Biosphere for Baltic

Exchange events 2018 – report

United Nations Educational, Scientific and Cultural Organization

Man and the Biosphere Programme Sweden

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Introduction

Biosphere for Baltic provides a unique opportunity for UNESCO Biosphere Reserves around the Baltic Sea to network, to share experiences and results, and to find new opportunities for collaboration. The aim of Biosphere for Baltic is to facilitate learning and disseminate good practices from the Baltic Sea region, within and beyond the network of biosphere reserves. Also, to highlight the contribution of biosphere reserves to the UN Sustainable Development Goals and the 2030 Agenda, with particular emphasis on SDG 14 - Life Below Water.

During 2018, Biosphere for Baltic arranged two international exchange events and two workshops in connection to conferences in the Baltic region. The project is coordinated by Kristianstads Vattenrike Biosphere Reserve and UNESCO's Man and the Biosphere Programme in Sweden.

This report is a summary from the international exchange events held in Kristianstads Vattenrike on May 13th-15th 2018 and in Archipelago Sea on October 3rd to 5th 2018.

Background

In September 2015, the United Nations General Assembly agreed on a global agenda for sustainable development – the 2030 Agenda for Sustainable Development. Unique in its kind, the Agenda with its 17 Sustainable Development Goals (SDGs) and 169 targets is tackling a broad spectrum of development issues crucial to human prosperity. It underlines a clear recognition that social, environmental and economic development cannot be treated separately. Rather, they are interlinked and interdependent dimensions of sustainable development that need to be considered in an integrated manner. Hence, the Agenda is, simultaneously, "(…) a plan of action for people, planet and prosperity". This requires an extensive transformation of our society. This is an issue that spans over all sectors, and strategies and methods for "breaking the silos" need to be developed. Solutions to global challenges are mainly local. Therefore, it is of great importance that communities are empowered to contribute to change. The public's awareness and engagement is a prerequisite for the implementation of the Agenda.

While addressing the Agenda, conflicts of interest may arise between goals and targets. UNESCO Biosphere Reserves are places where these conflicts are addressed, where needs are identified and analysed, where synergies are explored and where communities are included in finding solutions to sustainability challenges. With small means and little formal power, the biosphere reserves have achieved a range of results by connecting local initiatives to national and international strategies, by connecting people and nature, and by stimulating new knowledge development as well as education for sustainable development. The success of the biosphere reserves is based on collaboration, learning and a holistic view on people and nature – connecting local and global perspectives. Their thorough experience of integrated work with sustainable development make them interesting as strategic areas to learn from, invest in, and support when implementing the 2030 Agenda for Sustainable Development.

In June 2017, during the UN Ocean Conference, Man and the Biosphere Programme (MAB) in Sweden, Swedish National Commission of UNESCO, and the Swedish Agency for Marine and Water Management pledged a joint commitment to facilitate learning and dissemination of good practices from UNESCO Biosphere Reserves in the Baltic Sea Region, within and beyond the network of biosphere reserves. The intentions of this joint commitment shall contribute to raising awareness of sustainability challenges linked to the Baltic Sea, enhanced knowledge of interconnectedness between land and sea, as well as

learning from biosphere reserves as arenas for implementing the SDGs with a multi-stakeholder approach. Biosphere for Baltic is the result of this voluntary commitment.

Project participants

Biosphere for Baltic has a strong outreaching approach and aims to disseminate experiences within and beyond the network of UNESCO biosphere reserves. Nine biosphere reserves in seven countries are participating in the project:

Møn	Denmark
West Estonian Archipelago	Estonia
Archipelago Sea	Finland
Southeast Rügen	Germany
North Vidzeme	Latvia
Słowinski	Poland
Kristianstads Vattenrike	Sweden
Nedre Dalälven River Landscape	Sweden
Blekinge Archipelago	Sweden

Two themes

The project focuses around two themes: Source to Sea and Learning and Ocean Literacy. Both themes are of great importance to sustainable development in the Baltic Sea and for the implementation of SDG 14 – Life Below Water. The themes are also broad, in the sense that they cover many topics and can be interpreted widely.

Source to sea is highly relevant for the Baltic Sea, with its dynamic interface between land and ocean. Human activities upstream; on land and along rivers, affect the ecosystem downstream; in the coastal zone and the marine environment, with several associated environmental challenges, e.g. plastic pollution, water quality, eutrophication etc.

Ocean literacy is defined as “an understanding of the ocean's influence on you and your influence on the ocean” and learning is key to increased ocean literacy among people and in the society. Learning has also always been fundamental to the work in the biosphere reserves and is a part of their success stories. The biosphere reserves in the Baltic Sea region raise awareness and educate people on a daily basis – by connecting people to nature and by stimulating new knowledge development as well as education for sustainable development.

Sharing stories from our biosphere reserves

During the two exchange events the participants have shared experiences, exchanged knowledge, learned from each other and explored future collaborations. When invited to join, the participants were asked to contribute by sharing a project or initiative from their biosphere reserve that they would like to raise as a good example. The projects, or stories as we have called them, should also connect to one of the projects themes.

The intention with each story was to summarize and communicate the unique contribution of biosphere reserves for local implementation of SDG 14 – Life Below Water. The participants were asked to highlight the unique role and contribution of their biosphere reserve:

- as a platform for collaboration
- how it connects actors from different sectors
- the way it promotes learning and awareness-raising
- how it integrates other SDGs
- the effect on Baltic Sea ecosystems

International exchange event #1 – Kristianstads Vattenrike

Biosphere for Baltics first international exchange event was held in Kristianstads Vattenrike on May 13th-15th 2018. During the event, five of the nine biosphere reserves presented their stories, a dialogue workshop was held, and a field trip visiting ongoing projects in Kristianstads Vattenrike was arranged.

The event was moderated by Urban Emanuelsson, AB Urban Emanuelsson and professor at the Swedish Biodiversity Centre, Swedish University of Agricultural Sciences. Anders Tell, town councilor Kristianstad municipality, opened the even and participated during part of the program.

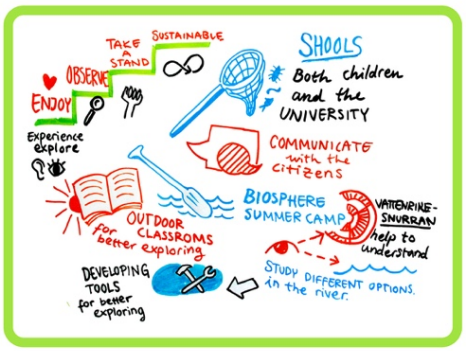
Kristianstads Vattenrike

Better balance and biodiversity in River Helge å and Hanöbukten #SourcetoSea

A large proportion of the land use within the biosphere reserve is intense agriculture, which creates a problem with nutrient leakage to surface water. As a method to decrease the leakage of nutrients, we restore or construct wetlands in the landscape.

A fundamental part of our work with wetland construction is cooperation between people from different categories (experts, agencies, landowners, engineers and other organisations). Trying to inform and educate landowners, to create an interest in water management actions. This have been a successful method to get in to "real work". Here is a description of our method:

- Identify a problem.
- BR organisation act as the coordinator, plan the overall project and seek funds.
- Do some fieldwork – look for suitable places, meet landowners, inform about the project, and try to create an interest.
- Establish a contract between the BR and interested landowner/s, which stipulates the amount of money offered and the expected result of the construction.
- Launch the project: Plan the project, get required permits, establish contracts, design the actions. The landowner is the manager of the project (often referred to a consultant).
- When the construction is finished an inspection take place. If everything is satisfactory, the landowner is compensated as agreed in the contract.



The project targets the national goal of good chemical and ecological status in the river and Hanöbukten.

River Landscape of Nedre Dalälven

Fishing conservation for sustainable recreational fishing #SourcetoSea

A project funded by LEADER for fishery conservation in the Biosphere Reserve Nedre Dalälven.
Aim: Strengthen the attractiveness of an area and challenging the hydroelectric companies to invest in migration and dam passages.

River Dalälven starts in the border region of Norway and Sweden. It is the second longest river in Sweden, 520 km, and has great national importance as a hydropower resource with some +50 hydro-power plants. The river also symbolizes Limes Norrlandicus, the climate frontier between the northern

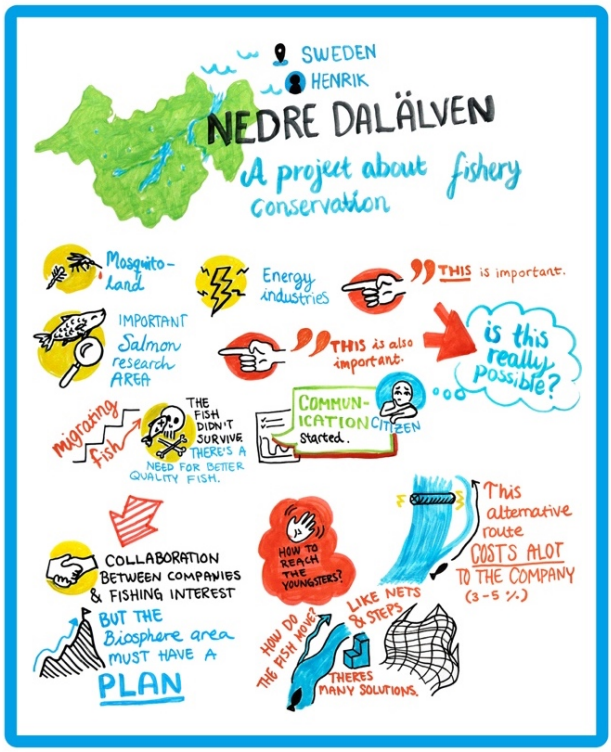
and southern flora and fauna of Northern Europe. Agriculture and forestry have evolved as a result of changes in the steel and iron industries. The river's character changes from deeper valleys to a more open landscape with large water areas, regularly flooded, in its lower part. In 2011 the area was designated as a biosphere reserve along approximately 200 km of the river. Consisting of a mixture of the river, flood plains, agriculture landscape and productive forests also including the Färnebofjärden National Park. Nedre Dalälven has been an EU Leader-area with more than 250 Leader-projects over the years. Our vision is "an attractive area based on sustainable jobs and viable businesses."

Two current projects in the biosphere reserve:
Sustainable hydroelectrical power Dalälven, initiated by Swedish Government, with the aim to evaluate environmental measures and energy benefits and to prioritize the most important ones.

Migrating fish in the lower part of Dalälven, a county collaboration initiative, which aims to analyse and evaluate the lowest part (approx. 75 km) of the river for the possibility to be used as natural spawning and nursery resource to replace most of the compensatory hatchery salmonids that was established along with the expansion of hydropower.

To strengthen dialogue and local engagement, Nedre Dalälvens Association initiated a project involving the entire biosphere reserve, called *Fishery conservation for sustainable recreational fishing in Nedre Dalälven*:

- Participation in the national and the regional projects.
- Initiating restorations of the river's habitat for different fish spices by active networking and increased dialogue between different stakeholders.
- Strengthen network between fishery conservation associations (FVOF), municipalities, tourism companies and county administrations.
- Attractiveness and competitiveness – branding of the area.
- Process-start for a fishing management plan in close cooperation with the concerned FVOF.



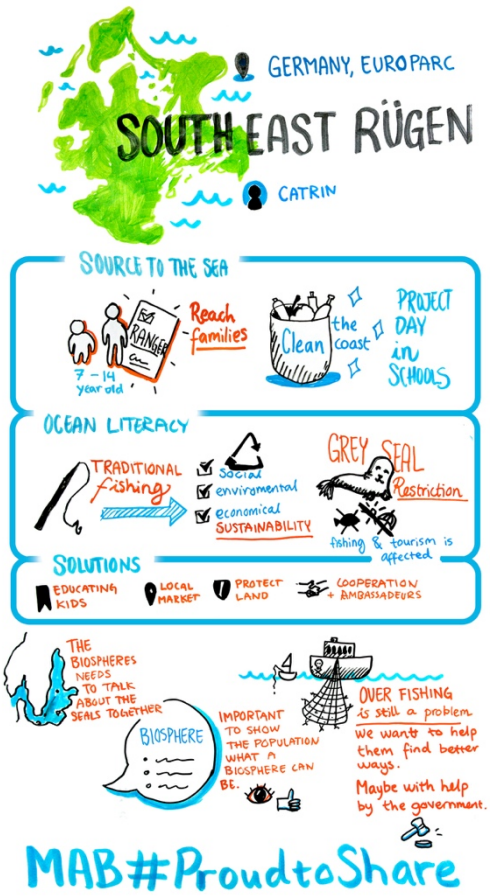
Southeast Rügen

Raising awareness of our cultural heritage #OceanLiteracy

On the Island of Rügen small coastal fishing has a century long tradition. Islanders mainly lived off the sea in addition to farming. Now the local tradition is gradually being replaced by big commercial fishing companies. The Biosphere Reserve Southeast Rügen see this as an important cultural heritage and is committed to the preservation of this tradition. Furthermore, in comparison with the commercial fishing methods, the biosphere reserve sees an added value in traditional fishing methods as these are "softer" and more environmentally, socially and economically sustainable.

One of the actions taken by the Authority of the Biosphere Reserve Southeast Rügen was to establish a working group in 2012. In a collective effort of regional fishermen, tourism resort administrations, gastronomy, the Authority of the Biosphere Reserve and other stakeholders the "Fisch(er)tage" (Fish(erman)days) were created. This event series, which last a week during the herring season, gives locals and tourists the opportunity to get into direct contact with local small coastal fishermen, and to learn about the tradition and different methods.

One of the more recent challenges faced by fishermen as well as the Authority of the Biosphere Reserve is the reoccurrence of the grey seals around the island of Rügen and in the Bay of Greifswald. On the one hand, fishermen fear for their livelihoods as these animals of prey are able to get into fish traps and gillnets. On the other hand, sun-tanning seals on the beach can cause conflicts with beach visitors. For the latter of the two potential conflicts, a seal management system has been put into place.



Kützenputz – a Junior Ranger activity #SourcetoSea

EUROPARC Germany (EUROPRAC Deutschland e.V.) and the National Natural Landscapes (Nationale Naturlandschaften) want to protect valuable German landscapes. They established a Junior Ranger Educational Program for children and youth to get them excited about nature topics and nature conservation (education for sustainable development program). The goal is to reach as many kids between the age of 7 and 14 – and their families – and get them excited about National Parks, Biosphere Reserves and Nature Parks. In the Biosphere Reserve Southeast Rügen, the Junior Ranger Program was established in 2005 working with school kids for a year on different topics. In 2015 a Junior Ranger Plus Program was created to give kids around the age of 14 a possibility to get more practical experiences in nature conservation activities.

Part of this educational program is an event called “Küstenputz” or “cleaning the coast” – during two weeks, schools collect trash on different beaches and they get a “project day” at the school where the kids learn about the problems/solutions.

West Estonian Archipelago

Baltic Sea Fish Mythbusters #OceanLiteracy

Fishing is a lifestyle for our coastal fishermen. Nevertheless, for many of them it is still a livelihood. Fish stocks have been decreasing in recent years, which means that the fish should be valued more locally. Also, it is necessary to bust a number of myths, for example, that eating a Baltic Sea fish is dangerous to our health, it contains harmful substances, or the fact that children do not like fish.

In order to bust these myths, a number of very popular events have been launched in our archipelago, which highlight the healthiness and excellent taste of local fish. Different kinds of fish festivals are held, the biggest ones are Fishermen's Days and Sea Days. Fish festivals are also held, for example, the Flat fish festival "Lestafest" and the Garfish festival "Tuulekala Festival". Local fishermen get a lot of attention and have the opportunity to offer their own catch - smoked fish, dried fish, pickled fish and various fish dishes. Fish cooking competitions are held, and the best fish chef is annually announced.

The fish industry has undergone several crises and we are delighted that small businesses have begun to explore fish processing. A variety of fish products are offered, including a gourmet product made from the most common species, such as the Baltic herring (Estonian National Fish). These are more expensive, but they already have a lot of popularity all over Estonia.

Fish marketing has also become a major issue, especially in the way we offer fish for sale. This winter, a new and very fashionable fishing shop was opened in Kärdla (Hiiumaa island), where you can buy other fishing accessories besides fish. The shop is so special in its architecture and interior design that people just like to go there, but no customer leaves the store without buying fish.

The problems in our archipelago, which we would like to highlight to find possible solutions through the international co-operation:

- Spawning grounds: how is it regulated in other countries, who is responsible of restoring fish spawning areas?
- Seals: how fishermen protect the catch from seals?
- Collection of seaweed and possibilities to use it - In Estonia, there has already been an idea to produce mulch, opportunities to produce soil and/or fertilizer etc?

North Vidzeme

Place a Stone in the Stream #SourcetoSea

Each of us at least once have thrown a stone in a lake, river or the sea. Without an idea, that stone and their clusters in water, placed with knowledge, can help the waters and ourselves in many ways. Initiative “Place a Stone in the Stream” as a method for local stakeholder motivation and involvement in river restoration and maintenance has been developed in North Vidzeme Biosphere Reserve as a low cost and self-sustaining activity.

The aim of the initiative is broader than the title:

- Support and increase biodiversity in rivers
- Improve river functionality and self-purification capacities (blue structures)
- Improve functionality of river coastal zone and maintain river landscape
- Adapt possible climate change impacts on to the river ecosystem
- Raise citizen awareness, motivation and community cooperation through practical involvement
- Improve the state of the Baltic Sea

Initiative embraces different activities and their combination suitable for each concrete river case and the problem to be solved - increase biodiversity and self-purification capacity, fish stocks, maintain coastal stability, sediment flow, improve landscape, etc.

Booklet is produced on processes in rivers and how to install stones.

Started in North Vidzeme Biosphere Reserve, initiative is spreading in the whole of Latvia.

Stone Phenomenon

Stone surface covered with “biofilm” is acting as diverse microhabitat. In the same time through bacterial and algal “biofilm” breaking and accumulating by flowing nutrients and acting as a natural water micro treatment unit.

Stones at shallow places typical for small streams acts as a mechanical aerator. Such aeration give possibility to survive oxygen sensitive aquatic species in summer periods with low flow, high water temperature and low natural oxygen saturation.

Oxygen deficient situations in streams would increase in changing climate conditions. In such cases mechanical aeration using stones can be applied as an innovative climate change adaptation tool for small rivers.

Field trip

The exchange events are also an opportunity to learn more about the hosting biosphere reserve and to get insight to some of their projects and activities.

During the event in Kristianstad the participants visited one of the wetland restoration areas connected to Kristianstads Vattenrikes project presented above. One of the landowners shared his views, especially emphasising how collaboration with the biosphere reserve have contributed to developing both his land and his business in a sustainable way.

The excursion also took the participants to an outdoor museum and classroom located in the nature reserve Äspet. A nature guide and educator told about Vattenrikets educational work and the participants got to take part and explore the shallow area and the shoreline.

Dialogue

Before the first international exchange event was closed, the participants joined in a conversation about the unique role of biosphere reserves, their method and approach. Furthermore, they identified success factors that contribute to learning processes and positive change for actions. The participants concluded:

- Biosphere reserves have the possibility to inspire others and to strengthen cooperation between different stakeholders by including people, their thoughts and ideas. Biosphere reserves create a neutral, inclusive and uniting arena where important sustainability challenges are highlighted and where solutions to those challenges are developed and tested in a practical context.
- Biosphere reserves have an important role to generate learning processes by communicating with stakeholders and the public WHY it is important to address certain sustainability challenges, they are science translators and link new knowledge to local place-based knowledge.
- Biosphere reserves inspire with good examples and empower people to contribute to change.

When discussing how the method can improve, in order to strengthen the biosphere reserve, the participants recognized that the method is complex and difficult to communicate. The best way to inspire is by showing good examples. There is also a difficulty reaching people and stakeholders who are not already interested. It is important to remember that a picture says more than a thousand words, so make sure to communicate the good examples through a diverse array of representative pictures.

Finally, the participants talked about the learning processes generated by the biosphere reserve and concluded that it is important to meet different stakeholders in their learning environment (for example landowners in their fields), and to inspire them to take ownership in the solution to the sustainability challenge, increasing their sense of pride.

International exchange event #2 – Archipelago Sea

The second international exchange event was held in the Archipelago Sea on October 3rd-5th 2018. The remaining four stories from the participating biosphere reserves were presented, a workshop was held and arranged was also a field trip to ongoing projects in the Archipelago Sea.

The meeting in Finland was moderated by Nina Söderlund, chair of Archipelago Institute of Åbo Akademi university and member of Pargas board. Carl-Sture Österman, director of environmental affairs Pargas, opened the event.

Attending the event was also representatives from the Swedish Agency for Marine and Water Management, including Jacob Granit, Director General; Thomas Johansson, Head of Marine Spatial Planning and Maria Hellsten, Executive Officer.

Opening presentation by Director General Jakob Granit, Swedish Agency for Marine and Water Management

Jakob Granit attended the first day of the event and gave an opening presentation on the importance of cooperation from source to sea in order to build a sustainable economy. He talked about the agency's mission "to preserve, restore and promote sustainable use of lakes, watercourses, the ocean and fish resources" and described their operating strategy for 2018-2020 that build on a coordinated management from source to sea. He pointed out that it is important to leave the silos and see the connections in the interconnected system and to work together in order to learn how to manage the system in an effective way. To achieve this, the SDGs and smart coordinated management is key. Finally, he concluded that the innovation and cooperation needed to achieve blue and green economic opportunities from source to sea is partly a social challenge.

Archipelago Sea

The concept “Gäddan & Gänget” – “The Pike & the Gang” #OceanLiteracy

The Pike & the Gang in day care

Since 2011, The Pike & the Gang have regularly visited all kindergartens in the Archipelago Sea BR. The Pike & the Gang are a bunch of soft toys that bring fun activities, with different themes on sustainability, to the children. Themes highlighted in previous years are:

- 2011 – Children´s rights and the involvement of children in the new, fused municipality. (The children's thoughts and ideas were included in the daycare strategy for the municipality)
- 2013 – Sorting of waste
- 2015 – Below the surface - a story about the state of the Archipelago Sea

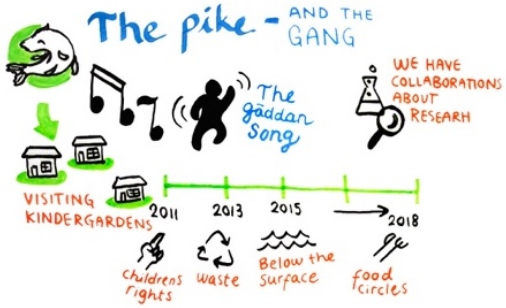
This year’s theme is the food circle. As the grand finale, a picnic for all 800 children in day care in Pargas was arrange on the 16th of May. Nearly 600 children attended - eating and dancing to the new “Pike-song”.

The Pike goes outer archipelago

The project “Expedition Skärgårdshavet” is teaching children and their parents about environmental issues and island culture in guest harbours in the archipelago. Right now, we are designing island-specific, permanent signboards containing activities and tasks that children and families can perform on their own in the harbours. By visiting several islands and fulfilling more tasks, children get more stamps in their island passports.

The Pike goes Kid´s Lab

The Kid´s Lab is a marine science lab at the Korpoström Archipelago Centre, where children can be marine biologists for a day and use microscopes and equipment that real researchers use.



Møn

Sustainable angling tourism and protection of the fish populations #SourcetoSea

Møn Biosphere Reserve include the shallow brackish coastal waters around the island of Møn. The shallow water contains populations of brackish water pike and perch. The brackish water pike and perch grows faster and bigger than their fresh water counterparts and are therefore attractive trophy fish for anglers.

Part of the Møn Biosphere Reserve foundation is the cooperation with Fishing Zealand. Fishing Zealand is a cooperation between Danish Sportfishing Association and for the time being twelve municipalities on the island of Zealand. The vision of Fishing Zealand is "world class sustainable angling tourism". To obtain this vision Fishing Zealand work with four main efforts:

- Nature and watercourse protection and restauration (no fish no angling tourism)
- Young people ("the future")
- Anglers and their organisations
- Angling tourism

This story concentrates on the protection and management of fish populations and species. The efforts for protection of the populations and improvement of the habitats includes watercourse and lake restoration, elimination of obstacles, information, no fishing zones, catch and release etc. Voluntary anglers organised in "the Zealand gravel gang" help the municipalities with monitoring and small restoration projects. These general efforts meet our challenge to protect and improve the conditions for the trout, the perch, the pike and other related species.

The brackish living predatory species (pike and perch) is vulnerable to fishing, to predators and to sudden chance in the salt concentrations. Especially the brackish water pike population is vulnerable and threatened. To deal with the problems and improve the conditions for the brackish water pike, Fishing Zealand has established a brackish water team consisting of anglers, scientists, commercial fishermen and civil servants from the municipalities. One of the main challenges is the lack of freshwater spawning areas. Lots of near coastal meadows with high water levels in springtime, has disappeared. In addition, the water regime has changed.

The brackish water team work with different options to re-establish former meadows. One of the options is the establishing of what the swedes has named "pike factories". The conditions differ partly form the Swedish ones. We gain our own experiences and hope that the establishing of pike factories is part of the solution of how to increase the

population of the brackish water pike in the coastal waters of Møn. All stakeholders will benefit, if the pike factories become a success.

We have produced a 10 minutes long film showing the process of the establishing of our first “pike factory” and the connected challenges. At the Biosphere for Baltics second international exchange event in Korpoström, Finland, we showed the film for the first time for an international audience.

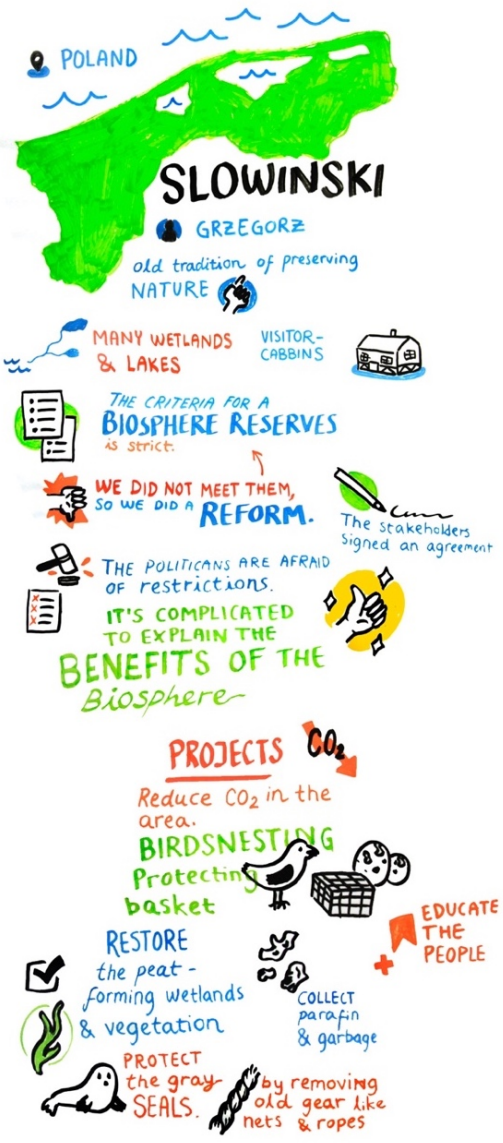
Słowinski

Activities for water ecosystems in the Słowinski BR #OceanLiteracy/SourcetoSea

Restoration of bogs to counteracting climate changes

Protection and restoration of bogs to reduce greenhouse gas emissions as counteracting climate changes. This action is implemented by an international project: Reduction of CO^2 emissions by restoring degraded peatlands in Northern European Lowland, which is implemented in Estonia, Latvia, Lithuania, Poland and Germany. Project is co-financed by: LIFE, BaltCF Foundation (Germany), NABU (Germany) Provincial Fund for Environmental Protection and Water Management in Gdańsk (Poland) and Naturalist Club (NGO Poland). Idea of the project is to integrate delivery of examples of how peatlands can be restored and managed to reduce CO^2 emissions in the diverse natural environment of these countries. The following activities are carried out as part of the project:

- actions towards coal resources accumulated in peatlands and preserving or restoring the peat-forming process
- removal of trees and shrubs from the surface of high bog peatlands and regenerative communities of peatbogs (area around 57 ha)
- testing innovative methods of restoring peat-forming vegetation in areas after peat exploitation, initiation of development of peat-forming vegetation in reservoirs after exploitation of peat through shaping their shoreline introducing peat forming vegetation on floating elements
- collection of complementary data on peatlands, construction of greenhouse gas emission scenarios, monitoring of project effects determining the water balance of peat bogs, mapping the network of drainage ditches, hydrological monitoring stratigraphic research of peat bogs, real vegetation mapping, monitoring of vegetation changes, estimation of the greenhouse gas balance using the GEST (Greenhouse Gas Emission Site Type) method and faunistic research.



Active protection of marine species

The next action of water ecosystems implemented within the Słowiński Biosphere Reserve is the active protection of species of birds and marine mammals. The project "Protection of mammals and sea birds and their habitats" is co-financed by the EU, under the Operational Program Infrastructure and Environment fund. Project is run by WWF in cooperation with the Water Birds Research Group KULING and the Słowiński National Park and is focusing on active protection of the ringed plover *Charadrius hiaticula*, which is subject to strict species protection and appears as a species at risk of extinction (V in the Polish Red Book of Animals). As part of this activity, birds and their breeding are monitored. Moreover, special nest baskets were placed on bird nests during the breeding season. Baskets protected the nests and the chicks from predators and trampling over by tourists' feet. Young birds have been captured by ornithologists, ringed and then released back into the wild so we can follow their wanderings. We noted a greater survival rate of hatched chicks under cover of baskets. This project will be continued in future years.

The project “Protection of habitats grey seal (*Halichoerus grypus*) and porpoise (*Phocoena phocoena*) in area of Słowiński National Park" has been implemented the years 2014-2017 and co-financed by Norwegian Financial Mechanism of the European Economic Area. The area of sea waters situated within the Słowiński National Park is a potentially good habitat for marine mammals. However, seals are rarely observed, and harbour porpoise has not yet been reported. The goal of the project was to improve the efficiency of management and monitoring of the area by identifying potential habitats of the Baltic mammals. The equipment enabling the detection of the presence of porpoises was deployed in the maritime area of Słowiński National Park as a part of this project. In addition, there was an increase in patrols conducted both from the shore and from the boat, which allowed to increase the possibility of monitoring the area of sea waters remaining within the limits of the Słowiński National Park. Moreover, during the periodic cruises, in addition to monitoring, searches and removal of lost fishing nets were carried out, thus the potential threat to marine animals was removed. To search for and remove abandoned ropes and fish nets, an underwater robot equipped with a camera and gripper was used. The underwater robot also provided interesting observations of the seabed and life there.

We care about clean beaches

Every year, the Baltic Sea waves throws out a lot of rubbish on the beaches. Beaches are cleaned by National Park Service, which cooperate with the Social Integration Center. SIC employs people at risk of social exclusion, thanks to clean-up work they are provided with employment. Areas outside the National Park are organized by the Maritime Office and local initiatives such as the "Barefoot" project of clean beaches in Łeba. The project aims at ecological education about the problem of littering and spreading the idea of responsible leisure. The project is co-organized by the Clean Poland Association, which undertakes a number of initiatives to protect the environment and actively counteracts the illegal storage of waste. This year, the Authorities of Łeba City also supported the action in Łeba.

Furthermore, we had to face the pollution of the beaches with paraffin lumps this year, which was thrown into the sea by one of the ships and then thrown to the beach. We collected over 5 tons of paraffin, but many small pieces of paraffin that could not be collected, remained in the sand.

Small local projects for water and climate

Many small local projects are implemented in the Słowiński Biosphere Reserve, for example one of them is the project “Maintenance of natural water retention ecosystems in the Municipality of Kobylnica”.

This project consists in the reconstitution of 4 small water reservoirs in order to counteract climate change. The aim of the project is to strengthen the region's resistance to climate change, including floods and droughts, and to prevent environmental hazards and limit the negative effect on the level of human safety. In the period of abundant rainfall or intensive thaw, these reservoirs will retain excess water, while in the case of drought they will be a very important point of its extraction Moreover, the landscape and recreational values of the areas on which this project is implemented have been improved. The project is co-financed from the European Regional Development Fund under the Regional Operational Program of the Pomeranian Voivodeship.

Education

Education is one of the most important activities, because it enables understanding of environmental problems and serving the development of proper social attitudes. In Słowiński Biosphere Reserve we conduct educational activities and every year ecological picnics with nature competitions are organized. One of them is the event Safe Waves of Adventure, which is to educate young people about the seaside nature but also show the proper rules of rest and recreation on the water. Children can also take part in the first aid training. The service responsible for safety in waters, National Park Service, WWF and other organizations are involved in this event. Great fun and learning in the fresh air by the sea.

Blekinge Archipelago

Thiamine deficiency in salmon, eider and blue mussel #OceanLiteracy

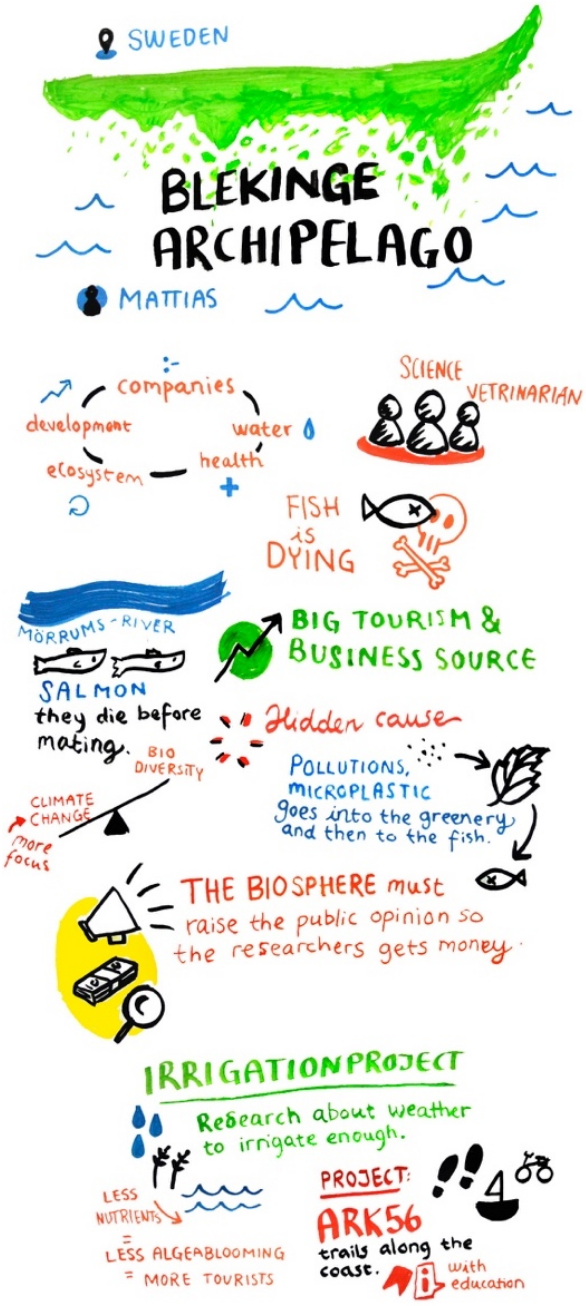
Since the -90´s scientists have proved that a lack of vitamin B1, thiamine, causes a high mortality on salmon eggs, the phenomenon called M74. Today, scientific evidence shows that several species are suffering from thiamine deficiency, among others the common eider, the blue mussel and also adult migrating salmon (not only the eggs). There are also preliminary results that show how the Swedish moose and Baltic cod also suffers from a lack of the vitamin.

Typical symptoms when suffering from a lack of the essential thiamine are difficulties in feeding and breeding, reduced immune system and a higher susceptibility to different viruses and bacteria, paralysis in different degrees and eventually death, which makes the deficiency a very serious problem.

Regarding the spread of the thiamine deficiency, Swedish and American scientists speak today of the whole northern hemisphere. In some states of North America, it is no longer allowed to take tests from moose for scientific analysis, because the animals are too few and too weak. In Sweden we have had a high mortality on adult migrating salmon in approximately 90% of the Baltic salmon rivers. The eider is perceptibly reduced in all Swedish archipelagos from the southernmost and at least up through Stockholm. Approximately the same spread seems to be the case for the moose.

In the biosphere reserve Blekinge Archipelago’s steering committee there has been an awareness of the thiamine problem since the salmon started to die in the famous river Mörrumsån, in 2014. From 2015 Blekinge Archipelago has been informing about this problem in different situations and have had a direct contact with scientists from the University of Stockholm. In collaboration with the salmon crown fishery of Mörrum, Mörrums Kronolaxfiske, who is a governmental administrator of the river and the fishing, a few articles have been produced together with the local newspaper journalists.

In January 2017, Mörrums Kronolaxfiske held a seminar on the problems of the Baltic salmon. Different authorities, organisations and other stakeholders were represented, and everyone seemed to understand the severity of the problem. Since then there has been a good national monitoring, veterinary analysis has been made to find different viruses, but no support from the state- or governmental authorities to scientists who are ready to find out what causes the thiamine deficiency. When scientists from the University of Stockholm showed their latest findings and reports to the Department of Environment in autumn 2017, they got the answer that the department can do nothing on their own initiative, actions can only be taken only after a greater public opinion has been produced on this matter.



Meanwhile the next generation of migrating salmon dies in the river. That means a lot of pain for the fish, some fish die before they have spawned and when they do, thousands of fry will not hatch the next spring. The population is at risk, fishing is bad and decreases the recreational opportunities, increases the risk for social conflicts on the scarce resource (sport fishing-fishing for a living) and big economical loss for the administrators and all other entrepreneurs who benefits from the fishing in the small village of Mörrum.

Therefore, Blekinge Archipelago has sent a letter to the Department of Environment and the Department of Rural Development. The letter, also directed to the director generals of several national authorities, is signed by biosphere reserves, different nature tourism companies and organisations with wildlife and nature conservation as purpose. Furthermore, this has inspired the county administrative boards in three different counties to also write a letter and hopefully, the two letters show that there now is a strong enough public opinion for the Department of Environment to support research on what causes thiamine deficiency.

Optimal irrigation management - water-food-energy nexus perspective #SourcetoSea

In early spring 2018 Blekinge Archipelago got in contact with a scientist at KTH (Royal Technical Academy) who is applying for supporting finances to develop a model for irrigation. Some pre-studies have been made that shows that such a model would have many benefits. Blekinge Archipelago is at this point just a stakeholder in the application, but very interested in the model's potential and to applicate it on agriculture in the area, ones it is ready.

If the application for finances gets a positive response, the research will be done in cooperation between KTH, SMHI (Swedish Metrological and Hydrological Institute) and NASA (National Aeronautics and Space Administration) in USA, to work out better weather forecasts to be able to predict when it is time to irrigate and when it is not.

Climate change can make up for big changes in weather types. Places that normally have regular rains can become drier or more wet depending on where they are and how these places relate to new winds, currents and sun exposure. In 2017 south Sweden suffered from an unusual drought, making ground water levels extremely low. Same thing happens often in different states in USA. Yet the last winter was unusually wet with water levels far above normal, which indicates that there might be bigger contrasts in future weather types too.

The model for optimal irrigation will show when farmers may irrigate without having a rain afterwards that cleans the soils and increase the nutrient infusion to the Baltic Sea. The model will also show when there is no rain to expect, but still use the water sources in a wise way if the season is dry. In this way the model will have economical, ecological and social benefits. Economically it will be possible to save electricity for water pumps and get an optimal growth in the crop. Ecologically less nutrients in the sea will contribute to stop the blooming of algae and the growing dying, oxygen absent bottoms. To get rid of algae close to the coast also has economic advantages since the archipelago in our area holds a big potential for revenue from nature and culture tourism. To use the water sources wise and to be careful with nutrients to the Baltic Sea is socially sustainable in the long run. The opposite means potential conflicts on the resources of water, both sweet and brackish.

If the model becomes realized, Blekinge Archipelago sees an opportunity to initiate a project together with farming organisations and expertise (Hushållningssällskapet, LRF) and see what other actions could be done to prevent nutrients to flow to the sea, such as grow buffer zones next to the ditches, creeks and rivers, create wetlands, restore small rivers, and so on.

Presentation - Ranger

Daniel Witt from Southeast Rügen attended the event and shared his experiences as a ranger within the Biosphere Reserve. The 12 rangers employed in Southeast Rügen have a wide range of assignments, including:

- landscape care and species protection; e.g. removal of giant hogweed, building toad fences
- monitoring activities; e.g. monitoring the grey seal population, forests and birds
- legal control duties; make sure that the 3,8 million visitors each year follow the BRs regulation
- visitor guidance and tourism infrastructure maintenance

In addition, the rangers run a junior ranger program and activities for schools. This educational program engages approx. 90 children, between 11- 14 years old, every week. During the summer, they also arrange a two-week camp for junior rangers with a special interest in nature and sustainability.

Workshop part 1 – #SourcetoSea

Blekinge Archipelagos story on optimal irrigation management from the water-food-energy nexus perspective was used as a case for discussion during the first part of the workshop session. Based on the governance model, the participants were asked to design a project or strategy for how Blekinge Archipelago could incorporate the ongoing irrigation research in their Biosphere Reserve – how they can link and translate the scientific results in order to support, reach out and connect it to relevant local actors and stakeholders. They were also asked to identify actions to prevent nutrients to flow to the sea. The participants worked in groups of five and were asked to be "Biosphere Master Minds" and provide their best advice.

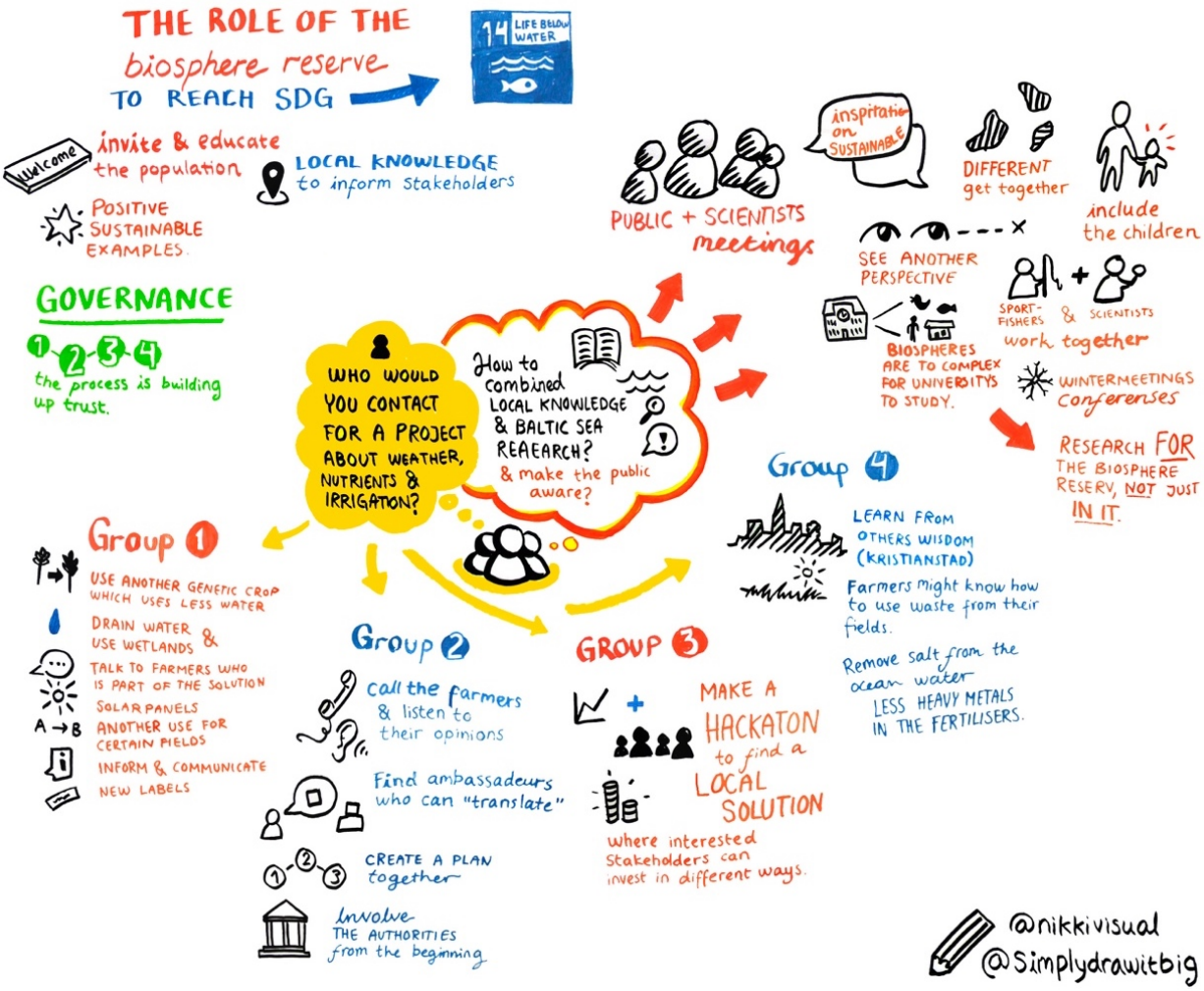
The presentations by the groups are summarized to the following strategy:

- **Start bottom up** Focus on creating something that can grow locally and then spread. How can we connect what we know to the context? Arrange a Hackathon where you invite everyone interested and that is led by experts. How connect data to the solutions. Find the added value! It is important to find and gather the right people.
- **Include the farmers** Show the problem - inform the farmers - show the farmers what is in it for them. Show how the irrigation influence the ecosystem. Show why - and listen - plan actions together. Find local leaders that can be the good example - translators ambassadors. Make use of the landowners and farmers knowledge and experience.
- **Build trust** Important to get the farmers to trust the method. They are putting their crop at stake. Show that the method really works. Start local field experiments.
- **Engage local authorities** Important to invite them from the beginning.

- **Evaluate** It is important to evaluate and modify your method/work along the way. It is also important to evaluate other methods (see suggestions below) as a complement to the method suggested.
- **Communicate** the positive aspects to the locals to increase the incentive for the farmers. Outreach. Know your local farmer!
- **Follow-up** on your results and evaluate again to build trust and promote development.

The groups also came with suggestions on following actions to improve irrigation and prevent nutrient leakage:

- What type of crop is grown? – are there other types or genetic variations that demand less water? Crop that can be used for biogas.
- How are the fields drained – can this be done in another way?
- Construct or re-establish wetlands.
- Solar panels can improve irrigation – can also give shadow to keep soil wet.
- Look at alternative use of the fields.
- Increase the ecological farming
- Use seaweed as fertilizer



Workshop part 2 – #OceanLiteracy

The second part of the workshop focused on Ocean Literacy and engaged the participants in short beehive discussions on:

- How do you combine local place-based knowledge with Baltic Sea research and monitoring?
- How do you work with public awareness raising of the Baltic Sea?

The discussions were shared in plenum and thoughts, reflections and ideas are summarized:

It was concluded that the biosphere reserves in the Baltic Sea region carries a lot of information and knowledge that can be shared, both between the biosphere reserves and with others, and that a platform like Biosphere for Baltic is important to stimulate cooperation and sharing of ideas. It is valuable to be able to share activities – "the wheel doesn't have to be invented several times". It was highlighted that biosphere reserves themselves are interesting for scientists to study. Researchers often visit biosphere reserves to conduct their research, but we should also encourage them to do research on the biosphere reserve itself. It was also pointed out that we need to spread the word – more people need to talk about biosphere reserves, it should be the lifestyle of people.

Examples on how the biosphere offices combine local place-based knowledge with Baltic Sea research and monitoring were given. Several of the biosphere reserves regularly arrange meetings and workshops inviting local producers (i.e. farmers and fishermen), entrepreneurs, business sector and other relevant stakeholders in order to promote dialogue. Every year Kristianstads Vattenrike arrange a conference open to the public where research projects in the area are presented. A similar event, the Archipelago Research Forum, is arranged by the Archipelago Sea biosphere each year. There are also examples of how citizen science is promoted in the biosphere reserves. In Denmark, Møn has been involved in a program where local sports fishermen contribute to the research on pike by marking the fish and by reporting their fishing effort and catch to the researchers.

Examples were also given on how Biosphere for Baltic already has inspired and contributed to individual biosphere reserves, both in terms of how to organize and setup the work within the biosphere reserves and how activities/projects are implemented. The experiences shared have also provided input and material to ongoing discussions in one of the participating biosphere reserves and contributed to the implementation of projects.

Field trip

During the second day of the event we visited the archipelago island Brännskär where Åbolands Skärgårdsstiftelse and the Archipelago Sea biosphere reserve are involved in a project that promote activities, entrepreneurship and year-round living in the archipelago. In 2011 Åbolands Skärgårdsstiftelse bought the old homestead on the island in order to prevent culturally important properties from being converted into private holiday homes/cottages. They lease the homestead to three families and together with them they run projects that promotes a living archipelago and sustainable year-round activities on the island.

One of the tenants, Linus Söderlund, guided us around Brännskär and told their story – from when they first moved to the island in 2012 till today. We were shown several of their ongoing projects and activities and the visit was completed with a fantastic lunch at their harbour café.


In our famous salmon river Mörrumsån from 2013- (Second biggest travel reason).
* Different behaviour
* Difficulties in feeding and breeding
* Reduced immune system and higher susceptibility to virus and bacteria
* Paralysis
* Death


Cooperation from source to sea to build a sustainable economy
Jakob Granit, PhD
Director General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