



LIFE III



LIFE and Europe's wetlands

Restoring a vital ecosystem



nature



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*Peter Gammeltoft (left), and
Patrick Murphy*

Wetland ecosystems hold an important part of Europe's biodiversity. They provide ideal conditions for a vast diversity of habitats and species. They are especially important for birds, providing vital nesting and migratory flyway areas, as well as for other fauna species, such as dragonflies and amphibians. Countless specialist plants depend on wetlands.

Wetlands support a wide range of public goods and services, such as providing fresh water and recreational and tourism opportunities. In addition, they act as carbon 'sinks' and are therefore a fundamental asset in our efforts to reduce levels of greenhouse gases in the atmosphere.

However, despite their importance, wetlands are disappearing (for instance, due to drainage and conversion to farmland) or are being polluted at an alarming rate and are among Europe's most threatened ecosystems.

In recognition of this, wetlands were one of the very first nature conservation issues ever put forward for European and international policy consideration under the 1971 Ramsar Convention on the conservation and wise use of wetlands and their resources. Following on from this, as a contracting party to the Convention on Biological Diversity (CBD), the European Community has taken decisive steps to fulfil its commitments and to meet the target defined by the heads of state and government to halt biodiversity loss by 2010. In May 2006, the European Commission adopted a communication on biodiversity and an action plan which defines priority actions to meet this target. Many of the objectives, targets and actions are directly relevant to the conservation and wise use of wetlands. The action plan also emphasises the links to other relevant environmental legislation, including the Water Framework Directive (WFD).

The Habitats and Birds directives and the WFD are the main pieces of legislation ensuring the protection of Europe's wetlands. The Natura 2000 network of protected sites and the integration of wetlands into future river basin management planning (under the WFD) are helping to guarantee their future conservation and sustainable use.

The EU has been a major provider of funds for wetland conservation projects both within and outside the Union. The Commission's financial instrument for the environment, LIFE, has been contributing to a large number of projects supporting the conservation of wetland ecosystems within the Natura 2000 network. This brochure presents a selection of these LIFE wetland projects. Most focus on the restoration and management of wetlands, while a number also target key wetland species.

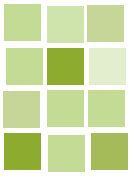
Looking to the future, it is expected that Member States will take full advantage of the renewed opportunities for funding wetland projects under the Commission's LIFE+ programme, launched in 2007.

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Europe's wetlands – status and threats

Europe's wetlands support a large diversity of plant and animal species and are also the source of a wide range of public goods and services, including tourism and the supply of fresh water. At the same time, however, wetlands are among the world's most threatened ecosystems, with some 50% of all wetlands having disappeared in the last century.

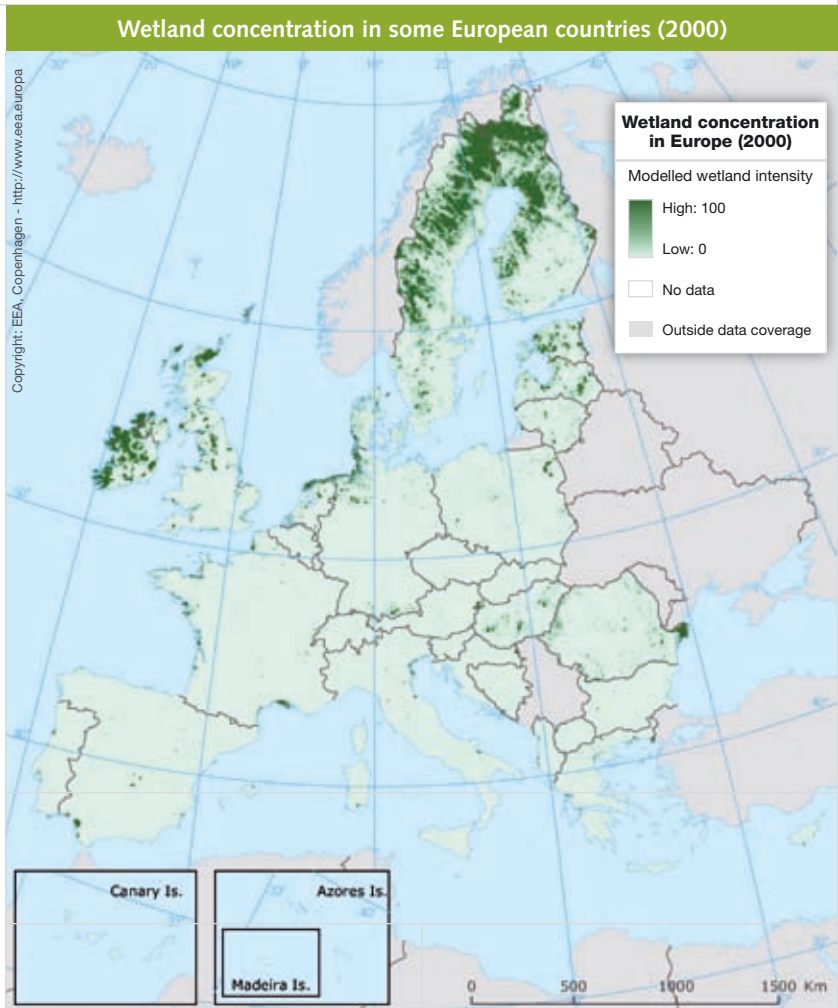
Wetlands are some of the planet's most productive ecosystems. Incredibly biodiverse, they sustain some of Europe's most important bird, amphibian, invertebrate and plant species during key stages in their life-cycle. They provide spawning grounds for fish and feeding and breeding areas for many migratory birds. Representing around 6% or the Earth's land area – some 570 million hectares, of which 2% are lakes, 30% bogs, 26% fens, 20% swamps, and 15% floodplains – they also provide important goods and services to society.

What are wetlands?

It is not easy to define precisely what wetlands are, with different international bodies often having slightly different definitions. Wetlands are not exclusively land or water environments. They encompass both environments at the same time, or at least most of the time, as there are also wetlands that can be seasonally aquatic or terrestrial.

However, in general wetlands are those areas where water is the primary factor controlling the environment and the associated habitats. They occur where the water table is at or near the surface of the land, or where the land is covered by shallow water.

Despite the range of definitions, the most widely accepted definition is the one set out in the text of the Convention on Wetlands, signed in Ramsar, Iran, in 1971, the first



international effort made to protect these important habitats. According to Article 1.1 of the convention, wetlands are:

“areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres”.

Types of wetland in Europe

There are many different types of wetland in Europe and their classification is not easy, due to their complexity, dynamic characteristics and their fluctuating and undefined borders.

The wetlands habitats listed in Annex I of the Habitats Directive (92/43/EC) and included in the Interpretation



Manual of European Union Habitats – EU-27 (July 2007)¹, are largely identified by their plant composition and in some cases by a range of ecological characteristics. In all, the directive lists some 40 wetland habitat types.

However, for the sake of simplicity, wetlands can be more broadly categorised into seven general types²:

- marine and coastal wetlands
- estuaries and deltas;
- rivers and floodplains
- lakes
- freshwater marshes
- peatlands
- man-made wetlands, such as canals and reservoirs

Threats

Wetlands are among the most highly threatened ecosystems on the planet. They have suffered continuous degradation and loss. According to Wetlands International³, an NGO dedicated to wetlands' preservation, some 50% of the world's wetlands have disappeared in the last century.

¹ http://ec.europa.eu/environment/nature/legislation/habitatsdirective/docs/2007_07_im.pdf

² *Wise use and conservation of wetlands, COM (95), European Commission*

³ www.wetlands.org

Wetland habitats included in Annex I of the Habitats Directive

Code	Habitat
1. Coastal and halophytic habitats	
1130	Estuaries
1140	Mudflats and sandflats not covered by seawater at low tide
1150*	Coastal lagoons
1160	Large shallow inlets and bays
1630*	Boreal Baltic coastal meadows
1650	Boreal Baltic narrow inlets
3. Freshwater habitats	
31 etc, 32 etc	All the habitats
7. Raised bogs and mires and fens	
71 etc, 72 etc, 73 etc	All the habitats
9. Forests	
9030*	Natural forests of primary succession stages of land upheaval coast
91D0*	Bog woodland
91E0*	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>)
91F0*	Riparian mixed forests of <i>Quercus robur</i> , <i>Ulmus laevis</i> and <i>Ulmus minor</i> , <i>Fraxinus excelsior</i> or <i>Fraxinus angustifolia</i> , along the great rivers (<i>Ulmion minoris</i>)
92A0	<i>Salix alba</i> and <i>Populus alba</i> galleries
92B0	Riparian formations on intermittent Mediterranean water courses with <i>Rhododendron ponticum</i> , <i>Salix</i> and others
92C0	<i>Platanus orientalis</i> and <i>Liquidambar orientalis</i> woods (<i>Platanion orientalis</i>)
92D0	Southern riparian galleries and thickets (<i>Nerio-Tamaricetea</i> and <i>Securinegion tinctoriae</i>)

* Priority for conservation

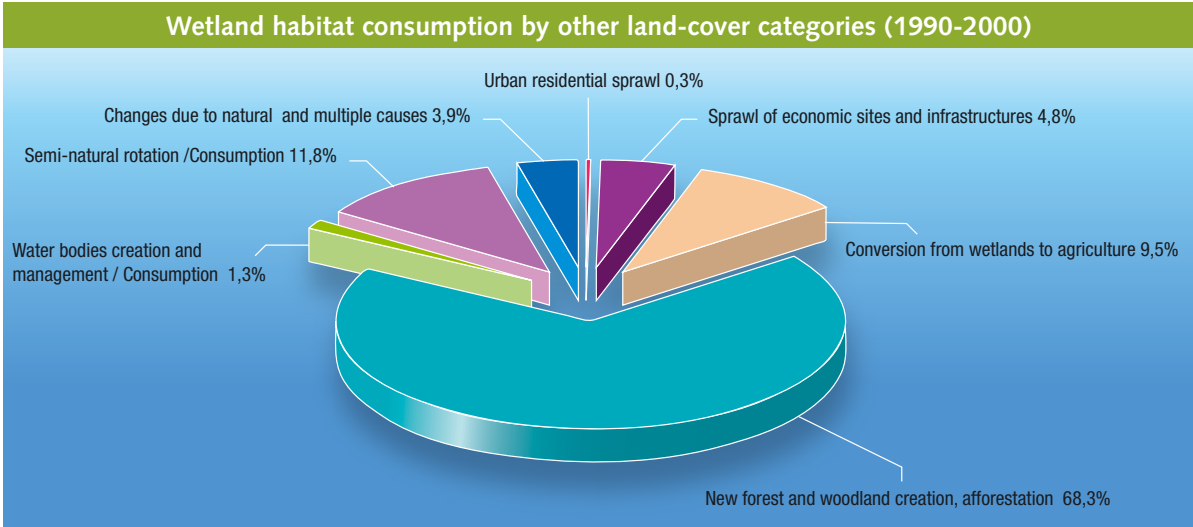
For the most part, this loss and degradation is caused by drainage for agriculture, infrastructure developments, forestation and malaria control, blocking and extraction of the water inflow, over-exploitation of groundwater resources, or the build-

ing of dams, to mention but a few of the many reasons why wetlands are deteriorating. Additionally, pollution from agricultural and industrial sources can increase the level of nutrients, pesticides or heavy metals, seriously impairing ecological processes.

Drainage is the main cause of wetland loss and degradation, especially in southern Europe

Photo: Aika Sopena





Source: Corine land-cover (23 countries) - Copyright EEA, Copenhagen, 2006

All of this has resulted in the great majority of wetland habitats being extremely vulnerable, with many of their dependent species also under threat.

Although the drainage of wetlands has been common practice in Europe for centuries, the extent of this human intervention has increased significantly in the past century, and especially in the last 50 years. Some two-thirds of the European wetlands that existed 100 years ago have been lost (European Commission, 1995), leading to a substantial decrease in the number, size and quality of the natural habitats of large bogs, marshes, and small or shallow lakes. This has dramatically altered both the visual landscape and the environmental functions of these habitats. Even with increased awareness and certain moves towards wetlands' conservation, this trend continues, albeit more slowly.

In 1995, the European Environment Agency (EEA) estimated that around 25% of the most important wetlands in Europe were threatened by groundwater overexploitation. In the Mediterranean basin, wetland loss is a par-

ticular concern. Spain, for example, has lost more than 60% of all inland freshwater wetlands since 1970. More northerly regions have also suffered, however. In France, 67% of wetlands have disappeared within the last century. Similarly, since the 1950s, 84% of peat soils have been lost in the United Kingdom, and 57% in Germany due to drainage for agriculture activities, forestry and landfilling for urban development. Lithuania has lost 70% of its wetlands in the last 30 years and the open plains of southwestern Sweden have lost 67% of their wetlands and ponds to drainage in the last 50 years. Overall, drainage and conversion to farm

land alone have reduced the wetland area in Europe by some 60%. Despite global and national recognition of their importance, Europe's wetlands remain under severe pressure from changing land use and pollution.

Wetland loss in selected EU countries 1950-1985

Countries	%
The Netherlands	55%
France	67%
Germany	57%
Spain	60%
Italy	66%
Greece	63%

Species such as water-lily (Nymphaea alba) are first to disappear in the wake of wetland water-quality degradation



Photo: Aixa Sopena

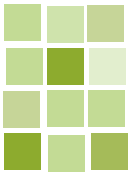


Photo: Ruppert Scholz - LIFE 97 NAT/D/4224



Sphagnum moss – the bog builder

What do wetlands do for us?

The goods and services that wetlands provide to humanity are numerous and fundamental to meeting some of our most basic needs. They supply us with much of our drinking water and help to recycle our groundwater. They allow us to irrigate farmland and harvest many species of fish and shellfish – more than two thirds of the fish we consume are dependent on coastal and inland wetland areas. They also support agriculture through the maintenance of water tables and nutrient retention in floodplains. Rice, a common wetland plant, is an important agriculture product in southern European countries.

Photo: LIFE03 NAT/IN/0039



Special wetlands: Peatlands – bogs, mires and fens

These habitats are characterised by their unique ability to accumulate and store dead plants as peat. Under certain conditions of low temperature, water saturation and lack of oxygen, dead vegetal material accumulates at a greater rate than it can decompose, leading to the formation of peat. Depending on the location and ecological conditions, distinctive fens and bogs can develop in this way.

Fens differ from bogs because they are much less acidic and have higher nutrient levels.

Requiring more northerly climates, bogs mainly occur in the Atlantic, Boreal, Alpine and some parts of Continental Europe's biogeographical regions.

Although approximately 60% of the world's wetlands are peat, these areas are sensitive to even the slightest environmental changes. Warmer temperatures, for example, begin to dry out these habitats, resulting in their degradation and, ultimately, complete destruction. Palsa mires, Scandinavian northern mire complexes with permanently frozen peat hummocks are already starting to melt as a consequence of rising temperatures.

Peatlands play an important role in the biosphere. They interact with fundamental life-support processes, involving biogeochemical cycling, food-chain support, hydrological dynamics and water quality, and provide habitats for many characteristic (and some highly adapted) plant and animal species.

Of particular importance is the role of peatlands as storehouses of large quantities of CO₂, thus reducing atmospheric greenhouse gases. However, peatlands remain carbon 'sinks' only as long as they remain in good status. When damaged, drained or burnt, or when peat is extracted for fuel, peatlands turn from being net carbon sinks to net carbon 'sources'. Therefore, the maintenance of peatlands in good condition is an invaluable asset in the fight against climate change.

Many other resources such as peat, game and berries also come from wetlands. For example the cloudberry (*Rubus chamaemorus*) found in the aapa mires and raised bogs is of economical importance in northern European countries.

Wetlands are also an effective buffer against flooding, as they can store water in their soil or retain it as surface water, thereby slowing down the rate of flooding. They are also nature's chemical filter 'factories' and encourage the breakdown of nutrients and sediments carried in water. They play a role in

Wetlands are ideal for recreation and tourism activities

sewage treatment, and often act as a source of hydroelectricity. For untold generations, we have also used them to support our transportation and communication needs, and as a very important space for recreation and tourism activities.

Lastly, wetlands are vital carbon sinks and, therefore, a crucial asset in the effort to reduce the levels of greenhouse gases in the atmosphere – wetlands may account for as much as 40% of global reserve of terrestrial carbon and can make an important contribution in combating climate change.

Despite all of these benefits and services, wetlands continue to be among Europe's most threatened ecosystems.

EU wetland conservation policy

Wetlands were one of the very first nature conservation subjects ever put forward for European and international policy consideration. Outlined below is a brief overview of the subsequent evolution of these policies over the last 30 years.

International wetlands policy initially came about as a result of pressure from bird enthusiasts, as wetlands are habitats of vital importance for birds and are among the core areas in the migration flyways of bird species. It was the response to international bird conservation concerns that resulted in the first major international agreement on wetlands, the Ramsar Convention. This agreement, which also happened to be the first modern global intergovernmental treaty on the conservation and sustainable use of natural resources, was signed in the Iranian city of Ramsar in 1971 and came into force four years later.

Photo: LIFE89 NAT/DK/6454



Wetlands are among the key areas in migration flyways of birds

The Ramsar Convention does not provide for supranational bodies such as the European Community to become contracting parties. However, since the adoption of the Birds Directive in 1979 (79/409/EEC) and the Habitats Directive in 1992, an ambitious and comprehensive legislative and policy framework has been put in place at EU level to respond to the challenges of the International Convention on the conservation and wise use of wetlands and their resources. As a contracting party to the Convention on Biological Diversity (CBD), the European Community has taken decisive steps to fulfil its commitments under the Convention and to meet the target defined by the Heads of State and Government, to halt biodiversity loss by 2010. In May 2006, the European Commission adopted a Communication on Biodiversity and an action plan¹ which defines priority actions to meet this target. Many of the objectives, targets and actions are

directly relevant to the conservation and wise use of wetlands. It also emphasises the links to other relevant environmental legislation, including the Water Framework Directive (WFD).

Natura 2000 network

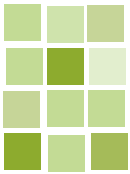
Established under the Habitats Directive, Natura 2000, the EU-wide ecological network of protected areas, is the centrepiece of EU nature and

biodiversity policy. The aim of the network is to assure the long-term survival of Europe's most valuable and threatened species and habitats. It comprises Special Areas of Conservation (SACs), designated by Member States under the Habitats Directive, and Special Protection Areas (SPAs), which Member States designated under the 1979 Birds Directive. Wetlands represent a significant number of Natura 2000 sites.

MedWet

The Mediterranean Initiative on the Ramsar Convention on Wetlands, or 'MedWet', was founded in 1991 with the aim of encouraging international collaboration among Mediterranean countries, specialised wetland centres and NGOs in protecting regional wetlands. It is a forum for 25 Mediterranean countries to meet and to identify key issues and take positive action to protect wetlands. In 2002, MedWet became a formal inter-regional structure for the implementation of the Ramsar Convention and now serves as a model for regional wetland cooperative structures elsewhere. Several LIFE projects contributed to the implementation of the MedWet initiative (www.medwet.org).

¹ COM/2006/0216 final: *Halting the loss of biodiversity by 2010 - and beyond - Sustaining ecosystem services for human well-being*



EU Birds Directive

The EU's early work on wetlands conservation was a product of the UN Conference on the Human Environment, held in Stockholm in 1972. The Community's first Environmental Action Programme was adopted a year later and then, in 1979, the Birds Directive was adopted.

With the aim of conserving wild birds, the directive explicitly recognises the need for the protection of wetlands as a vital habitat for water birds. Subsequently, between 1984 and 2006, Community actions relating to the environment were supported by LIFE and its predecessor, ACNAT. Funding, both within and outside the Union, was allocated to projects related to the maintenance, restoration or improvement of wetland sites, many of which were Special Protection Areas (SPAs), as classified under the Birds Directive, and listed as Ramsar Wetlands of International Importance.

The new LIFE+ programme (2007-2013) will continue financing wetland conservation, among other issues.

The EU has also provided funds for wetland conservation projects through other instruments, such as the PHARE Programme, within the Common Agricultural Policy and through the European Bank for Reconstruction and Development.

Curllew (Numenius arquata), a species very dependent on wetlands

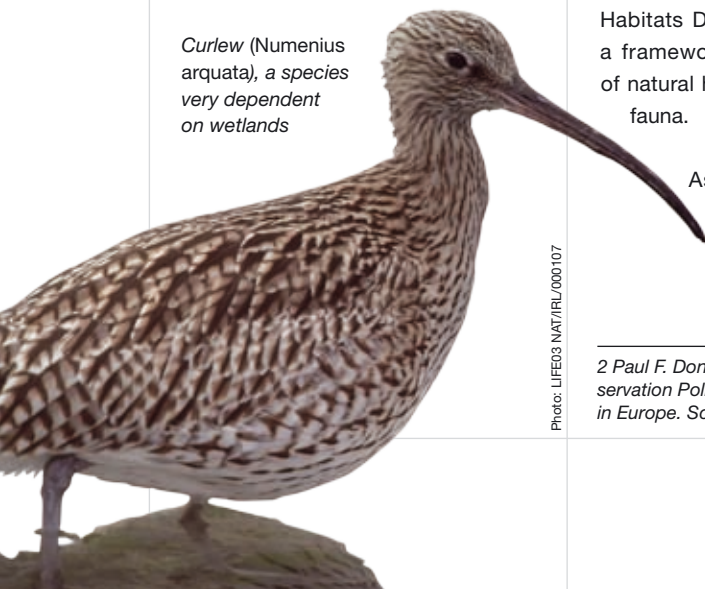


Photo: LIFE03 NAT/RL/000107



Photo: Aixa Sopena

Wetlands are a vital habitat for water birds

Member States are required under the directive to designate wetlands of international importance for birds as SPAs. As of June 2007, from the 4,830 SPAs proposed by the EU-27 Member States, 645 were listed as Ramsar Wetlands of International Importance. This represents a large number of SPAs and an important contribution to the protection of wetlands in the Natura 2000 network.

In August 2007, the journal Science published a BirdLife International study that showed that the Birds Directive has made a significant difference in protecting many of the continent's most threatened birds from further decline².

EU Habitats Directive

In 1992, the Community adopted the Habitats Directive, which provides a framework for the conservation of natural habitats of wild flora and fauna.

As of June 2007, the EU-27 Member States had proposed 21,474 Sites of Community

² Paul F. Donald et al. *International Conservation Policy Delivers Benefits for Birds in Europe*. Science, 10 August 2007

Importance (SCIs), covering an area of 626,870 km² and corresponding to 12.8% of the EU's total surface area. Within the directive, lagoons, Mediterranean temporary ponds, active bogs, wet meadows and calcareous fens were highlighted as habitat conservation priorities. A large number of proposed SCIs include wetland habitats and species such as amphibians, water plants and invertebrates, and are also listed as Ramsar Wetlands of International Importance.

Communication on Wise Use and Conservation of Wetlands

In its 1994 work programme for the implementation of the 5th Environmental Action Programme, the Commission included the Communication on the Wise Use and Conservation of Wetlands (1995)³. This was the first European document dedicated exclusively to the conservation of wetlands. The communication provided the strategic basis for a wetlands' policy, spelling out the issues that negatively affect wetlands and providing an outline of the actions that need to be taken.

³ COM/95/189 FINAL <http://eur-lex.europa.eu/COMIndex.do?ihmlang=en>



Photo: LIFE99/NAT/F/006309

Implementation of the WFD and EU nature conservation policy are the best guarantees of wetland protection

Water Framework Directive

The wetlands' communication was overtaken in 2000 by the Water Framework Directive – WFD - (2000/60/EC establishing a framework for Community action in the field of water policy)⁴. The WFD is the most substantial piece of EU water legislation thus far and aims to overcome the fragmentation of European water policy. It requires all inland and coastal waters to reach 'good status' by 2015.

This is to be achieved by establishing a River Basin Management Plan, within which specific environmental objectives and a corresponding programme of measures are set. This approach ensures that water is managed on the basis of the river basin – the natural geographical and hydrological unit – rather than administrative or political boundaries. Some Member States had already employed cross-border co-operation, covering the Danube, the Rhine, the Maas and the Schelde river basins.

⁴ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2000:327:0001:0072:EN:PDF>

WFD and wetlands

As the WFD provides a new framework for integrated river basin management, it offers a platform to address wetland-related issues. The directive clearly identifies the need for the protection and restoration of wetlands, but it does not provide any specific definition of what a wetland is, nor does it provide details on how wetland should be used to achieve the WFD objectives. Recognising this, a Horizontal Guidance on the Role of Wetlands in the Water Framework Directive (Guidance Document No. 12)⁵ was drafted. This document, though non-legally binding, is the most up-to-date reference document for European wetland policy.

The Guidance Document was prepared to assist Member States with the implementation of the WFD with regard to wetlands and the link with EU nature conservation policy, in particular the Habitats and Birds directives. However, it goes further than this, also outlining best practices beyond the legal requirements of the

⁵ http://www.wrrf-info.de/docs/Guidance_doc_12_Wetland_final_171203.pdf

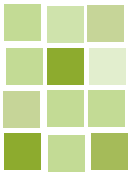
WFD, as in many cases, additional effort leads to enhanced results.

Other European legislation related to wetlands

Other European legislation also has relevance to wetland conservation, in particular when it comes to the prevention of pollution. Examples include the Nitrates Directive (91/676/EEC), the Groundwater Directive (2006/118/EC), and the Urban waste water (91/271/EEC) Directive.

There is also the recently adopted Flood Risk Management Directive⁶, which is directly relevant to wetlands. The directive will be implemented in conjunction with the WFD, notably through the coordination of flood risk management plans and river basin management plans, and through the coordination of public participation procedures in the preparation of these plans. In their favourable conservation status, wetlands play a vital role in water retention and act as an important buffer zone in the prevention of flooding.

⁶ <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/565>



LIFE and Europe's wetlands

Launched in 1992, LIFE (the Financial Instrument for the Environment) spearheads Community environment policy. LIFE co-finances environmental initiatives in the EU, certain third countries bordering the Mediterranean and the Baltic Seas, and some EU candidate countries. The LIFE programme¹ is divided into three thematic components: LIFE-Nature; LIFE-Environment; and LIFE-Third Countries. To date, the programme has co-financed some 2,750 projects, with a budget of over €1.6 billion.

¹ A new LIFE+ programme has recently been launched covering the period 2007-2013, For more information: <http://ec.europa.eu/life/>

Of these, since 1992, LIFE has co-funded around 120 wetlands-related projects across the nature, environment and third countries' thematic components. Almost all of these projects have been oriented towards nature conservation, reflecting the biodiversity value of the wetlands habitats.

This brochure examines those LIFE projects that directly target wetlands' ecosystems within the Natura 2000 network of sites. The majority of these projects focus on the restoration and management of wetlands, with some projects targeting specific wetlands bird species, and thus contributing to the implementation of the Habitats and Birds directives.

Furthermore, most projects support the Ramsar Convention and are indirectly linked to the implementation of the Water Framework Directive by maintaining or improving water quality and the status of ecosystems.

LIFE Nature Co-op projects and wetlands

'Co-op' measures were aimed exclusively at supporting the exchange of experience among LIFE-Nature projects. They had to involve at least three ongoing or past LIFE-Nature projects targeting similar nature conservation subjects, e.g. the same species or habitat type or groups, similar nature conservation themes or issues relating to communications, management planning, or exchange among those who share nature areas, such as farmers, foresters, fishers, etc.

Of the ten Co-op-financed projects, there were three that directly targeted the exchange of experiences on the issue of habitat and species management:

- Best practices in Finnish wetlands - networking for improved wetland management (LIFE2002NAT/CP/FIN/27)
- Handbook for actions to promote Bittern in Europe (LIFE2003NAT/CP/D/9)
- Experience exchange on habitat management among Baltic LIFE-Nature projects (LIFE2003NAT/CP/LV/10)

http://ec.europa.eu/environment/life/funding/life3/components/components_nat.htm

The projects chosen to illustrate such activity represent a small sample of the many LIFE projects that have addressed wetlands issues. Beyond those LIFE-Nature projects directly concerned with wetlands, there are many other LIFE-Envi-

ronment and LIFE-Third Countries projects that have also targeted wetlands.

For further information, see the LIFE website: <http://ec.europa.eu/environment/life/>

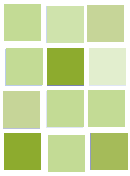
Re-wetting of the western Lake Dümmer fen area – Lower Saxony, Germany





Wetlands in general

Since the birth of civilisation, wetlands – those transitional regions between terrestrial and aquatic systems – have provided a wealth of services to society. Representing around 6% of the Earth's land area – some 570 million hectares, of which 2% are lakes, 30% bogs, 26% fens, 20% swamps, and 15% floodplains, they also supply the water that an enormous range of plant and animal species require for their day-to-day existence. However, wetlands are among the most highly threatened ecosystems on the planet, with some 50% of the world's wetlands having disappeared in the last century. Since 1992, LIFE has co-funded around 120 wetlands-related projects across the nature, environment and third countries' thematic components. Almost all of these projects have been oriented towards nature conservation, reflecting the biodiversity value of the wetlands habitats.



Finland: Conserving and managing valuable wetland bird habitats

This influential LIFE project helped to reconcile the needs of nature conservation, fishing, hunting and tourism at five of the most important wetland bird habitats in southwestern Finland: the two estuaries; Mietoistenlahti and Oukkulanlahti and the three shallow lakes; Koskeljärvi, Otajärvi and Omenajärvi. More than 20 species listed in the EU Birds Directive nest in the area or stop over during migration.



Baltic coastal meadows support important bird habitats

With the decline of grazing over the past 20 years – in some places the practice had been abandoned altogether – the wet meadows that once surrounded these waters had become overgrown. This led to a decline in populations of water bird species such as the ruff (*Philomachus pugnax*) – a migratory wader whose favoured breeding habitat is the bogs, marshes and wet meadows of northern Europe and Russia. The gradual overgrowing of the shallow lakes also became problematic for other reasons.

The project locations, all Natura 2000 sites, are popular with fishermen, boaters, hikers and bird-watchers. But, prior to the LIFE project, which was launched in the summer of 1999, there were no restrictions on their use and no infrastructure was in place to guide visitors on-site. Since the project areas were used for a variety of purposes, it was vital that all parties concerned should be committed to participatory project planning and management. Thus, the objective of this 56-month project was to reconcile the needs of

nature conservation, fishing, hunting and tourism.

What did LIFE do?

The project was implemented by Metsähallitus, the Finnish Forest and Park Service, in partnership with the five municipalities for the project areas and the SW Finland Regional Environment Centre. New use and management plans were drawn up for each of the areas and existing plans were revised in an effort to resolve conflicting pressures.

Special care was also taken to ensure that the growth in eco-tourism in these areas was sustainable. This included the provision of training to local tourism entrepreneurs.

To facilitate implementation of the management plans, the project purchased land in the project areas.

Management measures included clearing and mowing overgrown waterside meadows to enable grazing on at least 100 ha. For the first time in Finland, Warnstorfia moss was removed from a 10 ha expanse within lake Otajärvi (this species tends to choke other vegetation).

As a small but vital part of the project, the non-native predators, mink (*Mustela vison*) and raccoon dog (*Nyctereutes procyonoides*) were hunted systematically. Local hunters were enlisted to help establish the best hunting method.

Signposted nature trails were laid out and explanatory panels, towers and observation points were erected for the benefit of bird watchers. Other actions included the building of a marina at Mietoistenlahti bay with anchorages set up on lakes Otajärvi and Koskeljärvi. Old waterfront buildings were also demolished.

What was the outcome?

The project made a significant contribution to the conservation and management of the five sites. By April 2004, the official end date of the project, all the main actions had been successfully completed, with the exception of the management plans. The management planning work load was intense over the duration of the project, especially in terms of involving local people and all the different stakeholders. However, the beneficiary continued the planning work after-LIFE (more below) and was able to complete the plans in early 2005.



Bird observation tower built by the LIFE project

New management plans were drawn up for four of the sites and the existing plan for Mietoistenlahti was revised in order to resolve conflicting pressures. Special care was given to ensure that growing eco-tourism in the area would be compatible with sustainable use. However, hunting issues were the most problematic in some sites (especially in Koskeljärvi).

The main results included:

- The purchase of 194 ha via project co-financing and a further 100 ha through national funds.
- On-site restoration actions were carried out on the purchased land, for instance 130 ha of meadow was cleared and entered into agri-environmental schemes.
- Mowing was carried out on 100 ha.
- Boating was restricted in certain sensitive areas.

The project offered training to local tourism entrepreneurs. The beneficiary actively encouraged farmers to apply for agri-environment support, and in Oukkulanlahti and Otajärvi farmers applied for agri-environmental support for grazing within the SPA.

Trapping and eradicating mink and raccoon dogs was carried out in all five locations by local hunting clubs. The number of volunteers required for this work was far more than foreseen –an indication of the effort required to achieve this action. The LIFE project identified the best hunting methods and periods. The trapping of small predators has now been reinforced as part of the management of these sites. This work also improved the co-operation between hunters and the nature conservation administrations within the project areas.



Wetlands in general

At the end of the project, it was clear that long-term monitoring would be required in order to assess the impact of the project's measures on breeding and staging bird species. Project actions did however restore the overgrown meadows and increase areas of open water. Additionally, restrictions on boating or other activities potentially disturbing breeding/staging birds were applied or proposed, and the trapping of small predators was strengthened. Visitor control was also implemented by directing visitors to bird observation towers and relocating jetties.

The removal of water mosses, carried out in Otajärvi, turned out to be less successful in ecological terms. Removal did increase the free water area above the moss carpet, which is important for water birds, made the new carpet thinner and slowed down the return of the water moss carpet. Unfortunately this action alone, proved ineffective in helping to restore Otajärvi, but together with raising water levels and decreasing nutrient input to the lake, it would make a difference.

Life after LIFE

The project methodology (participatory preparation of management plans) has been widely used in other Finnish LIFE-Nature projects targeting wetlands. The experience of this project has already been used by another Finnish project to protect and manage the valuable wetland of Siikalahti, a five kilometre bay in Lake Simpelejärvi, located in south Karelia on the Russian border (LIFE00/NAT/FIN/007061). The beneficiary has also been active in the ongoing Finnish wetlands management co-op project (LIFE02 NAT/CP/FIN/000027), which was launched in 2002.

A follow-up study of the project was carried out in June 2007 by the LIFE

external monitoring team. It showed that the beneficiary and one of the partners, the SW Finland Regional Environment Centre, have continued the management of the areas as foreseen in the management plans, which, with the exception of Mietoistenlahti were finalised and approved after the project. The management plans were approved for the state-owned areas in Metsähallitus. However, the approval for privately-owned areas is voluntary and dependent on whether the landowners agree on the actions included in the plans. This caused some problems with respect to agreement on the hunting restrictions in some project areas (mainly in Otajärvi). Hunting in Natura 2000 sites is quite a contentious issue in Finland.) The partner SW Finland REC is still trying to find an agreement on the limiting of the hunting in part of Otajärvi.

The land acquisition in the project areas, notably in Mietoistenlahti and Oukkulanlahti has continued in the project areas after-LIFE with national funding. Currently around 90% of the land area in Mietoistenlahti is either owned by the state or private landowners have established private nature conservation areas. The corresponding figure for Oukkulanlahti is around 75%.

The management of restored coastal meadows has continued and also some new pastures have been established. The management is funded from the Finnish agri-environmental programme. The harrowing of the coastal line in Mietoistenlahti has also continued. Furthermore the clearing of the nesting islets in Otajärvi was repeated in 2006. The coastal meadows of Mietoistenlahti are, thanks to the restoration and management actions, among the best managed coastal meadow habitats in the country. Thousands of birds stop over in the area during the migration season and also several waders are nesting there.



A meadow cleared by grazing, supported by agri-environmental schemes

The systematic trapping of the small predatory mammals (American mink and raccoon dog) has not continued. According to the beneficiary, this was mainly because this is a volunteer activity and therefore difficult to continue after the project.

Finally, the monitoring of the management results and effects on the habitats and species (e.g. birds) is planned under the updating of the management plans due in 2012.

Project Number:
LIFE99 NAT/FIN/006278

Title:
Management of the most valuable wetlands in SW Finland

Beneficiary:
Metsähallitus - Forest and Park Service

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<http://www.metsa.fi/page.asp?Section=2817> (English)

Period:
Aug-1999 to Apr-2004

Total Budget: € 1,430,000

LIFE Contribution: € 715,000

Croatia: Promoting a 'wise use' approach to the management of Lonjsko Polje Park

Capacity building, raising awareness and promoting wider stakeholder participation were the main ingredients of success for this LIFE-Third Countries project located in Croatia's Lonjsko Polje nature park

Set in the floodplains of the Middle Sava River Basin in Posavina, the Lonjsko Polje Park covers over 50,000 hectares of wetlands and represents the largest floodplain area of the Danube River catchment. It is both a Ramsar site and an Important Bird Area and hosts seven habitats and 89 species listed in the Habitats Directive.

In 1998, the Croatian government established the Lonjsko Polje nature park public service (the project beneficiary) to protect, maintain and promote the park. The authority manages the site in accordance with Ramsar Convention guidelines – placing emphasis on good management and on stakeholder participation. However, at the time of the project launch (in 2001), it was clear that it did not possess the capacity to meet its management goals. It was, therefore suggested that capacity building, awareness-raising and the wider participation of stakeholders were needed to further implement international and national policies within the park.

The overall project objective was to develop and improve the Ramsar 'wise use' approach to the management and promotion of the park. Specifically, the project focused on: (1) protecting its biological and landscape diversity; (2) improving its benefits for the local people; (3) raising public awareness; and (4) insuring effective and environmentally-sound water management for the whole Sava River Basin.

What was the outcome?

The project ran for three years and on completion had successfully met its objectives. Over the project duration, the number of permanent staff employed at the park was increased from six to nine, and the park authority's capacity was reinforced through training and the upgrading of equipment. In addition, the project established a network of visitor and information centres.

A number of dissemination and awareness-raising actions were also carried out, including seminars and study tours on basic ecology, communication, interpretation (guiding) and monitoring. The experience and the results were published in a ranger's handbook, which was presented at regional and national level and, according to the beneficiary, has generated a high level of interest. In addition, the beneficiary hosted a GIS (Geographic Information Systems) training course which also proved popular among participants.

The beneficiary also delivered a number of lectures targeted at local schools, farmers, students, and experts. These helped to gain support for the park and to generate greater awareness of ways of meeting recreational needs whilst also addressing conservation concerns. The project also gathered feedback from visitors on the measures implemented by the project. In general, this feedback was "very positive".

Despite some difficulties, the project managed to involve stakeholder par-



Photo: LIFE00 TCY/CRO/076

LIFE actions targeted the protection of the park's rich biological and landscape diversity

ticipation at both planning and implementation stages – although the beneficiary reports that this objective was the most difficult to achieve. Nevertheless, a stakeholder committee was set up and co-operation was established with various organisations including the Croatian water and forest authorities, the police, building services, livestock breeders, and nature conservation and environmental protection organisations.

Project Number:

LIFE00 TCY/CRO/000076

Title: Towards wise use in Lonjsko Polje Nature Park

Beneficiary:

Lonjsko Polje Nature Park Public Service

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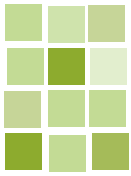
www.pp-lonjsko-polje.hr

Period:

Aug-2001 to Jul-2004

Total Budget: € 535,000

LIFE Contribution: € 332,000



Hungary: Restoring wetlands in the Hortobágy

Over the past 200 years, the steppe-like Hortobágy region in eastern Hungary has come under repeated assault, particularly its being disconnected from the life-giving Tisza River. But by restoring wetlands in this region much spoken of in Hungarian poetry and song, this LIFE project is also restoring a piece of the Hungarian soul.

The broad, wind-swept Hortobágy holds a special place in the imagination of the Hungarian people. This steppe-like region in eastern Hungary is part of the Alföld, or Great Hungarian Plain, and was designated a national park in 1973 – the country's first national park.

Unfortunately, over the past 200 years, the region has come under repeated assault. The list of inflictions to the ecosystem is long: sections were drained; certain puszta (prairies) were cultivated and disconnected from the Tisza River; its marshlands and sodic lakes were converted to fish ponds; in its alkaline grasslands and meadows, vast paddy fields were created; and damaging alien species were introduced. Moreover, natural rivers were transformed into channels; settlements and farmhouses foreign to the landscape were built; the ancient grazing system was destroyed; and traditional domestic animal types were displaced.

Despite these problems, the Hortobágy puszta remains an important habitat for numerous birds, and a group of naturalists, with help from LIFE-Nature, have been steadily working towards restoration of the region to its original pre-18th Century conditions.

What did LIFE do?

To restore the region, the Hortobágy Environmental Association (HEA), the beneficiary, engaged in three main activities:



The Pannonic steppe is regularly flooded in Hungary's Hortobágy region

1. Elimination of an unused channel network

Nearly 300 water control structures were removed from the puszta, which were later recycled as roads for local villages. Over 100 kilometres of channels and banks were eliminated with heavy equipment, resulting in rainwater forming shallow pools of about 200 hectares in the puszta. This rehabilitation process can be compared to an operation on a human body: they cut a single, rapid but healing wound in the landscape so as to ensure a long life. The wound healed fast, and the original vegetation re-colonised almost entirely in place of the backfilled channels by the following year.

2. Removal of woody growth from the puszta

The beneficiary also removed bushes and scrub (nearly 3,000 woody plants), most of which were low-value, invasive species introduced artificially to Hungary.

3. Creation of artificially flooded wetland habitat

Due to the presence of some irrigation channels still in use, whose elimination was not permitted, certain shallow ponds that had formed in old riverbeds had been left without a sufficiently large catchment area and hence with scarce water supply even in wet years. Thus in Nagy-Vókonya, the beneficiary managed to artificially flood by gravity one of these areas covering 200 ha.

What was the outcome?

In all, shallow-water habitats were enlarged from 37 ha to 295 ha, via inundation and the elimination of channels. The group continues to work on the elimination of paddy fields and irrigation systems in the pusztas of Hortobágy, which will not only protect wetland habitat, but also facilitate rainwater retention. However, to ensure that the results of the restoration work would be preserved, the beneficiary turned to traditional grazing.

Preservation via cattle grazing

The history of Hortobágy reveals that swards (grassy meadows) of the Hortobágy steppe can only be preserved and used by applying grazing stock of indigenous breeds. Any other attempts to maintain and exploit this area have been doomed to failure. Re-establishment of the traditional grazing system, however, serves both the interests of conservationists and people living near the Hortobágy.

To ensure the conditions for traditional herding of grazing stock, the shelters and well-sweeps were renovated. Also, due to the enhanced



LIFE enhanced habitat conditions for Annex I bird species, such as the spoonbill (*Platalea leucorodia*)

livestock population, new, traditionally designed summer shelters and windbreaks were constructed from natural materials. Winter fodder for the animals was produced outside the grazing area.

By the end of the project duration, the number of native livestock (Hungarian flecked and Hungarian grey cattle, Mangalica pigs, Racka sheep and goats) was increased by 1,040.

Plants and animals return

One of the favourable changes in the flora is that most of the damaged, dried out habitats in the wetland habitat were transformed into valuable alkaline meadow and marshland vegetation. Rare aquatic (*Lemnetea*) and mudflat (*Nanocyperion*) plant assemblages appeared in the area, with one species endemic to the Carpathian Basin, namely the Hungarian elatine (*Elatina hungarica*). On the project site, 288 plant species were recorded over the course of the project period.

The difference between grazed and ungrazed areas was studied with the help of terrestrial arthropod monitoring. From 2003 to 2005 altogether 22,463 terrestrial arthropods were recorded, 12,942 of which were found in the grazed units, and 9,521 were observed in the ungrazed tracts. The survey substantiated that the high intensity of grazing has a beneficial effect both on the insect fauna and the birdlife feeding on them in the pannonic salt steppes.

Thatched summer shelters built to service the enhanced livestock population, including the Mangalica pig





Grazing by indigenous stock breeds keeps the grass short and is beneficial to both insect fauna and birdlife

Additionally, between 2002 and 2006 225 bird species were observed on the project site. It is noteworthy that 13 of the recorded bird species are included in the IUCN Red List Species published in 2004. By 2006, a total of 96 breeding species were recorded, 11 of which are strictly protected by national legislation. Of the Birds Directive Annex I species after the restoration, in 2004 up to 56 pairs and in 2005 63 pairs of water bird species were nesting in Nagy-Vókonya. Furthermore, while in 2003 only 7,603 water birds were estimated to have appeared on habitats in place of the former, damaged paddyfield, following the restoration works, in 2004, 61,248 and in 2005, 96,755 individuals could find a roosting, foraging and stopover habitat on the project site.

Steppe and marsh rehabilitation

A similar and complementary project was undertaken in the region, but this time with the Hortobágy National Park Directorate in the role of LIFE beneficiary. The project aimed to restore the 'Pannonic salt

steppes and marshes' across some 10,000 hectares of the Hortobágy National Park.

The project planned to eliminate the artificial factors altering the natural micro-topography of the flood plain area by levelling down or filling in a total of 360 km of artificial dykes and irrigation channels.

Like the first Hortobagy project, the marsh rehabilitation also involved intensive grazing methods, this time to re-create the unique mosaic of alkaline wet and dry grassland patches. Intensive grazing of cattle keeps the grass short and gives the competitively-weak plant associations such as the *Puccinellio-Salicornetea* (habitat 1310) the space to spread in suitable solonetz soil areas.

The project provides enhanced habitat conditions for 37 species of birds listed in Annex I of the Birds Directive. Population growth was already seen during the project in important species such as bittern (*Botaurus stellaris*), common crane (*Grus grus*), aquatic warbler (*Acrocephalus paludicola*) and great bustard (*Otis tarda*).

Furthermore, otter (*Lutra lutra*) occupied all stagnant waters, ferruginous duck (*Aythya nyroca*) bred and the European pond turtle (*Emys orbicularis*) re-colonised suitable habitats.

The project also reconstructed small areas of special soil surface micro-forms, which are a special habitat type of salt steppes. In 2003, 514 dotterels (*Charadrius morinellus*) were observed on these patches, the highest number ever recorded.

Project Number:
LIFE02 NAT/H/008638

Title:
Habitat management of Hortobágy eco-region for bird protection

Beneficiary:
Hortobágy Environmental Association

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Period:
Jul-2002 to Jun-2006

Total Budget: € 830,000

LIFE Contribution: € 622,000

Italy: Conserving wetland and other habitats in the Rhaetian Alps

Four of the five management plans developed for Natura 2000 sites in the Rhaetian Alps under this LIFE project have already been adopted and implemented by local authorities. This experience provides an excellent model for other similar wetland areas.

The Rhaetian Alps in northern Lombardy host five Natura 2000 sites, covering more than 12,000 hectares, typical of the rich diversity of wetlands and alpine meadows of the region. At the bottom of the valley lies *Pian di Spagna*, a Ramsar site (designated a wetland area of international importance) with alluvial forests, reedbeds and open water. It is ecologically connected to the other four sites, passing through several vegetation types rising to alpine level (the highest point is 3,367 metres), boasting typical alpine flora and fauna.

Among the habitats of Community importance identified in the five sites, some are particularly sensitive to human activities. These include species rich *Nardus* grasslands, alpine pioneer formations of *Caricion bicoloris-atrofuscae*, residual alluvial forests and *Tilio-Acerion* (mix of ash, elm and lime) ravine forests. Among the major threats to the sites are the silting up of wetland habitats and overgrowth of grasslands, the spread of alien species, reed-bed and forest fires, and degradation of forest natu-

ral structure. The area is also subject to increasing tourist pressure, which needs to be managed to avoid further damage.

What did LIFE do?

The LIFE project was run by *Ente Regionale per i Servizi all'Agricoltura e alle Foreste*, the regional body which manages state-owned forestry and agriculture. Its overall objective was to introduce the management of the five Natura 2000 sites as a network. As a first step a GIS database was set up in order to define the location and state of conservation of the habitats, identify priority areas of intervention and provide data for site management plans. (Four of the five plans have already been adopted and implemented by local authorities on behalf of the regional administration.)

Habitat management actions were based on the most urgent conservation needs. They included the restoration of canals, opening up fire breaks in reed-beds, elimination of alien species in alluvial forest through selective felling and re-creation of plots of this habitat in selected sites.

Actions carried out in the mountain areas included the restoration of silted up springs and bogs, the elimination of sweet chestnut trees from *Tilio-Acerion* forests, mowing of *Nardus* grasslands and beech forest management in order to protect the beetle *Rosalia alpina*.

Monitoring the mountain wetlands conservation status



Alpine wetland site in northern Lombardy

Finally, the impact of tourism on sensitive areas was reduced through the creation of paths and observation points to drive and regulate movement and access of visitors. The awareness-raising campaign included the development of a website, the erection of information panels, the production of handouts, guided visits, seminars and environmental education in local schools.

Project Number:
LIFE03 NAT/IT/000139

Title:
RETICNET. 5 SCI for the conservation of wetlands and main habitats

Beneficiary:
Ente Regionale per i Servizi all'Agricoltura e alle Foreste, Italy

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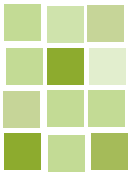
Website:
www.lifereticnet.it/

Period:
Jun-2003 to Dec-2006

Total Budget: € 1,811,000

LIFE Contribution: € 906,000





Latvia: Measures help conserve wetlands in Kemeris national park

This project provided the first step in the implementation of a nature management plan to protect the exceptionally rich wetland biodiversity of one of the Latvia's most important wetland regions.

Kemeris national park is one of Latvia's first national parks. Established in 1997 and covering over 38,000 hectares, it hosts over 30 habitats of Community importance including mire woods, black alder swamps, raised bogs, rich fens and coastal dunes. This diversity of habitats harbours populations of important wetland species listed in the Birds and Habitats directives such as corncrake (*Crex crex*), lesser spotted eagle (*Aquila pomarina*), spotted crane (*Porzana porzana*), and yellow lady's slipper (*Cypripedium calceolus*). Located within the park, Lake Kanieris is designated as an internationally important wetland under the Ramsar Convention and is an important site for migratory and nesting birds. The park is also a proposed Natura 2000 site.

At the beginning of the project, large parts of the park were not in a good state of conservation. The outer rim of the raised bog was drying out as a result of a series of ditches dug in the

LIFE restored the natural hydrological regime of the area



1930s and parts of the natural riverbeds were transformed into artificial drainage systems, thereby preventing the seasonal flooding that is so important for the birds. There were also more recent pressures from housing and recreation, as the park is located just 30 km west of the Latvian capital Riga.

What did LIFE do?

The project was run by the Kemeris national park administration, a government body responsible for the conservation and management of the park. In 2001, with support from the Danish environmental consultancy, CarlBro, the beneficiary drew up a nature protection (management) plan for the park, together with guidelines for its practical implementation. The LIFE project, launched the following year, was the first step towards implementation of the plan.

The main nature management actions in the plan included the restoration of 105 hectares of natural flood plain meadows along the river Slampe, in close cooperation with landowners and farmers, and the restoration of the natural hydrological regime of the active raised bog (4,635 ha) through the blocking of ditches. (For example, on the Lielais Kemeris bog, dams were constructed to block the 22 drainage ditches that had been built. This helped to decrease the discharge of water from the bog and the bog periphery. At the same time, the level of forest roads (4.5 km) was also raised to compensate for the rising level of ground water as a result of blocking the ditches.) Action to help conserve bird colonies at the lake Kanieris Ramsar site was also proposed.

What was the outcome?

All the objectives were fully met. The work to restore the natural flood plain meadows along the river Slampe – started earlier, but completed under LIFE, is particularly innovative as this involved the full-scale re-meandering of a straightened river course – a re-naturalisation solution that was new to Latvia. A little-known method (creating dams from peat using heavy machines) was also successfully introduced under the bog restoration work. According to the project's After-LIFE conservation plan this provided valuable experience that will be used in future restoration work for the Zalais and Raganau bogs.

Now, visitors are able to see the results of the restored water level in the park



Project Number:
LIFE02 NAT/LV/008496

Title:
Conservation of wetlands in Kemeris National Park

Beneficiary:
Kemeris National Park

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Period:
Sep-2002 to Dec-2006

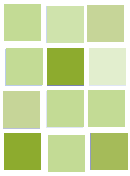
Total Budget: € 1,321,000

LIFE Contribution: € 991,000



Coastal wetlands

Coastal wetlands, including salt marshes or other marshes subject to tidal flooding and normal wind tides, provide breeding grounds and habitats for many marine organisms as well as for waterfowl, shorebirds, and other wildlife. They also protect against flooding and help maintain water quality. Furthermore, these coastal environments are important economically, generating employment in both the tourism and commercial fishery industries. Coastal wetlands come under assault in particular from residential and commercial development, agricultural and urban run-off, shoreline modification, municipal waste disposal, oil spills, and over-harvesting of resources.



Finland: Grazing wetlands for waders

This LIFE-Nature project concerns the restoration of 12 Natura 2000 sites by cutting the overgrown reed beds and restoring the Baltic coastal habitats by reintroducing grazing and involving the local population and farmers.

The Northern Coastal Gulf of Finland is one of the main bird migration routes across northern Europe and an important flyway for waterfowl and waders that winter in the southern part of the Baltic Sea and along the coasts of the North Sea. Every spring and autumn, large numbers of birds migrate through the Gulf of Finland, stopping over to rest or feed, and sometimes also to breed in the area.

These wetlands are home to a wide range of species and habitats, which are dependent on the regular natural flooding of the Baltic brackish waters. The Boreal Baltic coastal meadows¹ are one of the special habitats (considered priority for conservation under Annex I of the Habitats Directive) that are characterised by low-growing plant communities in the shore zone, and that are flooded by the brackish water with almost no tidal influence.

Most of these areas were traditionally used for mowing or grazing, keeping the vegetation low and rich in vascular plants, and were, therefore, suitable for nesting waders. Today, they are mainly covered with high vegetation reed beds (*Phragmites australis*) and are undergoing a process of overgrowing due to the disappearance of the grazing activities and increased nutrient levels. In some places, the process is so advanced that also trees and bushes have started to encroach, further accelerating the deterioration of these important wetlands.

The present LIFE-Nature project focuses on 12 specific sites along this flyway, covering a total of 3,630 ha. All are considered internationally valuable bird-rich wetlands by virtue of the fact

¹ 1630* - Boreal Baltic coastal meadows

that they host 35 species mentioned in Annex I of the Birds Directive. Important species such as the whooper swan (*Cygnus cygnus*), the whistling swan (*Cygnus columbianus*) and the smew (*Mergus albellus*) use these sites as resting areas. They are also important habitats for many plant and insect species mentioned in the Habitats Directive. A major part of the large white-faced darter dragonfly (*Leucorhinia pectoralis*) population in Finland, and of the entire Natura 2000 network, lives within the project areas.

What did LIFE do?

The main goal of the project was to restore the natural ecology of the coastal wetlands and meadows, which are important for waders and waterfowl during their migration and nesting period. The project aimed to increase the diversity of habitats, currently dominated by reed beds, by re-establishing the coastal meadows and opening pools that favoured species, mainly insects, which are dependent on open waters.

The project was run by the Uusimaa Regional Environment Centre and the Southeast Finland Regional Environment Centre along with 11 other partners and 16 co-financers includ-

ing local municipalities and other interest groups. It involved a range of activities, including the development of management plans for Natura 2000 sites in close consultation with experts, local inhabitants and land owners trying to resolve potential or existing conflicts between conservation and other land uses.

In order to restore the coastal wetlands, reed beds, trees and bushes had to be cleared. Two innovations from other Finnish LIFE projects were adapted for this purpose: crushing and rotoation² of the reed roots. The normal mechanical cutting was found to be unsuitable for restoring coastal meadows as it was time consuming and expensive, mainly because it involves a second step of collecting the cut reeds. It was also unsuitable for places where the siltation process was already too advanced.

The crushing technology involves the use of a special machine with blades similar to those used in machines designed for cutting roadside vegetation. The crusher can be fixed to a tractor or, on softer and wetter ground to an all-terrain tracked articulated

² Motorised system that works the soil by means of rotating blades

Before and after the mowing and cutting of reed beds in Gammelbyviken Natura 2000 site



2004



2006

vehicle. The crushed material is left in the soil, providing nutrients that promote further growth and leading to the need for cutting every 2-3 years. This technique is therefore only really effective where there is grazing after cutting, or recurrent cutting.

In order to restore all the area of the coastal meadows, cutting all the way to the water shore is necessary. This requires the use of special equipment that can operate in soft and flooded terrain. The surface soil was rotovated to a depth of 10-20 cm, impeding growth in subsequent years. Altogether, 161 ha of coastal meadows were cleared during the project.

After cutting, cattle and sometimes horses were introduced in order to keep the vegetation short, avoiding the need for further cutting in most parts of the meadows and thus maintaining favourable conditions for bird species. Agreements between farmers and the public land manager, Metsähallitus (a project partner), allowed for the establishment of 177 hectares of enclosed pastures on previously cut areas.

Some small predators, such as raccoon dogs and American mink, which are not indigenous to Finland, are a threat to the birds during the nesting period and can have a negative impact on breeding success. Therefore, the project promoters, in cooperation with local hunters associations, financed the purchase of traps, which the local hunters then armed and monitored. As a result of this initiative, 1,310 raccoon dogs and 391 mink were trapped. The success of the initiative was demonstrated by the success of nesting birds. The project also included the creation of small water ponds in the middle of the coastal meadows in order to provide habitat for wetland-dependent insects, such as the large white-faced darter.

What was the outcome?

The effects of the project actions in the restoration of the Baltic coastal

meadows has been followed up by extensive monitoring. Bird counting was carried out before the actions, in the autumn of 2003 and spring of 2004, and then again after the project was completed, in the autumn of 2006 and spring of 2007. Waders and water fowl benefited considerably from the project, in particular the restoration of open coastal meadows. In several areas, the number of waders resting during migration increased significantly. After restoration, the meadows became a very important place for several species during the migration period. Water birds (especially ducks) also found new feeding places and numbers increased significantly after the project was completed. Nesting birds, such as the lapwing (*Vanellus vanellus*) and common redshank (*Tringa totanus*) also benefited from the project.

In terms of vegetation, the effects were monitored through aerial pictures, which showed the presence of new shore plant species and the decline of reeds (see pictures before and after p. 22). The new pools were also monitored for the presence of insects – especially the dragonfly (*Leucorrhinia pectoralis*).

The project included the preparation of 10 management plans for the Natura 2000 sites. These plans, which have legal recognition, specify the current uses of the areas and the conservation status of the species and habitats. They also define the future funding source, as well the parties involved in the management of the areas. This project used a participatory approach in the preparation of the plans. Farming activities were closely linked to the management of the restored areas and the maintenance of the habitats after the project.

The conservation and management of the project areas and the increasing presence of birds attracted considerable interest and appreciation among local inhabitants. As a result, the project developed a system to control recreational access to the areas. This



Cattle were introduced, avoiding the need for further cutting and thus maintaining favourable conditions for birds

included 35 information boards, six nature trails and the construction of 14 bird watching towers. During the project, the group of environmental educators established a guidebook, *Retkelle kosteikkoon*, for teachers and educators and designed special cards about wetland species, which can be used for field trips or in the classroom.

The projects proved successful in enhancing the management of Natura 2000 sites that are important bird resting and breeding areas along the migratory areas of the Gulf of Finland. It also succeeded in securing the long-term management of coastal habitats by involving local farmers in their management and encouraging them to apply for agri-environmental support. Several restored areas are already managed by livestock grazing, which is supported through agri-environmental programmes.

Project Number:
LIFE03 NAT/FIN/000039

Title: Management of wetlands along the Gulf of Finland migratory flyway

Beneficiary:
Uusimaa Regional Environment Centre, Finland

Contact: Ilpo Huolman

Website:
www.ymparisto.fi/lintulahdetlife

Period:
Jul-2003 to Jun-2007

Total Budget: € 3,290,000

LIFE Contribution: € 1,645,000



Ireland: Realising a dream of an East Coast Nature Reserve

BirdWatch Ireland is currently restoring a wetland nature reserve, close to Dublin, as part of a four-year LIFE-Nature project to protect threatened water birds and rare fen habitats and to provide access to visitors. The relatively small-scale East Coast Nature Reserve, located within the Murrough Wetlands, demonstrates at national level the potential for reversing damage to wetlands in Ireland.

Oran O’Sullivan, the project manager of the beneficiary, BirdWatch Ireland, is a man with a mission: his long-held dream of realising a nature reserve along the country’s east coast, close to an urban population, is nearing completion thanks to co-funding from the LIFE-Nature programme.

The 90-hectare reserve was purchased at the start of the project, to help promote conservation needs across the whole Murrough – a 15 km long, but narrow coastal wetland complex, bounded on its seaward side by a shingle ridge. The reserve, at Blackditch Wood, County Wicklow, harbours three main habitats:

Calcareous fen, an EU priority habitat; wet grasslands and birch and alder woodland. The fen is the most important habitat for flora, while the grasslands and pools provide crucial nesting and feeding areas for highly endangered species: Greenland white-fronted goose (*Anser albifrons flavirostris*), whooper swan (*Cygnus cygnus*), and other bird species as the kingfisher (*Alcedo atthis*) and little egret (*Egretta garzetta*).

Ireland has a long history of damage to wetlands caused by drainage and agricultural reclamation. The reserve’s wet grasslands had been used for intensive sheep and cattle grazing.

Deep drains cut across the land and biodiversity was low overall. The fen was in a degraded state. Drains and planted conifers were drying it out and willow invaded from neighbouring woodland.

O’Sullivan praises the board of Bird-Watch Ireland’s “far-sighted” decision in 2003, to fund its share of the € 2.1 million project by selling off its prime head-office premises in central Dublin and re-locating to more modest offices, close to the project site. “By cashing-in our Dublin property, we were able to purchase the land and immediately begin the restoration works,” he says.

Aerial view of the East Coast Nature Reserve at Blackditch Wood, County Wicklow



What did LIFE do?

Led by the project officer, Jerry Wray, the main actions have focused on these three main issues:

- Water management
- Restoration grazing
- Tree and scrub removal

Water management

Improved habitat would be delivered through actions to reverse the drying out of the wetlands. This involved improving the hydrology of the fen by raising water levels and by the control of water flow through the installation of sluice gates. The sluices enable the control of water flow between and within the different habitats on the reserve. Water levels are maintained in the fen throughout the year, but are dropped in the grasslands during the summer months to allow cattle grazing.

The drainage ditches at Blackditch with unconventionally steep sides have been re-profiled and cut so that one side is more gently-sloping. This has increased ecological value by promoting emergent insect life and allowed an easier access to water birds.

Open water areas ('scrapes') have been created, which successfully attract water birds, including the target species: little egret (where, following the actions, up to four birds have been recorded) Greenland white-fronted goose (up to six birds) and whooper swan (up to 14 birds). Monitoring of bird numbers from within and

around the scrapes has also recorded numerous mallard, over 30 greylag geese (*Anser anser*) and snipe (*Gallinago gallinago*), some 200 teal (*Anas crecca*) and up to 300 wigeon (*Anas penelope*).

Restoration grazing

Prior to purchase, intensive cattle (and sheep) grazing on the wet grassland areas had damaged the habitat and was threatening the value of the site for wetland plants and water birds. However, the introduction of 'low intensity'¹ restoration grazing by cattle is proving adequate for habitat restoration and is also providing suitable feeding conditions for both wintering and breeding birds through the creation of 'tussocks' (tufts, or thick clumps of coarse grass or sedge). Says O'Sullivan, this low-level grazing has proven beneficial both to the project and to the grazers (two neighbouring land-owners). Crucially, no money changes hands: "We need to have the wetlands grazed in the summer. In return, they maintain fences and provide machinery, for example, tractors should we need them. It's a kind of barter system and it works."

In the fen, low-intensity grazing by Kerry Bog ponies (see box) helps control encroaching coarse herbaceous species and encourages special fen plants and grasses, such as saw sedge (*Cladium mariscus*). With their hardy pedigree, these diminutive ponies are remarkably well-suited to

¹ less than 0.5 livestock units/ha



Young ornithologist attends the project open day in September 2007

life in the wet conditions of the fen and are proving their worth in its restoration.

Tree and scrub removal

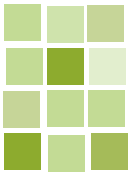
The removal of planted trees (which together with the encroachment of scrub had reduced the overall size of the fen) has proved the most time consuming element of the restoration work. Two elements were essential, the removal of a plantation of the American lodgepole pine (*Pinus contorta*) and the control of a large percentage of the invasive willow and gorse (*Ulex*).



Photo: LIFE03 NAT/IRL/107

Kerry Bog Pony

The Kerry Bog Pony is a rare breed of horse similar to the Shetland pony in stature. Also referred to as 'Heritage Ponies,' these diminutive horses were originally bred in the 17th Century as workhorses. Their strength and resilience made them ideal for hauling turf from peat lands, seaweed from the shore and even as a mode of travel. Unfortunately, by the late 20th Century the pony population in Ireland was on the brink of extinction, dwindling to only 20 individuals in 1994. Today, under the auspices of the Kerry Bog Pony Co-Operative Society and local breeders, there are approximately 130 individuals in the country. The ponies were donated to the project by the NGO, Genetic Heritage Ireland.



'Target' bird species benefiting from LIFE actions



Little egret

This all-white heron is regularly seen about the reserve feeding in the drainage ditches and pools. The birds' bright yellow feet act as a lure for fish.



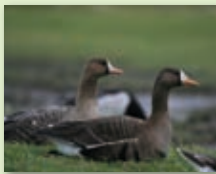
Whooper swan

Closely related to the more familiar mute swan (*Cygnus olor*) a small flock spends the winter at the nearby Kilcoole Marshes SPA (Special Protection Area). The project has put up decoys or models of the birds to encourage them to land on the reserve.



Kingfisher

Kingfishers feed in the drainage ditches where they dive from their perches into the water.



Greenland white-fronted goose

This goose has only been seen on the reserve a few times, but a similar goose, the greylag, is often seen and in large numbers. The team has also deployed decoys of this species in order to encourage them.

towards Natura site designation. This is changing."

Blackditch is an historic site for wintering whooper swan, the greylag and Greenland white-fronted goose. Prior to purchase of the site these species had only been infrequently recorded. Since BirdWatch Ireland took over the management of the site, they have all been recorded, including increasing numbers of little egret and many other bird species.

Access to the reserve is currently limited to supervised open days and school visits. But by spring 2008, the public will have full access via several paths and with the hide built under LIFE.

Life after-LIFE

Looking to the future, as the work on this project draws to a close O'Sullivan says he would like to work with more local land-owners using this site as a demonstration of good management practices. The beneficiary is also seeking additional funding to support the on-going maintenance of the reserve after-LIFE. In addition, there are plans for a possible, follow-on project targeting the purchase and restoration of old farm buildings, located just off-site, to provide an education and visitor centre for the reserve.

Photos: LIFE03 NAT/IRL/107

Winches were used to minimise the use of heavy machinery in the fen with all the material chipped adjacent to the fen. "We thought we were going to be able to sell-on this timber, but because of the difficulty of getting onto the water-logged land, no-body wanted it," says O'Sullivan. The control of the invasive willow on the main body of the fen was only possible using chainsaws. The tussocky nature of the ground made vehicular access impossible, and felled material had to be burnt in situ or extracted and chipped.

The removal of trees on the grassland areas of the site has created an open area over part of the reserve. This has encouraged geese, which prefer exposed situations. This has resulted in regular goose usage, including increasing number of Greenland

white-fronted goose, for the first time in over a decade.

What was the outcome?

The beneficiary has worked hard at informing people of its work at Blackditch – organising especially at the beginning, a number of public meetings to explain the project's aims, as well as open days for the public. According to O'Sullivan, at the early meetings there were some concerns, particularly among farmers, that they were going to flood the land. Now, he says, there is a clearer understanding and support for what they are doing: "This awareness-raising was needed and has been good for the project and for the environment...Traditionally in Ireland, there has been a rather negative impression among land-owners

Project Number:

LIFE03 NAT/IRL/000107

Title:

Restoration and management of the Murrough Wetlands for Annex I Habitats and Waterbirds

Beneficiary:

BirdWatch Ireland

Contact:

Oran O'Sullivan

Email:

oosullivan@birdwatchireland.ie

Beneficiary website:

www.birdwatchireland.ie/Default.aspx?tabid=226

Period:

Jul-2003 to Dec-2007

Total Budget: € 2,130,000

LIFE Contribution: €1,597,000

Italy: Conserving the Comacchio salt marshes

Targeting the restoration of a section of the salt marshes of Comacchio, this project demonstrated that abandoned habitats can become important areas for nature conservation and species protection.

The Comacchio lagoons – situated on the Adriatic coast of the Emilia-Romagna region of Italy – are part of the Po Delta wetlands, one of the country's most important wetland areas. In the northeast section, the coastal lagoons were artificially transformed to take in seawater, which was then evaporated to produce salt. Although man-made, these salt marshes provide ideal conditions for the growth of halophytic plants and are attractive resting grounds for numerous species of water birds. Located in the Po Delta Regional Park, the site is recognised as a Special Protection Area (SPA) for birds and a Site of Community Importance (SCI) under the Habitats Directive.

The salt works at Comacchio ceased operating in 1984. Since then the seawater, which originally replenished the evaporation basins, has no longer been regulated. Rainfall and insufficient inflow of salt water from the sea have contributed to a gradual fresh-watering of the lagoons, which are, as a result, slowly losing their distinctive ecological features.

What did LIFE do?

The five-year LIFE-Nature project was implemented by the Emilia-Romagna regional authority. Its main objectives were to restore a 600 ha section of the salt marshes and to promote the recovery of habitats and associated water bird species, such as terns (*Sterna bengalensis*, *Sterna hirundo*, *Sterna albifrons*) and gulls (*Larus melanocephalus*, *Larus genei*).

Environmental characteristics were studied and monitored in order to assess the effects of the project actions and to define a management plan for the area. In addition, facilities to reduce the disturbance to wildlife caused by visitors were set up. These direct site management activities were backed up by public education and awareness campaigns.

Project actions included the overhaul of the hydraulic network and the reactivation of the salt works according to traditional salt production practices. A particularly innovative aspect of the project was the installation of a system to monitor and survey the chemical and physical parameters of the water in the lagoon. Power lines, which are a hazard to the many species of nesting birds, were also buried or removed.

What was the outcome?

The project's main objectives, including the adoption of a site management plan, were met: water circulation was re-established in order to protect the typical habitats and species of coastal lagoons and salt production was recovered in a small section of the western part of the salt marsh. New bird nesting sites were established and the quality of the landscape was improved considerably.

The full impact of these interventions can only be assessed in the longer term. Meanwhile, however, the Po Delta Park is continuing the management of the restored salt marsh area – providing a guarantee



Flamingo (*Phoenicopterus roseus*)

for future conservation. Moreover the restoration of the salt works and its opening to the public is likely to increase tourist interest in this site and ensure direct benefits to the local economy.

Project Number:

LIFE00 NAT/IT/007215

Title: Environmental restoration and conservation of the habitat of the Saltpan of the SCI Comacchio Marshes

Beneficiary:

Regione Emilia-Romagna, Italy

Contact: Stefano Corazza

Email:

scorazza@ibc.regione.emilia-romagna.it

Website:

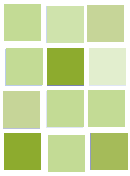
<http://www.lifenatura.it/emilia-romagna/LifeSALINA/life230frame.htm>

Period:

Jul-2001 to Sep-2006

Total Budget: € 1,597,000

LIFE Contribution: € 639,000



Spain: Cultivating alternatives to conventional rice farming

Agricultural activities, in particular rice farming and the associated use of pesticides, have had a considerable impact on the Ebro delta wetland system. However, this LIFE project showed how alternative rice-farming methods are perfectly compatible with the protection of one of the most important wetlands in the Mediterranean.



Photo: LIFE96 NAT/E/000512

Alternative agricultural management models were employed alongside conventional farming methods

The Ebro river delta, a Spanish wetland system of some 32,000 hectares, is a vital staging point on bird migration routes at the European level. As such, it is one of the most important wetlands in the Mediterranean, and a resting place for a wide range of birds listed in Annex I of the Birds Directive. More than 180,000 waterfowl spend the winter in the delta, and another 40,000 pairs nest there. It has been both designated as a Special Protection Area for birds and included in the Ramsar list of internationally important wetlands.

Although significant natural areas still remain, such as coastal lagoons, marshes, dunes and flood-

plain forests, most of the delta is now occupied by rice paddies. The impact of such agricultural activities and the accompanying use of pesticides has effected significant changes to the local hydrology, produced eutrophication¹ and damaged the natural aquatic environments of the delta, particularly the lagoons and marshes.

What did LIFE do?

This LIFE co-funded demonstration project, developed by the Spanish Ornithological Society (SEO/BirdLife),

¹ Eutrophication: the over-enrichment of a water body with nutrients, resulting in excessive growth of organisms and depletion of oxygen concentration

included the experimental cultivation of 60 hectares of rice fields, employing different management models – organic farming, farming with agri-environmental methods and conventional farming methods – in order to establish the economic and technical viability of models compatible with the conservation and regeneration of environmental assets.

Specifically, the project carried out a comparative analysis of four different farming systems in the Delta, where rice cultivation is the main activity, affecting up to 65% of the 32,000 ha: set-aside of rice fields, traditional rice growing, agri-environmental and organic systems.



Photo: LIFE96 NAT/E/00512

With 180,000 waterfowl wintering and another 40,000 nesting there, the Ebro river delta is one of the most important wetlands in the Mediterranean

What was the outcome?

A total of 12 ha were cultivated using conventional farming methods on land rented by SEO/BirdLife. Another 11.1 ha were also rented for growing rice in accordance with the regulatory board for Organic Agriculture. In these plots, rice was planted but no fertilisers or pesticides were used. Instead, other methods were used to combat pests, such as regulating the flooding period and level, weeding by hand and pheromone traps against the main rice pest

(*Chilo suppressalis*). Since 1999 the rice had been sown from a helicopter instead of being planted. This solution produced a decrease in the costs and greater plant densities.

Agri-environmental farming measures were implemented across 11.7 ha in accordance with the specifications of a zonal programme. Here, mechanical methods for weed control and slow-release fertilisers were used. Meanwhile, rice fields were set aside in two estates purchased by the beneficiary ("Del Clot" and of

"Riet Vell" reserves) to recover natural habitats.

Agronomic and ecological monitoring was carried out on all the plots, with an external advisor analysing the economic viability of the organic farming. This monitoring demonstrated that alternative methods (and particularly organic ones) resulted in clear improvements for the fauna and flora present. Feeding habitats for bird species clearly improved by using alternative rice farming methods, whether organic or agri-environmental.

Furthermore, the results also showed that both organic and agri-environmental farming were profitable, even if yields were slightly below those of conventional farming and production costs were higher. These alternative systems could be economically viable as long as they receive support in the way of agri-environmental subsidies, or a higher sale price (in the case of organic rice).

These arguments were being used by SEO/BirdLife to encourage local farmers to change from conventional rice farming to other practices with less environmental impact.

The delta, a wetland of some 32,000ha, is a vital staging point in bird migration across Europe



Photo: LIFE96 NAT/E/00512

Project Number:
LIFE96 NAT/E/00512

Title:
Improvement of habitat management in the SPA of the Ebro delta

Beneficiary:
SEO (Sociedad Española de Ornitología)

Contact: Alejandro Sánchez Pérez

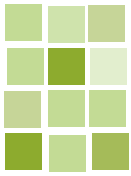
Email:
seo@seo.org

Website:
http://www.seo.org/home_articulo.cfm?id=1572

Period:
Jan-1997 to Mar-2001

Total Budget: € 1,219,000

LIFE Contribution: € 610,000



France: Working together for the eco-development of the Narbonnais lagoons

The LIFE-Environment project Eden (concerted eco-development around the Narbonnais lagoons) is an excellent example of the integrated development of a coastal wetland area. Adopting a participative approach, it brought together communities, industry, tourism and agriculture in a common objective – the protection and sustainable development of these lagoons. Significantly the project actions are continuing after-LIFE under a plan supported by the different stakeholders.

The coastal area of the Narbonnais ponds and lagoons, located in the region of Languedoc-Roussillon in south-western France, is an area of exceptionally high environmental value. Historically, this Mediterranean coastal region also supports a number of important economic activities including agriculture, shipping, fishing, and tourism. However, its strong economic development places pressure on the fragile natural environment of the lagoons, which are typically low in depth (1-1.5 m), separated from the sea by a lido. Rich in biological diversity, the hydrological and ecological functions of the lagoons are threatened by human actions, especially tourism.

What did LIFE do?

The LIFE project was coordinated by the development agency, (*Syndicat Mixte de Gestion du Parc naturel régional de la Narbonnaise*) comprising the joint forces of the regional nature park (*Parc de la Narbonnaise en Méditerranée*) in partnership with the chamber of commerce and industry of Narbonne and the chamber of agriculture of the department of Aude. The initiative had two main objectives: 1) to develop integrated environmental uses/management of the region and 2) to organise actions demonstrating an eco-development approach. A cross-disciplinary approach was used in order to implement over 40 actions within the catchment area of the lagoons, encompassing the 12,000 ha Natura 2000 site (also designated under the RAMSAR Conven-

tion). Before carrying out any necessary preventive work, several working groups were set up. For example, one was responsible for establishing the best way to manage the effluent (urban, industrial and agricultural) into the Robine canal, which empties into the lagoons; another was responsible for monitoring and evaluation of the lagoons' water quality and the promotion of management and development approaches favouring environmental restoration; while a third targeted the sustainable management of tourism. In all, some 43 actions were implemented by the project, almost all of which concern the management/treatment and monitoring of effluent emptying into the lagoons:

Management

- Clean port - Creation of a diagnostic "water and waste" scheme for the Port La Nouvelle, situated between the lagoons of Bages-Sigeon and the Mediterranean Sea.
- Regrouping of the Authorised Syndicates Associations (ASA) in charge of the agricultural management of water, to enable joint action across the whole catchment area.
- Development of a management plan for the Cercle and Labrador lagoon, a 950 ha site connected to the Narbonnais lagoons.
- Development plan for water effluents of the Croix Sud industrial area

Treatment

- Effluent treatment of nearby vineyards
- EPU Mobil – phytosanitary (pesticides) cleaning water system

Monitoring

- Waste from water treatment stations covering the lakes.
- The impact of human activities on the lagoon habitats by measuring water quality.

Finally, a key sustainable result of the project is a continuation of its management/treatment actions following the Eden methodology after-LIFE, under a so-called "contrat d'étang", which is currently being implemented by the different stakeholders across the region.

Narbonnais lagoons, south-western France



Project Number:
LIFE00 ENV/F/000600

Title: Concerted eco-development operating around the ponds and lagoons of La Narbonnaise area

Beneficiary:
Syndicat Mixte de Gestion du Parc naturel régional de la Narbonnaise

Contact: Thierry Laniesse

Email:
info@parc-naturel-narbonnaise.fr

Website:
www.parc-naturel-narbonnaise.fr

Period: Jul-2001 to Jul-2005

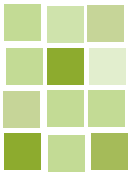
Total Budget: € 2,757,000

LIFE Contribution: € 1,062,000



Mediterranean wetlands

Due to the great climatic variability in the region, the range of types of wetlands in the Mediterranean is considerable, from large river deltas and lagoons on the north shore, to salty and temporary marshes in the South, which appear only every few years, as well as freshwater inland lakes. Additionally, the region's wetlands enjoy a strong cultural and commercial relationship with local inhabitants that dates back thousands of years. Unfortunately, over the last 100 years, the Mediterranean has lost about half of its wetlands, as a result of demographic and developmental pressures. Because of such threats, some of the most serious conservation and restoration efforts funded by LIFE have been made to counteract the problem.



Spain: Reversing decades of environmental damage

Lake Banyoles may well be a hot-spot for watersports and tourism, but its surrounding areas offer unique Mediterranean wetlands with priority-status habitats. Re-establishing lost wetlands is now helping to undo some of the damage done in recent decades.

Lake Banyoles is the second largest lake in the Iberian Peninsula. Its privileged location has given rise to a unique Mediterranean wetland. Surrounding the lake is a diverse environment of temporary and permanent lagoons and springs that are host to a range of valuable EU-listed habitats, some of which have priority status.

The lacustrine basin of Banyoles is the result of a karstic-tectonic phenomenon. It consists of a singular Mediterranean humid zone, located between the coastal plain and the mountains of the hinterland. Although the Lake Banyoles is the most important example of this geological process, the area around the lake itself is dotted with eight lagoons and abundant springs and sources. Some of these lagoons only appear intermittently in times of heavy rain, or when the subsoil contains a large amount of water, thus flooding surrounding areas. The finest example of an intermittent lagoon is the Espolla lagoon, situated 24 metres above Lake Banyoles and which only fills with water when the subterranean water pressure is high enough to overcome the difference in altitude.



Lake Banyoles is a traditional recreational area for boating and was the site of the rowing events during the 1992 Barcelona Olympics

The lake is also a traditional recreation area for boating, particularly rowing – it was the site of the rowing events of the 1992 Barcelona Olympics – as well as for picnics, fishing and hunting. Naturally, this sort of water-based tourism provides income opportunities for the local population. Unfortunately, however, it can also have some negative repercussions. The eastern shore of the lake has undergone considerable urban development with subsequent negative effects on the environment. In contrast, the western shore has retained its lakeside woods and floodplains, even though much of the land has been given over to agricultural use.

The diverse environment surrounding the lake is host to a range of EU-listed habitats

What did LIFE do?

The general objective of the project was the recuperation of and an increase in the area of the wetlands and lakeside woods that surround the lacustrine basin: the alluvial forests alder (*Alnus glutinosa*) and white willow (*Salix alba*), the narrow-leaved ash woods (*Fraxinus angustifolia*), and the white poplar galleries (*Populus alba*). To this end, the project developed new lagoons, redeveloped artificially created streams and the recuperated floodplains. Priority was given to the intermittent Mediterranean lagoons, which had all but disappeared from the zone until the project started.

The project facilitated the purchase by local town councils and the private



Photo: LIFE03 NAT/E/000067

Photo: LIFE03 NAT/E/000067

foundation, *Territori i Paisatge*, of a total of 37 ha of land, some 27 ha more than had originally been envisaged. Additional land is also to be acquired in the future, through land cessions agreed with several private owners.

After preliminary topographic and hydrogeological studies, the construction of four lagoons took place from December 2005 to December 2006 in the areas of Can Morgat and Amaradors-Lió. The fourth lagoon was created 'naturally', once a canal had been opened. Many types of birds are now using these water bodies, with a number breeding in the area. Also, amphibians, odonates and fish have been observed during scientific monitoring. Moreover, the improvements in the environment indirectly favoured the population of nesting aquatic birds, both migratory and wintering, as well as emblematic species such as the otter (*Lutra lutra*). Other restoration activities included the naturalisation of brooks, the restoration of ditches, clearance of the area, pruning and plantations.

The eradication of exotic species in particular cherry (*Prunus sp.*), giant reed (*Arundo donax*) and plantation of autochthonous vegetation, carried out in different areas of the lake basin, helped to enlarge and protect habitats under the directive: mainly temporary Mediterranean ponds (3170), calcareous fens with *Cladium mariscus* (7210) and residual alluvial forests of *Alnus glutinosa* and *Fraxinus excelsior* (91E0). Glyphosates were applied in a controlled fashion to an area from which alien species had already been removed. The cutting of alien species was undertaken by specialised personnel to avoid sprouting. Three brigades, comprising a monitor and two workers, now uproot these unwanted species every year from September to December. These workers come from an occupational centre for people with disabilities. All such activities are continually supervised by an expert botanist. This work has been successful in eliminating the problem species, but the brigades will

continue their pruning and clearance work in the future nonetheless.

The project also engaged in a range of public-use-oriented actions, including the conditioning of paths, signposting, refurbishment of recreational areas, and the construction of gangways and viewpoints.

Life after LIFE

The most important outcomes for the future conservation of this site are a) the approval of a revised 'Regulation of lake activities' legal protection instrument for the town councils, which prescribes what activities are sustainable with nature conservation and public-use regulation of the Banyoles Lake; b) the approval of a Special Conservation Plan for the whole lake basin - a regional legal protection instrument that covers the complete site of community importance (SCI); c) the creation of a consortium for a comprehensive management of natural and cultural assets of the lake, including all the relevant administrations with powers relating to the lake; and d) the creation of a new natural park that will include the SCI.

The constitution of the Consortium for the Management of the lake provides effective management of the area from now on. In fact, the LIFE project has had a pump-priming effect in relation to the conservation activities of the two town councils with competencies pertaining to the lake.

Indeed, this project is a good example of collaboration among different administrations (local, provincial and regional) and private entities (Foundation *Territori i Paisatge*) working together for the conservation of a natural site. The creation of inter-municipal management entity and the wide consensus achieved for the actions undertaken is the type of approach needed for the management of Natura 2000 sites, where different competencies are interwoven. Moreover, the



Photo: LIFE03 NAT/E/000067

Restoration activities included the naturalisation of brooks and the restoration of ditches

collaboration with private entities for natural heritage protection has also an important demonstrative effect in Spain, where this type of cooperation is not very common.

There is a dynamic and a momentum that has been achieved for the protection of the area, bringing on board businesses, local administration and other regional stakeholders.

Lake Banyoles - a unique Mediterranean wetland



Project Number:
LIFE03 NAT/E/000067

Title: Recuperation of the aquatic environment of Porqueres and the lake of Banyoles

Beneficiary:
Ayuntamiento de Banyoles

Contact: Jordi Bosch Batlle

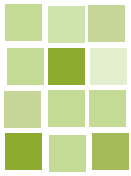
Email:
mcampos@consorcidelestany.org

Website:
www.lestany.net

Period:
Nov-2003 to Apr-2007

Total Budget: € 865,000

LIFE Contribution: € 432,000



Greece: Buffalo and cattle help to restore wetlands

This LIFE-Nature project used water buffalo and cattle grazing to restore the wetlands of a transboundary park that straddles Greece, Albania and the Former Yugoslav Republic of Macedonia, and in so doing, has helped to protect Dalmatian pelicans and one of the biggest colonies of pygmy cormorants.

In a little corner of the Balkans – or, rather, three corners – the triple border of Greece, Albania and the Former Yugoslav Republic of Macedonia – lies the Transboundary Prespa Park, the first transboundary area in the region to be protected. The lakes in the park, Mikri Prespa and Megali Prespa are some of the very oldest bodies of water in Europe. Lake Mikri Prespa in particular is a site of importance within the park, being home to the largest breeding colony of Dalmatian pelicans (*Pelecanus crispus*) worldwide, around 600 pairs, and to one of the biggest colonies of Pygmy cormorants (*Phalacrocorax pygmaeus*) – one of the rarest waterbird species on Earth – on the continent, around 700 pairs. A total of 261 species of birds have been observed there (including 164 nesting birds), 81 of them listed in Annex I of the Birds Directive.

As a result, the lake has been classified as a wetland of international importance under the Ramsar Convention and has been designated as a Special Protection Area under the Birds Directive included in the Natura 2000 network.

However, poor management of the lake's waters, which is connected to Lake Megali Prespa, and the lack of vegetation management (reedbeds) have significantly degraded the birds' nesting and feeding grounds, as the surface of wet meadows has been reduced. Wet meadows are shallow areas with low-lying vegetation that are annually inundated in the spring



Photo: LIFE02 NAT/GR/008494

Buffalo grazing is the most effective method for the re-creation of wet meadows

and summer, according to the fluctuation of the water level. These wet meadows, which are home to a host of aquatic organisms, serve as the key breeding and spawning grounds for numerous fish and amphibians, and are the feeding grounds for multiple species of rare waterbird.

When the Society for the Protection of Prespa was established in 1991, the degradation of the meadows had advanced precipitously. By 2000, it had deteriorated still further, with under 30 hectares of the original area covered by wet meadows remaining, as inhabitants abandoned their traditional activities in the area. A range of water birds stopped nesting there and other species, such as the pelicans and cormorants, faced direct or indirect threats. Meanwhile, fish populations – particularly carp (*Cyprinus carpio*) – continued to decline.

What did LIFE do?

The SPP's primary objective was the restoration of these wet meadows. A decade's worth of comprehensive research and pilot actions were performed. Various attempts had already been made to manage and protect the region, including an ACNAT¹ project for the Dalmatian pelican, a LIFE-Nature project (LIFE96 NAT/GR/003217) for the pygmy cormorant and the lesser white-fronted goose (*Anser erythropus*). Then, in 2002, with funding from LIFE, the beneficiary launched a project lasting until 2007 that would oversee the restoration of much of the vital wet meadows, as well as the implementation of an integrated management strategy for Lake Mikri Prespa.

¹ The funding mechanism predecessor to LIFE.



Photo: LIFE02 NAT/GR/008494

Dalmatian pelican and pygmy cormorant were the main target, but activities also benefited 18 other species

Specifically, the project aimed to improve the conservation status of the Dalmatian pelican and the pygmy cormorant, but the activities also directly benefited at least 18 other species covered by the Birds Directive. The main actions of the project included the reconstruction of a sluice that channels water from lake Mikri Prespa into lake Megali Prespa, in order to improve water-level management in the former; the restoration of the wet meadows in Mikri Prespa, covering some 70 ha; and the monitoring of the avifauna and the vegetation of the managed littoral sites.

Sluice reconstruction

Prior to the LIFE project, water management between Lake Mikri Prespa and the larger Lake Megali Prespa was performed through a simple iron sluice at Koula, the point where the two lakes meet. The sluice simply regulated the water flow from Mikri into Megali in order to service local agricultural requirements. However, this mechanism didn't take into account the demands of ecological protection. The new, modern sluice was built using LIFE funds following a series of local stakeholder consultations and hydrological, environmental and technical studies over the course of six months in the second half of

2004 and direct collaboration with the LIFE-Nature Project Scientific Committee and began operation the following spring.

As a result of the project's actions, from 2005 onward, the park has seen lake water levels consistently high enough to create new wet meadow areas, which in turn have seen the return of many rare water bird species who have now settled there - most successfully in the case of the glossy ibis (*Plegadis falcinellus*), which has been observed nesting again in Mikri Prespa. The species (listed in Annex I of the Birds Directive) had not bred in the area since the 1970s, and their initial discontinuation of breeding was attributed to the shrinkage of the wet meadows.

Wet meadow restoration

Prior to the project, at ten littoral sites, dense reed beds predominated, due to the surface of water meadows having been reduced. But, starting in 2002, project participants and local inhabitants cut down the reeds in shallow areas near the lake. This activity was performed every summer, establishing areas free of thick reed beds that were then ready for autumn grazing by buffalo and cattle.

Grazing by a water buffalo herd and two cattle herds was applied systematically over the course of the five years of the project at 11 different littoral sites. According to the project's monitoring data, buffalo grazing turns out to be the most effective method for the re-creation of wet meadows. At the launch of the project, the area covered by wet meadows had diminished to 30 ha. Since then, the total wet meadow area has grown more than threefold - to some 100 ha by project's end.

Meanwhile, with the help of agricultural machinery, the reeds and other vegetation cut during the annual summer pruning are turned into

grass balls, which are an ideal food supplement for the buffalo during the winter months. These balls are shared between the beneficiary and local stock-breeders. Beyond this, the cut reeds are used by locals to thatch their barns.

Improved breeding and feeding

The restoration activities of the project have resulted in an improvement in the breeding and feeding conditions of the Dalmatian pelican and the pygmy cormorant to the extent that their populations have now stabilised at a high level over the last five years. The largest breeding colony of Dalmatian pelicans in the world is being established in Mikri Prespa and, as of 2004, the number of Dalmatian pelican breeding pairs were estimated at 1,100. In addition, at the lake, Pygmy cormorants form the largest colony in the European Union, ranging between 540 and 710 breeding pairs.

Furthermore, populations of more than 20 other water bird species have also benefited. Beyond this, populations of fish and other aquatic organisms have directly benefited from the expansion of the total surface area of the wet meadows, particularly the carp, which offers a knock-on benefit for local fishermen.

Project Number:
LIFE02 NAT/GR/008494

Title: Conservation of priority bird species in Lake Mikri Prespa, Greece

Beneficiary:
Society for the protection of Prespa (SPP)

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Website:
<http://www.spp.gr/>

Period:
Jul-2002 to Jun-2006

Total Budget: € 1,863,000

LIFE Contribution: € 1,118,000



Spain: Conservation of wetlands of European importance in Andalusia

Mediterranean wetlands are unique and valuable habitats but also fragile due to the typical arid climatic conditions. This project demonstrates conservation actions in three such wetlands of European importance in the region of Andalusia in southern Spain. The know-how gained from the project could be applied elsewhere in the region and also in other European wetlands with similar characteristics.



Ricón lagoon, one of three small lagoons in southern Córdoba

The project specifically focuses on three emblematic wetlands – designated as Special Protection Areas (SPAs) – which are representative of the whole Andalusian wetlands and included in the RAMSAR list of wetlands of international importance. Two of the three targeted wetlands are closed basins, a common feature in this region. These give rise to the formation of lagoons of

different size which host habitats and species of high biological interest.

The first site is the *Fuente de Piedra* lagoon in the province of Málaga, known especially for its breeding colonies of greater flamingo (*Phoenicopterus ruber*). The second site is three closed basins with small lagoons (Rincón, Santiago, Amarga) in the south of the Córdoba province. The third wetland is the Odiel Marshes in the estuary of the Odiel and Tinto rivers in the Huelva province.

What did LIFE do?

Regional authorities in Spain are responsible for nature conservation, including the management of protected areas. The project beneficiary, the regional authority in the region of Andalusia (*Consejería de Medio Ambiente Junta de Andalucía*), aimed to improve the conservation status of 12 habitat types

of Community importance, including two priority habitats (coastal lagoons and Mediterranean salt steppes) on the three Natura 2000 sites.

Over a 39-month period a variety of actions were implemented to restore the ecological and hydrological integrity of the wetlands. These included the acquisition of land to recover flooded areas, restoration of lagoons which had been drained or were still used for agriculture, restoration of degraded nesting areas and replanting of lagoon shores.

The restoration works would also improve the feeding and nesting habitats of 44 EU-listed bird species, of which three are priority: the marbled teal (*Marmaronetta angustirostris*), the crested coot (*Fulica cristata*) and the white-headed duck (*Oxyura leucocephala*). A series of actions was also carried out in order to inform the local population and visitors of the importance of these habitats and species and to improve public use of these wetlands.

Project panel for one of the actions on the SCI and SPA Fuente de Piedra lagoon



What was the outcome?

Most of the actions were completed before project end (December 2006) and as a result, almost all of the project objectives were met. Only a few actions in the Odiel marshes encountered difficulties: namely, the adaptation of ponds for biomass production, which was not carried out because of safety concerns.

The variety of threats identified – silting up of basins due to agriculture, water pollution, disturbance of water level management regimes and reduction in flooded areas – and their particular ecological features make them suitable for demonstration of conservation initiatives that could be applied to similar wetlands in the future. Moreover, the project's outstanding technical manual is proving a useful management tool for other wetlands.

In the **Fuente de Piedra lagoon** the acquisition of 59 ha of land allowed the management of the water flow into the lagoon in order to improve its quality. This in turn increased the surface of wetlands. Two freshwater lagoons (*Laguneto del Pueblo* and *Cantarranas*) and deteriorated nesting areas were also recovered. In addition in order to improve knowledge of and visitor access to the area, two paths and several bird observatories were built.

Project handbook on Mediterranean wetland management



Flamingo colony in Fuente de la Piedra lagoon

In the **Odiel marshes** several actions were undertaken to recover the area devoted in the past to the production of salt. These actions involved the restoration of the marsh dynamic, the creation of a new freshwater lagoon and the installation of an observatory and a path.

In the **Lagoons of Southern Cordoba** the land acquisition allowed the reduction of the silting risk in the Amarga lagoon thanks to erosion prevention works carried out on the surrounding slopes and the reforestation of the area. In addition the Santiago lagoon, which had been drained in the past, was restored. An observatory was also installed between the Santiago and Rincón lagoons for birdwatching.

Two very useful documents were also produced: a "Manual for the Mediterranean Wetlands Restoration" and a "Hydro-geological study of the Lagoons of Southern Cordoba". The former provides information about the experiences accumulated from several LIFE projects focusing on the restoration of European Mediterranean wetlands. It also presents a series of guidelines to be taken into account when undertaking ecological restoration projects in Mediterranean wetlands. The hydro-geological study sets out the considerable achievements and knowledge gained over the

project duration of the hydro-geologic dynamic of the three targeted lagoons. The study also establishes the protection perimeters to be respected and offers different proposals for action, monitoring and control that should help improve decision-making related to the lagoon management.

Finally, the main focus of the project's awareness campaign was a portable exhibition, composed of six information panels accompanied by a leaflet, which was displayed in different municipalities of the three project areas. Other dissemination material included educational books, stickers and a poster.

Project Number:

LIFE03 NAT/E/000055

Title: Conservation and restoration of wetlands in Andalusia

Beneficiary:

Consejería de Medio Ambiente Junta de Andalucía, Spain

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www.juntadeandalucia.es/medioambiente/planesmed/life/programalife/lifehumedales/Introduccion.html

Period:

Sep-2003 to Dec-2006

Total Budget: € 2,913,000

LIFE Contribution: € 1,457,000



Mediterranean region: A permanent solution for temporary ponds

Temporary ponds represent an important but extremely vulnerable ecosystem in the Mediterranean area. Protecting the rich diversity of flora and fauna that have adapted to the unique conditions of these ponds requires specific conservation measures, such as those explored in this important LIFE project.



Photo: P. Maures & J. Roché

Around the Mediterranean, temporary pools and marshes are host to an incredibly rich range of flora and fauna, in particular invertebrates and amphibians. They are called 'temporary' because they experience annual dry periods and are subject to substantial inter-annual hydrological fluctuations. The many species that make these ecosystems their home are adapted to such changes. Indeed, the drying-up plays a key role in the way these ecosystems function.

However, the ponds are extremely vulnerable, and as such, are priority habitats under the Habitats Directive, as well as being home to many species listed in its Annexes II and IV, such as strigose pepperwort (*Marsilea strigosa*), great crested newt (*Triturus cristatus*) and marbled newt (*Triturus marmoratus*). Nonetheless, the ponds' small size, dispersion and only temporary submersion in water make them environments whose biological significance is often unnoticed by humans. As a result, the ponds are frequently damaged or destroyed when the landscape is modified, usually as a result of a lack of consideration in land-use decisions, such as those relating to agricultural or hydrological development.

With this in mind, from 1999 to 2004, the *Tour du Valat* Biological Station,

Temporary ponds are so called because they experience annual dry periods and substantial hydrological fluctuations.

a private research organisation and the LIFE-Nature beneficiary for this project, carried out an integrated research and conservation programme on temporary pools, targeting rare species (especially plants) and the impact of socio-economic factors. A second major component dealt with the management and conservation of selected sites.

What did LIFE do?

The aim of the project was to help conserve Mediterranean temporary ponds by combining two approaches. The first consisted of taking action to support seven sites located in three regions of France: Roquehaute, Valliguières and Agenouillade in Languedoc-Roussillon, Padulu in Corsica, and *Plaine des Maures, Besse et Flassans* and *la Colle du Rouet* in the Provence-Alpes-Cote d'Azur region. These sites presented a wide range of problems and management plans had to be established for sites that did not yet have one. Acquisition (180 ha) and control of land-use at the sites had to be achieved before it was possible to carry out the restoration and management operations necessary for their conservation.

The second approach was to develop a methodology for the management of this type of habitat that could then be transferred to the whole of the Mediterranean region. This involved drawing up recommendations and developing management tools. This approach was to be based both on the experience acquired on the project sites and on experience from the whole Mediterranean basin. Various awareness-raising measures were also planned to accompany the project, and in particular a teaching module for use in schools.

More specifically, through scientific research as well as more applied actions, the project aimed at:

- improving knowledge on key issues for the conservation of temporary pools, on population genetics and dynamics (plants, amphibians), and on inter-annual vegetation dynamics
- promoting experimental management of various sites, together with scientific monitoring: shrub removal, control through grazing or cutting, pool restoration...
- reinforcing the protection of the temporary pools.

What was the outcome?

Inventories of fauna, flora and human activities were completed for most sites, as well as some more in-depth studies of species or locally-important topics: users' perception of the ponds, a detailed inventory of the micro-pools, and monitoring of threatened species. The results of these studies served as the basis for the measures proposed in the management plans drawn up for three of the sites. Ultimately, an initial inventory of the temporary pools in Mediterranean France was carried out, which identified over 100 sites supporting almost 1,000 pools.

Control over land use by organisations for the protection of natural habitats is a prerequisite for the management of temporary pools. In total, some 83 ha were acquired within the framework of the project. In addition, management agreements were reached with the owners (private or communal) at five sites, significantly increasing the area where land-use could be controlled in the medium-term.

The project determined the framework for discussion prior to the management work being undertaken. This allowed permanent communication to take place between the site managers and the scientists involved in the project. Exchange visits between sites, theme-based workshops, and co-ordination of the network were all achieved employing such communication. Permanent co-ordination between all the various activities and partners was organised throughout the project. A steering committee was set up and meetings organised, with regular contact maintained with the European Commission and all the project partners.

Various awareness raising measures accompanied the project, including the development of a teaching model for schools



Photo: N.D. Agenouill



Mediterranean wetlands

Experimental management work took place on most of the sites. This included scrub clearing, digging-out pools, removal of invasive exotic species, and the restoration of filled-in pools. Most of this work was accompanied by careful monitoring of the impacts, in order to draw lessons that could be of relevance elsewhere.

Finally, a management handbook was published and a final international conference was also organised, bringing together almost 100 participants from all over Europe and the Mediterranean region. The project produced a comprehensive management guide in two volumes (which can be downloaded [in French only] from http://en.tourduvalat.org/nos_programmes/projets_terminees/mares_temporaires [Volume I] and http://en.tourduvalat.org/content/download/309/2501/version/2/file/Guide_gestion_vol2.pdf [Volume II]).

Handbooks on temporary-pond management



Raising awareness

In an effort to address the lack of public awareness concerning the importance of the biodiversity of the ponds, the various site teams regularly interacted with and provided information to local inhabitants, elected representatives and users of the sites. Numerous awareness-raising, communications and environmental education initiatives were undertaken: Natura 2000 "Green Days", events for schools, leaflets, information panels, web pages, posters, educational modules, press articles, TV programmes, and video recordings. A number of events were also organised to encourage local inhabitants to protect the temporary ponds.

The temporary ponds, which had previously received little attention in these three regions, either from local residents, elected representatives or other interests, are now viewed as a major challenge for which a range of planning initiatives have been undertaken: woodland management, control of fires, revision of the planning and zoning procedures. Thanks to the project, knowledge of the habitats and management of temporary ponds has improved, not only on the seven sites of the project but also in the French Mediterranean area in general, and even at an international

level - a specific Ramsar Convention resolution has been developed by the project (http://www.ramsar.org/res/key_res_viii_33_e.htm).

Almost all the partners have initiated medium-term projects and activities at six of the seven LIFE sites, in addition to regional initiatives that extend widely beyond the sites, notably in Corsica. Spain has subsequently designated several Ramsar temporary pool sites, and Corsica has proposed one as well. Lastly, a strong network of professionals working at the seven sites has also been established.

Thanks to the project, knowledge of the habitats and management of temporary ponds has been significantly increased, not only on the seven sites of the project but also across the French Mediterranean area in general, and even at an international level.

Temporary pond, Plaine des Maures, Var France



Project Number:
LIFE99 NAT/F/006304

Title: Conservation of Mediterranean temporary ponds

Beneficiary:
Fondation Sansouire, Station Biologique de la Tour du Valat

Contact: Jean Jalbert

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Website:
www.tourduvalat.org

Period:
Sep-1999 to Sep-2004

Total Budget: € 532,000

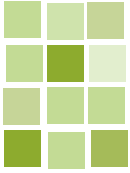
LIFE Contribution: € 504,000



Bogs

Bogs, very common across the northern hemisphere, are notable for their substantial peat accumulation, high water tables and acid-loving vegetation.

These habitats are enormous carbon sinks and thus, while in good health, are one of our greatest allies in the struggle against global warming. However, due to over two centuries of damage largely due to burning, overgrazing, peat extraction and industrial pollution, bogs across Europe and beyond have been so degraded that they can begin to release carbon instead. Thus contributing to their conservation and restoration is one of LIFE's most urgent and vital tasks.



Scotland: Partnership aids large-scale restoration of active raised bogs

The combined efforts of the Scottish Raised Bog Partnership has helped to restore to favourable conservation status over 1,000 hectares across 11 sites of the United Kingdom's remaining raised bogs. The project encouraged closer working relationships between NGOs and government agencies and demonstrated good practice in its management works.

Since the start of the nineteenth century the extent of primary, active, lowland raised bog in the UK has fallen dramatically from 95,000 ha to 8,100 ha – a decline of 85%, mainly due to commercial peat extraction and land drainage. Two thirds of the remaining area is found in Scotland, and, despite the scale of destruction, Scotland still holds a significant proportion of raised bogs in good condition.

The three-year LIFE project focused on 45% of the remaining UK resource, all in Scotland, within 11 sites (10 candidate Special Areas of Conservation). All of the sites – whether large or small, private or public – had been subject to human intervention at some stage through peat cutting, drainage works, tree planting, scrub encroachment and grazing pressure.

What did LIFE do?

The project was undertaken by the Scottish Raised Bog Partnership, a partnership involving the Forestry Commission for Scotland, Scottish Natural Heritage and the Scottish Wildlife Trust (the project beneficiary). Its overall objective was to bring 1,256 ha of active raised bog back up to a favourable condition by reducing existing or potential threats through the clearance of encroaching scrub, removal of non native forest plantations, blocking of ditches and controlling of grazing. The project also increased the area of raised bog by a further 315 ha through the clearance of trees, scrub and heather.

Photo: Peter Wakely - Natural England



Acid pool within a lowland raised bog

Most site-based operations were overseen by the respective site managers from the partner organisations. Local Operational Planning Teams (LOPTs) – a common approach in many UK projects – were set up to provide additional support, input and management infrastructure to the local operations.

The human dimension was also addressed with a variety of measures to increase local interest and access to the sites in order to raise awareness of the conservation value of raised bogs. A number of local open days were held, fact sheets and a newsletter produced and a conference organised to disseminate the results and best practice experiences of the project to other site managers.

What was the outcome?

On closure (at the end of 2003) the restoration work had been completed successfully at all of the eleven sites: Bankhead Moss, Braehead Moss, Carsegowan Moss, Coalburn Moss, Cranley Moss, Dykeneuk Moss, Flanders Moss, Moine Mhor, Longbridge Muir, Kirkconnell Flow and Threepwood Moss. The workload was substantial and included the removal of 430 ha of trees, clearance of 253 ha of encroaching scrub, installation of 2,153 dams into ditches, erection of 12,101 m of fencing and the removal of 3.6 ha of rank heather.

The key outputs of the project were in the delivery of conservation actions on site, particularly the large-scale tree removal works on the Solway Mosses. This project consolidated the achievements of earlier work and ensured that the conservation value of the sites became better recognised at both national and local levels.

In many mire restoration projects the most that can be expected from intervention is a reversal of a negative trend. Removing the apparent problem (trees or heather) alone, does not necessarily address the main cause, which is usually disturbance to hydrological functioning. However, where the dams were installed there was an immediate effect of raising water levels, which was well demonstrated at the Flanders Moss and Moine Mhor sites. Peat moss (*Sphagnum cuspidatum*) was the first coloniser of the open water.

The large-scale restoration work carried out at the at Longbridge Muir and Kirkconnell Flow sites built on previous LIFE projects (e.g. LIFE92 NAT/UK/013400 and LIFE98 NAT/UK/005432) and helped to maintain momentum and build confidence in the restoration techniques. The changes were immediate: the removal of tree cover reduced interception/evaporation losses by around 30%. The removal of tree cover also increases light, which was of benefit to *sphagnum* species.

The dissemination work carried out at and around the sites also proved valuable. Perceptions of peatlands are usually negative. This is because raised bogs have been traditionally viewed as unproductive, with little economic value

The dissemination work carried out at and around the sites also proved valuable. Perceptions of peatlands are usually negative. This is because raised bogs have been traditionally viewed as unproductive, with little economic value

Early marsh-orchid
(*Dactylorhiza incarnata*)



Cleared of trees, peat moss is already reclaiming the area (*Sphagnum* spp.)

since their use for domestic peat has all but disappeared. However, according to the beneficiary, the project's newsletters and open days helped to counter this negative perception and raise awareness, especially among the local communities, of the ecological importance of raised bogs and of the need to conserve them.

Finally, a key aspect of this project is that each of the eleven sites continues to be monitored by Scottish Natural Heritage, as part of their site condition monitoring programme. The ongoing monitoring shows whether the sites are in, or moving towards, favourable conservation status.



Photo: Peter Wakeley - Natural England

Project Number:
LIFE00 NAT/UK/007078

Title: Restoration of Scottish raised bogs

Beneficiary:
Scottish Wildlife Trust, UK

Contact:
Stuart Brooks

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Period:
Jan-2001 to Dec-2003

Total Budget: € 2,139,000

LIFE Contribution: € 1,459,000



The Netherlands: Using hydraulics to conserve the entire peat body of the Fochterloërveen

This comprehensive restoration project employed Dutch hydraulic engineering in order to better manage the Fochterloërveen, one of the largest raised bog areas in the Netherlands. Its innovative approach, addressing the conservation of the entire peat body, rather than focusing on the blocking of drainage ditches, has yielded very positive results.

At the end of the last Ice Age, about 10,000 years ago, an extensive area of peat bogs was created along what is now the border of the two northern Dutch provinces of Drenthe and Friesland. For centuries, peat was used for heating on a small scale. But large-scale land clearance for agriculture between 1600 and 1900 fundamentally changed the character of the region. All that was left of this once huge peat resource was the Fochterloërveen (3,000 ha) and a few smaller cores. But also here the peat degraded after the peat bog was drained for tree planting and farming. The result was a monotonous expanse of *Molinia* grasses. Only in the highest core area was the peat still intact, complete with the vegetation associated with raised bogs. Sufficient peat moss (*Sphagnum*) still

grew here to sustain peat formation: it therefore provided a core area from which the entire Fochterloërveen raised bog could be restored.

Apart from agricultural activities, this is an isolated region, which actually made the restoration work easier. In 1965, the drainage ditches were sealed off and extraneous water was kept out. The task of restoration itself began in the 1980s, with the building of low dykes, creating isolated compartments on the bog surface. The aim was to manage the water levels in each compartment in such a way that peat moss could grow there again. The compartments proved to be too big, however, and the differences in their height above sea level meant that some were too dry and others too wet.

What did LIFE do?

Raised bogs are fed by rainwater, of which there is a sufficient volume locally. Based on a *Hydrologische Inrichtingsplan voor Hoogveenregeneratie* (Hydrological Raised Bog Restoration Plan), the LIFE project – which was run by a Dutch nature conservation NGO, Natuurmonumenten – aimed to prevent rain water from flowing off the raised bog too quickly and to stimulate natural peat formation. This was achieved by:

- Construction of new compartments subdividing the bog by means of peat-covered dykes and dams - altogether 24.5 km of dykes and 39 dams were built.
- Inundation of these compartments to stimulate *Sphagnum* growth, to initiate peat production and to kill

LIFE helped to bring back an area of the Fochterloërveen peat body



the invasive purple moor grass (*Molinia*).

- Control of the water levels afterwards, as part of the monitoring of the bog restoration.

At the same time, a buffer zone of more than 400 ha was created around the bog with national funds.

The task of cutting peat with which to cover the sheet piling for the compartments needed to be done with care, so as not to cut such deep holes that peat formation becomes impossible. The restoration work also had to take account of possible flooding as a result of heavy rain, water seepage where the (excessively) thin peat lies on a sandy ridge, the swelling of peat when it gets wet, and access for visitors.

Works were also carried out to adapt the local traffic infrastructure to the new situation created by the re-humidification works. These included the replacement of an asphalted road (*Fochteloërveenweg*) by a narrower road with a surface of bricks on a pebble substrate and the replacement of asphalted cycle track (*Bonghaar*) with a gravel track on top of one of the dykes acting as border of a compartment. An observation platform and a short boardwalk leading to it were built beside this cycle track.

Wildlife screens and passages to guide reptiles (snakes) and amphibians to pass below the *Fochteloërveenweg* and the *Bonghaar* cycle track, were also constructed. The project's set of passages for snakes, built in 2001, were the first of their kind in the Netherlands.

What was the outcome?

At the end of the LIFE-project, all necessary dykes had been built with the system of dams in place to enable the water level to be control-

led inside the compartments. Thus the hydrology of the entire raised bog can be managed and peat formation can be initiated. This is quite unusual as peat restoration projects generally focus on drainage-ditch blocking, rather than addressing the entire peat body.

A method was developed during the project to measure the rate at which peat absorbs water after re-humidification and swells. This yielded the following positive results:

- The new dyke compartments allow a better control of the water levels: seepage no longer occurs to an extent that the bog surface desiccates; maximum annual water level fluctuation is 20-30 cm.
- The water quality is good (pH 4 and low in carbonates and nutrients): so the water chemistry is suitable to restart *Sphagnum* growth
- Natural methane production promotes floating of the free peat layer, so that *Sphagna* have a substrate to grow from.
- Purple-moor grass (*Molinia caerulea*) decreased and water peat-moss (*Sphagnum cuspidatum*) increased.
- The characteristic raised-bog hummock-forming peat mosses increased (*S. magellanicum*, *S. rubellum* and *S. fuscum*).
- The population of *Coenonympha tullia*, a threatened butterfly of which the site hosts the largest of the remaining Dutch populations, and the population of dragonflies are apparently increasing in size.
- The wildlife passages built during LIFE have proved very successful: in 2002 only one snake was killed by traffic, compared to up to 100 a year earlier.

Life after LIFE

With the work successfully completed on the rewetting of the raised bog, it was clear that further work would be required after project



Water levels are now maintained allowing peat moss to grow once again

closure in order to maintain the momentum of the project – to monitor developments (hydrological and biological), manage water levels, and, where necessary, to repair or upgrade the dams and dykes. A permanent site manager has been employed by the beneficiary to carry out the necessary management tasks, and national funds have been allocated for the after-LIFE monitoring.

Project Number:

LIFE99 NAT/NL/006280

Title:

Restoration programme of the Fochteloërveen raised bog

Beneficiary:

Natuurmonumenten, the Netherlands

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Beneficiary website:

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Period:

Feb-1999 to Jun-2003

Total Budget: € 4,274,000

LIFE Contribution: € 1,496,000



Germany: Reversing the impact of drainage and peat digging and conserving corncrake habitat

This very successful project built upon the experience of an earlier LIFE project and completed the measures started previously. It is now widely regarded as one of southern Germany's most comprehensive peat bog restoration initiatives.



Photo: Ruppert Scholz

Kendlmühlfilzen Natura 2000 site, southern Chiemgau after rehumidification

Post-glacial terrestrialisation of the southern part of the Chiemsee lake in Bavaria, Germany, left behind a landscape – southern Chiemgau – that even today is still rich in natural heritage, boasting considerable expanses of raised bog, bog woodland and fen. The fens are dominated by reedbeds and ‘*Streuwiesen*’ (very humid litter meadows characterised by sedges and *Molinia* grass). These are prime corncrake (*Crex crex*) habitats with between 10 and 20 calling males annually recorded in the project area.

The three raised bogs tackled by this project were all damaged by past drainage and decades of industrial peat digging (which was only banned in 1990). When the project started, they were covered in heather, *Molinia* grasses and birches, all of which are indicators of a degraded bog hydrology.



Corncrake
(*Crex crex*)

Photo: Landesbund für Vogelschutz Bayern

What did LIFE do?

This project (and its predecessor) was run by the Bavarian ministry for rural development and environment, now the Bavarian ministry for environment, health and consumer protection (*Bayerisches Staatsministerium für Umweltschutz, Gesundheit und Verbraucherschutz*).

In order to regenerate the raised bogs, on land acquired - in part - by the previous project, local hydrology was improved by closing drainage ditches, flooding old peat diggings and clearing birch thickets.

Habitats for meadow-breeding birds (including the corncrake) were increased by extending agricultural land use and converting arable land to pasture. About 100 ha of abandoned, overgrown *Streuwiesen*, shunned by the corncrakes, were cleared by initial mowing by local farmers. Three observation platforms, and a boardwalk crossing a raised bog were built to allow local people and the many visitors to the region to view bird life at Lake Chiemsee and the restored habitats.

What was the outcome?

In each of the bogs, the project used the same rewetting strategy to restore the hydrological balance. This included the purchase of private land affected by the works, blocking of ditches and removal of the worst overgrowth.

- In the **Kendlmühlfilzen raised bog**, 32 ha were bought. Fourteen dams with widths of 20 – 50 m were built across the large drainage ditches and a few hundred smaller ditches were filled in. The dams were arranged in such a way as to minimise seepage pressure and loss of water. Hydrologically, the results, at project termination were very promising: 200 ha of bog had gained an improved water level. The “Egelsee”, a shallow

Photo: Ralf Strohwasser



Boardwalk constructed through the Kendlmühlfilzen

lake which dried up 90 years ago, reappeared. Monitoring carried out at the end of the project revealed increasing numbers of breeding stonechats (*Saxicola torquata*), whinchats (*Saxicola rubetra*), snipes (*Gallinago gallinago*) and teals (*Anas crecca*). Thanks to this and the earlier LIFE works, an estimated 80% of the total area of the Kendlmühlfilzen bog is once again

evolving towards a more favourable conservation state. Tree regeneration in the humidified areas is seriously reduced and the typical ground vegetation of degraded, hydrologically unstable peat bogs (*Calluna* and *Molinia*) is expected to be replaced within the next years by peat-forming *Sphagnum* mosses, which have already started growing again at several points.



- In the **Bergener Moos-Wildmoos**, 1.25 ha was bought to round off purchases under the previous LIFE project (60 ha). Forty dams were built and 10 ha of tree and bushes cover were cut down.
- In the **Rottauer Filz**, 47 ha was bought, on another 4 ha the local community as owner gave permission for the works. A series of dams were built – in all, water levels were raised over a bog area of 70 ha.

Building on the work of its predecessor, the project cultivated a close and very effective partnership with the district authority (*Landkreis*), the forestry service, the local farmers' and hunters' organisations, local tourist agencies and conservation NGOs. Much of the mire restoration work was done by farmers, organised through the local 'Maschinenring' (labour and equipment pool).



Photo: Ralf Strohwasser

Information panel at the Bergener Moos Natura 2000 site

Life after LIFE

While the project officially closed in 2001, a supervision period followed until 2005. This showed that in general, the construction of the dams was successful. Only three of the larger ones were damaged and required subsequent improvements. The factors which caused the leakage were identified and remedied. Unexpectedly, the rewetting also had other positive effects: it seems that the influence of carbon-rich water stimulated a specific minerotrophic fen vegetation on many sites.

In 2005 the beneficiary was awarded LIFE programme funding for similar mire restoration works at the "Hochrunstfilze" and "Auer Weidmoos mit Kalten und Kaltenaue" Natura 2000 sites (LIFE05 NAT/D/000053).

Finally, a post-project follow-up study of the project was carried out in September 2007 by the LIFE external monitoring team. It showed that the project's long-term effects have continued. The rehumidification area has been extended after the LIFE project,

The Kendlmühlfilzen site prior to restoration of rehumidification measures. Picture below: After rehumidification in 2001 – the rapid re-establishment of peat-forming mosses (Sphagnum)

Photo: Dr. Lohmann

through additional restoration measures on degraded bogs. Now, since suitable hydrological conditions have been created, no further interventions are necessary.

Bird observation tower



Photo: Ralf Strohwasser



Project Number:
LIFE97 NAT/D/004224

Title: Raised bogs and habitats for the corncrake in Southern Chiemgau

Beneficiary:
Bayerisches Staatsministerium für Umwelt, Gesundheit und Verbraucherschutz

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Period:
Sep-1997 to Feb-2001

Total Budget: € 1,464,000

LIFE Contribution: € 732,000



Wetland restoration

Across Europe, in recent years, LIFE has funded a range of wetland restoration projects. Rehabilitation of previously existing wetland functions, from a more impaired to a less impaired or unimpaired state of overall function. Wetlands that have been modified, or even filled in or drained can retain their characteristic soil and hydrology, allowing their natural functions to be reclaimed. However, restoration is an incredibly complicated procedure involving a great deal of planning, long-term monitoring and management after it takes place. This means it can be a very expensive process indeed. Which is where, naturally, LIFE comes in.



Austria: Bog management

Following the end of industrial peat extraction, the Weidmoos region of Austria has become an important wetland habitat for more than a hundred bird species. But landscape management, which was much boosted by a LIFE-Nature project, is needed to prevent the area turning into woodland or a site for redevelopment.

The Weidmoos, located in the bog region north of Salzburg, is a mosaic of standing water, vegetation-free areas and forested patches. Its unique ecology make it an ideal breeding ground for the bluethroat (*Luscinia svecica*) – there are the 45 breeding pairs, one of the largest breeding populations in Austria. Other protected bird species including the marsh and hen harrier (*Circus aeruginosus* and *Circus cyaneus*), spotted crake (*Porzana porzana*), little bittern (*Ixobrychus minutus*), ruff (*Philomachus pugnax*) and wood sandpiper (*Tringa glareola*).

Without continuous management, however, this semi-open 132 ha site would rapidly turn into a wooded landscape, losing its special habitat mix so attractive to a range of bird species. Growing recreational pressure and creeping degeneration due to changed farming practices have further jeopardised the future of the Weidmoos.

What did LIFE do?

In 2001, the site became a designated area of the Natura 2000 network, and two years later, a LIFE-Nature project was set up to maintain and optimise the breeding, resting and wintering areas of the birds and encourage a more positive attitude towards the SPA among the local population. For this purpose, the project beneficiary, the regional authority *Amt der Salzburger Landesregierung*, built up a wide coalition of partners including an association, set up by hunters, landowners and mayors, to promote the Weidmoos as a local heritage site.



Photo: B. Riehl

The Weidmoos north of Salzburg is a semi-open 132 ha site that without continuous management would rapidly turn into a wooded landscape

The project planned to acquire 22 ha of former peat extraction sites and the right of use to a further 16 ha in addition to the 80 ha acquired before the start of the project. Conservation work on the site would focus on the construction of 45 small dams and landscape modelling to hold the water on site and improve the habitats for waterfowl. The project would also introduce the experimental management of wet meadows, reed beds, bare land and bushy areas and would optimise procedures to maintain the habitats over the entire 120 ha SPA. An existing management plan was used as a basis for drawing up detailed plans for the construction measures.

By building dams, some of which incorporate adjustable barriers, new areas of standing water were created leading to the increased irrigation of large areas of the Weidmoos. Landscaping along the banks of the existing and the newly created areas of standing water has also improved the environmental conditions for birds. However, to ensure the continued success of the project, detailed testing of standing water to be carried out twice a year was introduced. The results of this testing will help scientists to better understand the nutritional balance of the bog as well as help monitor the effects of dam construction measures on water quality. In addition, automatic water-

level gauges continuously record any fluctuations in water level.

The re-irrigation of areas, which were drained during peat cutting, was intended to halt the growth of scrub and prevent the Weidmoos becoming overgrown. Before the planned construction work could be put out to tender, however, it was necessary to carry out a survey of the site in order to gain planning permission. Another legacy of peat cutting, standing water areas, are lines of straight banks. The project has attempted to create a more interesting landscape by restructuring these banks.

The project has also made the Weidmoos more accessible to visitors while, at the same time, disturbing the bird life as little as possible. It constructed a discovery trail, information centre and viewing tower in the southern part of the moor. These measures were followed up with an awareness-raising campaign. In June 2005 the visitor facilities were opened to the general public.

Ongoing maintenance

In order to protect the Weidmoos bird habitats in the long term, regular maintenance is needed alongside the dam construction work and landscaping. Such work is espe-

cially needed in the peripheral areas of the Weidmoos which are insufficiently irrigated or not irrigated at all. Detailed plans were drawn up for the maintenance measures described in the existing management plan for the site. Ongoing measures include:

- *Creation of vegetation-free areas* on a regular basis, using the tracked excavators originally used in peat cutting. Areas of sparse or no vegetation are particularly important for the bluethroats, and the aim is to continue preventing these areas from becoming overgrown.
- *Maintenance of the wetland meadows and reed beds.* Regular mowing is necessary to prevent the wetland meadows and reed beds becoming overgrown. Mowing is being carried out with special regard for conditions in the Weidmoos and the needs of the bird species found there.
- *Management of trees and scrubs.* Although the presence of trees and shrubs is crucially important for many of the bird species found in the Weidmoos, individual trees or groups of shrubs that become too large could have a negative influence on the quality of the bird habitat.

The effects of the maintenance measures are being monitored so



Photo: B.Riehl

Creation of vegetation-free areas using the tracked excavators originally used in peat cutting

that undesirable outcomes can be avoided and necessary adjustments made. Throughout the project detailed records were kept of birds observed in the area, in order to monitor whether the measures being taken were having a positive effect on numbers. At the beginning and end of the LIFE project, aerial photographs and orthochromatic pictures were taken for documentary purposes. These provide a detailed record of landscape changes which have occurred in the course of the project.

Inauguration of the viewing tower



Photo: Gemeinde Lamprechtshausen

Project Number:
LIFE03 NAT/A/000010

Title: Habitat management in the SPA Weidmoos

Beneficiary:
Amt der Salzburger Landesregierung

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Period:
01-Apr-2003 to 30-Sep-2007

Total Budget: € 1,210,000

LIFE Contribution: € 605,000



Germany: Bringing back bittern to Galenbeck

This soon-to-be completed lake restoration project in eastern Germany is expected to raise the water level of the mire surrounding the lake Galenbecker See in order to provide optimum habitats for threatened species found in the region.

In recent years, the water level of the lake at Galenbeck in Mecklenburg, West Pomerania, has declined, and the surrounding areas of reeds and wet grasslands have been vastly reduced. During the last 50 years, following one of the biggest farmland reclamation and bog drainage schemes of the German Democratic Republic, the volume of the lake has declined by more than 50%. As a result of the continued sinking of the fen layer in the surroundings of the lake, the entire fen except the immediate vicinity of the lake now lies below the lake's water level, and the lake is therefore under constant threat of leaking. Valuable reeds, sedge marshes and wet meadows

have disappeared in the process, and with them a rich and diverse wildlife. The lake water has also become eutrophic and partly silted up, due to a permanent input of nutrients from agriculture and fish farming.

The lake is still an important staging post for at least 80 migratory bird species, and together with the adjacent fen, it has been registered as a wetland area of international importance (according to the RAMSAR Convention) as well as declared an EU special protection area for birds. However, prior to the start of the project, just two pairs of bittern (*Botaurus stellaris*) were

estimated to breed in the area, and the populations of corncrakes (*Crex crex*) and the lesser spotted eagle (*Aquila pomarina*) had also sensibly declined.

What did LIFE do?

The aim of the LIFE-Nature project was to restore the lake to its original condition, thereby bringing back a rich birdlife to the area. The project was based on several analyses and feasibility studies conducted in the 1990s and at the beginning of the century. Raising the level of the lake would require the construction of a 7.3 km dyke, preventing drainage of the water and marking off the project

Lake Galenbeck in Mecklenburg, West Pomerania – Germany





The water levels can be controlled through the use of channels

The general elevation of the water level in the project area will also result in a change of vegetation in areas that will not be permanently flooded. Apart from wet meadows, the landscape will be dominated by sedge marshes and herbaceous vegetation, which form the natural habitat of the corncrake. The restoration works will also encourage the propagation of the amphibious fauna, providing improved hunting grounds for the lesser spotted eagle (*Aquila pomarina*).

“Terrestrialisation” of the lake has also been sustained by the import of sediments into the lake. Part of the groundwork of the project has focused on reducing this process by filtering out nutrients in a network of reed beds in the main riverbed. A ban on the selective fishing of predatory species will ensure that the coarse fish population will be reduced. This in turn will increase the population of microscopic filterers in the plankton, further improving the quality of the water. The final objective is to create a macrophyte-rich clear water lake that serves as a retention basin for the adjacent fens and provides visual hunters such as the pike (*Esox lucius*) and bittern with suitable feeding grounds.

area from the surrounding cultivated grassland. The plan also entailed running the water flowing into the lake through a filter of reeds to remove nutrients. This would improve the transparency of the lakewater and enable the restoration of fish stocks to their natural levels.

As a first step of the restoration work, the beneficiary, *Staatliches Amt für Umwelt und Natur Ueckermünde*, acquired the use of considerable areas of farmland (330 ha in total), which would be flooded or become wetlands. The raising water level of the area will create new amphibia-rich wet grasslands and sedge mires for the lesser spotted eagle and the corncrake, as well as new reed beds for the bittern. To secure local acceptance of the scheme, an advisory board made up of representatives of interest groups was set up.

Within the redevelopment area, the project aims to raise the water level to 9.25 m (the normal high water

level) and create a rewetting zone which would cover 610 ha. Such a rise in the water level will result in a large submerged shallow water area adjacent to the lake, optimal for the growth of peat. Encouraging this process will maximise the potential habitat for reeds. In order to protect the moor grass meadows (*Molinia*) that are found in higher ground, excess water was drained through a fixed drainage step.



LIFE constructed a 7.3 km dyke that prevents water drainage



Clearing the surrounding area in order to build the dyke

Taking action

Project organiser, Horst Wroblewski says that he is confident that the bitterns will return following the restoration of the lake. Before the work began, the reed beds were too thick and dry and the numbers of bittern declined as a result of predation.

The positive impacts of the project, however, won't be realised immediately. "The purity of the water might be a problem at first, but after a few years it will be okay," Wroblewski says. In addition, the raising of the

level of the rewetting zone, which began in 2007, will be a gradual process. "It is possible to fill the rewetting zone in a year, but this is not good for the plants and animals, and it will therefore be done in four years," he says.

The rising of the water levels in the rewetting zone will also result in the flooding of a wooded area of the project site. A similar project in the region at Anklam has yielded interesting results. A wooded area that was destroyed by flooding over a decade ago is now showing signs of reforestation.

It was important for the project organisers to make sure the locals were informed and supportive of the measures. Wroblewski says that at first they feared the loss of their cattle, but through consultation they were made aware of the importance of the project. Local farmers were also compensated for any loss of land. Several awareness-raising activities have also been organised including a seminar and a guided

A larchwood look-out allows visitors to enjoy the returning wildlife

tour of the project activities around the lake. Other publicity initiatives included the setting up of a website and an exhibition.

Wroblewski says that the last big task is to protect the banks of the dyke from erosion. In some sections, the banks are being built with peat, and protected with an outer layer of rocks. Observation huts and signs are also being erected before the rising of the water levels.

Project Number:
LIFE00 NAT/D/007038

Title: Restoration project 'Galenbecker See' for priority species

Beneficiary:
Staatliches Amt für Umwelt und Natur Ueckermünde

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Period:
May-2001 to Dec-2007

Total Budget: € 5,780,900

LIFE Contribution: € 4,046,635



Germany: Restoring wetlands in the Dümmer region

The area around Lake Dümmer is one of the most extensive fen meadow landscapes of north-west Germany. A recent LIFE project in the western part of the region aimed to reverse the drying of the peat soil and, as a result, provide better conditions for the area's rich wildlife.



Lake Dümmer, Lower Saxony, is an important stopover point for migratory birds

The LIFE project, “Rewetting of the western Dümmer fen area”, forms a major part of a broader initiative to restore the entire Lake Dümmer area of Lower Saxony. A plan to rehabilitate the area was already drawn up in 1987. It resulted in a first LIFE project in the southern part (1998-2000) - LIFE98 NAT/D/005085, “Rewetting of the Ochsenmoor on the Dümmer”. More recently, a second project in the west aimed at a large-scale re-humidification of formerly drained agricultural lands, through the use of adjustable weirs to modulate water levels.

The Dümmer wetlands have been in decline since 1953 when a dyke was built around the lake and regular flooding of the meadows ended.

Previously the region contained rich habitats for the corncrake (*Crex crex*), the bittern (*Botaurus stellaris*), several meadow bird species and numerous other migratory birds. Following the construction of the dyke the land became dry, and agricultural activity led to the degeneration of the wetland. As a result, the populations of many breeding and resting birds decreased or disappeared entirely.

What did LIFE do?

The main target of the project was to regenerate wet grassland and re-establish the meadow bird area. The 4,500 ha Natura 2000 Special Protection Area is managed by a conservation agency (*Naturschutz-*

station Dümmer) that belongs to the environment ministry of the *Land Niedersachsen*. This agency was created in 1993 to introduce sustainable management of the rewetted grassland areas in co-operation with more than 100 local farmers. In fact, an association, “*Naturraum Dümmer-niederung*”, was set up to bring together not only local authorities and municipalities, nature protection associations and water and land management boards, but also local banks and industrial companies.

The LIFE project provided the funds for the purchase of the remaining land sections (175 ha – more than the 145 ha foreseen) required in the western



Restoration wetlands

Dümmer area for an overall restoration, while the necessary weirs and ditch closures were largely built with the beneficiary's own funds.

After completing the land purchase, the rewetting of the whole target area (1,200 ha) was achieved in winter 2006-2007. The water table of 43.5 km of drainage ditches can be controlled by 28 adjustable weirs and 14 overflow weirs.

A lease-back arrangement for conservation land was established that allows the land to be used for hay production or grazing which helps improve its ecological value. The project provided the farmers with special mowing machinery for use on such wet grasslands. Without such long-term care through haying, these areas would eventually become scrubby alder woodlands, a less favourable habitat for migratory birds.

What was the outcome?

The populations of many breeding and wintering bird species have already increased, and some bird species that have not been recorded for a long time, have now returned for breeding. Meadow bird species (black-tailed godwits, curlews, snipes and lapwings) are benefiting most.



An adjustable weir enables better control of the water table

In winter the meadows are covered in shallow water, and in summer the water is allowed to recede slowly so that the meadows and pastures can be farmed in accordance with conservation needs. In this way, the farmers in the region actively engage in nature conservation at Lake Dümmer. Local participation is a prerequisite for the restoration and further development of suitable habitats for water, wading and meadow bird species.

Blocking access to 30 km of pathways in both project areas has created a 2,000 ha "quiet zone" that protects bird species that are sensitive to disturbance and contributes to the area's conservation value. The pathways, however, are closed only when necessary (usually in winter).

LIFE provided special mowing machinery to the farmers – Here, a baler with special tyres

A conference to highlight the successes of the restoration work was held in 2007. A key aim was to exchange knowledge and experience of wet grassland management with other conservation projects. It included a one-day excursion. Monitoring of bird populations is continuing in the Dümmer region.

Project Number:
LIFE02 NAT/D/008456

Title: Re-wetting of the Western Dümmer fen area

Beneficiary:
Land Niedersachsen

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Period:
Jun-2002 to Apr-2007

Total Budget: € 3,103,000

LIFE Contribution: € 1,551,500





Wetland species

Many species are dependent on wetlands, especially aquatic plants and birds. The LIFE programme has been actively contributing to the conservation of these species and their habitats.

Furthermore, there are a handful of projects that work across multiple regions and Member States for the conservation of the same species or habitat. Here, we have a look at a group of projects that aim to protect the aquatic warbler (*Acrocephalus paludicola*), and another group of projects that have the bittern (*Botaurus stellaris*) and other species such as amphibians and insects as their target.



Aquatic warbler

The aquatic warbler (*Acrocephalus paludicola*), is by far Europe's rarest warbler. It breeds in temperate eastern Europe (Poland, Hungary, Germany, the Baltic States, Ukraine and Belarus) and has an estimated population of 15,000 pairs.

This small passerine bird is found in wetlands with sedge and similarly structured marshy habitats with a preferred water depth of 1-10 cm. Drainage of such wetlands and destruction of the habitat has meant

that this species has declined, rapidly, at a rate equivalent to 40% of the total population over the last 10 years. The species became extinct in western Europe in the twentieth century and has declined dramatically in central Europe. It formerly bred in France, Belgium, the Netherlands, former West Germany, former Czechoslovakia, former Yugoslavia, Austria and Italy. According to the IUCN and BirdLife, declines in the population numbers are predicted at a similar rate over the next 10 years.

This makes the aquatic warbler the rarest and the only globally threatened passerine bird found in mainland Europe. The species is classified as vulnerable at the global level and is listed as vulnerable in the IUCN Red List of Threatened Species (2007). At the European level, the bird is classified as endangered, and is included in Annex I of the Birds Directive.

Key EU breeding sites in Germany, Hungary and Poland are classified as Special Protection Areas under the Birds Directive and included in the Natura 2000 network. A European action plan was published in 1996¹ and the species was consid-

¹ <http://ec.europa.eu/environment/nature/directive/birdactionplan/acrocephaluspaludicola.htm>

Aquatic warbler males have a distinctive mating call



Monitoring the water level is crucial for the maintenance of the aquatic warbler habitat

ered priority for funding under the LIFE programme.

For many years, its wintering grounds were unknown, but recently it was discovered that the bird's European population spends its winters in Djoudj National Bird Sanctuary in Senegal, with between 5,000 and 10,000 birds present at this single site.

Aquatic warblers have been recorded migrating through 13 European countries. Birds from Poland and eastern Germany migrate along the Baltic coast in Poland and eastern Germany, then along the North Sea coast of western Germany, the Netherlands, Belgium and sometimes England, thereafter heading south along the French and Iberian Atlantic coast (see map at www.aquaticwarbler.net).

The main stopover and feeding areas during the post-breeding migration are in north-western France, along

Photo: Franziska Tanneberger - LIFE05 NAT/PL/101

Photo: Cezary Floro - LIFE05 NAT/PL/101



the Channel coast and further down across the Iberian Peninsula. These regions are characterised by a string of coastal marshes and wetlands which are currently suffering from a lack of adequate management. This is further aggravated by the secretive nature of this little warbler and the lack of knowledge on behalf of site managers about its ecological requirements.

Other threats to wetland zones, such as degradation of the hydraulic functioning, natural filling-up, water pollution, and man-made changes, have also led to a loss of diversity within French and Spanish marshes, and hence to a decline of their ecological value as feeding and resting habitat for the aquatic warbler.

LIFE has funded four projects focusing on the species along their migration route across stop-over sites. Projects in Spain and France targeted resting and feeding areas, while projects in Poland and Germany targeted breeding sites.

Specifically, the Spanish and French projects aim to maintain or rehabilitate the ecological functions essential for the receiving of the migrating aquatic

warbler; to improve the knowledge of the migratory stop-overs and the role of their habitats for the species (using radio tracking and other techniques); to restore and manage the wetland habitats (by clearing and maintaining ditches); to implement management plans for the most important stop-overs; and additionally, in the case of the French and Spanish projects, to share acquired experiences amongst each other.

- Conservation of the aquatic warbler in Brittany (LIFE04 NAT/FR/000086)
Website: www.life-phragmite-aquatique.org
- Conservation of the aquatic warbler in the ZEPA "La Nava-Campos" (LIFE02 NAT/E/8616)
Website: www.carricerincejudo.org
- Wetland restoration and management: Canal de Castilla Special Protection Area (LIFE06 NAT/E/000213)
Website: www.lifecanaldecastilla.org

Poland and Germany: LIFE project actions



So far, there is only one LIFE project, just recently launched, whose aim is the conservation of breeding sites in Poland and Germany (LIFE05 NAT/PL/000101 - Conserving *Acrocephalus paludicola* in Poland and Germany - www.wodniczka.pl). The project aims to stabilise aquatic warbler populations in key areas of its range in Poland and Germany, by simultaneously improving and increasing the habitat in the main stronghold of the species in Europe, Biebrza, and preventing the extinction of what remains of the population in Pomerania.

An international partnership of five NGOs and two protected area administrations from two EU Member States (Poland and Germany) are managing, monitoring and implementing the project's objectives across nine project sites (all designated SPAs). The main actions first involve the raising of awareness among local authorities, the local public and key stakeholders of the need for conservation of the warbler, in particular, its specific habitat requirements. Next, the project will improve the warbler habitat in Pomerania and Biebrza and then enlarge this territory. Lastly, the projects shall identify replicable financial and legal mechanisms for ensuring the long-term sustainable management of the warbler in Germany and Poland, and then secure the necessary funding.

The project will create 1,500 ha of new potential habitat in Pomerania and Biebrza and implement restoration actions on another 1,500 ha with the aim of obtaining an increase of 15% in the population of aquatic warbler. Measures to be implemented include hydrological management, removal of shrubs and overgrowth from wet meadows and mires, initiation of extensive grazing and considerate mowing of aquatic warbler habitats.

Mowing was part of the LIFE project's habitat restoration actions





Bittern

The bittern (*Botaurus stellaris*), a medium-sized, brown heron, is a shy and secretive bird, generally heard more often than seen. It is widely associated with reed beds and its plumage is the perfect camouflage for its reedy home. When alarmed, bitterns stop and stretch their neck and beak upwards; the markings along the underside of their neck imitate dry reedbed stems perfectly and the bittern will even sway in the wind.

The bittern is widespread but patchily distributed breeder across much of the EU, which accounts for less than half its global breeding range. Its European breeding population is relatively small (under 54,000 pairs), and underwent a large decline between 1970 and



The well-hidden bittern in Phragmites reedbeds

1990. Some three quarters of its European total population are found in Russia and the Ukraine. According to BirdLife, the EU-25 is home to 7,900–10,000 pairs, which represent between 19 and 23% of the European population.

Although the species had stabilised overall in the 1990s, with stable or increasing trends across much of Europe, its population has clearly not yet recovered to the level that preceded its decline. The loss of wetland habitat and their deterioration in quality are the main culprits for this situation. At the European level, the bittern has an unfavourable conservation status, although at global level the bittern is considered not endangered due to its widespread distribution.

The bittern has benefited from numerous conservation actions in many European countries, which were mostly financed by the LIFE-Nature programme. Indeed, it is the species most often targeted by LIFE-Nature projects, with a total of 69 having carried out various general measures that benefit the bittern in some way, and about 20 projects that specifically target the bittern.

LIFE Co-op promoting the bittern in Europe

This LIFE Co-op project was launched in 2004 to collect, interpret, prepare and disseminate the experiences, results and know-how of bittern LIFE projects.

The project is run in close co-operation between three project partners from Germany, the UK and France: the Brandenburg State Office for Environment, the Royal Society for Protection of Birds and the Ligue pour la *protection des Oiseaux*. It is the first time that the wealth of experience from across the continent has been brought together and made easily accessible to a European audience.

This aim of this co-operation was the publication of *the Bittern in Europe Handbook*, which offers detailed guidelines for actions to promote bittern protection, enriched by many examples from all over Europe. It brings together the experience and knowledge developed by LIFE projects and in so doing, improves our understanding of bittern ecology and habitat requirements.

The handbook has a very practical focus and is aimed at land managers, advisors and interested groups in wetland conservation. It is also aimed at government departments and agencies, water suppliers and local authorities.

Future bittern conservation projects will be able to draw upon the results and experiences of the recent LIFE projects in the United Kingdom, France, Germany and other countries. All these projects are proving that it is possible to reverse the decline of bittern populations.

LIFE03 NAT/CP/D/000009

Handbook for Actions to Promote Bittern in Europe

The handbook can be downloaded in pdf format from the LIFE website: http://ec.europa.eu/environment/life/funding/life3/components/documents/Bittern_in_Europe.pdf





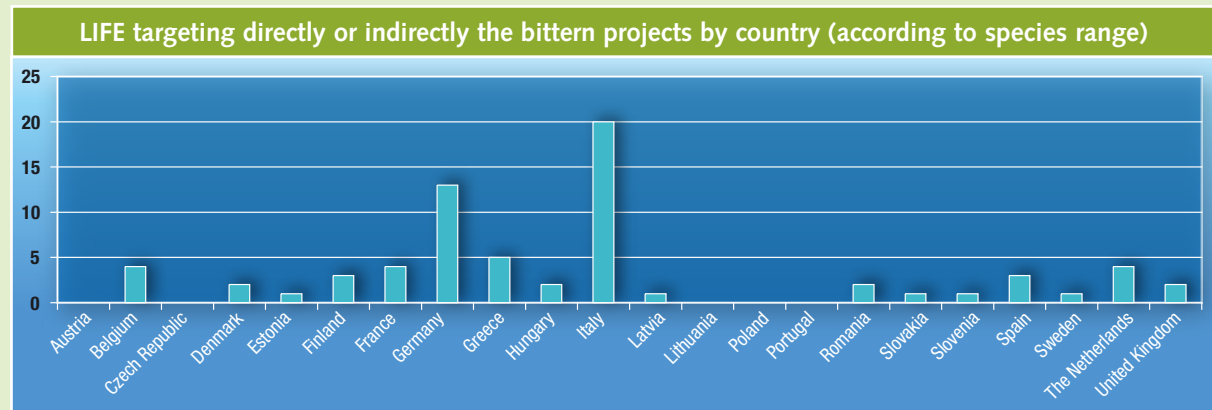
LIFE project actions

These LIFE bittern projects have been focusing on conservation actions to avoid their decline in most western European countries. The main actions involve the establishment of mechanisms for the legal protection of the species and key Natura 2000 sites by the implantation of legal binding management plans or the elaboration of national conservation or biodiversity plans. Additionally, there has been a great deal of ecological research, monitoring and assessment of the conservation status of the bittern. Specifically in terms of habitat management and creation, LIFE projects have engaged in land purchase and water quality monitoring and management. Lastly, LIFE has funded a range of awareness raising campaigns. LIFE projects have directly benefited the bittern by improving habitat conditions at the project sites and increasing the local population. Moreover, most of the recent research programmes on the bittern (France, Italy, the Netherlands, Poland, Sweden, Germany) were either directly funded by LIFE or connected with LIFE projects.

LIFE bittern projects have often been the starting point for follow-up projects, funded either by a second phase of LIFE or by other programmes. Prominent examples are the first bittern project in the UK, the Siikalahti LIFE project in Finland, or the LIFE projects in Bavaria and Mecklenburg-Western-Pomerania.

In France and the UK, LIFE projects organised national recovery programmes for the bittern. In many other countries, LIFE projects have restored and created wetland sites. The greatest number of LIFE projects has been in countries where, according to the Bittern Action Plan, populations decreased significantly, such as the UK, the Netherlands, Belgium, France, Spain, Germany and Italy (see graph).

Indeed, given the breadth of activities funded by LIFE and the major role LIFE has played in the implementation of strategies for bittern conservation on the ground, it is very probable that the bittern's status would be much worse in many countries, if LIFE funding had not been available.



LIFE funding and other wetlands species

Wetlands, whether they be swamps, marshes, bogs, or flood plains, are home to a great variety of interesting species, and not just aquatic bird species.

A large number of the species listed in the Habitats Directive Annex II depend on wetland environments. The amphibians, reptiles, insects, mammals and plants included in the directive must all be maintained at a "favourable conservation status" by the Member States.

Non-bird wetlands species that have in particular benefited from multiple LIFE projects include species of amphibians and dragonflies:

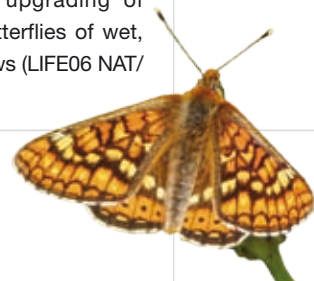
The Fire-bellied toad (*Bombina orientalis*) and other amphibian species were the subject of some six different projects:

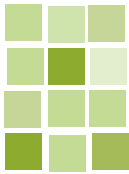
- Consolidation of *Bombina orientalis* in Denmark (LIFE99 NAT/DK/006454)
- Management of fire-bellied toads in the Baltic region (LIFE04 NAT/DE/000028)
- Conservation of 4 endangered species of amphibians in Luxembourg (LIFE96 NAT/L/003195)
- Restoration of priority habitats for amphibians (LIFE05 NAT/E/000060)
- Protection of *Triturus cristatus* in Eastern Baltic Region (LIFE04 NAT/EE/000070)

- Aurora System - active presentation of *Salamandra atra aurorae* and other amphibians (LIFE04 NAT/IT/000167)

Dragonflies (*Odonata*) and Lepidoptera (butterflies, moths and skippers) meanwhile were the subject of three different projects:

- Protection programme for endangered dragonfly species in the Southwest of Germany (LIFE96 NAT/D/3036)
- Conservation of endangered arthropods of *Extremadura* (LIFE03 NAT/E/000057)
- Conservation and upgrading of habitats for rare butterflies of wet, semi-natural meadows (LIFE06 NAT/PL/000100)





Further projects focusing on wetlands

The table below provides further examples of LIFE projects focusing on wetlands.

For more information on individual projects, visit the online database at:

<http://ec.europa.eu/environment/life/project/Projects/index.cfm>

The database provides useful, detailed search fields – for example under “keyword” (alphabetical or thematic) users may search under “wetlands”, “freshwater ecosystem”, “lake”, etc. Other search fields are “type of beneficiary” (e.g “Development Agency”, “NGO Foundation”, “Park-Reserve Authority” etc; and “type of project area” for example, “coastal wetlands”, “continental waters”, “inland wetland” etc.

NATURE			
Country	Start	Number	Name
Austria	1998	LIFE98 NAT/A/005413	Water World March-Thaya-Auen
	2000	LIFE00 NAT/A/007051	Management of floodplains on the Tisza
Belgium	1999	LIFE99 NAT/B/006285	Restoration of wetlands in Belgian Lorraine
	2000	LIFE00 NAT/B/007148	Actions for Birds of Reedbeds in Bassin de la Haine
	2002	LIFE02 NAT/B/008595	Minerotrophic mires and heath ecosystems in the Zuiderkempen
	2003	LIFE03 NAT/B/000019	Rehabilitation of peat and wet habitats on the Saint-Hubert Plateau
	2003	LIFE03 NAT/B/000020	Restoration and management of the lowland mire “Damvallei”
	2003	LIFE03 NAT/B/000023	Uitkerkse Polder: a surplus value for nature and people
Denmark	2002	LIFE02 NAT/DK/008588	Improving status of coastal lagoon Tryggelev Nor, Denmark - IMAGE
	2002	LIFE02 NAT/DK/008589	Restoration of Lake Fure - a nutrient-rich lake near Copenhagen
	2005	LIFE05 NAT/DK/000150	Restoration of raised bogs in Denmark with new methods
Estonia	2000	LIFE00 NAT/EE/007082	Restoration and management of the Häädemeeste wetland complex
	2003	LIFE03 NAT/EE/000180	Conservation of NATURA 2000 biotopes in Räpina polder
Finland	2000	LIFE00 NAT/FIN/007060	Protection and usage of aapa mires with a rich avifauna
	2000	LIFE00 NAT/FIN/007061	Protection and management of the valuable wetland Siikalahti
	2002	LIFE02 NAT/FIN/008470	Restoration of mire and bog ecosystems in North-Savo with reference to environmental education
	2002	LIFE02 NAT/FIN/008471	Protection of valuable bird-rich wetlands in Central Finland
	2002	LIFE02 NAT/CP/FIN/000027	Best practices in Finnish Wetlands - networking for improved wetland management
	2003	LIFE03 NAT/FIN/000036	Karelian mires and virgin forests
	2004	LIFE04 NAT/FI/000076	Restoration and maintenance of valuable aquatic bird habitats of Pirkanmaa
	2006	LIFE06 NAT/FIN/000128	Promotion of public awareness and protection of aapa mires in Lapland
	2006	LIFE06 NAT/FIN/000129	From Ancient to the Present Estuary, Kokemäenjoki Wetland Chain
France	1998	LIFE98 NAT/F/005192	Wetlands of Gavot
	1999	LIFE99 NAT/F/006315	Preservation and restoration of the habitats of the Ill wetland at Sélestat
	2004	LIFE04 NAT/FR/000086	Conservation of the Aquatic Warbler in Brittany
	2004	LIFE04 NAT/FR/000087	Conservation of the most remarkable habitats and species of the Poitevin Marshes
Germany	1998	LIFE98 NAT/D/005081	Protection of priority bog habitats and of the Bittern (<i>Botaurus stellaris</i>) in the Area of Upper Havel
	2000	LIFE00 NAT/D/007042	Optimization of the SPA ‘Düsterdieker Niederung’
	2000	LIFE00 NAT/D/007043	“Hohes Moor” peat bog
	2000	LIFE00 NAT/D/007057	Restoration of clear water lakes, mires and swamp forests of the Lake Stechlin
	2002	LIFE02 NAT/D/008462	Optimisation of the Blitzenreuter Seenplatte biosphere

NATURE			
Country	Start	Number	Name
Germany	2003	LIFE03 NAT/D/000004	Regeneration of "Grosses Torfmoor"
	2003	LIFE03 NAT/D/000005	Conservation and development of the inland salt marshes of Northern Thuringia
	2003	LIFE03NAT/CP/D/000009	Handbook for Actions to promote Bittern in Europe
	2005	LIFE05 NAT/D/000053	Rosenheimer master basin bogs
	2005	LIFE05 NAT/D/000111	Conservation and development of the inland salt marshes of Brandenburg
	2005	LIFE05 NAT/D/000152	Rehabilitation of the Baltic coastal lagoon habitat complex
Greece	1999	LIFE99 NAT/GR/006475	Conservation management of Amvrakikos wetlands
	2002	LIFE02 NAT/GR/008491	Conservation management in Stofylia-Kotychi
	2003	LIFE03 NAT/GR/000092	Implementation of management measures at the Agras wetland
	2004	LIFE04 NAT/GR/000105	Actions for the conservation of Mediterranean temporary ponds in Crete
Hungary	2002	LIFE02 NAT/H/008634	Restoration of pannonic steppes, marshes of Hortobágy National Park
	2004	LIFE04 NAT/HU/000118	Complex habitat rehabilitation of the Central Bereg Plain, Northeast Hungary
Ireland	2000	LIFE00 NAT/IRL/007128	Restoration Management for Annex I Birds at Termoncarragh Lake SPA
	2002	LIFE02 NAT/IRL/008490	Restoring Active Blanket Bog in Ireland
	2004	LIFE04 NAT/IE/000121	Restoring raised bogs in Ireland
Italy	1998	LIFE98 NAT/IT/005032	Lake Caldaro - an oasis for migratory birds in the heart of the Alps
	1998	LIFE98 NAT/IT/005117	Maremma Park: management of wetlands and sand dunes
	1999	LIFE99 NAT/IT/006212	Biodiversity of Iseo peat-moss: conservation and management
	1999	LIFE99 NAT/IT/006235	Actions of environmental restoration of Alserio Lake
	1999	LIFE99 NAT/IT/006248	Urgent actions for the conservation of some SCI in Foligno area
	2000	LIFE00 NAT/IT/007161	Paludi di Ostiglia: intervention for the protection of priority birds
	2000	LIFE00 NAT/IT/007209	Conservation and management of the biotope 'S. Genuario Wetland'
	2000	LIFE00 NAT/IT/007246	Restoration of the Soltarico oxbow Lake
	2000	LIFE00 NAT/IT/007281	NEMOS project - improvement of Alpine wetland areas
	2002	LIFE02 NAT/IT/008533	Conservation and improvement of habitats in the SPA of Venticari
	2004	LIFE04 NAT/IT/000177	Safeguard and showing off of the peat-bogs in Danta (Cadore)
Latvia	2003	LIFE03 NAT/LV/000081	Lake Pape - conservation, preservation and evolution
	2003	LIFE03 NAT/LV/000083	Management of the Lubana Wetland Complex, Latvia
	2004	LIFE04 NAT/LV/000196	Implementation of mire habitat management plan for Latvia
Netherlands	2000	LIFE00 NAT/NL/007049	Peat bog restoration programme of the Korenburgerveen
	2002	LIFE02 NAT/NL/008486	Restoration of biotope for <i>Botaurus stellaris</i> , <i>Anas penelope</i> and <i>Limosa limosa</i> in the SPA IJperveld
	2004	LIFE04 NAT/NL/000202	Tiengemetten, restoration of freshwater tidal area in the Haringvliet estuary, the Netherlands
	2004	LIFE04 NAT/NL/000206	From degraded to active raised bogs pSCI Bargerveen
	2006	LIFE06 NAT/NL/000074	Wetlands: challenges and innovation in succession management
Poland	2004	LIFE04 NAT/PL/000208	Conservation of baltic raised bogs in Pomerania, Poland
Portugal	2000	LIFE00 NAT/P/007085	Palustris, Management of the Special Area of Conservation of the Marsh of Arzila
Romania	1999	LIFE99 NAT/RO/006400	Integrated Management plan for the "Small Island of Braila"
	2002	LIFE02 NAT/RO/008573	Conservation of the natural wet habitat of Satchinez (continuation of the project 99NAT/RO/006394)
	2004	LIFE04 NAT/RO/000220	Improving wintering conditions for <i>Branta ruficollis</i> at Techirghiol



NATURE

Country	Start	Number	Name
Slovakia	2003	LIFE03 NAT/SK/000096	Restoration of Water Regime in Sur Fen Nature Reserve
	2005	LIFE05 NAT/SK/000112	Restoration of Wetlands at Zahorie Lowland
	2006	LIFE06 NAT/SK/000114	Conservation of Senne and Medzibodrozie SPAs in Slovakia
Slovenia	2006	LIFE06 NAT/SI/000069	Intermittent Cerknica Lake
Spain	1997	LIFE97 NAT/E/004179	Conservation of the Bittern (<i>Botaurus stellaris</i>) in the Endorreic Wetlands of the Ebro valley in Navarra
	1999	LIFE99 NAT/E/006417	Conservation of priority habitats in the Valencian Community
	1999	LIFE99 NAT/E/006339	Restoration of three wetland areas in Villacañas (Toledo)
	2000	LIFE00 NAT/E/007330	SCI Parga-Ladra-Támoga: recovery of bog woodland and dystrophic lake
	2002	LIFE02 NAT/E/008616	Conservation of the aquatic warbler in the ZEPA 'La Nava-Campos'
	2003	LIFE03 NAT/E/000052	Conservation and management of the SPA for Birds site of Community interest wetland "La Albuera" in Extremadura
	2005	LIFE05 NAT/E/000058	Management and conservation of temporary ponds in Minorca
	2006	LIFE06 NAT/E/000213	Wetland restoration and management: Canal de Castilla Special Protection Area
Sweden	2000	LIFE00 NAT/S/007117	Coastal Meadows and Wetlands in the Agricultural Landscape of Öland
	2004	LIFE04 NAT/SE/000230	Improvement of habitats for wetland birds in Askö-Tidö
	2006	LIFE06 NAT/S/000113	Restoration of the Wetland Area of Hejnum Kallgate
United Kingdom	2000	LIFE00 NAT/UK/007075	Restoring active blanket bog of European importance in North Scotland
	2000	LIFE00 NAT/UK/007078	Restoration of Scottish raised bogs
	2002	LIFE02 NAT/UK/008544	Sustainable Wetland Restoration in the New Forest
	2002	LIFE02 NAT/UK/008527	Developing a strategic network of SPA reedbeds for <i>Botaurus stellaris</i>

ENVIRONMENT

Country	Start	Number	Name
Germany	2000	LIFE00 ENV/D/000351	Living Lakes: Sustainable Management of wetlands and shallow lakes
Portugal	1999	LIFE99 ENV/P/000673	Integrated Managmeent Structure of Ria de Aveiro : ESGIRA - MARIA
Spain	2003	LIFE03 ENV/E/000118	Integrated management of lighting in the Albufera Nature Reserve (Valencia)
	2004	LIFE04 ENV/ES/000269	Integrated management of agriculture in the surroundings of community importance wetlands (sustainable wetlands)
Sweden	1996	LIFE96 ENV/S/000346	Wetlands in agricultural areas - complementary remedies to reduce nutrient transport to inland and co

THIRD COUNTRIES

Country	Start	Number	Name
Albania	2003	LIFE03 TCY/AL/000004	Capacity building on conservation of Albanian wetland ecosystems (alwet)
Bosnia Hezgorvina	1999	LIFE99 TCY/BIH/000035	Development of a new management policy for the Hutovo Blato wetlands, Bosnia-Herzegovina
International	2003	LIFE03 TCY/INT/000031	Protection et Développement Durable des Zones Humides en Afrique du Nord
	2002	LIFE02 TCY/INT/000069	Wetlands Moroccan Centre
	1994	LIFE94 TCY/INT/000988	MEDWET: Conservation and wise use of wetlands in the Mediterranean Basin
Israel	1997	LIFE97 TCY/IL/000038	Restoration and conservation in the re-flooded Hula wetland habitat in northern Israel
Russia	2004	LIFE04 TCY/ROS/000050	Bringing Regional Protected Areas of the Leningrad region (Russian Federation) into European Context

Available LIFE publications

LIFE-Focus brochures

A number of LIFE publications are available on the LIFE website:

LIFE and waste recycling: Innovative waste management options in Europe (2007 - 60 pp. - ISBN 978-92-79-07397-7) <http://ec.europa.eu/environment/life/publications/lifepublications/lifefocus/documents/recycling.pdf>

LIFE and Europe's rivers – Protecting and improving our water resources (2007 – 52pp. ISBN 978-92-79-05543-0 - ISSN 1725-5619) <http://ec.europa.eu/environment/life/publications/lifepublications/lifefocus/documents/rivers.pdf>

LIFE and Energy – Innovative solutions for sustainable and efficient energy in Europe (2007 – 64pp. ISBN 978 92-79-04969-9 - ISSN 1725-5619) http://ec.europa.eu/environment/life/publications/lifepublications/lifefocus/documents/energy_lr.pdf

LIFE and the marine environment (2006 – 54pp. ISBN 92-79-03447-2- ISSN 1725-5619) http://ec.europa.eu/environment/life/publications/lifepublications/lifefocus/documents/marine_lr.pdf

LIFE and European forests (2006 - 68pp. ISBN 92-79-02255-5 - ISSN 1725-5619) http://ec.europa.eu/environment/life/publications/lifepublications/lifefocus/documents/forest_lr.pdf

LIFE in the City – Innovative solutions for Europe's urban environment (2006, 64pp. - ISBN 92-79-02254-7 – ISSN 1725-5619) http://ec.europa.eu/environment/life/publications/lifepublications/lifefocus/documents/urban_lr.pdf

Integrated management of Natura 2000 sites (2005 - 48 pp. – ISBN 92-79-00388-7) http://ec.europa.eu/environment/life/publications/lifepublications/lifefocus/documents/managingnatura_lr.pdf

LIFE, Natura 2000 and the military (2005 - 86 pp. – ISBN 92-894-9213-9 – ISSN 1725-5619) http://ec.europa.eu/environment/life/publications/lifepublications/lifefocus/documents/military_en.pdf

LIFE for birds - 25 years of the Birds Directive: the contribution of LIFE-Nature projects (2004 - 48 pp. – ISBN 92-894-7452-1 – ISSN 1725-5619) http://ec.europa.eu/environment/life/publications/lifepublications/lifefocus/documents/birds_en.pdf

The air we breathe - LIFE and the European Union clean air policy (2004 - 32 pp. – ISBN 92-894-7899-3 – ISSN 1725-5619) http://ec.europa.eu/environment/life/publications/lifepublications/lifefocus/documents/lifeair_hr.pdf

LIFE-Nature: communicating with stakeholders and the general public - Best practice examples for Natura 2000 (2004 - 72 pp. – ISBN 92-894-7898-5 – ISSN 1725-5619) http://ec.europa.eu/environment/life/publications/lifepublications/lifefocus/documents/natcommunicat_lr.pdf

A cleaner, greener Europe - LIFE and the European Union waste policy (2004 - 28 pp. – ISBN 92-894-6018-0 – ISSN 1725-5619) http://ec.europa.eu/environment/life/publications/lifepublications/lifefocus/documents/waste_en.pdf

Industrial pollution, European solutions: clean technologies - LIFE and the Directive on integrated pollution prevention and control (IPPC Directive) (2003 - 32 pp. – ISBN 92-894-6020-2 – ISSN 1725-5619) http://ec.europa.eu/environment/life/publications/lifepublications/lifefocus/documents/cleantech_en.pdf

LIFE and agri-environment supporting Natura 2000 - Experience from the LIFE programme (2003 - 72 pp. – ISBN 92-894-6023-7 – ISSN N° 1725-5619) http://ec.europa.eu/environment/life/publications/lifepublications/lifefocus/documents/agrienvironment_en.pdf

LIFE for Natura 2000 - 10 years implementing the regulation (2003 - 108 pp. – ISBN 92-894-4337-5) http://ec.europa.eu/environment/life/publications/lifepublications/lifefocus/documents/lifefornatura_en.pdf

Other publications

Best LIFE-Environment Projects 2006-2007 (2007, 44 pp.-ISBN 978-92-79-06699-3 ISSN 1725-5619) <http://ec.europa.eu/environment/life/publications/lifepublications/bestprojects/documents/bestenv07.pdf>

LIFE-Third Countries 1992-2006 (2007, 64 pp. – ISBN 978-92-79-05694-9 – ISSN 1725-5619) http://ec.europa.eu/environment/life/publications/lifepublications/lifefocus/documents/TCY_lr.pdf

Best LIFE-Environment Projects 2005-2006 (2006, 40 pp. ISBN 92-79-02123-0) http://ec.europa.eu/environment/life/publications/lifepublications/bestprojects/documents/bestenv06_lr.pdf

LIFE-Environment 1992 – 2004 “Demonstrating excellence in environmental innovation” (2005, 124 pp. – ISBN 92-894-7699-3 – ISSN 1725-5619) http://ec.europa.eu/environment/life/publications/lifepublications/lifefocus/documents/lifeenv92_04.pdf

LIFE-Environment Projects 2006 compilation (2006, 56 pp.-ISBN 92-79-02786-7) <http://ec.europa.eu/environment/life/publications/lifepublications/compilations/documents/envcompilation06.pdf>

LIFE-Nature Projects 2006 compilation (2006, 67 pp. – ISBN 92-79-02788-3) <http://ec.europa.eu/environment/life/publications/lifepublications/compilations/documents/natcompilation06.pdf>

LIFE-Third Countries Projects 2006 compilation (2006, 20 pp. – ISBN 92-79-02787-5) <http://ec.europa.eu/environment/life/publications/lifepublications/compilations/documents/tcycompilation06.pdf>

A number of printed copies of certain LIFE publications are available and can be ordered free-of-charge at: <http://ec.europa.eu/environment/life/publications/order.htm>



LIFE "L'Instrument Financier pour l'Environnement" / The financial instrument for the environment

Period covered (LIFE III) 2000-2006.

EU funding available approximately EUR 945 million.

Type of intervention co-financing actions in favour of the environment (LIFE projects) in the Member States of the European Union, in associated candidate countries and in certain third countries bordering the Mediterranean and the Baltic Sea.

LIFE projects

- > **LIFE Nature projects** improve the conservation status of endangered species and natural habitats. They support the implementation of the Birds and Habitats Directives and the Natura 2000 network.
- > **LIFE Environment projects** contribute to the development of innovative and integrated techniques or methods to support environmental progress.
- > **LIFE Third Countries projects** support environmental capacity building and initiatives in non-EU countries bordering the Mediterranean and the Baltic Sea.

LIFE+ "L'Instrument Financier pour l'Environnement" / The financial instrument for the environment

Period covered (LIFE+) 2007-2013.

EU funding available approximately EUR 2,143 million

Type of intervention at least 78% of the budget is for co-financing actions in favour of the environment (LIFE+ projects) in the Member States of the European Union and in certain non-EU countries.

LIFE+ projects

- > **LIFE Nature projects** improve the conservation status of endangered species and natural habitats. They support the implementation of the Birds and Habitats Directives and the Natura 2000 network.
- > **LIFE+ Biodiversity projects** improve biodiversity in the EU. They contribute to the implementation of the objectives of the Commission Communication, "*Halting the loss of Biodiversity by 2010 – and beyond*" (COM (2006) 216 final).
- > **LIFE+ Environment Policy and Governance projects** contribute to the development and demonstration of innovative policy approaches, technologies, methods and instruments in support of European environmental policy and legislation.
- > **LIFE+ Information and Communication projects** are communication and awareness raising campaigns related to the implementation, updating and development of European environmental policy and legislation, including the prevention of forest fires and training for forest fire agents.

Further information further information on LIFE and LIFE+ is available at <http://ec.europa/life>.

How to apply for LIFE+ funding The European Commission organises annual calls for proposals. Full details are available at <http://ec.europa.eu/environment/life/funding/lifeplus.htm>

Contact

European Commission – Directorate-General for the Environment
LIFE Unit – BU-9 02/1 – B-1049 Brussels – Internet: <http://ec.europa.eu/life>

LIFE Focus / LIFE and Europe's wetlands: Restoring a vital ecosystem

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