



View from the visitor centre naturum Vattenriket.

Ecosystem Services in Protected Area Management

Report from the EUROPARC
Nordic-Baltic Section Seminar* May 3–5, 2011

Kristianstads Vattenrike Biosphere Reserve
Kristianstad, Sweden

Text and photos: Christina Anderson



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*This seminar was sponsored by the Nordic Council of Ministers.

Letter from the organisers

The Nordic-Baltic section of the EUROPARC Federation is a network of almost 50 member organisations in eight countries. We exchange knowledge and experiences related to our daily work as managers of protected areas.

Today, we are all aware of the critical stress that the world's ecosystems are under. Only by safeguarding and strengthening natural systems do we stand a chance to meet the increasing demands of a growing human population and the effects of a changing climate. We cannot afford not to, reports such as the *The Economics of Ecosystems & Biodiversity* (www.teebweb.org) have shown us.

Protected area managers have a key role to play as stewards of biodiversity and of the benefits provided to humankind by ecosystems – that is ecosystem services. But the question is how do we do this in practice, in our protected areas? To support our members, we looked to the Kristianstads Vattenrike Biosphere Reserve, where for many years they have integrated the ecosystem approach into their management plan. We wanted to see how they strive to let the ecosystems thinking saturate all work on nature conservation, education and development, and learn from their experiences.

In close cooperation with the Biosphere Office, we put together a programme that covered theory and practice in the form of workshops and onsite visits. Real-life cases highlighted the constant and dynamic process of integrating nature conservation and development, the natural and the human spheres, for true sustainability that includes ecological, social and economic dimensions.

The 25 seminar participants came from as close as Kristianstad University to as far as the Carpathian Mountains. They shared their wealth of experiences in the fields of research, development and nature management, with examples from all over the world.

In their evaluations participants gave the seminar an average score of 4.5 (out of 5). Several participants expressed a wish for more opportunities to learn about ecosystem services, and there is a clear demand for knowledge and tools for the practical implementation of the approach in protected areas.

Finally, we would like to extend our greatest appreciation and thanks to the participants for contributing their experiences and knowledge, and to the Biosphere Office and naturum Vattenriket for helping us to shape a rewarding seminar that successfully illustrated the importance of a dynamic network of local stewards, entrepreneurs and other stakeholders.

At the end of the day, networks like the one involved in Vattenriket seem to be the secret to success in many different sustainable development projects, whether it's creating a biosphere reserve or engaging urban communities to help transform their environment.



Thomas Hansson
President EUROPARC Nordic-Baltic Section
June 23, 2011, Rörum, Sweden



Welcome reception

Europarc Nordic-Baltic Section President Thomas Hansson and Lena Malmström, section coordinator

Participants gathered in the café at naturum Vattenriket to kick off the three-day seminar with a glass of wine and mingle.

naturum Vattenriket – gateway to the biosphere reserve

The naturum Vattenriket visitor centre is not only a gateway to Kristianstads Vattenrike Biosphere Reserve, but also the natural focal point for everyone engaged in projects in the biosphere reserve.

There are some 25 naturum visitor centres in Sweden. They are free of charge and located near Swedish national parks or nature reserves. The naturum provide visitors with information about the region's plants, birds, insects and animals. There, you can also learn about the cultural history and geology of the area, as well as people's

The visitor centre naturum Vattenriket is a stone's throw from Kristianstad city centre.



Karin Magntorn, director of the naturum Vattenriket, gave us a guided tour of the visitor centre, which opened in November 2010.

relationship to the nature and their impact on it there.

naturum Vattenriket is one of the most expensive visitor centres built. It opened in 2010 and offers a wide variety of activities and events related to the current season or the key themes of the biosphere reserve, lots to discover and experience in the fascinating exhibitions and a Nature School for children and teachers, among other things.

Visitor centres benefit local economy

While naturum's are free they attract visitors. The tourists benefit the local economy, says Karin Magntorn, adding that so far this year 70,000 people have visited naturum Vattenriket.



Seminar participant Claudia Danau from Romania takes a tour of the visitor centre.

From polluted wetlands to a Water Kingdom

In the 1960s the wetlands were perceived as waterlogged, unhealthy swamp. In fact, they were used as a garbage dump. During the 1970s, even though environmental issues were high on the political agenda and several conservation projects were initiated, values continued to decline at Vattenriket.

"In the mid-1980s, however, a network started to form, with a vision to preserve and develop the ecological values and cultural heritage while using the values in a sustainable way. The aim was to turn the wetlands into a Vattenrike "Water Kingdom", something that would put Kristianstad on the map. Kristianstad needed a new profile and the key individuals had contacts with the local top politicians."

In 1989 the so-called ecomuseum activities started in the River Helge å runoff area in Kristianstad and the coastal areas of the Hanö Bay. The aim of the outdoor museum was to preserve the ecological, cultural and historical values in conjunction with the area, as well as

to attempt to rejuvenate the values that had disappeared.

The eco-museum office became the bridging organization – between stakeholders at the international, national, county, municipal and sub-municipal levels – that eventually became the Vattenriket biosphere reserve office in 2005. Its work centred on nature conservation, cultural heritage management, eco-tourism, recreation and farming.

The bridging organization draws on the network of stakeholders for support, tailoring collaborations to each project. For example, projects on migratory birds benefit from international collaborations, and projects on flooded meadows benefit from local collaborations between farmers, birdwatchers and the municipality. In turn, the bridging organization provides coordination at the landscape level, identifies synergies between interests, helps resolve conflicts, and connects ideas to funding and knowledge.

Biosphere reserve*

What is a biosphere reserve?

A biosphere reserve is a representative ecological area that is internationally recognized, nominated by the national government and under sovereign jurisdiction of the state where it is located. They serve as living laboratories for testing and demonstrating integrated management of land, water and biodiversity.

Collectively, the more than 500 biosphere reserves in over 100 countries form a global network – World Network of Biosphere Reserves – that facilitates the exchange of information, experience and personnel. They are part of a UNESCO scientific programme.

The origin of Biosphere Reserves goes back to the “Biosphere Conference”, organized by UNESCO in 1968. This Conference resulted in the launching of the UNESCO “Man and the Biosphere” (MAB) Programme, through which UNESCO designates the biosphere reserves.

- [*www.unesco.org.uk/uploads/biopsphere%20reserves%20faq.pdf](http://www.unesco.org.uk/uploads/biopsphere%20reserves%20faq.pdf)

Biosphere functions

Each biosphere reserve is intended to fulfil three basic functions, which are complementary and mutually reinforcing:

- a conservation function - to contribute to the conservation of landscapes, ecosystems, species and genetic variation;
- a development function - to foster economic and human development which is socio-culturally and ecologically sustainable;

a logistic function - to provide support for research, monitoring, education and information exchange related to local, national and global issues of conservation and development.

A visit to Sånnarna sandy grasslands



Anders Hallengren, Thomas Hansson and Claus Helweg Ovesen during the outing at Sånnarna sandy grasslands to listen to the Natterjack toad. Sånnarna is also part of an outdoor museum and an outdoor classroom.

Anders Hallengren, with the Skåne County Administrative Board, led us on a visit of Sånnarna sandy grasslands to listen to the Natterjack toad (*Epidalea calamita*). Situated within Vattenriket biosphere reserve, Sånnarna, which means sand, has been cultivated since the Bronze Age.

The calcified soil provides a good habitat for interesting flora and fauna, such as the *Copris lunaris* beetle and is home to the second best area for solitary bees. Unfortunately, the Natterjack toad did not make itself heard to the group - perhaps because we were a little too early and the cold air prevented us from staying late. But we learned that the Skåne area hosts 13 species of amphibians and that during a good year there are 25 calling Natterjack males at Sånnarna.

Work to preserve the endangered vegetation at Sånnarna such as Sandpink (*Dianthus arenarius*) and Obtuse sedge (*Carex obtusata*) includes maintaining the fields by plowing them every six years. This helps attract special fauna, such as the solitary bees.

Sånnarna is also an outdoor museum and an outdoor classroom that includes demonstrations of cultivation areas to inspire teachers and students to experience the cultural, historic and biological values of these sandy grasslands and learn how they can be preserved. The outdoor classroom contains lab equipment and laminated work materials.



Sånnarna is also part of an outdoor museum and an outdoor classroom.

Biosphere Reserve in an Ecosystem Services Perspective

Sven-Erik Magnusson, head of the Kristianstads Vattenrike Biosphere Reserve, described Vattenriket from an ecosystem services perspective.

Kristianstads Vattenrike Biosphere Reserve, designated by UNESCO in 2005, includes the greater part of Kristianstad municipality with the rich wetlands of River Helge å and the town of Kristianstad at its heart.

Today Vattenriket Biosphere Reserve comprises more than 100,000 hectares of land and lakes, with at least 700 nationally red-listed species of flora and fauna, and at least 38 different species of fish, including European catfish and loach, have been caught in the inland waters.

Biosphere reserves are segmented according to zones (core, buffer and transition). Vattenriket's core area comprises seasonally flooded wet grasslands used for grazing and haymaking, where there is a rich birdlife. This is the largest area in Sweden of wet grasslands used for grazing.

The core area comprises nature reserves and Natura 2000 areas, while the buffer zone includes RAMSAR convention sites and is among the some 2,000 sites in Sweden that have been declared areas of national interest for nature conservation.

Ten thematic areas identified

But preserving the values in a cultural landscape needs a sustainable use and development, for which landowners, tenants, the municipality and others need to be engaged, Magnusson explained. While the zoning helps identify the valuable landscapes, ecosystems and ecosystem services, it doesn't say anything about the landscape and the elements in it. Magnusson said a more illustrative language was needed to engage stakeholders.

Hence, 10 thematic areas were identified within Vattenriket in conjunction with the biosphere reserve application: These are urban natural values; groundwater; sandy calcareous grasslands; wetlands along Helge å River; Ancient wooded habitats; Small valuable streams; the coastal dune landscape; Balsberget Hill and Lake Råbelövs-sjön; coastal waters of Hanöbukten Bay and valuable forests on the slopes of Linderödsåsen Ridge.

Starting with the wetlands and the sandy grasslands, the biosphere reserve office worked to develop the function of each area. The seasonally flooded wet grasslands, for example, are used for grazing and haymaking. There, valuable areas in the agricultural landscape are preserved through the production of "green meat" from cattle that graze in the grasslands, and the meat is then sold as naturally grazed beef. (See text from Håslövs ängar)

Local development projects

Biosphere reserves are intended to contribute to developing an area in a way that benefits people and the natural



Sven-Erik Magnusson, head of the Kristianstads Vattenrike Biosphere, described Vattenriket from an ecosystem services perspective.

environment, preferably through close cooperation with local stakeholders.

Local development projects in Vattenriket include biogas for municipal buses, wetlands ecotourism and the development of products, such as the abovementioned cattle grazing in the seasonally inundated grasslands.

Biological and recreational values are being developed simultaneously on a golf course in the sandy grasslands. The objective here was to show that it is possible to combine golf with the need to conserve and develop flora and fauna in sensitive sandy environments. The success of the project has attracted considerable attention and the project has become a model for others to follow.

Biosphere reserves exist in part to make it easier for the general public, students and researchers to explore everything of value that an area has to offer. With this in mind, Vattenriket maintains visitor sites, runs a Nature School and liaises closely with Kristianstad University and other universities.

People at the center of work with ecosystem services

Lisen Schultz, a researcher at the Stockholm Resilience Centre with a focus in ecosystem services, biodiversity and governance, shared her experiences working with the Millennium Ecosystem Assessment (MEA) and Kristianstads Vattenrike Biosphere Reserve.



Lisen Schultz, a researcher at the Stockholm Resilience Centre

Conducted during 2000–2005, the MEA was the first global assessment of ecosystem services, involving almost 1,400 experts from 95 countries. The UN program sought to provide answers on the state of the world's ecosystem services, how to manage them in a way that sustains their capacity to generate services, and establish how ecosystems affect human well-being. Kristianstads Vattenrike was one of 33 sub-global assessments under the MEA.

Four types of ecosystem services

Described as the benefits people derive from nature, ecosystem services are divided into four categories: Provisioning services, which we know the most about, include food, water and medicinal resources, while air quality, carbon sequestration, and pollination, are among the regulating services. They are the hardest to quantify, said Schultz.

Recreation and health, tourism and education belong to the cultural ecosystem services and, finally, habitats for species and maintenance of genetic diversity are in the category of supporting services.

The results of the MEA were challenging, showing that while people's needs are increasing, ecosystem services are decreasing. Resilience is decreasing and change is increasing, and humans are the biggest driver of the ecosystem changes. "And we don't really know how to drive the change in the right direction," said Schultz.

Vattenriket a positive example of transformation

The results prompted interest in looking to how one could learn from Kristianstads Vattenrike. There, the decline in ecological values was turned around, biodiversity conservation contributes to societal development, conflicting interests work together and nature conservation takes place in a productive, semi-urban landscape.

Schultz's project looked at how the management around Vattenriket was organized and how the transformation of management occurred. The research included a social-ecological inventory—that is, mapping the ecosystem services and the groups involved in managing them—as well as a look at the strategies and conditions that enable ecosystems management.

Contributions of local stewards

Schultz grew interested in the idea that the success of the biosphere reserve was built on the work of local stewards, which contributed with on-site management, monitoring and response, and local ecological knowledge among other things.

"If you look on it as a biologist you see the species; if you are an ecologist you see the habitat; if you are an economist you see the game or fish resources, but you don't see the people in this equation," said Schultz.

There were all sorts of associations, including fishing, hunting and forestry organisations, but according to Schultz, if you want to work with ecosystem services you have to think about the people who help sustain these services. "Ecosystems are generated by nature but also by social-ecological systems of people and nature together. This became clear after the MEA," said Schultz.

In Vattenriket, the flooded meadows and the ecosystem services they generate are the result of people's use of these areas for grazing and hay-making. Trying to conserve the meadows and the services they provide would be impossible without involving farmers.

Lessons from Vattenriket

As for lessons learned from Vattenriket that can be applied to other projects, Sven-Erik Magnusson, head of the biosphere reserve office, shared a few: First, you have to scan the area for people to talk to and connect with others. "You don't have to do all the work yourself," he said. And once interested stakeholders are

¹ Millennium Ecosystem Assessment website <http://www.millenniumassessment.org/>

*Biodiversity conservation contributes to societal development.
It's crucial to build on the work of the local stewards.*



brought together, the ideas will flow. Second, don't assume resources have to come in the form of money. "They can be facts or logistical support, too," he added.

Finally, he emphasized the need to build trust. "You don't meet for the first time when a conflict arises. You try to meet before," said Magnusson.

Schultz also cited many valuable lessons to be learned. Here are a few: 1) Biodiversity contributes to societal development. 2) It's important to identify and build on the work of local stewards. 3) Adaptive co-management builds on the personal relations between key individuals rather than formal links between various organisations. 4) Voluntary, informal collaboration promotes learning and flexibility but is vulnerable. 5) Learning can change preferences and enhance motivation for ecosystem management, and finally: 6) Strategic collaboration is an effective complement to broad participation and democratic processes.

PROJECT IN FOCUS

Probing the potential of peat

Paul Leadbitter works at the North Pennines Area of Outstanding Natural Beauty in the UK, a region rich in peat land. His primary interest in ecosystem services centers on the carbon storage and sequestration capacity of peat.



According to UNEP, clearing, draining and setting fire to peat land emits more than 3 billion tonnes of carbon dioxide every year, the equivalent of 10 percent of global emissions from fossil fuels. Further, climate change contributes to the release of methane from peat and exacerbates peat fires.

Peat comprises 3 percent of the world's total land surface and holds 10 times more carbon than forests in the world, says Leadbitter. "That is a very valuable ecosystem service."

The problem is that even though we know carbon has been stored in peat since the last ice age, we don't know exactly how much is stored there or how much carbon peat pulls in.

Leadbitter is working on a restoration project that also aims to measure the capacity of peat to store and sequester carbon. "The potential is that you can offset by buying the carbon in the peat. Then we can go to the private sector and ask them to invest in peatland carbon, but companies aren't going to invest in the peat system if they don't know how much carbon it's storing."

Ultimately, Leadbitter sees peat as an alternative in the voluntary trading carbon markets.

So far with the help of funding from the British government, the private sector and a foundation, the project has restored 200 square kilometers of peat land in the UK. There, letting the peat dry up has had negative consequences on flooding.

"If you restore the peatland vegetation it acts like a sponge after a certain amount of time," says Leadbitter. In addition to being relatively cheap to restore, he says peat's many benefits include biodiversity, water provision and sediment control.



Lennart Waldemarsson is one of two remaining farmers whose cattle graze at Håslöv meadows.

A visit to Håslövs ängar



Birdwatching at Håslöv meadows.

On our second day in Kristianstad, we visited the annually flooded meadows of Håslövs ängar, a nature reserve on the peninsula of Lake Hammarsjön in the Vattenriket Biosphere Reserve. Lennart Waldemarsson, a local farmer, and Hans Cronert from the Skåne County Administrative Board brought us on a guided tour.

The water system and vast meadows in these 180 hectares, which are under water during the winter months, provides an excellent habitat for migrating wetland birds and a nesting ground for species such as Blacktailed Godwit (*Limosa limosa*) and other wet grassland wader birds.

The reserve is managed by the Skåne County Administrative Board together with local farmers, such as Lennart Waldemarsson. Waldemarsson work exemplifies the crucial role of the steward in protected area management and the success of Kristianstads Vattenrike Biosphere Reserve. Waldemarsson shared the history of Håslövs ängar and his experiences as one of the few farmers still using Håslövs ängar as grazing and mowing ground.

Waldemarsson said the area looks about the same as it did in the 1950s, when all of the farmers in the village had cattle and used the hayfield and the pastureland. "The whole area was owned by the farmers in the village," he said.

In the 1960s profitability went down in milk and meat production and all the farmers in the village with one exception stopped production and the cattle almost disappeared from Håslövs ängar. The only farm that kept cattle since the early 1970s was the farm Waldemarsson and his wife owned.

With the change in agricultural production came neglect of the meadows, which weren't grazed and some of them weren't mowed. The shoreline became overgrown with reeds and willow bushes. Waldemarsson said that from an agricultural perspective these low productive areas were

not profitable enough and, hence, were of no interest for the high productive farmers.

In the mid-1960s the natural values of Håslövs ängar gained attention, and in 1967 the nature reserve was established. Håslövs ängar continued to be overgrown for years. Tufted Hair-grass (*Deschampsia caespitosa*) spread.

It wasn't until the 1980s before restoration work began. The Swedish Forest Agency cleared the fields on behalf of the County Administrative Board, and electric fences were put up to assist the remaining farmers. The fences are still in use today to keep grazing animals by the shoreline once they are released in the spring.

The Swedish Environmental Protection Agency has become owners of 95 percent of the area in the 1980s. Contracts were made with the farmers who were compensated in return for a well-grazed pasture and grassland. When Sweden joined the EU, those contracts were exchanged for the EU's environmental support for biodiversity in pastures and hay meadows.

Today the tools to manage the area are two herds of cows and their calves, which graze parts of the meadows, while other areas are mowed. Said Waldemarsson, "I truly believe that we have found a suitable working method that makes Håslövs ängar a bird area of great value, where people can enjoy the Swedish countryside."

The Håslöv meadows comprises 180 hectares of annually flooded grazed and mowed meadows.





Anita Zieme, chef and manager at Café Miró described the menu and the provenance of all of the ingredients for the hungry troupe.

An unforgettable feast

On our last night we enjoyed a fantastic dinner at the Café Miró, which is located at the Regional Museum in Kristianstad. There, chef Anita Zieme treated us to a feast of epic proportion, prepared with organic, locally grown ingredients.

Zieme's philosophy is to eat what is found locally and in her immediate environs, ie what is provided by the local ecosystem. A big source of her inspiration came from Hildegard of Bingen, the 12th Century German nun who was also a composer and doctor. She experimented widely with herbs and food.

"I wanted to be like her and started to read up on how she used things like medicinal herbs," says Zieme, whose father – a butcher – moved the family from Germany to southern Sweden to make sausages when she was a little girl. Her parents also had a vegetable store.

Zieme says their interest in gourmet food helped spur her passion for fresh and local products. "Already as a girl I was out a lot in nature. I was interested in plants, berries and things you find in the woods. I see everything as food," she says.

Zieme took over the management of Café Miró two years ago. Our feast included a weed soup with ramsons, nettles, dandelion and sow thistle; lamb entrecote, roasted beetroot and potatoes served with a blackberry and red onion chutney; and a broiled herb-encrusted salmon with a sauce of crème fraiche, ramsons and toasted mustard seeds.

Pike with sorrel sauce, mini nettle pizzas with herbs and cheese, honey-roasted walnuts and freshly baked rolls with Spanish chervil were among the dishes in the buffet. The honey came from the nearby town of Barum, the walnuts harvested from trees that grow in the museum's courtyard. For dessert Zieme prepared a pannacotta with the antioxidant-rich Sea-buckthorn, a berry that grows in

abundance in the Kristianstad region.

She doesn't work with a set menu. Instead, she lets the season determine the menu and what is locally available, which she can't always predict. "It has to be locally produced, preferably not transported by car," says Zieme. "Frequently kitchen gardeners will call to sell me something. All of a sudden, I can get an e-mail from someone with a whole load of mulberries!"



Just a few of the delicious dishes served at Café Miró.



Zieme only uses local, organically produced products in her menus.



Bird watching in Kristianstads Vattenrike with Hans Cronert

Bird watchers biking along the River Helge Ä.

On the beautiful morning of the last day of the seminar the early sunrays warmed the backs of those of us who left the comfort of our cosy hotel beds to go bird watching.

We made our way on bike to the outskirts of the town and onto the Linnaeus path, so named after Carl von Linné who visited the wetlands surrounding Kristianstad in 1749.

On the wet meadows by Isternäset, we saw many species: Black-tailed Godwit (*Limosa limosa*), Ruff (*Philomachus pugnax*), Shelduck (*Tadorna tadorna*) Common Teal (*Anas crecca*), Greylag Goose (*Anser anser*) and Wigeon (*Anas penelope*), to name but a few.

Bird watching with an international and knowledgeable group like this always adds an extra dimension. Not only were we able to name the birds in at least six languages, but we also had a very interesting discussion about the different management plans for migrating species – such as for some of the ducks and geese we saw – and how those impact the species populations and habitats in our respective countries.

Here at Isternäset we cycled along the train tracks, and as an early morning train passed, we realised that commuters can actually do quality birding on their way to work!

Excellent guided through the natural and cultural landscape by Hans Cronert, we passed the ruins of an old medieval fortress at Lillö and turned into more forested areas where the bird watching turned into bird listening. Chiffchaffs and White-throats were easily discernible, but by this time most of our attention had turned towards trying to



find the Penduline Tit. In Sweden, this red-listed bird breeds only in the south. Unfortunately, this time we did not hear it and neither could we find its elaborate hanging nest.

It was time to turn back home and get some breakfast at the hotel before the first theoretical session of the day.

Text and photos: Lena Malmström

International bird watching at Isternäset. From left to right: Hasse Berglund, SE; our eminent guide Hans Cronert, SE; Claus Helweg Ovesen, DK; Erika Klavina, LV; Claudia Danau, RO; Patrik Rein, SE. Among the species spotted at the coastal meadows at Isternäset were the Black-tailed Godwit (*Limosa limosa*), Ruff (*Philomachus pugnax*), Common Teal (*Anas crecca*) and Greylag Goose (*Anser anser*).

Putting a price on nature

Affixing a value to the various services nature provides is recognized as crucial for its preservation. Åsa Soutukorva, an environmental economist at Enveco Ltd., works with the valuation of ecosystem services. She shared some of the most important methods, illustrating with two projects in Sweden.



The world faces the challenge of learning to household ecosystem services. One of the most important ways of doing this is for society to start realizing the economic benefits it receives from nature. But while markets provide opportunities for tradeoffs in the private sector, ecosystem services are not priced there.

Still, people are willing to make tradeoffs for public goods. "Ecosystem services have some of the qualities of public goods, and we know that people have preferences and might be willing to pay for them," said Soutukorva. She shared some of the tools, of which there are two main approaches that economists use to value ecosystem services.

Toolbox for pricing ecosystem services – Indirect approach

Indirect approaches (also called revealed preferences) use existing links between environmental quality and market goods. A common valuation method under this approach is **the production function method**. For example, commercial fisheries depend on production factors such as labour, and equipment (boats, fishing nets and rods), but environmental factors like healthy marine habitats are also crucial to produce the fish. The method in this case would be about finding out to what extent the market price for fish is due to the environmental conditions that support fisheries.

Or, when looking at agriculture production, it means considering the economic value of the pollination services that bees provide. What does it cost to maintain an environment that enables bees to continue this vital work? What would it cost if the bees no longer provide this service?

These two examples illustrate the production function method. They put a value on keeping the environment clean for the fish and the cost of maintaining a healthy

environment so that bees can continue to do their vital pollination work.

Travel cost method

Another indirect approach method is **the travel cost method**, which is based on the economic sacrifices people make to visit a recreational site that is cleaner and more beautiful, for example. In other words, the recreational value of a site is obtained by estimating the demand for travels to the site. This method was used for the first time in the 1940s to value national parks by looking at people's travel costs to get to the national park. Today the travel cost method is often used to value changes in environmental quality at different sites.

Other methods under the indirect approach include **the property value method** and the **defensive expenditure method**.

The advantage of working with indirect methods is that they are based on real market behaviour, but it is limited in that it only provides information on the users' economic valuation, says Soutukorva. Non-use values, or existence values, are not covered by these methods, i.e., people might value nature even if they don't intend to "use" it directly.

Direct approach

The direct approach (also called stated preferences) is about creating a hypothetical market. The contingent valuation method is one important method belonging to this group. It has been used frequently for decades, all over the world. A change in the supply of a non-market good is described to a (usually random) sample of individuals by using conventional survey instruments. Questions are posed about trade-offs, from which it is possible to infer individuals' willingness to pay for a realization of the change.

Another example of a method belonging to this approach is “choice experiments”. The advantage of the direct approach is that it can also provide information on non-user values, or existence values.

There are other methods with weaker relationships to economic theory, such as **the replacement cost method**, which is about finding man-made substitutes to ecosystem services, such as the cost of creating a manmade substitute for a wetland.

Soutukorva illustrated with two Swedish examples.

The price of improved water quality

During 1989-1999 she participated in developing a study to affix a value to an improved water quality in the Stockholm archipelago, where eutrophication is a problem due to too large inputs of nitrogen and phosphorous and slow water exchange caused by natural barriers. Reducing the nutrient load is very expensive.

Two mail questionnaires were sent out during 1998 and 1999 to people living in the counties of Stockholm and Uppsala. In this survey they used sight depth to measure water quality. A contingent valuation (CV) study and a travel cost (TC) study were carried out to value the improvement.

In the CV-study respondents were asked to state their “willingness to pay” (WTP) for an improved mean sight depth by one meter. The change was described as “being able to see one’s feet wherever you bathe in the archipelago”. For the TC-study the surveys addressed questions about travel behavior, purpose of travel, travel costs, travel time, income and the importance of clean and clear water.

The TC-study found that demand for travel depended on water quality (sight depth) and that people in the Stockholm and Uppsala counties were willing to pay between 85* million and 273* million kronor a year for an increase of mean sight depth by one meter.

According to another study (Scharin, 2004), the cost of achieving a one-meter sight increase was 57 million kronor a year, so the net benefit to society would be 28 to 216 million kronor a year.

“We found out that there is a strong demand for travel to the Stockholm archipelago and that some of this demand is due to clean and clear water” said Soutukorva.

Valuing the cultural environment

The other study involved economic valuation of the cultural environment. Valuation studies were carried out in the province of Småland for the Swedish National Heritage Board. Two cultural reserves in Småland were valued. One was a planned reserve; the other already existed.

The “willingness to pay” question was how much would you be willing to pay for Högårps village to become a cultural reserve? The mean answer was 43 kronor. With a population of 28,000, that means that the aggregated WTP, or the total economic value, is 2 million kronor a year.

Increasingly policymakers are demanding economic values, but they are usually expensive to produce. One way to make use of existing studies is to apply the results to other similar cases, which is referred to as a **benefit transfer**.

Valuing ecosystem services met with a lot of skepticism initially and was criticized for being too hypothetical, but over the years the methods have been refined. “Today, the methods are much more accepted,” said Soutukorva.

By putting a value on the ecosystem services we can show the importance of something in a language that people understand. It illustrates the expense of not taking action, says Soutukorva.

One of the most comprehensive studies recently done is the so-called TEEB report (The Economics of Ecosystems and Biodiversity), which provides a wealth of international examples.

Examples of existing databases

Environmental Valuation Reference Inventory (EVRI), www.evri.ca

Nordic Environmental Valuation Database (NEVD), www.norden.org/pub/sk/showpub.asp?pubnr=2007:518

ValueBase, www.naturvardsverket.se/sv/Lagar-och-andrastyrmedel/Miljoekonomi/Miljovardering

**10 kronor = 1.5 US dollars at today's exchange rate.*

Assessing the aesthetic value of pollarded trees

For Maria Thordarson, Assistant Director of the Nature Conservation Department at the County Administrative Board of Västra Götaland, learning about ecosystem services is a priority and something she hopes to use in a LIFE project application.

"It's a new concept that we haven't worked with much. It's important for us to learn about ecosystem services so that we can use it in our own operations," says Thordarson.

The most immediate use for the knowledge gained at the seminar will be in a LIFE project application. The LIFE project will aim to recreate value for pollarded trees and coppicing, a pruning practice that was used for many centuries to produce fodder and wood fuel, but fell out of favor because the labor involved became too expensive.

"We want to bring back the value of 'working trees' by using modern machinery and selling what is cut off for biofuel," says Thordarson, adding that the trees have biodiversity building benefits in that old or managed trees develop many substrates which are home to a long list of threatened and red-listed lichens, fungi, insects, bats and birds.

Thordarson hopes the project also will have an aesthetic appeal to the public. "We want to test the method on road and railway verges to create a green infrastructure," says Thordarson. "Would people think it was positive to see an allée with pollarded trees? It would be interesting to do a study to see what kind of value that would hold for people."

She says they would like to use one of the methods of valuing nature outlined by environmental economist Åsa Soutukorva in her session on "Money Talks – the value of ecosystem services in monetary terms." In addition to learning about those approaches, Thordarson says she benefited from learning from Vattenriket's framework for structuring ecosystem services.

"It has been helpful to get examples of what has been done and how one can apply the study methods for valuing ecosystem services," says Thordarson. If the application is successful, this project will begin in the fall of 2012.



Empowerment and cooperation key to sustainable development”



The next speaker, entrepreneur John Higson, has been using “sustainable development platforms” to harness the creative capacity of individuals and groups and help empower them to realize their own self-defined visions. Based on cooperation between different stakeholders – ordinary people, politicians, decision-makers and other stakeholders – his sustainable empowerment platforms have been used to culturally vitalize a neighbourhood in Stockholm, make use of urban “wasted spaces” and create a sustainable community and organic farm.

100Hus Hornstull

Ordinary citizens, organisations, building owners and the private sector participate in 100Hus Hornstull. Hornstull is a neighbourhood on the southwest corner of Stockholm’s city core. Higson said it all started with the idea to give Hornstull inhabitants the possibility to express their uniqueness by creating art on the facades.

After surveying the interest in the community, which was positive, they approached a local real estate developer who helped them communicate with inhabitants of many of the buildings in the area. Several other people became project partners.

The project grew in line with the community’s wishes. More than half wanted to create an environmentally sustainable Hornstull. So far 92 buildings and 45 artists have joined in the 100Hus Hornstull project, which now comprises several components including art, storytelling, history and the environment.

Higson, through his company People Owned, helps build the platforms on which projects such as 100Hus are based, but the projects are implemented in partnership with other local stakeholders and ultimately handed over to the inhabitants and area stakeholders for management.

The idea has spread to several other neighbourhoods and towns in Sweden and has even found favour internationally. In Nairobi 100Hus has partnered with a local organisation art4action to introduce a similar project there.

100Hus Environment

Another project that grew out of 100Hus is 100Hus Miljö (Environment), an initiative to create a space on top of one of the local subway stations. 100Hus Miljö is slated to open this year and will feature an outdoor service area, restaurant and rooftop garden that will also serve as a habitat for birds and insects. “All of this came from the dialog with the local people,” said Higson.

Higson is also developing Drömgården (Dream Farm), an organic farm and recreational living cooperative to be owned by consumers, farmers and business-owners near Stockholm.

Whether working in a natural or urban environment, all development must be ecologically, economically and socially sustainable. And the recipe for success, he said, is to have a big vision that is developed by the community. “We don’t articulate our vision. We open a discussion so that people can be part of the creation process.”

Valuing the benefits of Natura 2000



Johan Lammerant, an environmental consultant with ARCADIS Belgium, is working on a large project to put a financial value on benefits provided to society from Natura 2000 sites on behalf of the European Commission's environmental directorate.

Toward that end, ARCADIS, together with environmental economists from UK-based eftec and ECNC in the Netherlands, have developed a 9-step tool that will help them value ecosystem services in 12 selected Natura 2000 sites around Europe.

"We are trying to show a link between conservation measures and ecosystem services in the Natura 2000 sites, as well as the people who are benefiting from those services," says Lammerant, adding that the results will hopefully help the directorate compete for EU funding.

During a workshop in Brussels in mid-June, relevant conservation measures for each site were selected and for each conservation measure the economic value of affected ecosystem services will be calculated. The project will be finished in September.

Vindelfjällen, the largest nature reserve in Sweden, with 550,000 hectares, is one of the sites that is being assessed in this project. Situated in Lapland in northern Sweden, Vindelfjällen comprises many different ecosystem services and habitats, such as the sea, river, mountain, grazing land and forest, to name a few.

Lena Lundevaller, is a nature reserve manager with Västerbotten County Council, which manages Vindelfjällen and 249 other reserves in the province.

"We have an enormous amount of services. It's a very important area for reindeer husbandry and reindeer grazing. We also have hunting and fishing," she says.

Lundevaller says the information they get from the study will be used to make decisions about priorities in the management of the protected areas and in discussions with stakeholders such as the municipality, the local population and organisations. "We have made a long list of the services and we are going to select a few to find out what the economic benefits are."

She adds that they have already learned that that they can start speculating how a change in one ecosystem service affects another. "It helps us make models and develop different scenarios for the various ecosystem services, whether they are going to increase or decrease. What happens if tourism increases? What happens if we cut down a forest?"



Our last meal together was spent inside this eel fishing shack, dining on salmon and learning about an initiative to preserve the eel in Sweden.

At Tvillingaboden we learned about a unique initiative to save the eel

On our last afternoon in Kristianstad, we were treated to another magnificent meal that started outside, looking over the Baltic Sea with a sandwich of egg and smoked eel on rye bread and ended in Tvillingaboden with a fascinating lecture about an initiative to preserve the red-listed creature.

Tvillingaboden or “Twin Shacks” is one of many eel fishing shacks that dot the southeast coast of Sweden, serving up eel feasts to people who come from near and far during the winter months, when eel are in season. Even the New York Times has been there to write about the famously Bacchanalian feasts.

A virtual museum run by Hans Inge “Hånsa” Olofsson, a fisherman, and his wife Maria Blombärg, an artist and cook, Tvillingaboden was first mentioned in the local newspaper in 1856 when there were still two shacks. They were destroyed by a hurricane that struck the coast in 1972. Only one was rebuilt. Hånsa’s family has been fishing for eel there since his grandfather laid the ground in 1923. Surrounded by old fishing equipment in the cosy candlelit space we were serenaded by Hånsa, an accomplished guitarist and singer while we feasted on Maria’s salmon. While we enjoyed the pie, Claes Bergkvist from Ålakadmin

“The Eel Academy”, an organisation dedicated to the preservation of the eel, fishing customs and the special culinary rituals associated with the eel, told us about a unique initiative called “Fish & Save”.

Hydroelectric plants a threat to the eel

The red-listed eel brood in the Sargasso Sea, then make their way toward rivers, lakes and streams in Sweden and in



Artist and cook Maria Blombärg welcomes us to Tvillingaboden. Europarc Nordic-Baltic Section Coordinator Lena Malmström to her left. Sven-Erik Magnusson, head of the Vattenriket Biosphere Reserve Office, to her right.

A fisherman repairs the net for the next fishing season.

other Baltic countries, where they spend between 10 to 15 years before journeying back to the Sargasso. But they face a number of threats on the way, Bergkvist, said, including hydroelectric plants, which pose a major obstacle to their survival in Sweden.

Of the 530.000 kilometres of streams and rivers in Sweden, 150.000 kilometres are interrupted by 2,000 hydroelectric plants. The downstream mortality of eel passing through these plants is as much as 70 to 90 percent. "Eel fishing is strictly regulated (90 days a year) but the hydroelectric plants are fishing 365 days a year," he said.

"If 100 eel have to pass through three plants on their way down to the sea, 30 will survive the first plant, nine will be left after the second one and by the time they pass the third plant, three eels have survived," said Bergkvist.

Fish & Save

Furthermore, 60 to 80 percent of eel caught in Sweden is sold for export to other countries. The Ålakademin's proposal "Fish & Save" is to capture 180 tonnes of eel from lakes, rivers and other bodies of water in Sweden each year and transport them to the west coast where they would be released and can journey to the Sargasso to breed.

Ålakademin estimates that the annual cost of capturing and transporting the eels would be 2.3 million dollars, a sum that should be financed by the hydroelectric industry, Bergkvist said. "They have a moral and ethical responsibility to pay these small sums," he said.



The idea is that the power companies redirect marketing budget funds to 'Fish & Save'. In return, Ålakademin will inform about the power companies' support for this eel-saving initiative. Said Bergkvist, "They can use this in their marketing."



We started with smoked eel sandwich on rye bread while Hånsa shared the history of Tvillingaboden.