignac/

ELBE

Coordinating structure / Administrative authorities

The Elbe River Landscape Biosphere Reserve extends across 5 federal states (Bundesländer) of Germany.
The coordinating structure is therefore divided into administrative authorities in each of the 5 federal states.

Contact information

Middle Elbe Biosphere Reserve Administration, state Sachsen-Anhalt; Guido PUHLMANN, poststelle@mittelelbe.mule.sachsen-anhalt.de
Administration of the Brandenburg Elbe River Landscape Biosphere Reserve, state Brandenburg;
Dr. Heike ELLNER, heike.ellner@LfU.Brandenburg.de
Administration of the Lower Saxony Elbe Valley Biosphere Reserve, state Niedersachsen;
Prof. Dr. Johannes PRÜTER, johannes.prueter@elbtalaue.niedersachsen.de
Schaalsee-Elbe Biosphere Reserve Authority, state Mecklenburg-Vorpommern; Klaus JARMATZ, k.jarmatz@bra-schelb.mvnet.de
State Office of Agriculture, Environment and Rural Affairs, state Schleswig-Holstein; Jens BASFELD, jens.basfeld@llur.landsh.de

Main features and specificities

The largest inland, trans-federal state Biosphere Reserve in Germany.

It represents one of the last remaining, near-natural river landscapes in Central Europe.

The Elbe river landscape is a long, narrow, continuous corridor which extends across diverse natural and cultural landscapes.

It extends along a 400-km-long section over five German federal states (Bundesländer), each with its own administration.

Cultural and social particularities linked to rivers

The landscape offers a rich cultural history including such gems as the World Heritage "Garden Kingdom of Dessau-Wörlitz".

Flood protection and dike construction are other elements of its cultural history.

Main know-how, skills and specialties

Establishing, leading and caring for dialogue processes with other river specific governmental institutions *(e.g. Waterways and Shipping Administration, flood protection agency)* and economic / private.

Main problems and concerns

- morphological deterioration of river beds
- sediment pollution
- biodiversity loss
- loss of flooding areas, riparian forests and traditional pasture land
- loss of diversity of habitat structures due to the intensification of agriculture
- conflicts between water and land use
- invasive species

Current scientific research topics and actions

- Improvement and partial restoration of natural morphodynamics in the Elbe River and several tributary streams
- Improvement of cross-linking between the river and floodplains (wetlands, oxbows)
- Increase in floodplain territory, also used for rerouting dike lines
- Adaption of uses of rivers and floodplains *(e.g. to minimize wildlife disturbing factors)*
- Effects of climate change on floodplain ecosystems and land use

Biosphärenreservat
Flusslandschaft Elbe

Feedback

Middle Elbe large-scale nature conservation project

A significant contribution to the sustainable development of the biosphere reserve is made by federally funded large-scale conservation projects, some of which are ongoing, and some of which have already been completed. The objective of the Middle Elbe large-scale nature conservation project was to develop a contiguous 9,000 ha network of genuine, floodable alluvial forests along 36 km of the Elbe from the Mulde to the Saale estuary. A key component of the project was the relocation of a dike, in order to safeguard and recultivate the floodplain and improve flood control.

Another dike relocation project in the Lenzener Elbtalaue had beneficial social and economic effects during the 2013 floods, demonstrating the importance of floodplain renaturalisation, such as green infrastructure. According to calculations by the German Federal Institute of Hydrology (Bundesanstalt für Gewässerkunde – BfG), peak levels were reduced by as much as 50 cm in the dike relocation area, with positive impacts observed more than 20 km upstream.

More information

http://www.flusslandschaft-elbe.de

Feedback

Within the Gorges du Gardon BR, there are 8 more or less developed canoeing sites, that were built without authorization, despite the designated area and water legislation. More than 1,000 canoes belonging to 5 professionals paddle in the gorges. Most of the trips are 8 km long, departing from Collias, and arriving downstream of the Pont du Gard. On peak days, there are nearly 3,000 boats on this part of the river.

A study of the issues related to canoeing and kayaking sites has been launched by the BR, in order to create good conditions for leisure activities on the river during summer, while respecting the environment. Through this study, the BR has been able to:
- Identify the access points for canoeing activities, as well as their advantages and drawbacks (land control, regulatory framework, conflict over use, ecologically fragile areas)
- Ensure user safety and reduce poor-quality facilities
- Contribute to the economic and touristic development of the BR.

A diagnosis of the organisation of river activities and their functioning was carried out in close cooperation with multiple partners (rental companies, French canoe and kayak federation, elected officials, local and regional authorities, inspector of the Gard designated areas).
Some on-site evaluations have shown the impacts caused by rental companies on landscapes and riverbank maintenance, which led to proposals to change their organisation, including the development or removal of some jetties.
Participatory local governance will be implemented to work on pedagogical information, sailing conditions and ecological issues. This could take the form of navigating scales according to river level and flow, the creation of no-stop zones around ecologically sensitive sites, etc., as well as training for rental companies and their staff in direct contact with customers on the ecological challenges and benefits of the gorges, so that they can fully understand their role as eco-actors in the area.

More information

Stéphanie Ferrier s.ferrier@gorgesdugardon.fr

GORGES DU GARDON

Réserve de BIOSPHERE
GORGES du GARDON

Coordinating structure / Administrative authority
Syndicat Mixte des Gorges du Gardon (SMGG)

Contact information
Céline BOULMIER (biosphere reserve coordinator)
c.boulmier@gorgesdugardon.fr

Main features and specificities

A Mediterranean river with irregular precipitation.

Last tributary of the Rhone river, the source of the river is in Lozère.

The Gardon is an assemblage of many smaller Gardon rivers that are named after the cities they cross, such as Alès, Anduze, Mialet... Together, they form the gorges du Gardon: a bigger karst system that has still not revealed all its secrets.

Cultural and social particularities linked to rivers

An industrial and mining past.

Gold panning.

Swimming area all along the river.

Gravel operations.

Main problems and concerns

- water pollution (eutrophication, toxic substances)
- morphological deterioration of river beds
- biodiversity loss
- conflicts between water and land use
- invasive species
- loss of river-related cultural heritage (knowledge, identity...)
- flooding risks and water shortages, due to extreme variations
- degradation of wetlands and environments

Main know-how, skills and specialties

Flood control.

Establishing dialogue and concerted governance.

Karst scientific studies.

Current scientific research topics and actions

- Hydromorphology of watercourses
- Pollution control
- Fighting eutrophication

JULIAN ALPS

Coordinating structure / Administrative authority
Javni zavod Triglavski narodni park (JZTNP) – Triglav National Park Public Institute.

Contact information
Davorin KOREN (Biosphere Reserve coordinator)
davorin.koren@tnp.gov.si

Main features and specificities

One of the most watered areas in Slovenia and Europe.

Important drinking water "reservoir" (huge quantity of quality underground water).

Karst springs, waterfalls, creeks, rivers, lakes, wetlands and southernmost raised bogs in Europe.

Alpine glacier lakes – on a limestone base!

The source of two important European rivers, the Sava and the Soča. The dividing line between the Mediterranean and Black Sea watersheds runs through the heart of the Julian Alps.

Cultural and social particularities linked to rivers

Important sites for many recreational activities (water sports, fishing, hiking).

Small hydropower plants.

Water-related cultural heritages.

Main problems and concerns

- water pollution (eutrophication, toxic substances)
- morphological deterioration of river beds
- biodiversity loss
- loss of flooding areas
- hydropower impacts
- conflicts between water and land use
- invasive species
- disappearing of river-related cultural heritages (knowledge, identity...)

Main know-how, skills and specialties

Management of visitors in protected areas *(e.g. water sports are limited to designated locations...).*

Protected area management.

Current scientific research topics and actions

- Eradication of non-native fish from high mountain lakes
- Water quality monitoring
- Waste water treatment in mountain huts
- Impacts of recreation on nature
- Prevention of dispersal of non-native invasive species *(e.g. Dreissena polymorpha, Fallopia japonica)*

Feedback

The abundance of quality water should not be taken for granted!

A large part of the Julian Alps Biosphere Reserve extends over the only Slovenian national park (Triglav National Park is the core zone). Strict nature protection regulations contribute positively to the general state of water. Due to the abundance of high-quality water, people living and working in the area have often taken it for granted and this is probably the reason for the lack of any major action concerning water protection in the past. Nevertheless, some important actions focusing on water conservation will take place in the near future – the main ones are encompassed in the *VrH Julijcev* project.

Some actions have been planned for mountain lakes, one of which is the eradication of non-native fish from high mountain lakes, which will lead to the restoration of the original state and improve the water ecosystem. Another action includes providing a reasonable solution for waste water treatment in a specific mountain hut, which currently contaminates water in the nearby lake. We also plan on re-establishing traditional ways of providing water supplies to some of the mountain pastures that are still used by local alpine farmers. With various other projects, we aim to raise public awareness of water protection.

More information

https://www.tnp.si
https://www.tnp.si/sl/javni-zavod/projekti/vrh-julijcev-izboljsanje-stanja-vrst-in-habitatnih-tipov-v-triglavskem-narodnem-parku/

MIDDLE VOLGA INTEGRATED

Main know-how, skills and specialties

Monitoring and research of the geographic environment and biological diversity by leading specialists from scientific centers of Russia (Moscow, St. Petersburg, Togliatti, Samara).

Regular scientific conferences and seminars, round tables; thematic exhibitions for schoolchildren, students and their teachers, as well as for the general population.

Publication of the scientific journal "Samarskaya Luka: Problems of Regional and Global Ecology" (since 1991).

Current scientific research topics and actions

- Ecological certification of reservoirs and watercourses
- Flora and rare species (relics and endemics)
- Encyclopedia of persons studying (studying) the biosphere reserve's nature
- Inventory of natural attractions of the Samarskaya Luka

Feedback

Samarskaya Luka is the ark of conservation of nature of the Middle Volga. The unique Middle Volga bend has been bestowed on us by nature. Here, in a small area, the centuries-old history of the Russian state and the most valuable, unique nature are tangled together. The secrets of the Samarskaya Luka have not yet been revealed and are waiting for their researchers.

More information

https://sites.google.com/site/tltrbo
http://www.ievbras.ru
http://npsamluka.ru
http://zhreserve.ru

Coordinating structure / Administrative authorities
Zhiguli Nature Reserve
Samarskaya Luka National Park
Institute of Ecology of the Volga River of RAS

Contact information
Institute of Ecology of the Volga River of RAS
Address: 445003, Russia, Samara region, Togliatti, Komzin st., 10.
Telephone: (8482) 489-977; Fax: (8482) 489-504; E-mail: *ievbras2005@mail.ru*

Main problems and concerns

- High eutrophication, industrial and domestic pollution of the Volga and the lower reaches of the Usa River (Usinsky Bay)
- Loss of biodiversity of valuable species (sturgeon), low-floodplain meadows, floodplain-valley sedge-veral forests and willow shrubs
- Hydropower impact, leading to an unnaturally-oscillating level regime, dramatically changing the hydrological regime of the Volga and its inflow
- Biological invasions of a number of species of hydrobionts and other groups of terrestrial organisms
- The disappearance of a number of elements of the river's natural and cultural heritage *(e.g. the spring drift, steamship and sailing civilian and fishing vessels)*

Main features and specificities

Tectonic uplift in the conditions of the Russian Plain.

Outcrops of ancient Paleozoic sedimentary rocks.

An ancient relict relief, formed mainly in the pre-Pleistocene time.

Refugium of ancient preglacial and postglacial natural complexes, including relict plant and animal species.

High biological diversity of natural-territorial complexes.

Cultural and social particularities linked to rivers

The main river of the biosphere reserve is the Volga, which borders it for more than 220 km.

The Usa (a tributary of the Volga) is another important river which flows through the northwest of the BR for a length of 70 km and forms a vast catchment area of about 2,000 km².

The largest Russian urban agglomeration of Samara-Togliatti was formed around the BR.

The richest historical past of the BR, its present and its future are connected with the Volga River and its influx.

MURA DRAVA DANUBE

Administrative authorities of the existing biosphere reserves
Ministry of Environment and Energy (Croatia) and Danube-Drava National Park Directorate (Hungary) for the Mura-Drava-Danube Transboundary Biosphere Reserve (HR-HU) *(designation in 2012)*
Institute for Nature Conservation of Vojvodina Province for Bačko Podunavlje Biosphere Reserve *(designation in 2017)*
Institute of the Republic of Slovenia for nature conservation for the Mura River Biosphere Reserve *(designation in 2018)*

Planned administrative authorities
Regional Management South-East Styria for the planned Biosphere Reserve Unteres Murtal *(designation expected in 2019)*

Main features and specificities

Unique free-flowing and dynamic river corridor "Amazon of Europe".

Some rare species still live in the steep banks, gravel islands, oxbow lakes or floodplain forests.

Educational infrastructure in visitor centres in protected areas.

A joint 5-country Biosphere Reserve is planned.

Cultural and social particularities linked to rivers

Flood protection.

Drinking water.

Freshwater recreation activities.

Water mills still in use.

Variety of fish species.

Main know-how, skills and specialties

Transboundary Biosphere Reserve and transboundary cooperation.

Free-flowing river without barriers for e.g. fish migration.

A chain of protected areas via 5 countries.

Cross-sectorial cooperation.

Restoration of river branches, oxbows and main river for nature conservation and flood protection.

Main problems and concerns

- water pollution (eutrophication, toxic substances)
- morphological deterioration of river beds
- biodiversity loss
- loss of flooding areas
- hydropower impacts
- conflicts between water and land use
- invasive species
- disappearance of river-related cultural heritages (knowledge, identity...)
- threat of establishing new hydropower plants

Current scientific research topics and actions

- Species monitoring: yearly bird monitoring of the river corridor
- Research on IUCN red list species

Feedback

Cooperation along 3 rivers in 5 countries

The 5-country Transboundary Biosphere Reserve Mura-Drava-Danube connects protected areas from the Mura along the Austrian-Slovenian border via the Drava through Croatia and Hungary to the Danube in Serbia. Along this chain of protected areas, various projects focusing on different topics (nature conservation, education, visitor guidance and tourism, etc.) are currently being implemented - in one or more countries along the three rivers.

Within the Interreg project coopMDD, representatives of protected area administrations of all five countries started to work together in 2017 on common goals and actions for the shared river corridor. A basis for further cooperation and for managing a future 5-country biosphere reserve was established.

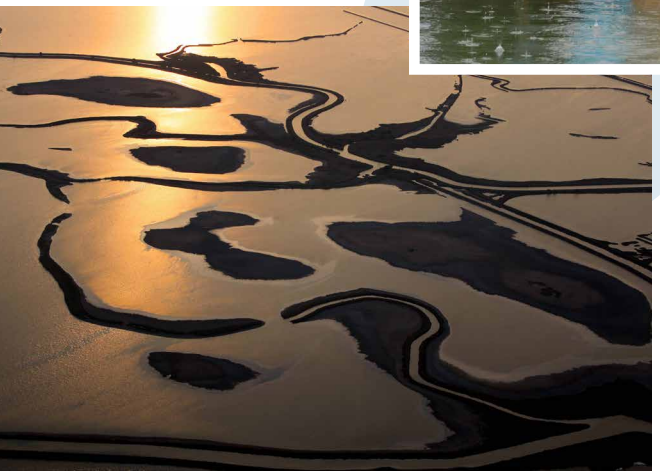
Contribution provided by WWF Austria

Feedback

Longterm management and conservation of coastal lagoon systems

The Po Delta is the result of the action of the river, which has gradually sedimented at the mouth over the centuries, leading to the progressive advancement of the coastline and creating a complex lagoon system with a rich ecosystem comprising abundant species. The "Po Delta Biosphere Reserve" is a paradise for birds, fish and molluscs, but also for human activities that have distinguished the Delta's landscape, its traditions and development. Indeed, a vital objective of the management institutions involved in the Biosphere Reserve is the long-term conservation of coastal lagoon ecosystems and their biodiversity.

To survive, these ecosystems need essential hydraulic circulation to prevent the eutrophication of the lagoon waters due to the accumulation and breakdown of underwater vegetation, which can lead to anoxic events. The approach in progress is an integrated coastal zone management approach, developed through a LIFE+ named AGREE. The project is based on an ecosystem and functional approach aimed at the conservation of habitats and species of importance to the community and to the adaptation at the natural dynamicity of the Po delta.



PO DELTA

Biosfera Delta Po
man and nature together

Coordinating structure / Administrative authorities
The managing body is composed by the Parco Regionale Veneto del Delta and Ente per la gestione per Parchi e Biodiveristà - Delta del Po

Contact information
info@biosferadeltapo.org

Main features and specificities

The Po Delta is a plain developed by the actions of the River Po and of recent human activities.

The Biosphere Reserve comprises 2 Italian Regions, 2 Provinces, 15 Municipalities and 118,000 inhabitants.

It embraces 2 Regional Parks, 34 Sites of importance for the Community and 16 Natura 2000 habitats such as lagoons, fish farms, fossil dunes and channels.

It includes 900 flora species, more than 360 bird species and it is an international destination and reference point for birdwatching.

The 140,000 ha of the BR are characterised by fish farming areas, specific agricultural activities, wetlands, woodlands, and urban areas.

Cultural and social particularities linked to rivers

Fish farming, mussel farming, rice production and salt works.

Agri-food excellences with 3 PDOs and 3 I.G.P. products.

The Delta Po Biosphere Reserve has a rich historical heritage, which is also recognised in the List of UNESCO World Heritage Sites. It encompasses extraordinary architectural artefacts and staggering historical events, which have deeply modified the territorial arrangement of the Po Delta.

The territory of the BR is an important destination for natural and seaside tourism.

Main problems and concerns

- water pollution (eutrophication, toxic substances)
- biodiversity loss
- loss of flooding areas
- invasive species
- general change of the hydrographic functions

Main know-how, skills and specialties

Wetland conservation and lagoon management.

Biodiversity monitoring.

Traditional eel fishing and fish and mussel farming.

Biosphere Reserve branding strategy.

Current scientific research topics and actions

- Long-term lagoon management
- Biodiversity monitoring
- Development of policy instruments to foster the use of ecosystem services
- Sustainable tourism

TERRES DE L'EBRE

Coordinating structure / Administrative authority
The Terres de l'Ebre Consortium Environmental Policies (COPATE)

Contact information
Josep ARAGONÉS (Biosphere Reserve Coordinator)
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Main features and specificities

The Ebro River is the main icon of the Biosphere Reserve and comprises many aquatic ecosystems, whose conservation depends on the integral management of the basin. The Ebro River is the largest river in Spain.

The Ebro Delta, included in the Ramsar Convention, is one of the best-known and greenest wetlands in the Western Mediterranean, where more than 360 species of birds and 50 species of fish have been counted. The most important are the Greater Flamingos, Adouin's gull, Spanish toothcarp, Ebro barbell...Moreover, the final part of the Ebro crosses different ecosystems and natural habitats, ranging from mountain altitudes of 1,500 metres to sea level with sandy expanses and wetlands in the delta plains, passing through tectonic zones, and the Ebro valley and alluvial deposits.

Main problems and concerns

- hydropower impacts: the lack of sediments is causing the regression of the Ebro Delta
- delta dynamics such as subsidence plus the rise in sea level (climate change)
- invasive species
- pollution of water (eutrophication, toxic substances)
- salinization of the final part of the river
- biodiversity loss
- loss of flooding areas
- conflicts between water and land use

Cultural and social particularities linked to rivers

The river and its wetlands confer a great variety of landscapes and exceptional richness on the area, but also give a strong sense of belonging and personality to the local population, so much so that in the 2000's, a powerful social movement in defence of the Ebro emerged as a reaction in response to the political proposal of Ebro water capture.

The rich resources of the river have transformed the area into a leading agricultural sector in an extended agrarian matrix (composed by rice paddies, citrus and olive groves, vineyards, almond trees...). These agricultural activities, combined with fishing, shell fishing, aquaculture and tourism, are the main economic activities in the area.

Main know-how, skills and specialties

Branding: The Terres de l'Ebre Brand.
Governance and participatory process.
Adaptation and mitigation climate change effects.

Current scientific research topics and actions

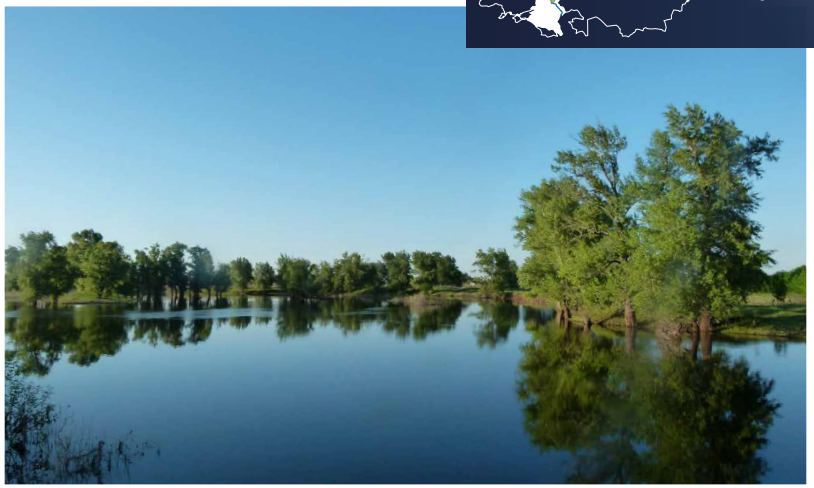
- Green economy and biofuels
- Energy Efficiency and Smart grids
- Sediment dynamics

Feedback

One major concern of TEBR is the effects of climate change. For this reason, TEBR has been participating in a LIFE called CLINOMICS with other territories of Catalonia since 2016. This project tries to improve the resilience of local economies, particularly in the primary sector.
The goals achieved in the project have been the creation of local participatory governance structures for adaptation to climate change, and a plan of action to adapt to climate change in a consensual way, and the selection of two pilot actions to be implemented on the territory. These are: a drought observatory and an autochthonous oyster hatchery.

More information

www.ebrebiosfera.cat
https://www.copate.cat
http://lifeclinomics.eu



Feedback

Model for the restoration of wetlands of the Volga-Akhtuba floodplain

The Volga-Akhtuba floodplain is the world's largest river valley. Its potential is actively used by humans and the valley suffers from anthropogenic pressure.
Restoration of degraded wetlands on the territory of the Biosphere Reserve has been underway since 2008 as part of international UNDP/GEF projects. In order to ensure the sustainable existence of floodplain ecosystems in the management of economic activities, a system of evaluation by biological indicators was developed.

In 2015, the model area for the restoration of wetlands using the system of estimated indicators was chosen by the channel from Erik Kashirin, which supplies three floodplain lakes. To improve the hydrological situation, the channel was cleared. In order to speed up the process of biodiversity restoration, technologies have been tested for the biogenic stabilization of shores and the replacement of invasive plant species by local species, which have created ecological niches for fauna. The recovery area was more than 9,000 ha.
The model of biodiversity restoration creates the prerequisites for its replication, which is confirmed by the plans of the regional authorities and the financing of activities within the framework of federal programmes in Russia.

More information

http://bd-energy.ru/documents/ CASE-VOLGA.pdf

VOLGA AKHTUBA FLOODPLAIN

Организация Объединенных Наций по вопросам образования, науки и культуры · Программа « Человек и биосфера »

Coordinating structure & administrative authority
State Budget Institution of the Volgograd Oblast «Nature Park «Volga-Akhtuba floodplain» (VAF)

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Main features and specificities

The unique natural hydraulic streamflow regime has been preserved in the Volga valley.

Regulates the environmental component and local climate in the south of Russia.

Includes a variety of landscapes and numerous interconnecting tributaries, channels, eriks, and lakes (about 3,000) among the North Caspian semi-desert.

Includes internationally important wetlands (Convention on the Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar, 2 February, 1971) and internationally important key avifaunal area (RU 125 "Akhtubinsk wetland").

Hosts about 1,200 plant species, more than 1,400 invertebrate species, about 322 animal species, including 62 animal species and 19 plant species and other organisms listed in the Red Books of various ranks.

Cultural and social particularities linked to rivers

Historical and cultural heritage is represented by 168 objects, including: 128 archaeology monuments, 39 historic monuments and 1 architectural ensemble.

Played an important role in the victory of the USSR during the Great Patriotic War (Battle of Stalingrad).

Currently, 97 rural settlements are involved in the joint Biosphere Reserve management.

"Green lungs" for the large industrial urban agglomeration and an attractive place for recreation and rehabilitation.

Main problems and concerns

- hydropower impacts
- loss of flooding areas
- conflicts between water and land use
- invasive species

Main know-how, skills and specialties

Restoration of wetlands.

A new approach to the assessment of biodiversity of VAF based on biological indicators for managing wetlands in the reserve.

Replenishment of the gene pool of Phasianus colchicus Linnaeus to combat invasive species.

Current scientific research topics and actions

- Assessment of the state of natural and natural-anthropogenic complexes and objects using biological indicators
- Monitoring plants and animals, including those listed in the Red Books
- Destruction of invasive species
- Preservation and restoration of oak forests
- Hydrological monitoring

EDITED BY

The Dordogne Basin biosphere reserve

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