



# SERVICES OF NATURE



## INTRODUCTION

The main driving force of today's society is the increasing social and economic welfare. This goes along with increased production and consumption of goods and services, which contributes to the degradation of ecosystems surrounding us. We can say that while prosperity grows – nature diminishes.

But does it really matter if a few unknown butterfly species go extinct? Or is there something more to lose?

The scientific evidence is growing that together with those butterflies, bugs and flowers much more could be gone. Degraded ecosystems lose their capacity to deliver services for humans, such as purify polluted water, pollinate crops, lessen the effects of natural disasters or buffer the effects of climate change.

The European Union has realised this threat and started to counteract the loss of natural diversity and ecosystem functions. Possibly the most important step in this regard is the establishment of the European ecological network Natura 2000. Today, the network includes sites in all 27 Member States – all of them put together would make an area bigger than two times Germany. As the EU recently highlighted<sup>1</sup> the conservation and management of this ecological network can significantly contribute to halt the decline of nature and the life-supporting ecosystem functions it delivers.

In this guidance we would like to introduce the non-expert to the topic of ecosystem services and to highlight the relationship between the conservation and management of the Natura 2000 sites and the maintenance of ecosystem services. In particular, the publication tries to answer the following questions:

- » **What is the connection between the protection of animals and plants and the welfare of people?**
- » **What is the EU doing to preserve nature and ecosystem services?**
- » **How can we keep ecosystems functioning through active management?**
- » **What good examples exist at EU level?**



## WHAT IS NATURA 2000?

Natura 2000 is the cornerstone of the European Union's nature policy. The aim is "to contribute towards ensuring biodiversity through the conservation of natural habitats and of wild fauna and flora in the European territory of the Member States (...)" (Art 2.1. of the EU Habitats Directive).

Natura 2000 is a European ecological network of protected areas designated by EU Member States based on legally binding legislation: the Habitats and Birds Directives. The network consists of two types of areas: special areas of conservation (SAC) designated according to the Habitats Directive and special protection areas for birds (SPA) designated under the Birds Directive. Member States are responsible for taking all necessary measures to guarantee the conservation of these sites and prevent their deterioration.



**BACKGROUND** The Yorkshire Dales region in the North of England is famous for its landscape and has a long tradition of pastoral farming. The large number of hills and slopes and the **low quality soil** make the area especially suitable for cattle grazing. The existence of the characteristic **flora and fauna is entirely dependent on the livestock farming** systems, e.g. grazing. The animals are needed to keep grasslands free from overgrowing by trees and bushes. For conservation purposes, native cattle breeds are the most suitable, because they are adapted to the rough weather conditions and can be kept outside almost all year.

Over the last 40 years there has been a **change from traditional cattle farming to more intensive sheep enterprises**. The changes in the agricultural system, along with a general increase in stock numbers, have resulted in a general **decline in the natural values** of the site.

An EU supported project started in 2002 with the primary aim to conserve the local flora and fauna. This was achieved through reinstating grazing by traditional cattle breeds. Through the provision of grants to farmers native cattle herds and the necessary infrastructure were established. 15 farming enterprises were converted to more appropriate mixed grazing systems. The project helped to restore and maintain some 1800 ha in two Natura 2000 areas. The continuous research on plant and animal species showed that the project helped the number of rare plant species to grow.

## ADDITIONAL BENEFITS AND ECOSYSTEM SERVICES

- » **Clear water and soil**  
No fertilisers used in on the pastures » Ground water, surface waters and soil are not polluted, animal fodder and beef meat doesn't contain fertiliser and pesticide residues
- » **Socio-economic benefits**  
New, high quality local product and a market was created » farmers obtain premium prices for their product on the market » livelihood for rural communities
- » **Genetic resources**  
Breeding of traditional, native cattle breeds » genetic variations of cattle is maintained (can be used later in breeding)

## FOOD PRODUCTION

### HIGHLIGHTED ECOSYSTEM BENEFIT: FOOD PRODUCTION

In addition to nature, people also gain benefit from the project, if they consume the high quality beef meat produced in the area. Although the cattle are not managed entirely to organic standards, no pesticides and fertilisers are used on the Natura 2000 land with represents the principal part of the grazing. The native cattle are better adapted to the harsh weather. They spend more time grazing in the (non-fertilised) fields all over the year and less in the byre. There are some early indications, that the **beef meat produced under conservation management is healthier and tastier than the conventional one**. A new Meat Quality Research just started recently will compare the quality of beef meat produced under conventional circumstances and in protected areas, e.g. through looking at components as n-3 (omega-3) polyunsaturated fatty acids and vitamin E. It will also compare the quality and healthiness of meat from different breeds of cattle.



**BACKGROUND** The **Yzerbroeken** is the name of the **natural floodplains of the Yzer River** located in the Western part of Belgium, near the French border. The area is a **Natura 2000 area protected under the EU Birds Directive**, but it is also protected under the Ramsar Convention<sup>3</sup> because of its special, rich bird fauna. It is a huge area (around 3-4000 ha), but it is not only important for the birds and bird lovers. Due to its special location it served as an important flood protection area for decades.

The area is located about 25km inland from the coast. The land **between** the Yzerbroeken and the sea is very characteristic: it is totally flat. Yzerbroeken is located just at the border of the flat area. When floods occur, a lot of water comes fast into the river at this point, but the river cannot discharge the water quickly into the sea: the water sticks in the floodplains. In addition, water discharge at the river mouth is only possible at low tides so that during high tides the river has to wait - leading to high water levels inland. Thus **floods occur and have occurred for hundreds of years here** creating a special type of grassland and marshland landscape and attracting special wildlife.

During the past few decades, agricultural use has changed in the floodplain. There has been a shift towards **more intensive agricultural use. Dikes were built** to protect the land from floods and the area was drained resulting in decreased water levels – all of this had a very negative impact on nature generally and birdlife in particular. Also, the more intensive land use in the area, in which flooding was prevented, increased the flood risk in villages elsewhere along the banks of the Yzer where in the past no floods had ever occurred.

## ADDITIONAL BENEFITS AND ECOSYSTEM SERVICES

- » **Recreation**  
Restored floodplains » beautiful, restored natural landscape  
» recreational opportunity for local people and tourists
- » **Fresh water**  
Natural river ecosystem » decomposition and waste water treatment – provision of fresh water (drinking, bathing water etc. )
- » **Adaptation to climate change**  
Climate change » sea level rise, more extreme weather events » more floods » increased need for floodplain in the future

## FLOOD PROTECTION



### HIGHLIGHTED ECOSYSTEM BENEFIT: FLOOD PROTECTION

To halt the unsustainable agricultural practices and to restore the original rich biodiversity a nature restoration plan for the entire valley was drawn up in 1990. At first there was a lot of opposition from local agricultural organisations but then **two disastrous flood events** occurred in **1993** and **2005**. After this, **agreement was reached between all parties that the Yzerbroeken has to be managed as nature conservation and flood protection area**. No more dikes can be built and the agricultural practice is adapted to floods. Local people realised, that nature oriented land management doesn't only benefit nature but provides a very important ecosystem service: the protection from floods.

**BACKGROUND** With its 940 hectares, **Lake Fure is the biggest lake in Denmark.** It was one of the most **valuable water habitats for birds and fish** species at the beginning of the 20th century, as well as a great place for recreation for the inhabitants of nearby Copenhagen. The area is designated under the Birds and the Habitats Directive as well. Unfortunately, the **uncontrolled waste water loading** from the highly urbanized surroundings disturbed the natural cycles and **lead to a break down of the ecosystem functions** of the lake. The high nutrient levels resulted in a massive build-up of phytoplankton (algae) and the spread of worthless fish species. The underwater-vegetation for which the lake was once famous also disappeared.

A **conservation project took place** between 2002-2007 with the goal of restoring the natural ecological processes and the recovery of the original vegetation and stabilising fish populations. The nutrient load was reduced and a better oxygenation of the lake was achieved. The **environmental conditions improved** resulting in **visibly cleaner water, fewer algae and less worthless fish.** The original flora and fauna is slowly recovering. While the transparency of the water is still not the best possible and algae numbers are still above the desired level, the project achieved much in this respect. It is expected that there will be a response time of a number of years before it is possible to see all the results. The project is still running until 2012.

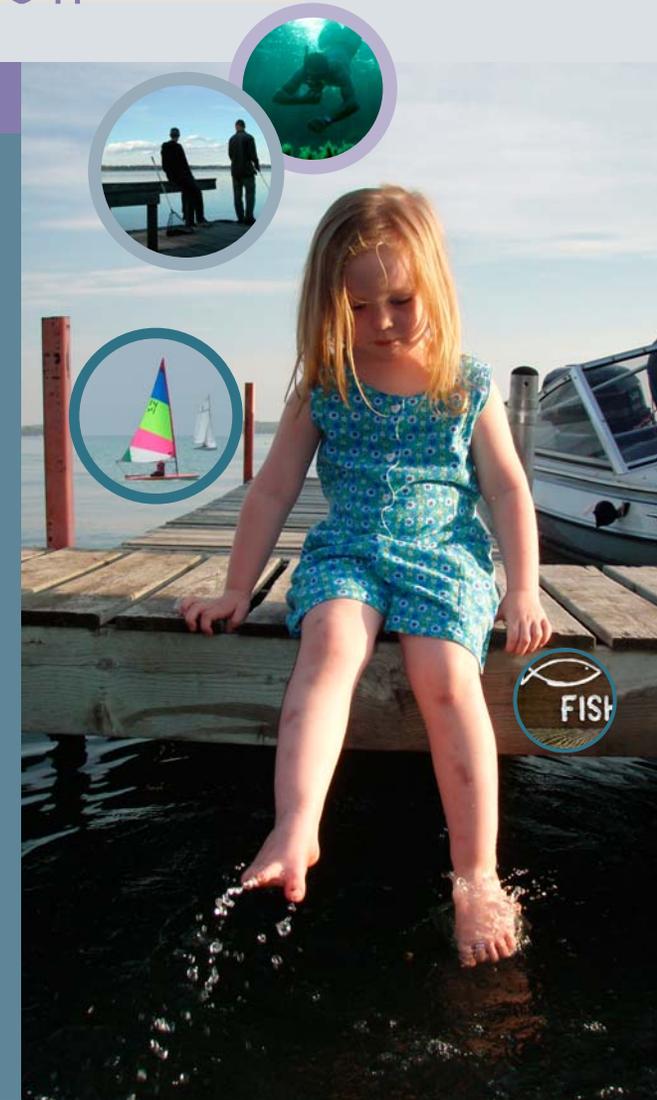
### ADDITIONAL BENEFITS AND ECOSYSTEM SERVICES

- » **Nutrient regulation**  
Restored ecosystem functions » decomposition of natural and human waste (dead plants, animals) » nutrients (P, N) are recycled and are returned to the lake ecosystem
- » **Food production**  
Water quality improved » more valuable fish species » fish for food
- » **Science and education**  
Ecosystem functions, species and habitat restored » Limnology Scientific Station provides place for education and science
- » **Social benefit**  
Cleaner water – return of valuable fish species » Fishing societies and community's thrive

## RECREATION

### HIGHLIGHTED ECOSYSTEM BENEFIT: RECREATION

The **enhanced environmental conditions**, such as a more transparent water and less phytoplankton (algae) benefit the people who come to the lake for different **recreation purposes**, such as **fishing, swimming, sailing and other**<sup>4</sup>. Also **businesses which are based on recreation** (e.g. boat renting operators) **benefit** from the overall improvement of ecological conditions. The EU supported nature conservation project in the Natura 2000 area increased the possibilities of human recreation.



**BACKGROUND** Not many people can imagine a successful combination of honey production, an economical enterprise and nature protection at the same time. But a Polish example shows that cooperation between local beekeepers and environmentalists is possible and can be beneficial for both sides. In the South-West part of Poland, in the town of Przemków, a few open-minded beekeepers started to work together with two NGOs<sup>5</sup> and the local landscape park to develop a new initiative. **Honey production at that time was economically not viable**, so the primary goal of the initiative was to ensure job security for the beekeepers. The **creation of a market for new honey products** seemed a good opportunity.

Beekeepers were actively involved in maintaining the characteristic structures in the **Natura 2000 site "Przemkowskie Heathland"**. Heathlands are rare and endangered ecosystems protected under the EU Habitats Directive. The most important threat for them is overgrowing. So **beekeepers help to keep the fields open by removing trees and bushes** and thus contribute to the **conservation of nature of European importance**.

The honey produced here is certified by the European Union and is labelled as a **regional product**. To fulfil the standards of the regional product, certain quality criteria have to be maintained, e.g. the level of heaths' pollen has to be more than 50 per cent. The fact that the honey is produced in a protected area, which is written on the bottles, is a guarantee for its high quality and healthy ingredients, and thus a higher price can be required. This is how the protection of the area has helped producers to find a market niche and is used as a tool to promote a regional brand.

### ADDITIONAL BENEFITS AND ECOSYSTEM SERVICES

- » **Food production**  
healthy, high quality local product – bio honey and other pollen products
- » **Natural pharmaceuticals**  
biochemical substances contained in honey
- » **Social benefits**  
creation of the regional product » income » maintenance of specialized social structures: beekeepers' communities and local rural communities
- » **Cultural benefits**  
Wine&Honey festival organised once a year » maintenance of local traditions, heritage

## POLLINATION



### HIGHLIGHTED ECOSYSTEM BENEFIT: POLLINATION

The management of heathlands is not only important for conservation but also for the beekeepers. The open flowery fields are necessary for the bees to produce honey. **Without management the fields would be overgrown** by forest and beekeepers would lose their job. When maintaining the **Natura 2000 sites**, beekeepers are actually **preserving** the very ground of their **existence**. The eco-honey is labelled as a **regional product** by the EU and helps beekeepers to **secure a higher income**.

**BACKGROUND** Wetlands are a characteristic element of the Latvian landscape. One of the great wetland areas is the **Lubana Wetland Complex**, which covers more than **40 000 ha**. We can find a lot of different **bogs, mires and fens** here. In previous times the area was partially used for farming. The desiccation of peat bogs and grasslands through drainage ditches has led to habitat degradation and overgrowing. This contributed to a significant decline of natural assets, as well as to **emission of CO<sub>2</sub>** and **CH<sub>4</sub>** through carbon decomposition.

**Bogs are unique wetland ecosystems.** In these wetlands, dead plant material cannot fully decompose due to the acidic and anaerobic conditions. The partially decayed plant material is the peat, which gives the common name of these habitats: ‘peat bogs’.<sup>6</sup> Bogs are inhabited by a **highly specialised fauna and flora**, which is often only found here and nowhere else. For their high natural values bog habitats are protected under the EU Habitats Directive.

But there is a special characteristic of peat bogs that makes them interesting for today’s societies. Scientist have proved, that well preserved peat bogs are **one of the most important carbon sinks on Earth**.<sup>7</sup> The UK has about 15 percent of the world’s peatlands – storing the equivalent of over 20 years of UK industrial carbon dioxide emissions. **Whilst undisturbed peat bogs take in and store carbon, damaged peat lands emit greenhouse gases into the atmosphere.** When peat bogs dry out or when they are converted to other uses (e.g. agriculture) they quickly begin to lose the stored carbon in form of greenhouse gases, thus **contributing to global warming**. Therefore not only the special natural values make the conservation of bogs a priority. Keeping them in a good ecological state will also help to save the climate.<sup>8</sup>

## ADDITIONAL BENEFITS AND ECOSYSTEM SERVICES

### » Water purification

Healthy peat bog » stores carbon and filters water » water coming from bog is clean

### » Aesthetic and cultural services

Interesting bog, moor landscape (“home of ghosts”), funny “creatures” (e.g. fly-catching plants) » attractive for visitors, schoolchildren

### » Food, herbs

Local people use the area for collecting berries, wild fruits and herbs.

## CLIMATE CHANGE MITIGATION



### HIGHLIGHTED ECOSYSTEM SERVICE: CLIMATE REGULATION

The peat bogs of the **Lubana Wetland Complex** store a large amount of carbon. If the bogs are drained, damaged or dry out they will emit the carbon into the atmosphere, contributing to global warming. In 2003, local authorities joined forces to restore the natural water regime and to bring bogs back in a favourable condition. Ditches were blocked, dams and water gates were built in order to limit a water discharge on almost 10 000 ha. These actions will contribute to the **restoration of the peat bog ecosystems** to help them maintaining and storing carbon levels and thus **counteract global warming**.

- Example 1. Food production** » Paul Evans (Nature England), Paul.Evans@naturalengland.org.uk, www.limestone-country.org.uk
- Example 2. Flood protection** » Floris Verhaeghe (Ministerie van de Vlaamse Gemeenschap), floris.verhaeghe@in.vlaanderen.be, www.framebpm.net, www.natuurpunt.be/download/activecontents/ac882paper.pdf
- Example 3. Recreation** » Peer Skaarup peska@sns.dk, www.furesoeprojekt.dk
- Example 4. Pollination** » Andrzej Ruszlewicz (Fundacja Zielona Akcja), Andrzej.Ruszlewicz@wp.pl, www.eko.org.pl/kropla/23/miod.html
- Example 5. Climate change mitigation** » Dace Arina (Project Manager), daces@email.com; Ugis Bergmanis, bergmanis.teici@apollo.lv, www.madona.lv/lubans/l\_zinojumi\_a.html

#### Nature & Biodiversity homepage of the European Commission

[http://ec.europa.eu/environment/nature/index\\_en.htm](http://ec.europa.eu/environment/nature/index_en.htm)

**National Natura 2000 information** » [http://www.natura.org/national\\_links.html](http://www.natura.org/national_links.html)

#### Good practices in managing Natura 2000 sites

<http://ec.europa.eu/environment/nature/natura2000/management/gp/index.html>

„Time is life” CD ROM prepared by CEEWEB, 2006

**Value of biodiversity- Documenting EU examples** where biodiversity loss has led to the loss of ecosystem services. Final report for the European Commission. Kettunen, M. & ten Brink, P., Institute for European Environmental Policy (IEEP), 2006, Brussels, Belgium. 131 pp.

<sup>1</sup> Communication from the Commission – Halting the loss of biodiversity by 2010 – and beyond – Sustaining ecosystem services for human well-being, [COM/2006/0216 final]

<sup>2</sup> Ecosystems and human well-being – current state and trends – findings of the Condition and Trends Working Group / edited by Rashid Hassan, Robert Scholes, Neville Ash., 2005 Millennium Ecosystem Assessment

<sup>3</sup> Convention on Wetlands of International Importance especially as Waterfowl Habitat, United Nations Educational, Scientific and Cultural Organization (UNESCO)

<sup>4</sup> Studies have found that water quality for recreational purposes is valued at \$10 and \$80 per year (Adamowicz, 1991), US.

<sup>5</sup> Przemkowski Landscape Park, Fundacja Zielona Akcja (Foundation Green Action), Fundacja Partnerstwo dla Środowiska (Partnership Foundation for Environment)

<sup>6</sup> Wikipedia, EUNIS habitat classification

<sup>7</sup> Estimate of the amount of carbon stored globally in peat lands range from 120-400 Gt (Franzén 1994; Franzén et al. 1996; Ajtay et al. 1979; Sjörs 1980, 1982; Adams et al. 1990).

<sup>8</sup> Intergovernmental Panel on Climate Change Fourth Assessment Report, 2007.



## SERVICES OF NATURE –

How Natura 2000 contributes to the provision of ecosystem services for human wellbeing

- » This publication has been prepared by CEEweb for Biodiversity. Written by Urszula Biereznoj and Sarolta Tripolszky
- » CEEweb for Biodiversity is an international network of non-governmental organizations in Central and Eastern Europe (CEE). The mission of the network is the conservation of the biodiversity through the promotion of sustainable development.

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