



Nature



Best LIFE Nature Projects 2007-2008

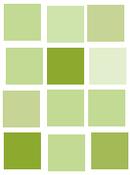
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This is the first year that we have made a selection of LIFE Nature projects that have proven to be exemplary in their area of work. Following an initial review carried out by its external monitoring team, the European Commission selected the 26 most outstanding LIFE Nature projects completed by 2008. The Member States and the external monitoring team then reviewed these 26 'best' projects to select a top five based on the following criteria:

- Short-term conservation status improvement (max 30 points);
- Short-term leverage effect (additional resources mobilised) (max 10 points);
- Long-term sustainability of improved conservation status (max 30 points);
- Long-term leverage effect (max 20 points);
- Long-term regional / national / international Impact (max 10 points).

These five 'Best of the Best' (BoB) projects can be held up as models for others as to what constitutes a successful, well-designed and well-executed LIFE Nature project.

The BoB projects have targeted a broad range of endangered species and habitats across several Member States - a fitting tribute to the diverse and wide-ranging work of LIFE Nature to improve the conservation status of endangered species and natural habitats, and to support the implementation of the Birds and Habitats Directives and the Natura 2000 network.

The BoB project activities included: the reintroduction of rabbits in Andalusia to increase the population of the highly endangered Iberian lynx; conservation of priority bird species (Dalmatian pelican and pygmy cormorant) in Lake Mikri Prespa, Greece; conservation of the Hungarian meadow viper – Europe's most endangered snake; improvement of coastal habitats for waders in Finland by cutting overgrown reed beds and reintroducing grazing with the support of the local population and farmers; and the restoration of Finland's boreal forests to increase biodiversity.

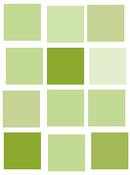
Julijana Lebed Lozej of the Slovenian Ministry of Environment and Spatial Planning took on the delicate work of co-ordinating this selection process. I would like to thank her and all the colleagues from the Member States and external monitoring teams who evaluated the contenders. I would also like to thank the project beneficiaries and their partners for their excellent work in favour of nature conservation.

To shine a spotlight on the top five, the European Commission's LIFE Unit organised a well-attended award presentation during Green Week in Brussels, on the 24th June 2009.

The higher profile that the best LIFE Nature projects receive through these awards ensures that more people know about the LIFE programme and the projects it co-finances. I am confident that these awards will continue to grow in stature and range in the coming years.

Angelo Salsi

Head of the LIFE Nature Unit, Directorate-General for the Environment



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★ "Best of the Best" projects

Introduction

The EU Member States represented on the LIFE Committee and the European Commission's LIFE Unit have announced the Best LIFE Nature Projects 2007-2008. The results of the selection, as approved by the LIFE Committee members in the spring of 2009, are the 26 projects featured in this publication. These projects represent the most recent successful LIFE Nature projects in terms of best practices and /or demonstration actions on nature conservation, being a reliable contribution to the implementation of the Habitats and Birds Directives.



The winners of the Best LIFE Environment 2008- 2009 and Best LIFE Nature 2007-2008 awards held as part of the EU's Green Week. The ceremony provided an opportunity to reward the most successful recent LIFE projects and highlight their achievements

The LIFE Nature component of the LIFE programme co-funded a total of 1 028 projects between 1992 and 2007, with a total budget more than €1 443 million.

To help improve the transmission of LIFE Nature project results, the LIFE Unit decided to identify and reward those best practice projects with the highest potential for transferability. This, the first Best LIFE Nature Projects exercise, is the product of an identification and evaluation process based on a set of criteria developed by the LIFE external monitoring team in collaboration with the European Commission.

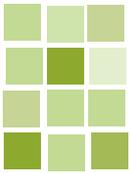
A total of 26 projects were selected as 'best' projects, with five awarded the title, 'Best of the Best' (see

table). The projects selected were drawn from across the EU-27 and contribute to LIFE Nature's main objectives of implementation of the EU's Habitats and Birds Directives and the establishment and management of the Natura 2000 network of sites.

How were the best projects selected?

Scoring of completed LIFE Nature projects was launched in the summer of 2006. Projects were initially technically assessed by the LIFE Unit's external monitoring team, provided by the Astrale consortium. The monitors





LIFE Nature Best of the Best projects targeted a range of species and habitats

ranked all the projects that ended by December 2008 to produce a first list. The final selection was undertaken by the Member States under the co-ordination of Julijana Lebed Lozej of the Slovenian Ministry of Environment and Spatial Planning with projects marked according to the following criteria:

- Short-term conservation status improvement (max. 30 points);
- Short-term leverage effect (additional resources mobilised) (max. 10 points);
- Long-term sustainability of improved conservation status (max. 30 points);
- Long-term leverage effect (max. 20 points);
- Long-term regional / national / international impact (max. 10 points).

The selected projects range from ones targeting individual species listed in the Habitats or Birds Directive to Natura 2000-site-based projects (on a single or multiple sites) with actions targeting several species and habitats. Species targeted by the Best Projects 2007-2008 included the Iberian lynx, the Hungarian meadow viper, Zino's petrel and Eleonora's falcon, as well as several boreal forest, bogs, wetland and river habitats.

In view of the importance of these aspects to project success, project beneficiaries are also required to provide an after-LIFE conservation plan where they analyse the long-term conservation benefits of the project with their final report. This information forms an integral part of the evaluation process.

Coastal meadows (left) and Thymus serpyllum (right) both benefitted from LIFE projects



The 26 best LIFE Nature projects 2007-2008

Species

Pearl mussels	Belgium
Falco eleonorae	Greece
Caretta	Greece
★ HUNVIPURS	Hungary
Peneireiro	Portugal
Freira da Madeira	Portugal
Crex	Slovenia
★ Lince Andalucia	Spain

Wetlands

Saint Hubert	Belgium
Olvassuo	Finland
Aapa & Avi	Finland
★ Gulf of Finland	Finland
Karelian Mires	Finland
Westliche Dümmerniederung	Germany
★ Mikri Prespa	Greece
10 GEMETEN	The Netherlands
Blanket bog	United Kingdom

Forest

Bossen Vlaamse Ardennen	Belgium
★ Boreal forests	Finland
Life to Koli	Finland
Piedrosul Rodnei	Romania
Söderaasen	Sweden

Rivers

Rivier D'Ain	France
GERVE	Spain
Bande rhénane	France
Donauufer	Austria

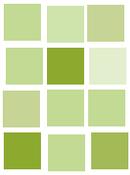
★ "Best of the Best" projects



Species

The European Union recognises the importance of safeguarding its most threatened species. In 1979, the Birds Directive was adopted, its aim to protect all wild birds in the EU, and in 1992, the Habitats Directive was adopted, extending the protection to some 1 200 threatened plant and animal species and to 220 habitat types. More recently, in 2006, a new EU Biodiversity Action Plan was designed to halt the loss of biodiversity, in particular species loss.

Several species included in the annexes of the Habitats and Birds Directives have been targeted by LIFE projects. The following pages highlight some projects whose actions have been selected as examples of best practice in conservation across the EU.



Spain: Rabbit reintroduction feeds success of Iberian lynx project

A Spanish LIFE project led by the regional government of Andalusia exceeded expectations around conservation of the threatened Iberian lynx. Mainly through restoring rabbit numbers in target areas, the project supplied the much needed prey for natural breeding of the lynx in the wild. It not only stabilised lynx numbers, but increased the population by around 75%.

The Iberian lynx (*lynx pardinus*) is the world's most endangered feline species and the most endangered carnivorous mammal in Europe. Numbers of the animal declined significantly from around 1 000 in 1990 - across nearly 50 breeding areas - to estimates of fewer than 200 by 2002. The animal, common throughout Spain and Portugal until the 14th century, is now only found in the south-west of the Iberian Peninsula.

The government of Andalusia was well aware of the importance of the Iberian lynx in terms of the region's biodiversity and heritage.

The lynx is an umbrella species that helps in the conservation of a whole ecosystem that also includes imperial and golden eagles, wolves and eagle owls. The regional government therefore supported a project in 2001-2002 to investigate where populations of the cats could still be found. This revealed that the Iberian lynx was only present in two areas: the Sierra Morena and Doñana.

Local investigation and understanding of the lynx highlighted that although other factors - such as roadkill and poaching - were responsible for unnatural deaths of lynx, the principal reason for the decline in numbers of the animal was the scarcity of its main prey: rabbits.

Rabbits make up 95% of the diet of the Iberian lynx. If there are not at least 2-3 rabbits/ha, it becomes

impossible for a female to successfully breed and feed her litter. However, the prevalence of myxomatosis and viral haemorrhagic pneumonia in the second half of the 20th century had reduced rabbit numbers by more than 90% in some areas.

Building partnerships for species protection

To build on and move beyond the findings of regional projects, the

Andalusian government applied for LIFE funding to develop a partnership project to consolidate and guarantee the future of the lynx populations, principally by restoring rabbit populations.

"One of the advantages of undertaking a LIFE project was that it allowed us to include other partners crucial to the work of protecting the lynx," explained Miguel Angel Simon, the project co-ordinator from the

Iberian lynx (lynx pardinus), the world's most endangered feline



Photo: Jesus Rodriguez-Osorio





Rabbits make up 95% of the diet of the Iberian lynx

regional government of Andalusia. These partners importantly included organisations representing hunters and landowners, as well as environmental NGOs.

A particular challenge of the project is that most of the land is private property and hunting is one of the most popular land uses in the area. The project therefore brought the partners together to discuss land-use changes and co-operative actions necessary to build rabbit

numbers. These discussions led to a total of 94 agreements covering land management of some 136 000 ha of potential lynx habitat.

In Doñana, rabbit hunting was a big issue, so the agreements created reserves where no hunting was allowed. The hunters agreed to this sacrifice - generally of around 20% of their land - because they also saw the potential for long-term increases in rabbit numbers across their territory. In the Sierra Morena, hunting

The project considerably increased the rabbit population by implementing several measures (sowing and artificial burrows)



is mainly of deer, so agreements focused on general measures to improve rabbit habitats.

Monitoring and observation of the lynx

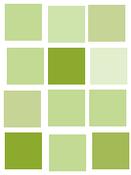
Although the direct focus of the project work was on improving rabbit numbers, the ultimate objective, of course, was to make the lynx populations more sustainable. To this end, the project team carried out monitoring activities, both to better understand the species and to track changes.

Photo traps were used to take photos of lynx whenever they trod on a metal plate acting as a trigger. This enabled lynx numbers to be counted much more accurately since individual animals could be identified in the photographs through their distinctive fur markings. The project team came to recognise each animal, and gave them individual names.

Tracking devices were also attached to the animals to monitor their movements. Although these did not provide the permanent tracking now available from GPS systems, they were particularly useful in locating individuals and finding dead animals. This enabled greater understanding of causes of mortality, highlighting the unexpectedly high importance of disease.

The photographs also provided some surprising insights into the habits of the lynx. “We thought that the lynx was a very solitary animal,” explains one of the project leaders in the field, Jose Maria Gil. “However, the photographs revealed they live in small families with the male taking a role in looking after the young.”

Observation of lynx excrement also revealed the extension of lynx activity into areas where rabbit numbers were increasing. At times of likely food shortage, particularly for a female cat with a litter, extra feeding



The area of habitat available for the lynx has been reduced by human activities

stations were created where rabbits were introduced without available warrens for their protection. However, this was limited so as not to affect normal feeding behaviour.

Raising awareness and increasing protection

Human activity can also impact directly on the lynx and the project worked to reduce this threat. Works were undertaken to widen the space alongside roads winding through the mountainous territory to improve the possibility of lynx avoiding vehicles. The beneficiary also introduced roadside reflectors, which aim to scare the lynx away from roads as a vehicle approaches.

Changing public attitudes and awareness has been an important objective. Signs were erected alongside roads running through important lynx territories. These reminded drivers of the presence of the lynx and to reduce their speed to prevent accidents and roadkill. Common stopping points for people visiting the area, such as cafes and hotels, have been targeted with information on the cat. Some 10 such informa-

tion points were created during the project.

Public awareness of the lynx in the local area is high. The image of the lynx is used in numerous settings, including as a symbol of a local town and a local security company. Moreover, the work of the beneficiary has improved people's awareness of the species' vulnerability. During the visit to prepare this article the beneficiary was approached by two separate groups of people asking about the progress of the lynx population.

The project partners were particularly important in raising interest in the conservation of the lynx amongst different groups. "A major development of this project was that hunters' groups started to talk to their members about conservation issues for the first time," explained the project co-ordinator.

The project also helped to change landowners' attitudes towards the administration. Initially distrustful and apprehensive, they have seen their rights respected and valued and gradually and increasingly have collaborated to help protect the lynx.

The project far exceeded expectations. Not only was it able to prevent further loss of the species in the two regions, but it even managed to increase the populations. The monitoring activities of the project revealed that numbers of individual lynx increased from around 60 to over 120 in Sierra Morena and from around 30 to over 40 in Doñana.

In addition to being recognised as one of the Best of the Best LIFE Nature projects, the project was also awarded a prize of €3 000 during the Natura 2000 Green Days. However, for Mr. Simon, "the greatest reward is when we find a new lynx in the wild."

The sustainability of this project has been all but guaranteed through the continued commitment of both the regional administration and a further successful application for LIFE funding. The new LIFE+ project (LIFE06 NAT/E/000209) will be working to reintroduce lynx bred in captivity into the wild; to link the currently separated population groups; and to increase the genetic diversity of the lynx in Doñana.

Project Number: LIFE02 NAT/E/008609

Title: Population recovery of Iberian Lynx in Andalusia

Beneficiary: Consejería de Medio Ambiente de la Junta de Andalucía

Total Budget: €9 285 000

LIFE Contribution: €3 900 000

Period: Jul-2002 to Jun-2006

Website: http://www.juntadeandalucia.es/medioambiente/contenidoExterno/LIFE_lince/infogeneral/introduccion.html

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Slovenia: Safeguarding the corncrake for the long-term

This LIFE Nature project implemented a 10-year management plan and innovative restoration and eco-tourism actions.

The corncrake (*Crex crex*) is part of the same family (*Rallidae*) as the moorhen, coot and rail, but, unlike most of its relatives, lives on dry land. *Crex crex* is a globally threatened species, classified as 'vulnerable' at both world and European level and listed in Annex I of the Birds Directive and Appendix II of the Bern Convention.

In Slovenia, a significant concentration of the species (c. 250 singing males) can be found in the area surrounding Lake Cerknica, in the flat fields of Ljubljansko barje and along the Nanošćica River.

Historically the three areas included large tracts of grassland, which were managed to provide fodder for livestock and hay for local farmers. However, traditional agriculture practices are no longer profitable and are being abandoned, with a consequent exodus from rural areas. Abandoned land eventually leads to the development of vegetation, that is too dense for corncrakes. In other areas, conversely, the intensification of agriculture, including a conversion to crop production, early grass mowing and the fertilisation of meadows, is also putting the species under threat.

The LIFE Nature "kosec" (*Crex crex*) project set out to create conservation tools to ensure the successful long-term protection of the corncrake in Slovenia and to speed up the country's adoption of the Birds Directive.

The project achieved good results. These included the elaboration of an Action Plan for Corncrake 2005-2015 and a National Corncrake Monitoring Scheme. Another significant output at the policy level was the introduction

of a new Agri-Environmental Scheme for the protection of the Corncrake and other endangered wet grassland birds in priority Natura 2000 sites. This scheme falls within the Rural Development Programme for the Republic of Slovenia 2007-2013 and was introduced in co-operation with the Ministry for Agriculture, Forestry and Food. The new scheme offers new incentives to farmers for corncrake habitat management in key Natura 2000 sites.

To increase the potential habitat for the corncrake, plots of land were leased or purchased in the three sites where the species is found. At Lake Cerknica, more land was acquired than had been anticipated at the beginning of the project. At Ljubljansko barje, while less land was purchased than expected, the total area of land (including leased land) was also larger than foreseen at the outset. Good practice recommendations for purchasing farm land from private landowners were drafted by the Municipality of Cerknica, a project partner.

An innovative bird friendly mowing technique was successfully tested during the project. After some initial reluctance from farmers, the technique was finally accepted and widely demonstrated in the project areas. In fact, the technique became a symbol of bird friendly grasslands management and was presented in a leaflet and brochure produced by the project.

A bird observatory was built at Ljubljansko barje using local and natural materials to integrate it into the wet grassland landscape in a sensitive and discrete fashion. The same design principles could now be applied to other visitor infrastructure within the Ljubljansko



Corncrake (*Crex crex*)

barje Landscape Park, which was established at the end of 2008.

Creating a long-term future for *Crex crex*

Excellent communication and co-operation was established with the responsible public institutions in the field of Agriculture and Rural Development and especially with advisory organisations for local farmers. This provides a good basis for the long-term management of the project areas, a fact reinforced by the beneficiary's after LIFE-conservation plan.

Project Number:

LIFE03 NAT/SLO/000077

Title: Establishing long-term protection of *Crex crex* in Slovenia

Beneficiary:

DOPPSBirdLife Slovenia

Total Budget: €809 000

LIFE Contribution: €607 000

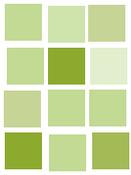
Period: Mar-2005 to Jun-2008

Website: www.life-kosec.org

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Belgium: pearl mussel restoration pays off

Pearl mussel numbers have greatly declined in Europe, and a LIFE project was launched to safeguard four populations in Belgium through habitat restoration and management.

Over the last century, more than 95% of the total number of pearl mussels (*Margaritifera margaritifera*) in Europe has disappeared. Within Belgium, only one large population (more than 1 000 individuals) and a few small populations can be found in the Rulles, Sûre, Vierre and Our basins.

The lifecycle of the pearl mussel is very complex: larvae reside in the gills of a trout (*Salmo trutta forma fario*) in order to change into small mussels. They then bury themselves in a substratum of the riverbed and remain there for several years. If the riverbed is choked with fine sediment, oxygen cannot reach the young buried mussels which then die. For this reason, the species is sensitive to livestock and forestry machinery entering streams, works to stabilise riverbanks and riverbed reprofiling, as this often releases large quantities of fine sediment into the water which settles downstream and blocks the circulation of the oxygen in the river bed. Larvae and young mussels are also affected by water pollution.

The LIFE project aimed to restore populations in four catchment areas in Belgium. It began by surveying a total of 289 km of rivers and streams – monitoring mussel numbers, brown trout populations, habitat types and valley bottoms. The University of Liege carried out two detailed studies of the quality of the sediment.

These efforts highlighted 600 problem areas. Based on these findings, the project then implemented a series of management initiatives to tackle the problems in key target areas, and solved the most urgent ones.



The project targeted the last population of water pearl mussels in Belgium

The project also took steps to improve the river banks and alluvial planes. It erected 76 km of fencing, constructed 10 wooden bridges and installed 119 drinking troughs to prevent damage to riverbanks, disruption of the riverbed and trampling of the mussels by livestock. This work was carried out with the full co-operation of 43 farmers in the target area.

Land purchase of some riverbanks was required to ensure optimal management of the habitats. The project bought 132 ha from more than 100 landowners (a further 43 ha was acquired through other sources of funding). Elsewhere, land-use agreements, co-financed by the Rural Development Regulation (1257/99) were proposed to farmers. The project convinced more than 80 landowners to remove some 70 ha of coniferous trees, which had gradually replaced original grasslands in the river basin. This opened the valley bottom and restored a network of humid meadows, which are much more effective at holding riverbanks together (preventing the release of fine sediment), provide organic particles to feed the mussels, and allow more light to reach aquatic fauna in the river. Deciduous forests were also restored across 16

ha of riverbank, providing shade to specific parts of the river and ensuring the cool temperatures needed by the mussels in the summer.

Following the project's initiatives the Walloon government approved an investment plan for water treatment stations that took into account the needs of the pearl mussel. This was the first time in Belgium that nature conservation objectives were a determining factor at such a level of water treatment policymaking.

Finally, conservation status was applied to more than 230 ha of the river basin, restricting land use and reminding anglers to avoid trampling on mussels. An essential element of the success of this project was the aligning of all actions in one overarching strategy that involved all the different sectors – local authorities, water authorities, anglers, farmers and forestry workers.

Project Number:

LIFE02 NAT/B/008590

Title: Conservation of habitats of pearl mussels in Belgium

Beneficiary: Ministère de la Région Wallonne represented by the Centre de Recherche de la Nature, des Forêts et du Bois

Total Budget: €2 323 000

LIFE Contribution: €1 161 000

Period: Sept-2002 to Aug-2007

Website:

<http://biodiversite.wallonie.be/offh/lifemp/>

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Portugal: The lesser kestrel flies again

The LIFE Nature Peneireiro project in Portugal took steps to reverse the decline of *Falco naumanni*.

The lesser kestrel (*Falco naumanni*) has undergone severe population decline, in particular during the second half of the twentieth century. This bird – the male of the species has a distinctive grey head – makes its home in old buildings, and forages for food in the farmland that surrounds small towns and villages, especially in Greece, Italy, Portugal and Spain. It has been threatened both by loss of nesting sites as old buildings have been renovated, and by loss of feeding areas as farming practices have changed, for example by reductions in cereal crops.

In Portugal, where the LIFE Nature Peneireiro project took place (LIFE02 NAT/P/008481) only 31 known breeding colonies of this once widespread bird remained at the turn of the century, almost all in the southern Alentejo region. The project beneficiary, the *Liga para a Protecção da Natureza*, sought to build on previous initiatives to improve the prospects of the lesser kestrel in three Special Protection Areas (SPAs) in Alentejo: Castro Verde, Vale do Guadiana and Campo Maior.

The project's main aims were: to increase the number of sites that could be used for nesting by the lesser kestrel; to improve its foraging habitats; to monitor progress; and to build conservation of the species into long-term management plans covering the protected sites. In particular, the beneficiary wanted to

Lesser kestrel occupying a new nest site



Photo: Rui Cunha

define agro-environmental schemes for the management of the targeted SPAs, because it recognised that extensive agriculture is vital to the survival of the lesser kestrel.

New nesting sites

A number of measures were put in place to meet these aims. For six *Falco naumanni* colonies, walls were repaired in buildings that offered potential nesting sites, new holes were opened and nest boxes and clay pots were made available. A total of seven new breeding structures, known as breeding walls, were built in specified areas where suitable foraging habitat was available in the Castro Verde and Vale do Guadiana SPAs. These walls had 424 new nests. Over the four years of the project, a total of 817 new breeding sites were made available, involving 615 nesting cavities in walls, 120 nest-boxes and 82 clay pots. For this, the contribution of owners of buildings throughout the target areas was essential.

To make foraging areas more suitable for the species, agreements with farmers were signed so as to increase the foraging areas near lesser kestrel colonies. To reverse land abandonment in Vale do Guadiana SPA, 199 ha of cereal crops were sown in areas around the colonies between 2003 and 2006. The beneficiary also worked to improve the management of its own lands (covering 1 700 ha in Castro Verde SPA) to be more kestrel-friendly.

Importantly, in Castro Verde, agro-environmental planning was built into zonal plans, and these in turn were incorporated in the Portuguese Rural Development Programme (2007-2013). Thanks

to this, it will be possible to assure the long-term conservation and protection of the lesser kestrel foraging habitats in the region.

Good results

The results of the project were encouraging. Management plans were finalised for 18 lesser kestrel colonies, and during the period of the project, the population of the bird increased so that, by the project's close, there were some 445 pairs breeding in 55 colonies – a 54% increase on 2001. Care was also taken to rescue young birds that fell from the nest and to release these back into the wild. The increases can largely be explained by success in the Castro Verde SPA, where the most comprehensive measures were put in place; results in the other SPAs covered by the project were less clear-cut. Nevertheless, the Castro Verde success showed that such a thorough approach to breeding site and foraging habitat management can have important conservation benefits.

Project Number:

LIFE02 NAT/P/008481

Title: Peneireiro – Re-establishment of the Lesser Kestrel (*Falco naumanni*) in Portugal

Beneficiary:

Liga para a Protecção da Natureza

Total Budget: €832 000

LIFE Contribution: €624 000

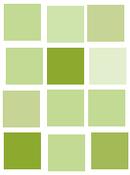
Period: Feb-2002 to Sep-2006

Website: <http://www.lpn.pt>

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Portugal: Zino's petrel - flying high

The Freira da Madeira LIFE Nature project raised the conservation status of a rare sea bird species from critically endangered to endangered.

In the 1960s, Zino's petrel (*Pterodroma madeira*), a species native to the Portuguese island of Madeira, was thought to be extinct. In 1969, however, a local ornithologist, P.A. Zino, found breeding ledges in the island's high central massif, and the species was put under observation. Work during the 1980s and 1990s improved the prospects of the species, despite setbacks, such as the killing of 10 of the birds by cats on one ledge in July 1991. But the species remained critically endangered, with a world population of 30-40 breeding pairs by 2000.



Photo: Filipe Viveiros

Zino's petrel (*Pterodroma madeira*) only breeds on Madeira island, Portugal

The LIFE Nature Freira da Madeira project (**LIFE00 NAT/P/007097**) set out to take further steps to safeguard the species. The project, carried out by the public authority of the Parque Natural da Madeira, concentrated on Madeira's Maciço Montanhoso Oriental (eastern mountain massif), which hosts all the known nesting sites of Zino's petrel. But measures were also taken in the Laurissilva of Madeira, an area of humid laurel forest. This area was thought to be the source of one of the main threats to Zino's petrel – black rats. Feral cats also represented a threat to the bird, as did pillaging of eggs by collectors, and uncontrolled tourism.

A management plan was therefore needed. The objective was to buy 320 ha of land, including the central part of the nesting area of Zino's petrel, and to implement measures such as cat and rat control and more surveillance. The project also set out to remove livestock from the bird's breeding areas, as grazing had led to soil erosion and general degradation of the local environment.

The project also planned to carry out surveys to improve the biologi-

cal knowledge of Zino's petrel and its relationship with its environment. In parallel, an awareness-raising campaign helped to spread information about the project's actions and thus enable the local population and visitors to understand the importance of preserving such an endangered species, which is unique to Madeira. This campaign also promoted the presence of Zino's petrel as a tourist asset for the area.

The project successfully carried out the planned activities, including having to go to court to acquire some of the land for which conservation measures were planned. A monitoring network for the study of fauna and flora was put in place, and a wide and comprehensive management programme was introduced. Two sites, the Maciço Montanhoso Oriental and the Floresta Laurissilva, were incorporated into the Natura 2000 network. This designation for these sites means they must be more carefully managed in the future.

The main achievement of the project was that during its course, the known population of Zino's petrel effectively doubled from 30-40 to 65-80 breeding

pairs. The increase was mainly due to discoveries of new nests, but management actions carried out by the project also played an important role. Taken together, the project's actions helped raise the species' conservation status from 'critically endangered' to 'endangered' on the International Union for Conservation of Nature's (IUCN) Red List. According to this, 53 out of 63 nests surveyed during the 2006 breeding season were found to be active. Ongoing surveys may yet reveal more breeding sites.

Project Number:

LIFE00 NAT/P/007097

Title: Conservation of Zino's Petrel through restoration of its habitat

Beneficiary: Parque Natural da Madeira

Total Budget: €1 697 000

LIFE Contribution: €1 188 000

Period: Apr-2001 to Apr-2006

Website:

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Greece: LIFE finds Eleonora's falcon in better health than thought

This Greek LIFE Nature project significantly improved both knowledge and awareness of the Eleonora's falcon, and by proving that its population numbers had been seriously underestimated in the past, allowed a more optimistic assessment of its European and national conservation status.

The majestic Eleonora's falcon (*Falco eleonora*), is a migratory bird, which winters in Madagascar and other islands in the Indian Ocean. Uniquely, it breeds during late summer on remote Mediterranean islands, mainly in Greece, but also in smaller numbers in Spain, Italy and the rest of Mediterranean countries, from Cyprus to Morocco. This unusually late breeding period is timed to coincide with the autumn migration of small passerine birds from Europe to Africa, an important source of proteins the falcon feeds to its nestlings.



Photo: HOS

Eleonora's falcon (Falco eleonora)

In Greece, where the project took place, the species population was estimated at only 4 500 pairs in 2003 (project start). The main threats identified were predation of eggs and chicks by invasive species such as rats, human disturbance of breeding colonies, and habitat degradation.

The project's main aim was to implement the prescriptions of the International Species Action Plan, to secure in the long-term a favourable conservation status for the Eleonora's falcon in Greece and the Mediterranean region. It focused its actions on nine Special Protection Areas (SPAs) around Crete and other Aegean islands. The areas host the most important colonies of the species in Greece, accounting for approximately 35% of the world population.

A first in species monitoring

A number of measures were put in place to meet these aims. The first complete colony survey, to estimate and map the breeding distribution of

the species worldwide, was carried out in collaboration with the RSPB and Mediterranean Birdlife partners. This was the first time such a detailed effort had been conducted for the species, using a common methodology for all countries concerned. The results have been stored in a GIS, to provide the baseline for any future species monitoring. As a result of the survey, the estimated Greek population of the species was revised upwards by almost 300% (to more than 12 000 pairs), and consequently the global estimate was doubled (>15 000 pairs). Combined with monitoring of breeding at selected colonies, the survey also provided valuable information on the negative impacts on breeding, caused by invasive predators such as rats, certain agrochemicals and, in some cases, disturbance caused by tourism.

Measures to reduce these impacts were introduced. For example, the eradication of rats (a predator causing more than 40% egg losses in specific colonies), a conservation measure applied for the first time in Greece, was

carried out on five islets in the Northern Sporades. Rainwater collectors to allow the birds to bathe and water were built or renovated in key locations on the islands of Antikythera and Dia. A national wardening plan was put in place to monitor colonies, and to help reduce human disturbance.

A number of communication activities helped in raising public awareness and appreciation of the species. These included leaflets, educational materials (distributed to more than 100 schools), a documentary and a book on Eleonora's falcon in Greek and English.

Finally, a global network has been established for the collection and exchange of information on the species' conservation. This is an extremely valuable tool for the co-ordination of decision-making processes related to the conservation of Eleonora's falcon.

Project Number:

LIFE03 NAT/GR/000091

Title: Conservation measures of *Falco eleonora* in Greece

Beneficiary:

Hellenic Ornithological Society/
BirdLife Greece

Total Budget: €1 160 000

LIFE Contribution: €870 000

Period: Mar-2003 to Oct-2007

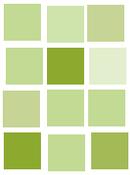
Website:

www.ornithologiki.gr/life/falcoel

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Greece: Reducing turtle mortality rates at sea

ARCHELON, the Sea Turtle Protection Society of Greece, has carried out several LIFE Nature projects, the last focusing on reducing the mortality rate of the loggerhead turtle (*Caretta caretta*). This project expanded the work of the Sea Turtle Stranding Network, as well as upgrading facilities at the beneficiary's rescue centre and working with fishermen's associations to raise awareness.

A major problem for loggerhead turtles is that they can accidentally get caught in fishing nets and on hooks. While the scale of the problem can only be estimated, some 17 000 small vessels (6-12 m long), 380 pelagic longliners and 400 trawlers operate in Greek waters, and many captures are estimated to take place each year, resulting in direct and indirect turtle mortalities.

One of the problems that the beneficiary encountered was intentional killings by fishermen because i) turtles have damaged their equipment; ii) they think turtles deplete fish stocks; or iii) turtles are believed to bring bad luck. During the course of the project, the attitudes of 285 fishermen were documented, and 25 Memoranda of Understanding were signed with fishermen's associations. The beneficiary also responded to the concerns and needs of the fishermen – turtles can cause damage to their gear – by producing leaflets and DVDs that tell them what to do if they capture a turtle.

Injured turtle recovering at the Glyfada rescue centre



Photo: Jon Eldridge

The LIFE project focused on areas where most turtle strandings occur. By identifying hotspots in Crete, Western Greece, Messiniakos Bay, Argolikos Bay, Rhodes and Kavala, the beneficiary was able to concentrate activities in those areas. Two 'first-aid' centres for injured turtles were set up in affected areas – Crete and Amvrakikos Bay in Western Greece.

Rehabilitation

Injured turtles are brought to ARCHELON's rescue centre at Glyfada, south of Athens, for rehabilitation. During the project 163 wounded turtles were admitted, with nearly half being later released into the sea. "Head wounds are most difficult to heal, but though it may take a long while – the longest we've had is five years – most have a chance of recovery," says project manager, Aiki Panagopoulou. Costly procedures, such as blood analysis, are conducted externally, however, as the beneficiary sees little benefit in carrying out such actions onsite.

Everyday work at the rescue centre, which was set up in 1994, is handled by a team of international volunteers numbering from four to eight at any one time. Recent LIFE funding has allowed the centre to construct large outdoor tanks for the turtles, though during the winter the turtles are mostly housed in smaller tanks inside a greenhouse-type structure to maintain the required water temperature. LIFE funding also paid for a back-up electricity generator and the installation of new pumping and filtering systems.

Turtles are released in spring to maximise their chance of rehabilitation, but it appears not all turtles re-adapt to life back in the sea. Some spend too much time on the surface of the water, a practice known as basking, and a specific aim of the project was to introduce tracking of released turtles with satellite telemetry and tagging to assess their progress. The rescue centre is also a popular spot for school visits. As part of the latest project, the beneficiary added a new seminar area with A/V equipment and created a mobile exhibition and educational materials for schools that cannot visit the centre.

The beneficiary is now planning to build up a cooperative network with Croatia and Italy in order to share information and best practice. "The Adriatic Sea is responsible for a significant number of turtle captures," explains Panagopoulou.

Project Number:
LIFE02 NAT/GR/008500

Title: Reduction of mortality of *Caretta caretta* in the Greek seas

Beneficiary: Archelon

Total Budget: €1 477 000

LIFE Contribution: €886 000

Period: July-2002 to April-2008

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<http://www.archelon.gr>

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Hungary: Giving LIFE to the Hungarian meadow viper

LIFE Nature has given the Hungarian meadow viper an important boost. This project has taken key steps towards the long-term conservation of the most endangered snake in Europe.



Photo: Bálint Halpern

Hungarian meadow viper (Vipera ursinii rakosiensis)

The “puszta” plains south of Budapest conceal a rare and endangered species: they are one of only three remaining locations in the world (in two European countries) where the Hungarian meadow viper may be found. The global population of *Vipera ursinii rakosiensis* is estimated to be around 500 individuals and restricted to three populations: one in Romania (only discovered in 2002) and the other two in Hungary. This subspecies was formerly widespread on the Hungarian Plain and, as recently as the 1950s, it was still very common. Today, however, the Hungarian Meadow Viper can only be found in two main areas:

- Hanság, close to the Austrian border, where the meadow viper populations are restricted to small patches of grasslands left over from intense conversion to agriculture and forestry on an enormous scale.
- Kiskunság, south of Budapest, where the remaining populations of

V. ursinii rakosiensis survive in an area of highly fragmented lowland habitats (post-glacial sand dunes and meadow-steppe grasslands-puszta) in the Kiskunság National Park.

In 2004, the Hungarian Ornithological and Nature Conservation Society (MME Birdlife Hungary), together with Kiskunság National Park Directorate and Duna-Ipoly National Park Directorate set in motion a LIFE project with the short-term objective of preventing the extinction of the Hungarian meadow viper and the long-term objective of securing the conservation of this small venomous snake. The project consisted of several actions, with the main ones being:

- The creation and operation of a Hungarian Meadow Viper Conservation Centre;
- Viper surveys on potential and former sites and habitat monitoring and genetic studies;
- Grasslands habitat restoration by

- reconversion of previous forested areas into viper suitable habitats;
- Public awareness campaigns.

Viper conservation centre

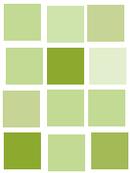
The need for the implementation of a captive breeding centre was initially raised in the 1990s, when the continuous decline in numbers of meadow vipers was first observed. The main objective of the Hungarian Meadow Viper Conservation Centre is to breed vipers collected from threatened populations and at a later stage to reintroduce them to the wild in suitable habitats and secured areas.

The conservation centre was established in 2004 on the site of an old farm owned by Kiskunság National Park. The project beneficiary is now responsible for running the centre.

The viper breeding programme started in 2004 with 10 adult vipers, collected from four different populations in Kiskunság National Park. The breeding pairs were kept inside 3x3 m wired enclosures where they were able to breed in conditions replicating semi-natural viper grassland habitat.

In order to reduce the possibilities of inbreeding depression, genetic screening of all the individuals was implemented by the project. Thanks to genetic methods it was possible to identify the ancestors of newborn individuals, thus allowing the creation of larger breeding groups while still keeping control over breeding line-





Viper enclosures in the captive breeding centre

ages. Moreover, the project established a viper identification methodology using photographs of each viper's head – the scales and markings are unique to each individual.

At the breeding centre, a higher percentage of newborn vipers and juveniles

reach maturity than in the wild thanks to a steady supply of crickets to feed on and a lack of predators.

The project also developed an artificial ceramic burrow that can serve as a hiding and wintering place for vipers. Most of the juveniles are kept and fed

in temperature controlled rooms over winter. This accelerates the growing process by up to one year compared with juveniles that winter in burrows in the enclosures.

Successful captive breeding took place every year for the duration of the LIFE project. As of end 2008, the centre had 388 Hungarian meadow vipers. The centre also provided an opportunity to increase knowledge about the reproduction, behaviour and ecology of this shy species. Veterinary support – and crickets as food for the vipers – came from Budapest Zoo.

Snake census

The project monitored and surveyed the wild meadow viper populations in Hungary and Romania in order to assess the species' conservation status and to find new populations. In 2007, together with the beneficiary of the Romanian LIFE project - **LIFE05 NAT/RO/000158** - a monitoring programme was started for the Transylvanian viper populations. All monitored individual were measured and

The meadow viper

Vipera ursinii is a post-glacial relic species that occurs as a series of isolated populations in restricted areas of southern and central Europe. This viper is the smallest of the European vipers and rarely exceeds 60 cm. Although venomous, it is virtually harmless to humans. The subspecies are all morphologically similar and have the typical viper-like appearance (triangular head) and a dorsal zigzag and other dark markings on a lighter background. Meadow viper populations are very highly fragmented and are confined to two distinctly different habitat types – three of the five currently recognised subspecies are only found in mountain habitats, while the other two subspecies prefer lowland steppe grassland (see distribution map). All five subspecies have been suffering severe declines, which have been very significant for the lowland steppe subspecies (Hungarian meadow viper subsp. *rakosiensis*) already resulting in the extinction of the species in Austria. Hence this subspecies is now considered to be one of the most endangered snakes in Europe. The decline of the species has largely been caused by direct habitat destruction and fragmentation. Lowland populations in particular have suffered huge losses through agricultural reclamation of their steppe grassland habitats and now some small isolated populations show evidence of loss of genetic diversity and severe inbreeding. Moreover, these snakes suffer from illegal collection and persecution.



The meadow viper has been targeted by several LIFE projects: the *V.ursinii* by a French project (**LIFE06 NAT/F/000143**), the *moldavica* subspecies by a Romanian project (**LIFE99 NAT/RO/006404**), and the *rakosiensis* subspecies by projects in Hungary (**LIFE04 NAT/HU/000116**) and Romania (**LIFE05 NAT/RO/000158**).



Photo: João Pedro Silva

Juvenile viper in terrariums with warning lamps

photographed for future identification. Blood samples were collected to enable genetic screening and consequent assessment of the genetic “health” of the wild population. This also enables accurate geographic delimitation of *rakosinensis* subspecies populations from other *V. ursinii* subspecies populations, especially those found in potential contact zones such as the Danube delta (which belong to the *moldavica* subspecies).

Grassland restoration

With the support of volunteers, the LIFE project restored to grasslands a 26 ha area of forest that divided two recent viper habitats in the Peszéradacs area. False acacia and pine forests had been planted on this land in the early 1980s, destroying important viper wintering places. In the restored areas it is now possible to observe patches of grassland similar to neighbouring natural grassland. The beneficiary hopes that this restoration action will enable the reconnection of the two divided viper subpopulations.

Combating fear and ignorance

Raising awareness for the conservation of a reptile, especially a venomous

snake, is not easy. The project undertook a series of activities to increase acceptance and involve the local population and academia in the species conservation programme. Dissemination activities included the publication of brochures, leaflets and press releases, the setting up of a regularly updated website and public forums and educational presentations.

The project also shared knowledge and conservation methodologies with other LIFE projects targeting *V. ursinii*.

The future - viper reintroduction

The success of the captive breeding programme gives a sound base for reintroduction of vipers into the wild. As a result, MME/ BirdLife Hungary together with Austrian partners proposed a LIFE+ project - Conservation of Hungarian meadow viper (*Vipera ursinii rakosiensis*) in the Carpathian-basin (LIFE07 NAT/H/000322) - that started in 2009. The aim of this project is to release at least 400 vipers back into natural habitats, while also carrying out larger scale habitat restoration and conducting a major public awareness campaign to reduce concerns

about the risks of reintroducing venomous snakes. The reintroductions are planned for Hungary, with a further aim of identifying options for future introduction of the species into Romania and Austrian areas, where it became extinct last century. Budapest Zoo and Vienna Zoo will partner with the project to boost public support for its actions and a documentary will be produced to increase understanding about the species among a wide audience.

Project Number:

LIFE04 NAT/HU/000116

Title: Establishing the background of saving the Hungarian meadow viper (*Vipera ursinii rakosiensis*) from extinction

Beneficiary:

MME/ BirdLife Hungary

Total Budget: €649 000

LIFE Contribution: €324 500

Period: Jan-2004 to Dec-2007

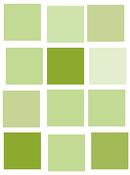
Website:

www.rakosivipera.hu

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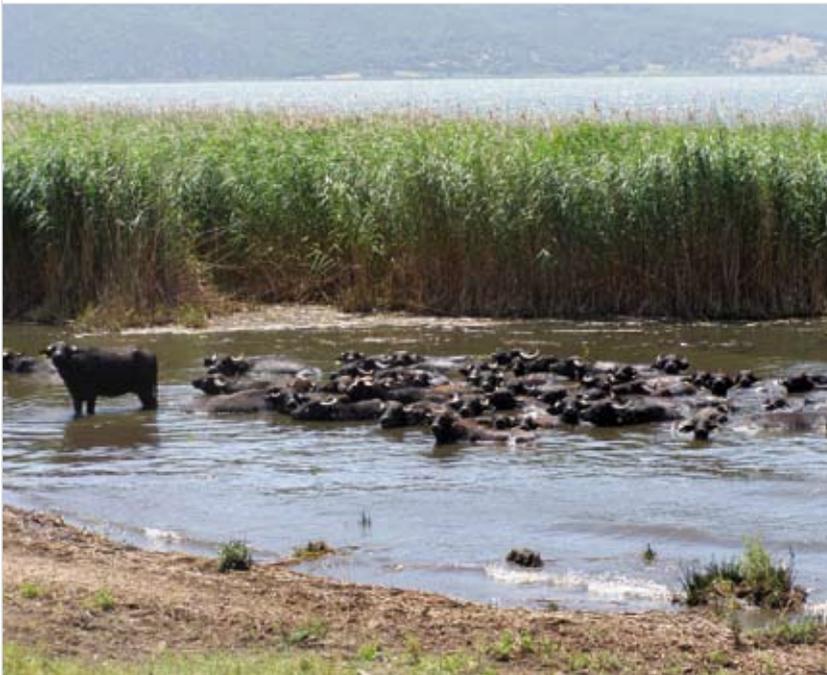
Wetlands

The Habitats and Birds Directives and the Water Framework Directive (WFD) are the main pieces of legislation assuring 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 the future conservation and sustainable use of these important ecosystems.

The LIFE programme has supported many projects whose actions have targeted wetland area within the Natura 2000 network. The following pages present a number of successful projects that have been selected as best practice examples on managing and/or restoring wetland habitats around the EU.

Greece: Buffalo restore wetlands, bring back birds

This LIFE Nature project used water buffalo and cattle grazing, as well as summer cutting of vegetation, to restore wetlands within the Greek part of a transboundary park that straddles Greece, Albania and the Former Yugoslav Republic of Macedonia. In doing so, it has helped to protect Dalmatian pelicans and one of Europe's largest colonies of pygmy cormorants.



In Prespa, buffalo grazing is the most effective method for the re-creation of wet meadows

commercially important carp (*Cyprinus carpio*) - and breeding grounds for amphibians. At the same time they are the feeding grounds for multiple species of rare waterbirds.

However, the lack of vegetation management since the mid-1980s resulted in a reduction of the surface area of wet meadows and the expansion of reedbeds, which has directly affected breeding waterbird populations. As a result, two waterbird species stopped nesting in the area (glossy ibis and spoonbill) and others remained in low population numbers for several years (e.g. herons and pygmy cormorants). Moreover, inadequate water level management affected the level of inundation of the wet meadows each spring. It also threatened the bean harvest around the lake shore because of a shortage of irrigation water in summer in dry years and flooding in spring in wet years.

In 1991, the Society for the Protection of Prespa (SPP) was established with the primary objectives of restoration of the wet meadows and the management of the water level. Despite comprehensive research and pilot actions, by 2000, less than 33 ha of the original wet meadows area remained, as inhabitants abandoned their traditional activities. A range of waterbirds stopped nesting there and other species, such as the pelicans and cormorants, faced direct or indirect threats. Meanwhile, fish popu-

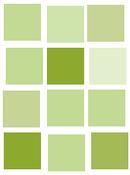
In a little corner of the Balkans – or, rather, three corners – the triple border of Greece, Albania and the Former Yugoslav Republic of Macedonia – lies the Transboundary Prespa Park, the first transboundary area in the region to receive protected status. The lakes in the park, Mikri Prespa and Megali Prespa, are two of the oldest water bodies in Europe. Lake Mikri Prespa is a site of particular importance within the park, being home to the world's largest breeding colony of Dalmatian pelicans (*Pelecanus crispus*). The lake is also host to one of Europe's largest colonies of pygmy cormorants (*Phalacrocorax pygmaeus*) with around 600 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, Lake Mikri Prespa 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.

Mikri's Prespa wet meadows are shallow areas with low-lying vegetation that are inundated each spring. These wet meadows, which are home to a host of aquatic organisms, serve as the key spawning grounds for endemic fish species -Prespa roach (*Rutilus prespensis*), Prespa bleak (*Alburnus belvica*) and Prespa nase (*Chondrostoma prespense*), and the





Project co-ordinator Yannis Kazoglou in a restored wet meadow area

lations of species spawning on wet meadows – including carp – continued to decline.

LIFE to the rescue

In July 2002, with funding from LIFE, the beneficiary (SPP) launched a project to oversee the restoration of much of the wet meadows, as well as the implementation of a long-term integrated management strategy for Lake Mikri Prespa. (Various attempts had already been made to manage and protect the region, including an ACNAT project for the Dalmatian pelican, and a LIFE Nature project - **LIFE96 NAT/GR/003217** - for the pygmy cormorant and the lesser white-fronted goose [*Anser erythropus*]).

The new project aimed to improve the conservation status of the Dalmatian pelican and the pygmy cormorant, but the activities also directly benefitted at least 18 other species covered by the Birds Directive. The main project actions 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 gate at Koula. The sluice simply drained the overflow water from Mikri into Megali in order to avoid flooding of the littoral agricultural areas and retain water for irrigation. However, this mechanism didn't take into account the demands of ecological protection, as well as the real needs of the farmers' fields. Following a series of local stakeholder consultations and hydrological, environmental and technical studies, a new, modern sluice was built and began operating in spring 2005.

Thanks to the new sluice gate, since 2005, lake water levels can be main-

tained at relatively high levels in spring, thus efficiently flooding wet meadow areas. In turn, this evolution has supported the return of rare waterbird species, including the Annex I-listed glossy ibis (*Plegadis falcinellus*), which has been observed nesting in Mikri Prespa for the first time since the 1970s.

Today the responsibility for managing the sluice gate lies with a special committee of the Management Body of the Prespa National Forest, consisting of all the relevant stakeholders, including the Municipality of Prespa, the local farmers' association and the SPP.

Wet meadow restoration

Prior to the LIFE project, dense reed beds predominated along the lake's shore, occupying wet meadow areas. Every summer from 2002 onwards, the reedbed vegetation was cut down in shallow areas near the lake at nine littoral sites by project participants and local inhabitants. This created 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 six littoral sites. According to the project's monitoring data, buffalo grazing is the most effective method for the re-creation of wet meadows. This grazer selectively eats the reed sprouts as well as other plant species leaving the space for typical wet meadow vegetation to grow. It is also able to enter shallow water creating patches of free water and vegetation, something that is very important for birds, in particular the Pygmy cormorant.

The success of the grazing activities can be measured by the fact that the area of wet meadows at Lake Mikri Prespa increased from 33 ha at the start of the project to some 100 ha by its conclusion. The buffalo herd also



Dalmatian pelicans

expanded: from an initial 20 animals to 70 by 2006.

During winter, the buffalo's diet is based on hay bales made from the reeds and other vegetation cut during the summer months at the project sites. These bales are shared between the beneficiary and local stock-breeders. It is notable that the vegetation at the littoral sites has improved over the years, shifting from high, species-poor helophytic vegetation to diverse meadow vegetation of higher nutritional value as fodder, a fact that has been appreciated by local cattle breeders. Beyond this, the cut reeds are occasionally used locally to thatch 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 was estimated at 1 100. The lake also hosts the largest colony of Pygmy cormorants in the European Union, ranging between 540 and 710 breeding pairs.

Furthermore, populations of more than 20 other waterbird species have also benefitted. Beyond this, populations of fish and other aquatic organisms have directly benefitted from the expansion of the total surface area of the wet meadows, including the commercial carp, which is highly valued by local fishermen and visiting anglers.

Life after LIFE: management plan and transboundary cooperation

To build on the success of the restoration actions, a management guide was developed in the final year of the Lake Mikri Prespa project to be used by the competent authorities of the area after LIFE. This valuable tool establishes guidelines for:

- Sustainable water and vegetation management in the lake;
- Scientific monitoring of bird species and vegetation in managed areas;

- Definition of land-uses in directly affected littoral areas and the sustainable management of these areas;
- Organisation of institutional measures and actions for long-term wetland management, taking into consideration the ecological balance of the lake and the social and economic development of the area.

Since the Mikri Prespa/Megali Prespa lake system is shared between Greece, Albania and FYROM, the three countries must work together to effectively protect the area. Previous major collaborative efforts, as well as the experience and results gathered by the LIFE project, have laid the groundwork for the transfer of knowledge from Greece to the neighbouring countries and directly led to the proposal of a project on Integrated Ecosystem Management in the Prespa Lakes Basin of Albania, FYR-Macedonia and Greece. This project is currently running and is financed primarily by the Global Environment Facility (GEF)/UNEP, and is jointly managed by UNDP country offices in FYROM and Albania in partnership with the Ministries of Environment in both countries, while local NGOs and other authorities support its actions on all three sides of Prespa.

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)

Total Budget: €1 863 000

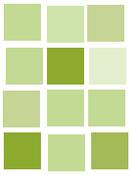
LIFE Contribution: €1 118 000

Period: Jul-2002 to Jun-2006

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

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Finland: Cutting and grazing restores coastal habitats for waders

This LIFE Nature project restored 12 Natura 2000 sites by cutting overgrown reed beds and reintroducing grazing with the support of the local population and farmers.

Every spring and autumn, large numbers of birds migrate through the Gulf of Finland, stopping to rest or feed, and sometimes to breed in the area. The wetlands in the northern coastal areas of the gulf are home to a wide range of species and habitats, which are dependent on the regular natural flooding of the brackish Baltic waters. These Boreal Baltic coastal meadows, which are considered priority for conservation under Annex I of the Habitats

Directive, are characterised by low-growing plant communities in the shore zone.

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 becoming increasingly overgrown because of the disappearance of the grazing activities and increased nutrient levels. In some places, the process is so advanced that trees and bushes have started to encroach, further accelerating the deterioration of these important wetlands.

The LIFE Nature Gulf of Finland project focused 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 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.



These coastal meadows were restored by mowing

They are also important habitats for many plant and insect species mentioned in the Habitats Directive. A large part of the population of the large white-faced darter dragonfly (*Leucorrhinia pectoralis*) not only in Finland, but also within the entire Natura 2000 network, lives within the project areas.

Increasing habitat diversity

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 including local municipalities and other interest groups. Project activities included the

Mowing on wet soil with a double wheel tractor





Mowed area and restored ponds for dragonflies

development of management plans for Natura 2000 sites in close consultation with experts, local inhabitants and landowners. By involving all these different stakeholders, the project sought to resolve potential or existing conflicts between conservation and other land uses.

Restoration of the coastal wetlands required that reed beds, trees and bushes were cleared. Two innovations from other Finnish LIFE projects were adapted for this purpose: crushing and rotoation 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 that cut roadside vegetation. The crusher can be fixed to a tractor or, on softer and wetter ground to an all-terrain tracked articulated vehicle. The crushed material is left in the soil, pro-

viding nutrients that promote further growth and lead 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 was necessary. The surface soil was rotoated to a depth of 10-20 cm, impeding growth in subsequent years. Altogether, 161 ha of coastal meadows were cleared during the project.

Cattle and horses good for waders

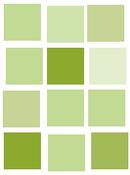
After cutting, cattle and sometimes horses were introduced in order to keep the vegetation short, avoiding the need for further cutting in most parts of the meadows and thus maintaining favourable conditions for bird species.

Agreements between farmers and the public land manager, Metsähallitus (a project partner), allowed for the establishment of 177 ha 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 the success of breeding. Therefore, the project promoters, in co-operation 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.

After cutting grazing, was introduced to keep vegetation short for the benefit of waders





Specially adapted machines were used to help restore the coastal reedbeds

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.

Extensive monitoring has been conducted to assess the effects of the project actions. This began with a bird census in the autumn of 2003 and spring of 2004. A second survey was conducted after the LIFE project was completed, in the autumn of 2006 and spring of 2007. It was found that 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. The new pools were also monitored for the presence of insects – especially the dragonfly (*Leucorrhinia pectoralis*).

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 included 35 information boards, six nature trails and the construction of 14 towers for bird-watching. Guidebooks and cards about wetland species were produced for use by teachers in the classroom or on field trips.

The project successfully enhanced 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 and encouraging them to apply for agri-environmental support. Several restored areas are already being 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

Total Budget: €3 290 000

LIFE Contribution: €1 645 000

Period: Jul-2003 to Jun-2007

Website:
www.ymparisto.fi/lintulahdetlife

Contact: Ilpo Huolman

UK: Blanket bog conservation on a grand scale

Located in northern Scotland, this partnership project brought together conservation bodies and government agencies for the restoration of priority areas of damaged peatland on a grand scale – over 18 000 hectares.

The Caithness and Sutherland Peatlands are the largest and most intact areas of active blanket bog found in the United Kingdom, and one of the largest in Europe. Covering more than 140 000 ha, the Natura 2000 site is both an SCI (site of Community importance) under the Habitats Directive, and an SPA (special protection area) under the Birds Directive, in view of the value of the priority habitat for a diverse range of Annex I birds, such as the red-throated diver (*Gavia stellata*) and the golden plover (*Pluvialis apricaria*).

Much of the blanket bog remains in good condition. However, parts have been seriously damaged by various management practices. Hill drainage and commercial forestry have particularly affected this fragile ecosystem, causing both direct loss of habitat, as well as increasingly impacting on adjacent unplanted areas through encroachment by exotic plantation species and hydrological changes.

Building on the initial results of an earlier 1994-98 LIFE Nature project in Scotland and Ireland, the aim of this project was to substantially enlarge the area of restored blanket bog – targeting the restoration of 18 300 ha of the key areas around the Natura 2000 site. It would also devise a land use strategy for the long-term sustainable management of the site, in co-operation with the principal stakeholders – the Forestry Commission and private landowners, conservation NGOs, tourists and the local community.

The project was led by the Royal Society for the Protection of Birds (RSPB) the



The project benefited more than 16 000 ha of blanket bog in total

project beneficiary, in partnership with the forestry authorities, Scottish Natural Heritage and Plantlife Scotland.

Restoration efforts

The main restoration efforts included blocking drains on the blanket bog and afforested peatland, and removing trees from the blanket bog. Almost 4 000 ha of peatland was also purchased, including 1 556 ha of active blanket bog within the SAC, while other actions were carried out on privately-owned land. A range of public-awareness raising activities were also carried out to ensure the continuation of support built up among local landowners and communities by the earlier LIFE Nature project, and to encourage more people to visit this unique, but remote, part of the world

The project was very successful. The blocking of drains has benefited the condition of more than 16 000 ha of the blanket bog. The project also removed commercial forestry from over 1 500 ha of land that was previously blanket bog.

A key achievement was the development of a management plan for the area until 2015. This aspect of the project, led by Scottish Natural Heritage, will help to ensure the long-term sustainable management of the peatlands. The 'Peatlands Partnership' will work to combine the project's conservation aims with the economic objectives of local stakeholders.

Project Number:

LIFE00 NAT/UK/007075

Title: Restoring active blanket bog of European importance in North Scotland

Beneficiary:

Royal Society for the Protection of Birds (RSPB)

Total Budget: €4 548 000

LIFE Contribution: €2 729 000

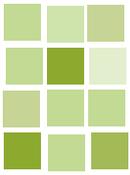
Period: Mar-2001 to Dec-2006

Website:

www.lifepeatlandsproject.com

Contact: Stuart Housden

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Finland: Bringing LIFE to the wilderness

The Finnish LIFE project Olvassuo improved the conservation status of peatland and forest biotopes unique in Europe. It was particularly successful in restoring natural wilderness habitats affected by human intervention at the same time as developing nature-based tourism in the area.

The natural mosaic-like variation of the aapa mire wilderness in the Oulu region of Central Finland does not exist on such a scale anywhere else in Europe. It provides crucial bird nesting areas and the last natural wilderness area south of the Arctic Circle in Europe for aapa mires, boreal virgin forests and bog woodlands.

The fauna of the area includes the flying squirrel (*Pteromys volans*), bear (*Ursus arctos*), wolf (*Canis lupus*), lynx (*Lynx lynx*) and otter (*Lutra lutra*). Nesting birds include five pairs of red-throated divers (*Gavia stellata*), 20 pairs of swans (*Cygnus*), 160 individual hazel hens (*Bonasa bonasia*), 100 wood grouse (*Tetrao urogallus*), 100 cranes (*Grus*) and more than 300 pairs of ruffs (*Philo-machus pugnax*).

However, these habitats are under threat from drainage of the mires, fragmentation of virgin forests, forestry roads and traffic, and uninformed public use.

The LIFE Nature Olvassuo project targeted restoration of natural biotopes in three extensive areas covering more than 60 000 ha at Olvassuo, Litokaira and Iso-Tilansuo-Housusuo. Some 80% of this area consists of priority habitats: aapa mires (65%); virgin forests; raised bogs; and bog woodlands.

Surveys, plans and restoration actions

The project conducted detailed surveys of vegetation, aphyllophorus fungi and bird populations in the target areas to supplement an inventory

of the existing data on the area and its land-use history. Based on these findings, 12 restoration plans were designed. More than 70 local citizens participated in five consultation hearings and draft reports were circulated for comment before the plans were finalised.

The project acquired 924 ha of target land. More than 600 ha of aapa mires were restored, predominantly through the removal of trees and filling of drainage ditches. Wooden dams were constructed to stem the biggest and most strongly flowing ditches. These measures helped restore the original water regime and nutrient balance, preventing drying and subsequent changes in vegetation.

Some 150 ha of forests were restored, mainly by increasing the amount of decaying wood on the ground or controlled burning, but also by creating small clearings and experimental harrowing of the soil. Furthermore, trees and bushes were removed from 2.4 ha of meadows, which were then mowed annually to restore their natural condition.

Controlled human impact

Small-scale recreational zones were established at easily accessible fringes, whilst 10 km of old forest roads were removed. Two nature trails, three bird observation towers, six resting sites, 5.7 km of boardwalks and eight information points were installed. These measures will control human impact on the sites, without actually forbidding access to more remote areas - except in the Olvassuo strict nature reserve.



More than 800 ha of aapa mires were restored

The management plans will ensure that the natural environment of these areas is protected for the future, as well as guaranteeing local inhabitants' right to use these lands. To further promote sustainable nature-based tourism, a seminar, photo exhibitions, video and mire guide were prepared.

Project Number:

LIFE02 NAT/FIN/008469

Title: Protection of aapa mire wilderness in Ostrobothnia and Kainuu

Beneficiary: Metsähallitus, Natural Heritage Services, Ostrobothnia-Kainuu

Total Budget: €1 700 000

LIFE Contribution: €835 000

Period: Dec-2001 to Dec-2005

Website: www.metsa.fi

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Belgium: Restoring peatlands on the Saint-Hubert Plateau

LIFE Nature actions have made impressive conservation gains in upland Belgium, where an integrated programme of habitat restoration actions has helped to restore a complex of peat bogs, peaty moors, wet heathlands and sphagnum birch woods.

The Saint-Hubert Plateau is an upland area located in southern Belgium's Ardennes region. Covering some 20 000 ha, the plateau supports a mosaic of different habitat areas including beech forests, bog woodlands, alder forests, transition mires and raised bogs with interesting fringe vegetations along the watercourses.

Unsuccessful afforestation efforts during the last century led to a situation that threatened much of the area's natural wetlands. Forest drainage works radically altered soil structures and hydrology levels in the boggy upland environment. This reduced the availability of suitable vegetation for large foraging fauna, such as the local deer herds that had traditionally roamed the plateau. Purple moor-grass had also begun to invade the open areas as the wetlands dried up.

Concern among local environmental bodies and plateau users led to the development of a LIFE Nature project proposal that aimed to help reverse the wetlands' decline.

Plateau restoration plans

The LIFE project focused its attention on 842 ha of the Saint-Hubert Plateau, targeting priority conservation areas

Moor-grass was controlled by a flock of 400 sheep



supporting remnants of peat bogs and peaty moors, as well as other humid habitats, including wet heathlands and sphagnum birch woods. Many of these areas had been planted with spruce stands in the previous decades and the biodiversity characteristic of peat habitats had therefore largely decreased.

Initial restoration efforts involved identifying areas where spruce plantations could be abandoned, and so facilitate the habitat rehabilitation works. Some 300 ha were appropriate for this type of conservation approach. A management plan was then prepared for an integrated set of LIFE interventions based on: cutting and extracting unwanted spruce; filling drains, building dikes and preparing pond areas in order to restore a more natural water regime; cutting young trees and purple moor-grass to control colonisation; and grazing a flock of 400 sheep intensively over 100 ha. Cattle were also used to help maintain vegetation levels.

Remarkable results

Results from these actions surpassed the LIFE team's expectations. Particularly impressive gains were made in restoring some 472 ha of peatlands and wetlands, compared with the project target of 150 ha. Other conservation achievements included: some 624 ha were placed under natural reserve protection (RND); 81 km of drains were neutralised; 24 large ponds and 2 449 small pond areas were created; 15.5 km of mineral dikes have been built; 3.43 ha of peat moss seed were dispersed; 14.87 ha of cotton grass were planted; 6.72 ha of willows were reproduced, from over 15 000 cuttings; and

85.21 ha of new leafy habitats (i.e. deciduous forest) were also established, comprising birch (*betula*), rowan ('mountain ash') (*sorbus aucuparia*), and oak trees (*quercus*).

Three new observation towers have been built, enabling the public to view the restored habitat area and local wildlife, information about which has been provided via 13 new educational panels. Further awareness about Saint-Hubert's flora, fauna and associated conservation measures has also been raised by a documentary on the LIFE project.

Long term results from the LIFE works continue to be monitored against baseline inventories of butterflies, plants, birds, deer and other local species. Key outcomes from this process include a doubling of the number of black stork nesting pairs and confirmation that common cranes once again stop-over during spring and autumn migration - these are clear indicators of the Saint-Hubert's wetlands' remarkable restoration.

Project Number:

LIFE03 NAT/B/000019

Title: Rehabilitation of peat and wet habitats on the Saint-Hubert Plateau

Beneficiary:

Unité de Gestion Cynégétique du Massif Forestier de St-Hubert ASBL

Total Budget: €2 128 000

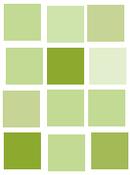
LIFE Contribution: €1 064 000

Period: Sept-2003 to Aug-2007

Website: http://biodiversite.wallonie.be/offh/life_tourbieres

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The Netherlands: Tide restoration in the Rhine-Maas delta

The construction of a dam in the Haringvliet estuary in 1970 has had a serious impact on the region's flora and fauna. A LIFE project boosted efforts to restore tidal flow in the estuary by focusing on the island of Tiengemeten.

The creation of a dam on the Haringvliet estuary in the Dutch Rhine-Maas delta prevented tidal flow such that mud flats and salt marshes shrank as a result. Since 1990, however, measures have been taken to restore tidal movements, as part of a larger conservation initiative that includes the island of Tiengemeten.

At the beginning of the LIFE project, the island was still largely used as farmland (700 ha), surrounded by reed and shrub vegetation (300 ha). It was much visited by day trippers arriving by ferry from the Rotterdam area, by yachtsmen and other water sports enthusiasts. The project transformed the entire farmland area into tidal ecosystems and created a large estuarine landscape (1 000 ha).

The polders were turned into creeks, reedlands, brushwood, and tidal forest (known as the Wildernis area). In order to create this area, the Mariapolder was modelled to form large shallow depressions. The surrounding dike was pierced to connect the polder with the Haringvliet and to allow the tides to further shape the land. The surface level of the other polders, Middenpolder and Benedenpolder, was lowered to create open water areas, and the surrounding dike was also lowered in places to allow flooding at high tide.

The actions taken on the island are expected to boost the target species of the project including the sturgeon (*Acipenser sturio* - to be re-introduced at a later stage), the corncrake (*Crex crex*) and the bittern (*Botaurus stellaris*) as well as alder forests,



Polders were transformed under project actions, with the public being invited to test these modifications

which should develop on the main island. Additionally, small islands in the open water should provide habitats for the root vole (*Microtus oeconomus*).

The project also constructed a new visitors' centre. Located not far away from the city of Amsterdam and in a densely populated region, the area has the potential to become a popular recreational facility. The public was regularly informed about the modifications of the landscape and also invited to go to the island to observe and follow these modifications. Public opinion was critical to the success of the project, which entailed removing long-established farmers from the island and relocating them on land elsewhere. (At the start of the project eight or so families were still living on the island). Local people were also engaged in the setting up of a new campsite and the running of a private B&B in Weemoed.

The continuation of the project's goals is assured by the active participation of local and regional authorities. The final outcome has not yet been deter-

mined, but further restoration of the tide is expected in the coming years.

Tiengemeten is to become a nature island on which nature-based recreation, for which there is a great demand from Rotterdam and the southern Netherlands, will still be possible. LIFE-Nature will hence contribute also to the visitor guidance in this large Natura 2000 site.

Project Number:

LIFE04 NAT/NL/000202

Title: Tiengemeten, restoration of freshwater tidal area in the Haringvliet estuary, the Netherlands

Beneficiary: The Dienst Landelijk Gebied (Service for the Rural Territory)

Total Budget: €6 379 000

LIFE Contribution: €1 722 000

Period: Nov-2003 to Dec-2007

Website:

www.tiengemeten.deltanatuur.nl

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Finland: Restoring mires for priority species

The Finnish region of North Karelia contains many priority habitats including bog woodlands, aapa mires, active raised bogs and boreal forests. A LIFE project was launched to draw up management plans and conduct inventories of the area.

North Karelia is of great importance for the protection of boreal forests and the unique mire complexes that make up the transition zone between aapa mires and active raised bogs. The natural forests located near the Russian border are important for the survival of many forest species in the EU (*Diplazium sibiricum*, *Dytiscus latissimus*, *Pteromys volans*, *Tetrao urogallus*, *Dendrocopos leucotos* and *Caprimulgus europaeus*).

The region, however, is threatened by drainage interventions, the impact of former commercial forestry, a lack of comprehensive management plans and the impact of visitors. The project selected nine sites that are part of the Natura 2000 network where these problems are most evident. It conducted species inventories on some 13 000 ha of land.

The knowledge acquired was used to prepare long-term management plans for all the project sites and six mire/forest restoration plans. Local people were engaged in the planning process, participating in the planning group, at public meetings and in media initiatives – 16 press releases were drafted resulting in 45 press articles about the project. Site brochures were produced for three areas (Koitajoki, Kolvananuuro, Petkeljärvi-Putkelanharju) and thematic pages were created for the project's website on ravines and geomorphology, mires, boreal forests and eskers. In addition, 16 public events and 17 expert events were organised, attracting some 1 050 participants. Though engaging the local community in the project was time consuming, it helped foster a greater acceptance



480 ha of raised bogs and aapa mires were restored by the project

and recognition of the importance of Natura 2000.

The project succeeded in protecting 76 ha in Paiholan metsä (with project funding), acquiring 105 ha of land for conservation and protecting 65 ha of Natura 2000 sites (with other funding). Nature conservation areas were established on 97.5% of the project areas, and 373.5 ha of forests were restored by controlled burning, increasing the quantity of decaying wood, increasing variability of the forests by creating small openings to facilitate the development of mixed forests and also mimicking of storm effects. Restored forests will develop into valuable boreal forests within a few decades. Around 480 ha of mires were also restored. Blocking and filling of around 125 km of ditches resulted in an increased water level of these restored mires.

To lessen visitor impact on the region, five nature trails were created in selected areas (Savijärvi, Petkeljärvi-Putkelanharju, Kolvananuuro, Pitkävaara and Koitajoki) and permanent information boards were erected in other project

areas. Also, six artificial nesting islets for red-throated divers (*Gavia stellat*) and black-throated divers (*Gavia arctica*) were built in Petkeljärvi-Putkelanharju.

Another key result of these activities was the protection of threatened beetle species in controlled burned areas and the discovery of a new species (*Aradus montandoni*) for Finland. Furthermore, the increased water level of the restored mires resulted in increases in mire vegetation and butterfly populations, as well as enhancing their importance for migrating birds in spring and autumn.

Finally, the project has received international interest, hosting visitors from Lithuania and China. It also co-operated with the experts of the Baltic Environmental Forum and was presented at the Silva06 Fair, which attracted 8 000 visitors in three days.

Project Number:

LIFE03 NAT/FIN/000036

Title: Karelian mires and virgin forests - pearls in the chain of geohistory

Beneficiary:

North Karelia Regional Environment Centre

Total Budget: €1 462 000

LIFE Contribution: €719 000

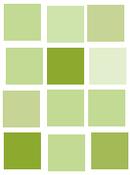
Period: Nov-2002 to Jan-2007

Website:

<http://www.ymparisto.fi/default.asp?contentid=249906&lan=en&clan=en>

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Germany: Restoring fen meadows in Lower Saxony

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.

The Dümmer wetlands of Lower Saxony have been in decline since 1953 when a dike 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. The construction of the dike dried the land, and agricultural activity caused the degeneration of the wetland. As a result, the populations of many breeding and resting birds decreased or disappeared entirely.

In 1987, a rehabilitation plan for the entire Lake Dümmer area was drawn up. As part of this broader initiative, LIFE supported a project (LIFE98 NAT/D/005085) for large-scale rehumidification of the Ochsenmoor on the southern area of the Dümmer.

More recently, a second LIFE project (LIFE02 NAT/D/008456) in the west of the Lake Dümmer area aimed at a large-scale re-humidification of formerly drained agricultural lands, through the use of adjustable weirs to modulate water levels.

Creating the right conditions

The main target of the second 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 that 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 Dümmeriederung", 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 businesses.

LIFE provided the funds for the purchase of the 175 ha required for an overall restoration in the western Dümmer area; specific measures such as construction of weirs and filling in of ditches were largely paid for out of 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.

One key measure was the establishment of a lease-back arrangement for conservation land 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 equipment for use on wet grasslands. Without this long-term care through haying, these areas would eventually become scrubby alder woodlands, a less favourable habitat for migratory birds.

The construction of weirs allowed the water table management that benefited the waders

Another important step was the creation of a 2 000 ha "quiet zone" by blocking access to 30 km of pathways in both project areas at certain times (usually in winter) to protect bird species that are sensitive to disturbance.

Increased bird populations and new arrivals

The populations of many breeding and wintering bird species have increased, and some bird species that had 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. The area is now also suitable for cycle tourism.

A conference to exchange knowledge of wet grassland management and highlight the successes of the restoration work was held in 2007. 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

Total Budget: €3 103 000

LIFE Contribution: €1 551 500

Period: Jun-2002 to Apr-2007

Website:

www.life-duemmer.niedersachsen.de

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Finland: Biodiversity benefits for bog habitats

LIFE Nature support has helped to improve the conservation status of raised bogs in Finland and also created a network of improved aapa mire habitats that stretch from east to west across the country. Project results have also created knock-on economic benefits.

Aapa mires are popular nesting areas for a variety of bird species and also act as important resting and feeding sites for migrating and moulting birds. In recognising the value of such bog biodiversity, Lapland's Regional Environment Centre set up a LIFE Nature project to implement conservation management strategies for five sites in the central Lapland aapa mire zone. Sustainable development formed the core objective for this project's integrated approach and its aims focused on balancing bog conservation actions with better managed public access in aapa mire areas.

A project area covering some 48 200 ha of aapa mire in central Lapland was selected for the LIFE Nature works. The sites formed a wide corridor of wetland areas stretching from east to west across the country, and these were carefully chosen in order to facilitate gene flows between the wetland populations of the eastern part of Finland and Scandinavia.

Key bird species recorded as nesting in the project area included 1 800 pairs of wood sandpipers (*Tringa clareola*), 400 pairs of ruffs (*Philomachus pugnax*) and 180 pairs of golden plovers (*Pluvialis apricaria*). Large predators were also resident in the area, which supported small populations of wolves (*Canis lupus*), wolverines (*Gulo gulo*) and brown bears (*Ursus arctos*). Important plant species, such as the Annex II-listed *Hamatocaulis lapponicus*, *Ranunculus lapponicus* and *Saxifraga hirculus* grow in the area.

The LIFE project's conservation plans were drawn up using public consulta-

tion techniques to ensure understanding of, and support for, the project activities from local communities. More than 6 300 ha of land was acquired for nature conservation purposes and a further 225 ha leased on a five-year contract.

Conservation actions, combining shrub removal and vegetation mowing, led to the restoration of 80 ha of mires, 15 ha of wet meadows and 10 ha of forest. Threats to herb-rich forests, caused by invading spruces, were evaluated and eliminated from key sites. Controlled burning methods were applied in a number of areas and these have helped to provide suitable habitats for the three-toed woodpecker, black fire beetle and false morel. Other species have benefitted from increased decaying wood resulting from the LIFE works.

Nearly 350 monitoring sites were established and these provided useful data about the habitat preferences of several rare mushroom species. Information was also gathered to assess the effects of 'slash-and-burn' conservation methodologies in these mires. Information regarding soil quality, forest structure, vascular plants, macrophytes and the presence of potential forest damaging insects (*Ips typographus* and *Tomicus* sp.) was also gathered. Ongoing monitoring, for instance of butterfly species, will enable the beneficiary to assess and update the LIFE project work in the longer-term.

LIFE legacies

LIFE's environmental legacies are matched by the socio-economic benefits that have been generated in relation



The project acquired more than 6 300 ha of land with mires, wet meadows and forests

to eco-tourism. Synergies with other EU funds have helped encourage visitors into the project area, through the development of eco-tourism products linked to the mires. These include constructing new all-access nature trails and renovating traditional barns on the mires. Social funds helped to train 'mire guides' in nature tourism and develop know-how about eco-product development and marketing.

Project Number:

LIFE00 NAT/FIN/007060

Title: Protection and usage of aapa mires with a rich avifauna

Beneficiary: Lapin ympäristökeskus

Total Budget: €3 230 000

LIFE Contribution: €1 589 000

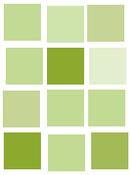
Period: Nov-2002 to Oct-2005

Website:

<http://www.ymparisto.fi/default.asp?contentid=245789&lan=en&clan=en>

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Forests

In recent decades, changes to the way Europe's forests are used – such as intensified silvicultural practices, the introduction of exotic species and increased uniformity – have reduced the environmental quality of these vital ecosystems, which cover 30% of the continent's land area.

The LIFE programme has supported many projects across the EU whose actions have targeted forest ecosystems. The following pages present a selection of some of the best projects dedicated to the restoration of forest habitats.

Finland: Fire breathes new LIFE into forests

This Finnish LIFE Nature project developed some unusual techniques for restoration of forest biodiversity in a ground-breaking partnership between the public sector, private sector and army.



Fire has proved to be a very powerful forest management tool

Small-scale attempts to restore forests and mires to a natural condition began in the 1980s, but Forest Life was the first large-scale project dedicated to ecological restoration of forests. According to Rauli Perkiö of Metsähallitus, “Deadwood is one of the key things for promoting biodiversity in Finland.” The need to increase deadwood was first noticed in the 1990s. For instance, at one of the project sites, situated in Repovesi, some 200 km northeast of Helsinki, there was only 5 m³ of deadwood/ha prior to the LIFE project – studies say at least 20 m³/ha is needed.



“The importance of deadwood is not well understood in many countries,” notes Maarit Similä of Metsähallitus. “For ordinary people it is very hard to understand that we cut big trees and leave them to rot.” The LIFE programme’s focus on dissemination and communication activities is very useful, she believes, because “we can inform people about Natura 2000 and what we are doing.” Timo Lehesvirta, Environmental Manager of UPM-Kymmene’s Forest Division concurs: “Communication is very important – deadwood is not a bad thing in conservation areas and not a bad thing in commercial areas.”

The 3 000 ha Repovesi site is made up of the 1 500 ha Repovesi National Park (“a wilderness area for southern Finland”) and 1 500 ha belonging to UPM that has been set aside as a private conservation area, making it the only place in Scandinavia with a national

Fire is not the first thing that usually comes to mind when the topic of forest restoration is mentioned. In fact, in southern Europe, forest fires are a major threat to species, habitats, property and people. But for the Finnish Forest Life project (**LIFE03 NAT/FIN/000034**) fire proved to be a very useful tool in the effort to increase biodiversity at 22 of the 33 Natura 2000 sites targeted for restoration.

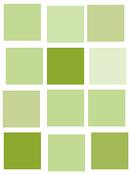
The project, which ran from 2002-2007, was carried out by Metsähallitus, the state enterprise that is responsible for protecting 3.8 million ha of the country’s land and 3.1 million ha of its lakes and waterways. The beneficiary worked in partnership with WWF Finland, UPM-Kymmene Corporation, the University of Joen-

suu and the Karelian Brigade of the Finnish Defence Forces.

Forest Life targeted the ecological restoration of both forests and mires, and the management of esker forests and forests containing the Birds Directive Annex I-listed White-backed woodpecker.

The value of deadwood

Boreal natural forests, esker forests and bog woodlands are considered a priority under the Habitats Directive because of their scarcity. Pressures from commercial forestry mean that although there are some 225 000 ha of these habitat types in southern and western Finland, little of that area is in a ‘favourable’ condition.



The project opened small clearings in the forest using diverse methods, such as explosives and chainsaws

park and private forest together. The creation of the national park in 2003 was also a public-private collaboration, since UPM donated 560 ha of its land to enable it to happen (under Finnish legislation, national parks must cover at least 1 000 ha).

Part of the Repovesi National Park is used as a training ground and firing range by the Finnish Defence Forces. This led to an innovative method of creating small clearings and increasing the stock of deadwood. In 2006, an area of 10 ha of former commercial pine and spruce stands in the army zone was cleared using explosives. “Forty pioneer trainees exploded the trees using 1 kg of TNT per stem,” explains Senior Lieutenant Pasi Myller, Staff Officer with the Karelia Brigade, Kymi Engineer Battalion. “The army would be blowing things up anyway,” notes Rauli Perkiö. “Our needs and their needs coincided.”

Achievements of Forest Life

- Restoration of 33 Natura 2000 sites
- 5 939 ha of boreal forests (356 ha of controlled burning; Increased volume of dead wood on 2 702 ha; 2 881 ha of small gaps in the forest canopy)
- 410 ha of forest-covered mires
- 561 ha of esker forests
- 196 ha of white-backed woodpecker habitats

Fires to mires

Controlled burning was another method used to create small gaps in the forest canopy and encourage a more varied age structure of the tree stock. Fires are set using liquid gas. The equipment needed to control a blaze is expensive and was purchased with LIFE funds. Stands selected for controlled burning had to be near water (to stop fire spreading) and include large trees (which burn more easily and are a better substrate for threatened species than smaller ones).

“In Scandinavia, forest fire is one of the main ways of creating and promoting original species,” notes Timo Lehesvirta. Species that are dependent on fire-damaged deadwood include the beetles *Melanophila acuminata*, *Allandrus undulates*, *Acmaeops Septentrionalis*, *Clypstraea pusilla*, *Epuraea*

silesiaca, *stephanopachys linearis*, and *S. substriatus*, all of which have been observed in burned Forest Life stands by the project partner for monitoring, the University of Joensuu, and all of which are classified as ‘threatened’ or ‘near threatened’ in Finland.

“The variation in time it takes for results at species level is very interesting,” comments Mr. Lehesvirta. “Some polypore species take 100 years to appear, some beetle species appear within hours.”

A total of 350 ha of forests were subject to controlled burning across the Forest Life sites. Other methods used to increase the amount of deadwood included girdling and felling of trees. Unused logging roads were removed at two project sites to allow regrowth of trees.

Increasing the volume of deadwood is crucial to increasing local biodiversity





White-backed woodpecker

The White-backed woodpecker (*Dendrocopos leucotos*) is found in large, mature, well-lit deciduous forests with plenty of deadwood. The latter is essential because the species feeds on insect larvae that live on decaying wood. For Forest Life, some 200 ha of White-backed woodpecker forests in the project sites of Linnansaari, Puulavesi and Kujjärvi-Sonnenen were managed by removing spruces and small rowans from deciduous forests to increase the amount of light. Birch trees were both girdled and felled to increase the quantity of decaying wood.

Some 561 ha of esker forests were restored through small-scale controlled burning and cutting at locations such as the Maakylä-Räyskälä Natura 2000 site in southern Finland. The aim of these actions was to replicate the effect of wildfires, which have been suppressed in commercial forests, and encourage the growth of plant species that thrive in cleared and burned areas, such as Breckland thyme (*Thymus serpyllum*), which is also a host plant for the rare moth *Merrifieldia leucodactylia*.

Drainage ditches were dammed and filled on 10 of the Forest Life sites (including Repovesi) to increase water and nutrient levels and improve these forest-covered mires to more favourable status.

“These are not like natural mires yet, but the water table level has risen and mire species can spread naturally, even in ditched areas,” notes Maarit Similä. A sign of this is the abundance of *Sphagnum girgensohnii* and other species native to mires at Repovesi.

Results of the restoration actions were monitored at the end of the project and will continue to be monitored afterwards. Small opening stands were created to estimate the growth of birch and aspen, while in deadwood stands traps were set up to collect beetles. Maarit Similä indicates that there are “17 monitoring areas for increased volume of deadwood in pine-dominated forests (three monitored stands per

area), of which 13 were a part of Forest Life. In spruce-dominated stands there are 14 monitoring areas, of which 10 were in Forest Life. The effects of small openings created are monitored in 19 areas, with 15 of those in the Forest Life sites.”

Balancing landscape and biodiversity

“Biodiversity targets are good for forest health,” believes Timo Lehesvirta. “They create a buffer against future climate change and possible harmful invasive species.” Nonetheless, he also notes that “Creating biodiversity can take landscape values away. In Repovesi we have both recreational and biodiversity targets: our job is to put those targets together.”

Among the many positive outcomes of Forest Life is the fact that there has been an increase of red-listed species, especially those dependent on dead, decaying or charred wood in restored forests. Numbers of xerothermic species increased in restored eskers and restoration strengthened the population of the White-backed woodpecker.

At the policy level, restoration became a mainstream forestry practice. During 2003 and 2004, more than 300 forest workers and supervisors of natural heritage services received training in practical restoration work. “Participating in the LIFE Nature project was a unique experi-

ence,” says Teijo Niveri, a UPM forest worker. “I realised that nature management in commercial forests and protected areas both support environmental goals set.”

Dissemination activities (including DVDs, brochures, conference presentations, etc) as well as media coverage of project actions, helped make restoration more widely understood and accepted by the general public.

For Rauli Perkiö, LIFE’s support has had a highly beneficial impact for Metsähallitus’s ongoing work in Finland’s forests: “We know better and cheaper and more efficiently how to do almost every restoration action (e.g. restoring mires). Now we know the best methods to use, before we only had good guesses.” Cost monitoring of Forest Life actions provided important information for planning phase II of the government’s Programme on Forest Biodiversity in Southern Finland (METSO 2003-2016).

Timo Lehesvirta is appreciative of the level of cooperation between the project partners and beneficiary. “One of the most valuable things about the project is that we have worked together – it’s a modern way to safeguard forests for the future.”

Project Number:

LIFE03 NAT/FIN/000034

Title: Restoration of boreal forests and forest-covered mires

Beneficiary: Metsähallitus

Total Budget: €3 680 000

LIFE Contribution: €1 840 000

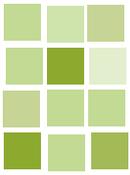
Period: Dec-2002 to Dec-2007

Website:

www.metsa.fi/metsa-life

Contact: Jussi Paivinen

Email: jussi.paivinen@metsa.fi



Belgium: Forest restoration in the Flemish Ardennes

Decades of intensive silvicultural practices have adversely affected the biodiversity of Belgium's Flemish Ardennes. A LIFE Nature project, however, boosted restoration efforts through the acquisition of land, felling of poplars and the widening of forest areas by extensive grazing.

Though land surrounding the species-rich ash and alder wooded areas of the Flemish Ardennes has been intensively used for centuries, traditional management practices preserved the region's rich flora and fauna. Reconstruction programmes following World War I, however, created beech plantations and introduced an upper storey of cultivated poplars in composite forests.

Important woodland grazing was replaced by cyclical management for the production of wood, resulting in the suppression of the typical herbaceous layer and the reduction of biodiversity. At the same time, adjacent farming areas were also more intensely exploited and some forest stands were cleared and cultivated, further fragmenting forest biotopes. Pools disappeared and streams became eutrophic, threatening the habitat of the great crested newt (*Triturus cristatus*) and brook lamprey (*Lampetra planeri*).

The project's land purchase enhanced connectivity between areas of core habitats



LIFE project actions

The project beneficiary, WWF, teamed up with Natuurpunt, a conservation NGO, and the Flemish government, which together own large areas of this region. Furthermore, the project acquired a total of 140 ha to create larger blocks of land, which could then be coherently restored and managed. Such large-scale land purchase also enhanced connectivity between core areas.

Restoration of forest areas was further aided by extensive grazing and the felling of poplars to return the area to its original condition. Management of existing woods was limited to encouraging rich herb layers to develop, a relatively easy and efficient way to enhance and maintain biodiversity in the forests. Those areas with livestock are also easily managed.

Stakeholder involvement and life after LIFE

Another important success of the project was the involvement of volunteers and local stakeholders and regular and positive collaboration with public authorities, communication with the general public and collaboration with farmers. Such co-operation has continued after the end of the project. An after Life conservation plan set out a staffing structure and land-purchase strategy for the future. In addition, provincial authorities have decided to finance the restoration of a stable



Limited management of woods encouraged the rich herb layers to develop

bought in Ename. The restored stable will be used to store management equipment and will serve as an information centre for visitors. Hiking paths have proved to be hugely popular and an awareness-raising campaign in the region has improved the visibility of the Natura 2000 network.

Project Number:

LIFE00 NAT/B/007156

Title: Action Plan for conservation and restoration of three woods in the Flemish Ardennes

Beneficiary: World Wide Fund for Nature Belgium

Total Budget: €2 838 000

LIFE Contribution: €1 127 000

Period: Oct-2001 to Dec-2006

Website: <http://users.pandora.be/life-natuur-be-7156/>

Contact: Geert Lejeune

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Sweden: Safeguarding forests for the future

The LIFE Nature Söderåsen project gave habitats and species in the ancient broadleaved forests of southern Sweden a better chance of survival.

No environment in Sweden is as diverse, or is home to so many endangered species, as the southern Swedish deciduous forest, in particular the broadleaved forest. These forests differ in many ways from those of central Europe, because the exploitation pressure has been lower and Sweden has suffered less from air pollution. The Söderåsen National Park, situated in the north-west part of Skåne, the southernmost province of Sweden, is one of the largest continuous areas of species-rich broadleaved forest in northern Europe. The park was established in 2001, and covers some 1 625 ha.

The biggest threat to the forest is the spread of Norway Spruce (*Picea abies*), which for economic reasons has been planted on the Söderåsen ridge since the beginning of the last century. Through the LIFE Nature Söderåsen project, the beneficiary, the Skåne County Administrative Board, aimed to start converting spruce plantations and areas that had been clear-cut into deciduous forest. The project also set out to preserve existing deciduous forests, which, in the long-term, will extend the habitats of many threatened birds, insects, fungi, lichens, mosses and other species. Scientists will also benefit, gaining a reference area for research and monitoring.

Spruce removal: a 20-year plan

Several different methods were used to phase out the spruce. Many stands were thinned and will be cut successively in the future in order to help deciduous trees gradually spread. The beneficiary wanted to avoid creating

new clear-cut areas, and so planned to remove the spruce over a 20-year period, with thinning and cutting of corridors, edges and gaps. The intention is that remaining deciduous trees and spruce will act as shelter for naturally regenerating deciduous trees. Across a 280 ha area, spruce that had grown as undergrowth in broadleaved forests was removed. Other foreign tree species, mostly sycamore maple (*Acer pseudoplatanus*), were also cut or controlled in different ways.

In areas that had been clear cut, deciduous forest was re-established through soil scarification and planting. In total more than 512 000 seedlings, which will form the future broadleaved forest, were planted. Most of the seeds were oak, but in addition beech, hornbeam, maple, ash, lime and cherry were collected. The national park has significant animal populations, and hunting is not permitted, so all planted and sowed areas were fenced (some 50 km of fencing was erected in total) to protect the seedlings from animals. Project staff also dedicated much time to dissemination activities. A brochure and a film were produced and signs were erected in the forest.

Many significant steps

The control measures targeted at species such as spruce and birch made an important contribution to the survival of the natural deciduous forest habitats. Scarification activities penetrated the thick grass layer in some areas allowing regeneration of natural forest habitats, and supporting the survival of new saplings. Fencing effectively protected the seedlings, and had a positive effect on



Ringing bark was used to phase out spruces gradually

their height and growth. The project also benefited from rising prices for spruce cuttings that enabled income to be generated. This money provided the means for more conservation work, meaning larger areas than originally foreseen were fenced and planted. The project staff received a commendation for financial management and the project consequently attracted attention from Germany, Denmark, Germany, Lithuania, Sweden and the UK.

Project Number:

LIFE02 NAT/S/008483

Title: Restoration of deciduous forest in Söderåsen National Park

Beneficiary: Länsstyrelsen i Skåne Län / Söderåsens Nationalpark

Total Budget: €1 761 000

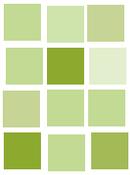
LIFE Contribution: €762 000

Period: Jun-2002 to Dec-2006

Website: www.nationalpark-soderasen.lst.se/life/index.html

Contact: Oddvar Fiskesjo

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Finland: Controlled burning aids regeneration of Koli forests

Innovative management strategies, including the use of fire (controlled burning) for long-term regeneration, were the main feature of this very successful Finnish forest project.

The Koli National Park in eastern Finland includes a mix of boreal forest habitats, Fennoscandian herb-rich forests, different meadow types, lakes, eskers (ice gravel deposits) and bog woodlands. The Finnish tradition of 'slash-and-burn' agriculture has been in use in Koli for more than 250 years. And the region's national heritage landscapes have attracted tourists for over a century. However, prior to becoming a national park in 1991, more than 20% of Koli's forests had been economically exploited: the forests lacked the decayed wood and natural fires necessary for regeneration and, in herb-rich forests, spruces were taking over. Other threats to the landscape included the overgrowth of meadows and earlier drainage of bog woodlands. Awareness of the park's natural values among locals and visitors also needed improving.

The four-year 'LIFE to Koli' project was run by the Finnish Forest Research Institute (Metsäntutkimuslaitos), or 'Metla' for short. It aimed to draw up long-term management and restoration plans for the forests, meadows and bog woodlands of the national park. A plan to introduce controlled burning for up to 50 years would be introduced. The target was to create 15 ha of freshly burnt boreal forest, to provide the necessary conditions for regeneration of cultivated forests over a total area of 100 ha. Other planned conservation measures were the removal of spruce in 5 ha of herb-rich forests, restoration of meadows in 5 ha and filling in of ditches in 25 ha of drained bog woodlands.

The project reached its targets, developing and beginning to implement



The project draw up long-term management and restoration plans for the habitats of the national park

long-term actions and management plans for the targeted areas within the national park. Some 107 ha of cultivated forests were restored (approximately 76 ha through increasing the amount of decaying wood and some 31 ha by controlled burning). Slash-and-burn agriculture (burning, sowing and harvesting) with traditional rye and turnip seeds was carried out with the support of local farmers. As a result, the area of priority habitat (Annex I) western taiga boreal forest was increased from 423 ha to 547 ha. In addition, 28.3 ha of bog woodlands and 3.7 ha of various semi-natural grasslands were restored. The project also increased the area of the managed (mainly grazed) semi-natural grasslands from 26 ha to 30 ha.

To publicise the project activities, three guidebooks on the restoration actions were published: on forest and mire restoration, slash-and-burn practice and meadow management respectively. In addition, three thematic nature trails were built for herb-rich forests, slash-and-burn, and restoration of forests and mires.

Finally, a monitoring scheme was established to assess the effects of the restoration actions on forest structure, vegetation, macrophytes (aquatic plants that grow in or near water), forest damaging insects and slash-and-burn practice on soil. Importantly, the monitoring will continue after-LIFE.

Project Number:

LIFE03 NAT/FIN/000035

Title: LIFE to Koli - Restoration of the forests and meadows in the nature park

Beneficiary: The Finnish Forest Research Institute (Metsäntutkimuslaitos)

Total Budget: €664 000

LIFE Contribution: €332 000

Period: Nov-2002 to Oct-2006

Website: www.metla.fi/hanke/8025

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Romania: Restoring alpine forest habitats in Pietrosul Rodnei

This LIFE Nature project in northern Romania targeted the restoration of two seriously threatened alpine forest habitats - mixed cembra pine/spruce forests and mugo pine shrublands - on the slopes of Mount Pietrosul Rodnei. As well as achieving its short-term restoration objectives, the project has also done much to help guard against soil erosion and future avalanches.

The 6 415 ha Pietrosul biosphere reserve, now also a proposed Natura 2000 site, hosts a number of habitats and species of Community interest, some of which have become damaged by human activities. The main threats include tourism (e.g. skiing, hiking, mountaineering), selective logging, livestock-grazing and disturbance from hunting, for example of chamois (*Rupicapra rupicapra*).

Among the habitats of Community interest in the reserve, forests close to the timber line are the most seriously degraded. The mugo pine (*Pinus mugo*) now covers only 21% of its former area, while the native population of the cembra pine (*Pinus cembra*) has become almost extinct on this site, surviving only in small patches.

The distributional trend of another priority habitat, *Pinus mugo* and *Rhododendron hirsutum* shrubland, is also on the decrease. When allowed to grow naturally, this has a continuous carpet effect that helps guard against soil erosion. However, during the 1970s, the *P. mugo* carpet was cut over a large area in Pietrosul to create land for livestock grazing. As a result, the area has become more prone to avalanches. For example, in 1996 an avalanche killed four hikers within the LIFE project area.

Hard work brings results

To address these issues, the LIFE Nature Pietrosul Rodnei project set out to recover cembra pine/spruce and mugo pine habitats in a 50 ha area, located mainly on the very steep (40-60°) northern slopes of Mt. Pietro-

sul Rodnei, (rising to 2 303 m, it is the highest peak in the Rodnei mountains). The project manager, Mr. Ioan Blada, is a strong personality who accompanied the project from the start to its successful completion. He personally managed all the activities, climbed the mountain countless number of times and watched the seedlings grow. His enthusiasm and effort at the age of 74 are admirable especially when thinking of serious health problems that appeared in the course of the project, but did not stop him.

A key project action involved the planting of seedlings with similar genetic origin and environmental requirements, sourced from neighbouring areas within the reserve. This proved to be a very arduous task - sticks and seedlings were transported from Borsa (650 m elevation) to the project area (1 800 m elevation) along a highly treacherous path, using a primitive caterpillar track. The sticks, used for field marking of the seedlings, were carried on workers' backs to the planting area. A chalet was built to provide shelter for the project team, researchers and other workers during the planting phase and other project actions on the mountainside. This chalet is now regularly used by the warden of the biosphere reserve.

Despite the difficulties involved, some 15 500 seedlings were planted (the target was 10 000) and monitoring revealed that they had a high survival rate.

To ensure the conservation of other flora and fauna, a management plan was elaborated for the entire Pietrosul Rodnei biosphere reserve. This was backed



The recovery of the cembra and mugo pine habitats took place on very steep slopes

up by surveillance and monitoring. A GIS distribution map was also prepared for the forest, herbaceous, and stony habitats in the reserve.

In 2004, the Romanian government declared a national park in Pietrosul Rodnei, covering a much larger area than the biosphere reserve. Following the establishment of the park, the LIFE project expanded its management plan to cover this larger area.

Project Number:

LIFE03 NAT/RO/000027

Title: Restoration forest habitats from Pietrosul Rodnei biosphere reserve

Beneficiary: ICAS-Forest Research and Management Institute

Total Budget: €213 000

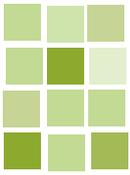
LIFE Contribution: €107 000

Period: Jun-2003 to Jun-2007

Website: www.icass.ro/life_pietrosul/index.htm

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Rivers

As part of the EU's Water Framework Directive (WFD), the European Commission has set an ambitious target of achieving 'good ecological status' for all Europe's rivers by 2015. While significant progress towards this goal has already been made, the impact of human actions continues to threaten the ecology of river habitats in many areas of Europe.

The LIFE programme has supported many projects across the EU whose actions have targeted river ecosystems. The following pages present a selection of some of the best projects dedicated to the restoration of river habitats.

France: restoring natural alluvial dynamics through partnership

The LIFE Nature Rivière d'Ain project developed local co-operation to minimise human interference and maximise restoration of natural aquatic and alluvial habitats. River channels were restored and key species, such as the otter, floating water plantain and woodlark, all benefitted.

The lower valley of the River Ain crosses a vast plain in eastern France where it has created important alluvial and aquatic habitats. Two Natura 2000 sites are adjacent to each other along the last 48 km of the river and where it joins the larger River Rhône, covering 2 294 ha, or half of the floodplain.

However, the construction of dams, riverbank improvements, gravel extraction and catchment systems along the river's course have hollowed out the river bed, drained secondary channels and dried wet zones. The river valley has changed from a braided bed to a single channel, impacting directly on natural ecosystems.

A partnership approach

The LIFE Nature Riviere d'Ain project aimed to maintain or restore the natural river dynamics and the diversity of habitats, wildlife and flora associated with it. Basing its approach on partnership between farmers, landowners and managers, the project held around 100 meetings with stakeholders and local councillors.

An initial project study identified 15 habitats and 24 species of particular European or Community interest, including the otter (*Lutra lutra*).

The project purchased some 30 ha of land and achieved protection status for more than 2 000 ha. This enabled the restoration of five channels totaling 2.6 km and the return of 20 000 m³ of material to the riverbed. Within two years, 20 new flora species reappeared on the Sous-Bresse

channel, including the ecologically important floating water plantain (*Luronium natans*).

A policy of non-intervention over a 1 500 ha area next to the river was introduced to facilitate the natural development of willows and alder-ash forest. Elsewhere, a poplar forest was restored - to avoid the hybridisation of the indigenous poplar with the cultivar poplar - and the rhizomes of the invasive Japanese knotweed were crushed. The project also wrote a guide to the management of the site's alluvial forest.

Some 258 ha of dry grasslands were restored by clearing. A group of seven livestock farmers was formed to maintain the area through grazing. To further encourage sustainable forms of land use, a hunters group set up game reserves and rabbit warrens and reintroduced 300 rabbits.

To protect key sites from public interference, 27 signs and barriers were installed and three eco-paths established over 3.5 km with 57 information boards. Awareness-raising efforts included information packs, natural heritage guides, newsletters, a website and a week-long River Festival attended by more than 4 000 people.

Improving long-term biodiversity

The activities of the LIFE project had a directly beneficial impact on local biodiversity. The nightjar (*Caprimulgus europaeus*) and woodlark (*Lullula*



The project restored the Ain's natural river dynamics

arborea) both returned to the site. Otter numbers increased noticeably, particularly in the Sous-Bresse channel.

The project's co-operative approach led to the local acceptance of a five-year River Contract (2006-11) and the proposal to extend the protected zone over 1 100 ha. These actions should ensure the long-term preservation of the site's natural heritage.

Project Number:

LIFE02 NAT/F/008482

Title: Conservation of the habitats created by the fluvial dynamics of the lower Ain river

Beneficiary: SIVU du Bassin Versant de la Basse Vallée de l'Ain

Total Budget: €1 722 000

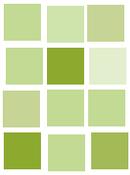
LIFE Contribution: €861 000

Period: Jun-2002 to Dec-2006

Website: www.bassevalleedelain.com/life/fr/index.php

Contact: Catherine Petit

Email: cle.basse.vallee.ain@wanadoo.fr



Spain: Conserving European mink and key riverine habitats

Species conservation and river/ habitat restoration were the dual targets of a LIFE Nature project located in Spain's Navarra region.

The project targeted the conservation of one of Europe's most endangered mammals, the European mink (*Mustela lutreola*) and the preservation of riparian (riverbank) habitats in the lower stretches of the Aragon and Arga river systems in Navarra. The site of Community interest (SCI) hosts one of the largest surviving populations of European mink in Europe, and 10% of its Spanish population. Other animal and bird species of European importance found there include the European pond turtle (*Emys orbicularis*), otter (*Lutra lutra*), and the purple heron (*Ardea purpurea*). Riparian galleries with willow (*Salix alba*) and poplars (*Populus alba*) cover a large part of the sites. These are among the favoured habitats of the European mink.

The project had three main aims. Firstly, it needed to ensure a sustainable population of the European mink in the areas of the Natura 2000 site where it had been detected, and to provide the species with possibilities for expansion. Secondly, it aimed to restore the riparian habitats associated with the Aragon and Arga rivers, in order to improve habitat connectivity. Thirdly,

it would implement actions to control the main threats to the species, which include the presence of its main rival, wild American mink, and an additional local threat of high mortality rates due to road traffic.

Measuring success

The project was successful. Restoration works - including the creation of new biotopes as well as improving the connectivity of existing ones - have resulted in important improvements to the habitats of the European mink. Habitat improvement actions such as the creation of gullies (24.03 ha), meanders (30.30 ha), wetlands (5.9 ha) and breeding areas (1.7 ha) were carried out, while alterations to dikes and dam structures have helped to improve the river flow dynamics and to enhance the Arga river floodplain. Some 33 'black spots' along the road network and on irrigated land were eliminated to reduce mink mortality rates. Moreover, a landfill site was sealed and restored to its natural state to boost desired habitat cover.

In total, more than 13 ha of priority riparian galleries forest habitats were restored, with improvements in quality in a further 70 ha. The results from this combined package of practical conservation work are judged to have boosted the population density of the European mink. The solitary, nocturnal animal is difficult to spot in the wild. However, by catching, tracking (and quickly) releasing individual animals, samples provided estimates of numbers living in a particular stretch of river. This work also helps to detect (and eliminate) the highly-invasive American mink.

Importantly, the long term sustainability of the project's efforts has been aided by a 45% enlargement of the SCI. A new management plan agreement for the site is expected. This will strengthen legal protection for the mink habitats.

Restoration of the riverine habitats favoured the European mink populations



Project Number:

LIFE05 NAT/E/000073

Title: Ecosystemic management of rivers with European mink

Beneficiary: Gestión Ambiental, Viveros y Repoblaciones de Navarra, S.A (an independent branch of the Navarra Government's Environmental Department)

Total Budget: €1 692 000

LIFE Contribution: €1 015 000

Period: Jan-2005 to Dec-2007

Website: www.life-gerve.com/

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France: Alluvial restoration on the banks of the Rhine

This LIFE Nature project restored valuable alluvial habitats in the Rhine valley that have been damaged through water management activities. Actions were taken to join up former branches of the river and introduce controlled flooding in certain areas.

The project site covers 16 000 ha and extends along the whole of the French side of the Rhine. It comprises more than 10 400 ha of alluvial forest including 3 200 ha of priority habitat (alluvial forest of *Alnus glutinosa* and *Fraxinus excelsior*). These alluvial environments shelter some 20 Annex II species, in particular *Dicranum viride*, a very rare moss found in France, which is a good bio-indicator of the quality of the forest. The forest is also home to a population of some 150 European beavers.

Water management projects, including the construction of canals, have had a detrimental impact on the area: the branches cut off from the river by canal works were threatened with extinction because insufficient quantities of Rhine water were reaching them; and meadowlands, which are dependent on regular flooding, were facing disappearance.

Restoring exceptional biodiversity

The LIFE Nature Living Rhine project carried out a programme of actions to restore the habitats and conserve the exceptional biodiversity of the area, while establishing strong links with German and Swiss partners. Such actions consisted of a range of studies, including a cartographic survey, an historical survey, a survey of the distribution of tree species specific to the banks of the Rhine, and the mapping of obstacles preventing the free movement of salmon, bullheads, lamprey and beavers etc. These studies were used to draft technical documents detailing the conservation and restora-



Restoration works enabled the reflooding of former Rhine branches

tion of the habitats under threat. A key achievement of the project was the official validation of the management plan for the whole Natura 2000 site of Rhin-Ried-Bruch.

Restoration work enabled the return of water to nearly 20 km of the former branches of the Rhine, resulting in an observable increase in biodiversity. Controlled and localised flooding in certain forests along the Rhine was also conducted with the consent of the municipalities concerned.

At the following sites, the main actions taken were:

- **Sauer delta forest:** letting the water circulate once more in the oxbow lake (Fahrgiessen), removing mud deposits, removing fallen timber, selective cutting of trees on the river bank;
- **Offendorf forest:** restoring the Rossmoerder in the Offendorf forest by bringing in water, removing mud deposits and preserving flora;
- **Strasbourg forest:** restoration of the Altenheimkopf water course;
- **La Wantzenau forest:** water courses were re-wetted with water from the counter-canal of the Rhine.
- **Rhinau:** supplying water to the Alt-

wasser in the Rhinau-Daubensand forest from the counter-canal; fostering the self-cleansing of the water courses on Rhinau Island and accentuating the flooding phenomenon in the forest by modifying the water supply from the Vieux-Rhin;

- **Obersaasheim forest:** restoring the Giessen (an old branch of the Rhine) and rare humid areas by creating small ponds and planting certain tree species;
- **Geiswasser, Vogelgrun and Fessenheim forests:** removal of trees not characteristic of the Rhine forest (pine, poplar and locust trees).

The project also preserved dry grasslands favourable to orchids by removing invasive plant species and shrubs and introducing late mowing.

Finally, the project delivered a wide range of communication and awareness-raising activities, including the creation of a tri-lingual internet site, discovery trails and a "Living Rhine" exhibition.

Project Number:

LIFE00 NAT/F/007277

Title: Preservation and restoration of the Rhine's valley habitats

Beneficiary: Région Alsace, DAFTE

Total Budget: €6 231 000

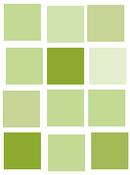
LIFE Contribution: €2 785 000

Period: Jan-2002 to Jun-2007

Website: www.rhin-vivant.com/accueil.htm

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Austria: Restoring riparian habitats on the river Danube

LIFE Nature support has successfully helped restore natural river flow dynamics on the Danube east of Vienna.

The Donau-Auen National Park, east of Vienna in Austria, covers a total area of 10 000 ha and includes a 36 km stretch of the river Danube. Included in the Natura 2000 network, it is one of the last major floodplain areas in Europe and one of the largest and best preserved regions of lowland riparian forest in Central Europe. Parts of the river bank have previously been modified in order to facilitate navigation on the Danube. Meanders and branches had been straightened and re-directed. The results of these interventions had affected the river's hydro-dynamics, leading to the drying up of wetlands and damage to riparian habitats.

National Park authorities were aware of these problems and developed a dedicated LIFE Nature proposal as a result. The LIFE Nature Donauufer project set out to restore river banks in the Donau-Auen area to a semi-natural state, building on efforts from a previous LIFE project that had helped to restore sediment transport systems in the river in order to improve habitats and reduce flood risks.

Ambitious plans

The Donauufer plan was based on ambitious objectives to restore the Danube's floodplain dynamics and so allow the river to work for itself in terms of natural erosion and deposition processes. This involved removing all artificial aspects of the river banks over a 3 km pilot section, along the left bank of the Danube opposite the town of Hainburg.

Results from these river restoration measures have been significant and more than 30 m of the river bank was

eroded. This recreated a new gravel bank more than 300 m long, which in turn provided new space for flood water to disperse and so contributed to flood protection in Hainburg, as well as downstream in Bratislava. Further habitat improvements were made following the removal of 36 dikes on the Orth floodplain. In addition to enhancing natural water flows, these actions also reduced forest-road access to parts of the floodplain, which had had a knock-on effect on sensitive species in the area.

Biodiversity benefits

The combined actions of both LIFE Nature projects have generated benefits for a number of important species in the National Park. Positive restoration outcomes led to the expansion of habitat included in Annex I of the Habitats Directive, such as 'Alpine rivers and their ligneous vegetation with *Salix elaeagnos*' (3240). Improvements to this particular habitat have helped provide nesting and feeding sites for the common sandpiper (*Actitis hypoleucos*) and little-ringed plover (*Charadrius dubius*). Other biodiversity benefits include the availability of more nesting sites for kingfishers (*Alcedo atthis*) along the new eroded riverside. These colourful birds are included in the Annex II of the Birds Directive (79/409/EEC) and the National Park now has one of the highest numbers of breeding pairs of kingfishers in Austria.

LIFE support to restore the Danube's floodplain dynamics also led to more available habitat and burrow sites for the beaver (*Castor fiber*), which is another Annex II species (92/43/EEC). Beavers had been reintroduced into the



Removal of the artificial river banks restored natural erosion and improved the floodplain habitats

park 30 years ago and the LIFE work to reconnected side branches of the river has helped to increase their distribution. Further conservation gains, linked to the reduction of human disturbance, have been reported for endangered birds such as the black stork (*Ciconia nigra*) and the white-tailed eagle (*Haliaeetus albicilla*).

Project Number:

LIFE02 NAT/A/008518

Title: Restoration of Danube river banks

Beneficiary: Nationalpark Donau-Auen, Austria

Total Budget: €1 778 000

LIFE Contribution: €711 000

Period: Jul-2002 to Jun-2006

Website: www.donauauen.at

Contact: Carl Manzano

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Available LIFE publications

LIFE Focus Nature brochures

LIFE and Europe's reptiles and amphibians: Conservation in practice
(2009 - 60 pp. - ISBN 978-92-79-12567-6)

Nature & Biodiversity: Projects 2007
(2009 - 63 pp. - ISBN 978-92-79-12257-6)

Learning from LIFE: Nature conservation best practices
(2008 - 68 pp. - ISBN 978-92-79-11635-3)

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A number of LIFE publications are available on the LIFE website:
<http://ec.europa.eu/environment/life/publications/lifepublications/index.htm>

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+) 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.eu/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

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