



Best LIFE Nature projects 2013



LIFE Nature

Environment



EUROPEAN COMMISSION ENVIRONMENT DIRECTORATE-GENERAL

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Foreword



Frank Klingenstein
LIFE Nature & Biodiversity "Best of the Best" coordinator 2013
German Federal Ministry
for the Environment, Nature
Conservation and Nuclear Safety

This is the fifth year that the LIFE Nature Best Awards have been granted to the most exemplary projects financed within the framework of the European Union's LIFE programme. The procedure for selecting the most outstanding projects completed by the end of 2013 followed the established protocol (see p. 4), but this year also saw two innovations. For the first time, the Awards ceremony was held alongside the meeting of the Ornithology and Habitats Committees, the bodies of EU Member State delegates responsible for assisting the European Commission in the implementation of the Birds Directive and Habitats Directive respectively. This provided an excellent opportunity to show national policy-makers – as well as the press and wider public – the valuable work that LIFE projects are doing. The second innovation was the inclusion for the first time of LIFE Information and Communication projects with a nature conservation theme, as Dirk Schaap explains below.

As the LIFE Programme's National Focal Point for Germany I had the privilege of coordinating the process by which the National Focal Points of the Member States selected the 'Best of the Best' LIFE Nature projects. The high standard of work under consideration made choosing between projects a challenging but enjoyable task. Indeed, it was both enlightening and heartening to see the impact that LIFE is having on the ground across the EU in support of the implementation of the Birds and Habitats directives and the Natura 2000 network. Long may this continue.



Dirk Schaap
LIFE Information & Communication
"Best of the Best" coordinator 2013
Netherlands Ministry of Infra-
structure and the Environment

Scoring of completed LIFE Information & Communication (LIFE INF) projects was launched in the spring of 2014. I had the honour of coordinating the selection of the first such projects to be awarded 'Best of the Best' status. LIFE INF projects were assessed according to the following criteria: nature conservation impact; relevance to environmentally relevant issues; quality of communication actions; multiplier effect; networking activities; innovative campaigning methods; impact on the target group; and their regional, national, or international impact.

A successful LIFE Information and Communication project should address a nature conservation problem through an information or communication action, or strategy, where communication or information is clearly the best, or only, instrument to address the problem. It should also have a clear innovative element and it should be replicable and applicable to other situations.

I hope that these first award-winning LIFE INF projects with a nature conservation theme will serve as an example to all those involved in communicating conservation messages across the EU.





BEST LIFE NATURE PROJECTS

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LIFE NATURE
BEST AWARD
WINNERS 2013





BEST OF THE BEST PROJECTS

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PLTHautes-Fagnes

Rehabilitation of heaths and mires on the Hautes-Fagnes Plateau

2 LIFE07 NAT/EE/000120

HAPPYFISH

Saving life in meanders and oxbow lakes of Emajõgi River on Alam-Pedja NATURA2000 area

3 LIFE08 NAT/GR/000539

AMIBIO

Automatic acoustic monitoring and inventorying of biodiversity

4 LIFE09 INF/GR/000319

PROM.SUS.FIS.PR.PRESPA

Compromise for a reduction of the environmental impact of the retail sector

BEST PROJECTS

5 LIFE05 NAT/DK/000153

Houting

Urgent actions for the endangered Houting "Coregonus oxyrhynchus"

6 LIFE05 NAT/PL/000101

Aquatic Warbler project

Conserving *Acrocephalus paludicola* in Poland and Germany

7 LIFE06 NAT/FIN/000129

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From Ancient to the Present Estuary, Kokemäenjoki Wetland Chain

8 LIFE07 NAT/FIN/000151

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9 LIFE07 NAT/GR/000285

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10 LIFE07 NAT/P/000654

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Netze des Lebens

Biotope networks - networks of life : promoting a forest corridor system with a European perspective

The LIFE Best Nature Awards

The LIFE Best Project Awards recognise the value of the LIFE programme to demonstrate good practice and the benefits of achieving results that can be replicated across Europe. For the first time, this year's LIFE Nature awards included Best LIFE Information and Communication projects with nature conservation themes.

By pointing the spotlight on those projects with the best potential for having a long-term positive impact on nature conservation and biodiversity, the LIFE Best Awards represent a valuable way of furthering the good dissemination work that many of the projects themselves have carried out. A total of 13 projects engaged in nature conservation were honoured at this year's awards ceremony, which was held on 29 April in Brussels. These award-winners were spread amongst nine Member States.

The selection procedure for projects completed by the end of 2013 followed the existing protocol – with a long list drawn up by the external monitoring team, based on project evaluations, followed by an internal assessment of the most outstanding projects by the European Commission. From this list of 'Best' projects, the National Focal Points jointly made a final selection of 'Best of the Best' projects. The selection procedure for LIFE Nature projects is based upon scoring of both short-term and long-term benefits. The former include conservation status improvement and short-term leverage effect; the latter: long-term sustainability, leverage effect, and regional/national/international impact.

Of particular interest this year was the recognition of two LIFE Information & Communication projects with a nature conservation focus: the German project 'Netze des Lebens - Biotope networks - networks of life: promoting a forest corridor system with a European perspective' (LIFE08 INF/D/000032);

and 'PROM.SUS.FIS.PR.PRESPA' (LIFE09 INF/GR/000319), which was one of four projects to be awarded the 'Best of the Best' accolade for exceptional achievement. The Greek project halted the decline of fish biodiversity in the Prespa basin by promoting sustainable fishery practice.

The other three 'Best of the Best' projects were 'PLTHautes-Fagnes' (LIFE06 NAT/B/000091) – which restored endangered peatland and wet habitats in the Hautes-Fagnes plateau of the Belgian Ardennes – 'HAPPYFISH' (LIFE07 NAT/EE/000120) – which restored oxbow lakes in the Emajõgi River and in the Alam-Pedja Natura 2000 site in Estonia to improve conditions for several EU priority fish species – and 'AMIBIO' (LIFE08 NAT/GR/000539) – which developed an innovative acoustic biodiversity monitoring system that can operate remotely, quickly and non-obtrusively.

The remaining 'Best' projects also made noteworthy contributions to maintaining natural habitats and species in a favourable state, while demonstrating effective ways of managing the Natura 2000 network. The projects covered a wide variety of natural habitats – ranging from marine sites in the Baltic Sea (inventories of marine species were carried out by the 'FINMARINET' (LIFE07 NAT/FIN/000151) project) to habitats favourable for the endangered aquatic warbler in Germany and Poland (LIFE05 NAT/PL/000101), and seabird nesting sites in the Azores (the Portuguese project 'Safe Island for Seabirds' (LIFE07 NAT/P/000649).

Winners of the LIFE Nature Awards 2013



Photo: ASTRALE EEG/Justin Toland



Photo: LIFE06 NAT/IB/000091



Photo: LIFE08 NAT/GR/000559/AUSTRALE EEEIG/Justin Toland



Photo: LIFE09 INF/GR/000319/AUSTRALE EEEIG/Tim Hudson



Photo: LIFE07 NAT/EE/000120



BEST OF THE BEST PROJECTS

Belgium: Restoring the degraded habitats of the high fens

The PLTHautes-Fagnes project implemented an ambitious large-scale programme to restore native woodland, heathland, fens, mires and eventually active peatbogs on the Hautes-Fagnes plateau.



Part of the area restored by the project - Rotavated *Molinia* grassland areas and water table exposed after works

The Hautes-Fagnes plateau in the Ardennes was once covered by over 20 000 ha of heath, fens, mire and peatbogs, but these have become degraded, fragmented and reduced to around 5 000 ha. Hautes-Fagnes State Nature Reserve was established in 1957 to conserve these semi-natural and natural habitats. Today, seven Natura 2000 network sites in the Hautes-Fagnes (including the nature reserve) protect ecologically valuable habitats and species.

The PLTHautes-Fagnes project aimed at reversing habitat degradation and declining biodiversity caused by peat extraction, forestry and extensive drainage. More than 90% of peatland habitats degraded by drainage have effectively become monospecific of purple moor grass (*Molinia caerulea*), large tussocks of which cut the light from and mineralise the topsoil preventing other flora from regenerating. The LIFE project restored 2 800 ha of degraded heathland and mires, with 1 300 ha of this subject to major intervention such as deforestation, sod cutting and rotovation (mulching).

Project manager Maité Loute explains the roles of the LIFE team: “Yves Pieper and his colleagues from Wallonia’s department for nature and forests conducted the forestry work, Philippe Frankard is the scientist attached to the public service of Wallonia who initiated the project, while myself and Didier Mackels represent the nature reserve.”

The scientific team started to experiment with small-scale peatbog rehabilitation on the Hautes-Fagnes around 20 years ago. The LIFE project adopted these techniques and applied them for the first time on a large scale on the plateau.

Cutting conifers on peaty soils

On a forest track at the edge of a commercial spruce (*Picea abies*) plantation, Mr Pieper surveys an area that was incorporated into the nature reserve and deforested five years previously. “Forestry expanded around the 1930s, when a lot of money and effort went into planting spruce trees, but



Photo: P. Ghietto

Sod striping in degraded bogs in 2011 (left). Border between the restored area (with heather and more diverse species) and non-restored area (with *Molinia*)

it did not work on the peat soils," he explains. "On peat you can only expect one crop, after that the trees are unstable and prone to windfalls and attack by beetles. So we decided to clear-cut 105 ha of spruce at the beginning of the LIFE project, with the aim of restoring peatland habitats."

To protect the fragile soils, the logging companies were obliged to remove trees only on tracks cushioned with spruce branches; these are still visible on the ground. Mr Pieper notes: "The LIFE project then funded the rehabilitation of the area. In 2010, we started digging numerous small ponds and some bigger ones." These now contain colonising vegetation, and attract insects and birds.

In total, the project removed over 1 540 ha of spruce by cutting, with isolated single trees being sawn and left on site or bark ringed. The cultivation of conifers was also stopped on a further 603 ha through agreements made with landowners.

When commercial spruce plantations were extended from the mineral to peat soils, an extensive network of ditches was dug to drain the waterlogged land. To reverse the degradation this caused, the project either filled in or blocked these ditches at regular intervals (e.g. every 30 m) so they held water. Some 178 km of ditches in total were blocked.

The project enclosed 19 plots totalling 125 ha with fences to keep out grazing deer. This allows the natural regeneration of broadleaved woodland - beech, birch and oak. These habitats have a higher biodiversity than in exotic conifer habitats. Several river valley areas were also restored as alluvial forest with black alder (*Alnus glutinosa*), enhancing the ecological corridor connecting the plateau and the lowlands.

Removing monotonous *Molinia*

The LIFE project used specialised machinery to remove purple moor grass and topsoil in degraded areas, to expose

bare peat near the water table level and enable previously suppressed seeds of peatland species to germinate. Depending on the moisture level in the ground, various biotypes emerged.

The sod was lifted or scraped on around 80 ha of wet heathland and mires to completely eliminate purple moor-grass. Skilled operators either lifted a thin peat layer (5-15 cm) or scraped vegetation and peat to a greater depth (25-40 cm in degraded peatbogs). "The machinery moved on two large wooden platforms, one put in front of the other. If we didn't do this, it would completely sink," recalls Mr Pieper.

Rotovating was a cheaper option for extensive areas of degraded habitats (€2 000/ha compared to €6 000/ha for scraping). It involved shredding purple moor-grass and tilling the soil to a depth of 5-10 cm, then bulldozing it into long mounds.

In fen and mire locations, explains Mr Frankard, "gentle slopes were made to create ecological gradients of moisture favourable to different peat moss species."

Raising water levels

Sod-cut land is undergoing further dramatic transformation in the south of the nature reserve, near Rurhof. "Just three years ago", says Ms Loute, "this area was degraded peatbog with homogenous purple moor grass, but it is now diversified humid habitat. We made dams from clay dug nearby, with pipes in them to allow the water level to be regulated."

"Next week, after waiting two years to allow the dam to stabilise, we will raise the water level by moving the pipe," says her nature reserve colleague Mr Mackels, indicating the end of a pipe rising to the surface of a lagoon. This method will inundate a much larger area. In all, the LIFE project flooded 23 ha of degraded peatbogs by constructing 8 km of dams.





Photo: Roger Herman

Sphagnum species recolonise the newly-restored areas creating habitats for other new species such as dragonflies

Peatbog vegetation establishes within two to four years. "There are about 15 sphagnum moss species in the Hautes-Fagnes, all preferring different levels of moisture," explains Mr Frankard. "Pioneer species of sphagnum have returned here," he points to a blanket of *Sphagnum cuspidatum* on the open water and other species, such as *S. fallax* and *S. magellanicum*, among the re-establishing cottongrass (*Eriophorum angustifolium* and *E. vaginatum*). Sphagnum mosses grow better under other species, which create a favourable microclimate. "Sphagnum is appearing everywhere in the LIFE areas," notes Mr Frankard, "as are other wetland species, such as a rare marsh clubmoss (*Lycopodiella inundata*) that disappeared from the plateau before 1930 but has now reappeared in seven sod-lifted locations."

Increasing biodiversity by mowing and grazing

Repeated mowing of purple moor grass on around 50 ha enabled sphagnum mosses and other wetland vegetation to re-establish. A 12 ha area was mowed specifically to create mating grounds (leks) for black grouse (*Tetrao tetrix*). "The mowing machine exerts very little pressure on the ground, only 80g/cm²," says Mr Mackels. "This is less than the pressure on the ground when walking. Without this machine it would be impossible to mow here."

"The LIFE project erected fencing for sheep and a herd of Scottish highland cattle on around 400 ha of peaty heathlands, fens and degraded raised bogs," explains Mr Frankard, in an open area being grazed by sheep close to the main road. "We have 1 200 sheep in this area, mainly a local red Ardennes breed. They graze at a low density from May to June here, and will then be moved to another site. It is a good way to manage large areas." Mowing and grazing has increased biodiversity on over 420 ha of wet heathland, to the benefit of characteristic flora (e.g. bilberry, cranberry,

heather, marsh gentian and moss orchid), insects (e.g. dragonflies and cowberry fritillary) and birds (e.g. common teal and European stonechat).

The long view

Transition mires are a stage between fens and active peatbogs. Sphagnum moss partially decomposes to form peat in active peatbogs, but the transitional and peat-forming processes occur over a very long period of time. Active peat bogs once covered more than 1 000 ha of the Hautes-Fagnes, but fewer than 125 ha remain. They are visible in the landscape as long grey streaks, for instance, west of the ridge on which the Botrange Tower marks Belgium's highest point (694 m).

The LIFE project conducted extensive restoration work on degraded peatbogs, where peat is no longer actively produced. "These worked sites were once all *Molinia* in degraded peatbog areas close to active peatbog," says Mr Frankard. "After three years, we have acidic fens, transition mires and flooded lagoons beneficial for wading birds."

Throughout the Hautes-Fagnes plateau, the project's interventions are making the landscape more attractive to visitors. The LIFE project funded pathways and multi-lingual information boards, explanatory leaflets and a film. The new wetland areas also act as firebreaks and can reduce the severity of wildfires.

The LIFE project team is very happy with the results of the restoration work. The project has created a mosaic of different wetland habitats that act as 'steeping stones' for the re-establishment of characteristic fauna and flora across the entire plateau. Mr Frankard and his scientific team will continue the biological monitoring programme for many years to come. The habitat transformation and increased biodiversity evident in the pilot areas from 15-20 years ago gives a good idea of the dramatic large-scale changes this project has set in motion.

Project number: LIFE06 NAT/B/000091

Title: PLTHautes-Fagnes - Rehabilitation of heaths and mires on the Hautes-Fagnes Plateau

Beneficiary: Direction Générale Opérationnelle "L'Agriculture, Des Ressources Naturelles et l'Environnement" (DGO3) - Departement de l'Etude du Milieu Naturel et Agricole (DEMNA)

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Website: <http://www.lifehf.be>

Period: 01-Jan-2007 to 31-Dec-2012

Total budget: €4 500 000

LIFE contribution: €2 250 000



Estonia: Reopening oxbow lakes to safeguard fish populations

Reconnecting oxbow lakes to the Emajõgi River in Estonia has helped boost populations of priority fish species.



Reconnected oxbow lakes - reopening done by the project (circles) - November 2011

The great meandering Emajõgi River – which translates as ‘the mother river’ – in southern Estonia is a wonderful example of the geographic progression of a river over time. The river flow has worn off sediments from the sides of river banks and deposited them on the opposite banks, creating a bending course way. In many cases, the silt deposits have increased to the point of isolating stretches of the river as oxbow lakes.

These geographic formations, however, are disastrous for fish populations. Many species spawn in the alluvial meadows and, in particular, in the oxbow lakes in springtime, when the river level commonly rises over the banks. This raised water level reconnects the lakes – but only temporarily. The drop in the river level in the months that follow

causes whole populations to become isolated and the fish die in vast numbers in the deoxygenated, stagnant lakes. This phenomenon happens mainly in hard winters with long-lasting ice cover.

The problem for the Emajõgi River has long-since been understood. In fact, in the 1960s an initiative to remove sediments helped reconnect many oxbow lakes with the main river. The initiative in turn helped secure the populations of the European priority species – asp (*Aspius aspius*), spined loach (*Gobitis taenia*), Eurasian weather loach (*Misgurnus fossilis*) and European bullhead (*Cottus gobio*) – which are found in the river today. However, around 10 years ago oxbow lakes started forming again and preparatory measures for a new set of conservation actions were taken.





Working to reconnect an oxbow lake and the main course of the Emajõgi river

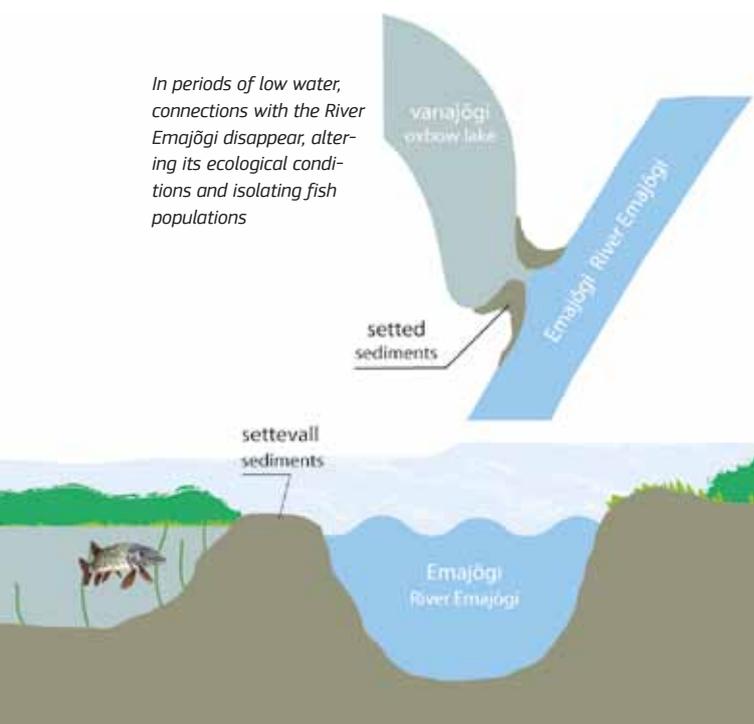
Such measures resulted in the award-winning LIFE project, HAPPYFISH. Meelis Tambets, a senior expert at Eesti Loodushoiu Keskus/Wildlife Estonia, the project beneficiary, recalls that before the project he would receive calls from people saying that the situation was getting worse and that something should be done. "Fish were losing their habitats and we wanted to give these habitats back to them," he says.

The project focused on the Alam-Pedja Natura 2000 site and initially identified 20 oxbow lakes that it wished to reconnect to the main river. The list was halved to 10 (though the remainder have now also been reconnected thanks to EU Cohesion Funds). Such an operation requires a degree of care to ensure that excessive force is not exerted on the river banks. For this reason, in some areas mechanical diggers were mounted on specially constructed raft-like structures.

Additionally, the oxbow lakes were opened up in such a way as to minimise the amount of sediment likely to build up again in the future. The project even took the time to involve botanists in the analysis of the reconstituted sediment banks. Initially, they discovered that biodiversity on the banks was much improved as a result of the restoration work. These new banks were 10 times as species rich as the undisturbed banks, where two or three species tended to dominate – though over time this effect is likely to diminish as these reconstructed banks will also be overtaken by a few shrub plants.

Furthermore, just one end of the oxbow lake is commonly opened up to avoid the through flow of the river. By allowing one end to remain blocked off, the temperature of the water in the lake is increased, making it more favourable to the spawning of fish populations.

In periods of low water, connections with the River Emajõgi disappear, altering its ecological conditions and isolating fish populations



Illustrations: A.Tavita

Analyses of all the lakes were carried out before any earth was moved in order to ensure that the planned measures would yield the anticipated results. According to the project, the total length of the reconnected oxbow lakes is greater than the length of the river before the actions. The site is indeed impressive in its scale. Restoration took place over a 14.7 km stretch of the river (50.2 ha of water surface) and sediments were removed over sections of the river amounting to a length of 720 m. The work is expected to enable fish to freely access these reconnected areas for the next 50-60 years.

Another key measure to promote fish populations was the removal of shrubs and bushes on the alluvial meadows. These meadows have become overgrown and unsuitable as spawning sites. Restoration measures resulted in the protection of more than 50 ha of spawning grounds. In total, the reopening of the meanders and management of the floodplains has made it possible for fish to use an additional 24 sites as spawning grounds.

Fish fanfare

Asps are protected by law in Estonia and it is illegal to fish them. In order to specifically target conservation measures for the species, the project tagged individuals to determine when and where they go to spawn. A total of 70 individuals were marked in this way. Studies showed that each year the same migration patterns occur. "It's amazing that they can make an oxbow lake their own. We didn't expect that at the start of our studies," says Mr Tambets.

The data suggest that each oxbow lake can be seen as a unique ecosystem, and if a particular lake becomes unsuitable for spawning then this will result in the disappearance of a whole population of fish.

To further ensure the sustainability of asp in the river, reintroductions were carried out. Though the reintroduction of this fish species is far from easy, the beneficiary had been experimenting with different procedures before the start of the project. By the time it commenced, however, they were ready, says Mr Tambets, and 53 000 one-summer-old individuals were released into the Emajõgi River at the Natura 2000 site.

The project team is cooperating with fishermen to build up a network of monitors, which is showing that fish populations have already markedly improved in the restored areas. Monitoring has also confirmed the direct link between the breadth of the mouth of the oxbow lake and the amount of oxygen in the lake.

According to the project, the telemetry tagging and the breeding programmes yielded extremely valuable knowledge that will be very useful for future initiatives. The beneficiary has launched a follow-up project, HAPPYRIVER (**LIFE12 NAT/EE/000871**) to carry out further river management measures along the Emajõgi River.

Asp is considered an umbrella species: widening the mouths of the oxbow lakes and guaranteeing good habitats for this target species also ensures healthy populations of many other fish species found in the river.

Though asp can't be fished, recreational fishing is hugely popular in Estonia (though there are no signs of overfishing on the Emajõgi River). "It's part of the culture," says Mr Tambets, adding that one-third of the population regularly enjoy angling. "People care about fish, and the public really care about what we've done."

In fact, the project is widely known throughout the country, owing in no small part to coverage on national TV. "Nature programmes that focus on fish are always popular, and our



Around 53 000 young asps (*Aspius aspius*) were released in the River Emajõgi network of waterbodies

project people were often invited to speak on TV and radio," says Mr Tambets.

"Telling people that something good is going on in the fish world makes people happier. We should have called the project 'Happy People' because people really care about the fish," he enthuses.

The 'happiness' was spread to the kids, too. Camps were arranged at the Natura 2000 site, enabling more than 120 young people to learn more about the wildlife and conservation efforts, whilst a useful booklet was produced to explain the project activities. A further dissemination tool was a noticeboard erected at the Alam-Pedja site, providing information on the target species and inviting visitors to discover more about the area's natural values.

In recognition of its achievements, the HAPPYFISH project received the Estonian award for the Best Environmental Action of 2011.

Project number: LIFE07 NAT/EE/000120

Title: HAPPYFISH - Saving life in meanders and oxbow lakes of Emajõgi River on Alam-Pedja NATURA2000 area

Beneficiary: Eesti Loodushoiu Keskus/Wildlife Estonia

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Website: www.loodushoid.ee/HAPPYFISH_LIFE_projekt_Elusti_15.htm

Period: 01-Feb 2009 to 30-Nov 2012

Total budget: €1 158 000

LIFE contribution: €574 000





Greece: Acoustic monitoring innovation in Athens

The AMIBIO project developed an automated system for the acoustic monitoring of biodiversity on Hymettus Mountain in Athens. This pioneering project has identified nearly 50 species not previously known to be present in this Natura 2000 network site.



The Hymettus mountain Natura 2000 network site overlooks Athens

Hymettus is the closest mountain and peri-urban forest to the city of Athens, located just 7.5 km from Syntagma Square as the crow flies. Covering an area of 8 100 ha, more than 600 species and sub-species of plants can be found on Hymettus.

“Forest fire is the most significant threat to our mountain,” explains Vassiliki Dimitriou, forest manager at SPAY, an association of 12 municipalities dedicated to the protection and development of Hymettus and one of the partner organisations involved in AMIBIO.

This innovative LIFE project had two main goals, explains project leader, Nikos Fakotakis, a professor at the University of Patras / Wire Communications Laboratory: “One was

to collect all sounds from the environment to see what kind of species we have and the other was to protect the area - from human activities mainly.”

To achieve these goals, the project set out to develop and deploy a prototype hardware system based on small multi-sensor monitoring stations and a remote central station for automatic signal processing and analysis. This would be used to conduct an inventory of biodiversity in the project site and enable the monitoring of key trends over time, including, “estimation of the density of the animals through their vocal activities, estimation of the health of certain species from their vocalisation, monitoring and warning of threats to rare species or species threatened with extinction, and monitoring of migrating birds,” says Professor Fakotakis.

The second main goal of the project centred on round-the-clock monitoring to detect danger and crisis events: specific atypical sound events, including natural and human-induced disasters (fires, storms, etc.), as well as those related to potentially hazardous human activities – such as gunshots or motocross.

Building the network

Over the three years of the project, the AMIBIO team built a network of 17 solar-powered monitoring stations, controlled via a central dashboard that allows operators to log-in and fix problems remotely. Each monitoring station contains microphones and ultrasound equipment for acoustic monitoring (the latter for bats and insects whose sounds are outside the range of human hearing); it also contains devices to measure temperature and other environmental factors.

Building the local stations from scratch was challenging says Professor Fakotakis, “we had to redesign the whole system at least four times...and we had to improvise,” he recalls. “We had to make a very efficient monitoring station - with just five volts of power, operating 24/7,” explains Ilias Kotinas from the University of Patras, who developed the Amibio Web Portal, the central interface through which the stations are controlled. “The other problem was that there were many peripherals - four microphones in each station; one weather station; one hard disk. All these peripherals need a lot of current inside a small device,” says Mr Kotinas.

A lot of work was required to be able to run the intensive algorithms needed to identify the sounds in this low-power environment. ‘Lite’ sound detectors were installed in the monitoring stations that were able to classify basic sounds and send priority messages about ‘alarm events’ to SPAY to investigate. “There is a map that shows we have had a gun shot here, motocross here - so the authorities can monitor what happens in real-time and then can react,” explains Mr Kotinas.

Another challenge was to select locations for the stations with a strong 3G signal that would enable them to transfer data continuously. The project collected some 20 gigabytes of (mostly audio) data each day, which was then transferred to a central server, where more complex algorithms could be run to match sound recordings from Hymettus to specific species in a reference library of some 28 000 identified sound recordings of insect, avian, mammalian and amphibian species. There was also the question of what to do in the event of not being able to access the network. Environmental data and information about ‘crisis events’ is stored locally on a hard disk, enabling it to be sent later or retrieved manually.

Expert help

A team from the Technological Educational Institute of Crete (TEIC) applied its expertise in sound pattern recognition to enable the project to automatically identify and classify sounds. “In the first place you have to make reference data. You have to listen and label the different kind of sounds in order to train the system. And once you train the system you can have automatic classification,” explains Professor Fakotakis.

“In order to train our system we use our own databases,” adds the professor. One reason for this is that, “the songs of the birds here and the songs of the same birds in another place and another country are different,” he points out.

The project partnered with the Zoological Research Museum Alexander Koenig (ZFMK), in Bonn, Germany, whose renowned experts in identifying species from their calls were able to access the audio files through a specially-designed interface and directly contribute to the biodiversity assessment of the project site.

More species found

AMIBIO conducted 11 biodiversity surveys: three for insects; seven for birds; and one for bats. Thanks to these efforts, the list of known sound-producing animals in the study area was enlarged from 133 to 182 species. Of the 49 new-found species, 29 are insects, 19 birds and five mammals (bats). Seven of those bird species are listed in Annex I of the EU Birds Directive - European shag (*Phalacrocorax aristoteles*).

Sonogram of the common bow-winged grasshopper (*Chorthippus biguttulus*)





crocorax aristotelis desmarestii, white stork (*Ciconia ciconia*), western marsh harrier (*Circus aeruginosus*), Caspian tern (*Sterna caspia*), Boreal owl (*Aegolius funereus*), common kingfisher (*Alcedo atthis*) and greater short-toed lark (*Calandrella brachydactyla*) - whilst all five newly-identified bats are included in Annex IV of the Habitats Directive and one, the common bent-wing bat (*Miniopterus schreibersii*) is listed as globally Near Threatened by the IUCN and is in Annex II of the Habitats Directive.

Based on its recordings, the project programmed, trained and tested detectors to recognise 28 of the 182 species in the inventory, including rare species. The AMIBIO monitoring system was also used by ZFMK's researchers to give a rough estimation of abundance through mapping of presence at the monitoring locations. This showed that most of the threatened species in the area depend upon open and semi-open habitats, rather than forest.

Mission to explain

SPAY was responsible for communicating the work of the project to the general public and target audiences. Key actions included school visits to see the monitoring stations and an AMIBIO Info Day, which was well-attended by journalists, volunteer forest firefighters and local policymakers and dignitaries. "The national TV channel, SKAI, also reported on the project," adds SPAY's press officer, Florent Celhay.

After-LIFE plans

Although the LIFE project has come to an end, the biodiversity assessment produced by the project will serve as the baseline for the future development of an official conservation plan for Hymettus, something that SPAY hopes will be achieved in the next two to three years, depending on finance and political will. The German zoological experts are continuing to analyse the vast amount of monitoring data generated by the project to learn as much as possible about the biodiversity of Hymettus. The monitoring stations also are still in use, however, support needs to be found to cover the cost of data transfer (the telecommunications company, Cosmote, generously provided free data transfer for the duration of AMIBIO and for one year after). "The project was really a success - it would be a pity to stop here with all the experience we have now," says Professor Fakotakis.

The beneficiary is hoping to put its experience to good use by setting up a spin-off company to licence the technology developed through the LIFE project. "Many people want to use the technology, to apply it in other areas," says Mr Kottinas. Professor Fakotakis and his team have also identified potential improvements to the monitoring network: "If we did it again we would have quite a different approach now - we



Photo: ASTRALE EEG/Justin Toland

Checking a monitoring station. The project designed a system capable of operating 24/7 on just five volts of power

would make the system more compact and cheap so we can install more stations, also adding stereoscopic microphones and image data," he says.

Within the framework of a LEONARDO project (New skills for new jobs in the forest sector - DRYMOS), SPAY and the University of Patras are also planning to launch a smart phone app in late 2014 to provide visitors to Mount Hymettus with information about the species they may encounter. A longer-term goal would be to add real-time species recognition to create a kind of Shazam for the sounds of the natural world. "For the moment we have approximately 20-30 different recognisers - that's not good enough. You have to increase that up to 100 or more and that costs a lot," notes Professor Fakotakis.

Project number: LIFE08 NAT/GR/000539

Title: AMIBIO - Automatic acoustic monitoring and inventorying of biodiversity

Beneficiary: University of Patras / Wire Communications Laboratory

Contact: Nikos Fakotakis

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Website: <http://www.amibio-project.eu>

Period: 01-Feb-2010 to 30-Jun-2013

Total budget: €1 664 000

LIFE contribution: €831 000



Greece: Communicating to conserve Lake Prespa

A variety of effective and transferable methods for using information as a nature conservation tool have been demonstrated by LIFE in northern Greece.

The first ever Best of the Best project prize for a nature project using co-finance from the LIFE+ Information and Communication strand has been awarded to the Society for the Protection of Prespa (SPP). This accolade recognises the SPP's successful work with a broad spectrum of partners and stakeholders, building consensus approaches to help conserve one of Europe's environmental treasures.

Prespa forms a border region between Greece, Albania and the FYR of Macedonia. Its lakes are some of the oldest in the world, dating back millions of years, and this history gives the area a unique mix of biodiversity.

"Prespa is one of the 10 most important wetlands in the Mediterranean, especially for fish," explains the SPP's managing director, Myrsini Malakou. Although nine of the region's 23 fish species are endemic, the wetlands are better known for their bird life. A lack of awareness about the

importance of the fish species, "had led to intensive fishing practices and some of the fish species were threatened with extinction," adds Ms Malakou.

She explains that it was, "a real challenge," for the SPP to raise awareness about fish protection amongst all the different stakeholders. "Through the LIFE project we wanted to create a common base of understanding between the local, national, and international actors about the importance of these fish," she says.

Lingua franca

In addition, the LIFE team also wanted to establish a common language between stakeholders to avoid confusion and ensure that everyone involved understood each other. This would be important to ease the introduction of future management measures for fish protection that were needed.

Filming electro-fishing for the project documentary



Hence the project's main goal focused on identifying the most effective way to implement fish conservation measures using this common understanding among the various organisations and individuals who could help.

"LIFE Information and Communication was the best option for this because it was not linked to the imposition of strict restrictions and it was not linked to fears of local people that we would prohibit fishing. It was linked to raising awareness about the importance of Prespa's fish," notes Ms Malakou.

Acting in parallel

The work of the project can be broadly divided into two sectors of activity. "One sector was targeting the wider audience: both in the region of Western Macedonia and in Greece as a whole. We wanted to inform the public about the importance of freshwater ecosystems because these are not very common, nor well-known, in Greece," explains Ms Malakou. "We also wanted to inform people about the importance of freshwater fish as part of our biodiversity, and in particular the fish from Prespa," she adds.

The second tranche of actions were targeted at local stakeholders. "We had to rebuild their confidence and values about fish. Commercial fishing was previously a very important economic activity for this area, but unfortunately in recent years this has not been the case and people had started to consider it as a secondary activity," notes Ms Malakou.

Reversing such a decline in interest in Prespa's fisheries amongst local communities was another core aspect of the LIFE project's overall nature conservation goals.

The project featured members of the local fishing community - such as Mrs Toula Christianopoulou (pictured) - in a series of TV spots



Photo: SPP ARCHIVER Kouroumizis

Relevant messages

The work of the project draws attention to the need to design communications to which target audiences can easily relate. The SPP achieved this by using LIFE Information and Communication co-funding to explain how its scientific research about the lakes, wetlands and surrounding catchments was linked to the everyday activities of local people.

Demystifying the technical research's information and presenting it within the context of daily life was a notable success factor for the project. A common starting point for the project team was to find out what local people already knew about their area. From here they then blended their scientific knowledge with the community's existing know-how.

Ms Malakou stresses that this was possible by concentrating on raising awareness about how the environment of the fish affects people too, and how changes to the lake can have either positive or negative effects on the ability of the Prespa area to remain an attractive place to live, work and visit.

"It was important for us to understand people's needs, expectations and worries. It was also important for the community to understand the findings of our scientific research," she explains. With LIFE's support, this common understanding was established and agreed so that all the stakeholders now understand how they can work better together towards the same aims.

A good example of LIFE's success in using its information potential to promote sustainable development can be seen by reactions to the SPP project from the local fisheries stakeholders. "The project gave local fishermen the opportunity to express our opinions and share our observations about the behaviour of the birds and the fish in the lake," says Adonis Toutountzis, a professional fisherman.

"We also learned new things about the lakes," he reveals. "We used to have lots of eels in the lake but we don't see them anymore and we were worried about what was happening. The scientists explained that our lakes are no longer connected with the sea, so the eels can't come back here."

Another lesson from the project that has been effectively communicated is the fact that, as Mr Toutountzis explains, "some non-native fish species are not good for the lakes. They are a problem for our endemic fish. So if there is any need to restock the lakes in the future it has to be done with care using scientific knowledge and supervision."

Assessing effectiveness

The project coordinator, Marianna Vlassi, believes that it is difficult to distinguish between the effectiveness of the different information tools, because together they all form necessary parts of a jigsaw. They all implemented different components of a strategy that was needed to reach different audiences with different messages. She considers that TV spots and documentaries were valuable in spreading messages to thousands of people, but she highlights the importance of using them as a ‘means to an end’ – rather than being the ‘end’ in and of themselves.

Ms Malakou reinforces the importance of this advice for others interested in using LIFE Information and Communication funds in similar ways. She recommends designing the information campaign so that high-profile tools, such as TV programmes and adverts, are accompanied by follow-up actions. These complementary actions need to be planned to catch and make immediate use of the interest and momentum that is generated by the mainstream media exposure.

“TV publicity should be used as a catalyst that reaches and encourages large target audiences to get involved with accompanying actions at local, regional, and national level. This will help to ensure your project has specific results on the ground,” says Ms Malakou.

Qualitative outcomes

Indicators were used by project staff to assess the effectiveness of their information tools in achieving the desired results on the ground. Whilst it was useful to have indicators that showed how much communication had occurred, standard metrics such as number of copies of publications distributed, number of events held, or number of people spoken to, were of limited use in evaluating the project’s impact. Other, more qualitative, indicators were thus deployed that could better measure the PROM.SUS.FIS.PR.PRESPA project’s real benefits.

“We used specific evaluation indicators that were related not to the [amount of] information that was spread, but to the result of it,” explains Ms Malakou. “For example, it was important for us to gain institutional and policy improvements for the fisheries and we succeeded in this indicator by including fishermen in Prespa’s Wetland Management Committee, which decides on the area’s wetland management measures.”

Other evaluation feedback identified the benefits from designing-in flexibility when developing information tools. “We were able to evaluate our communication activity as we



Photo: SPP Archive

Fish exhibition in Kastoria Environmental Education Centre

went along and modify our approach accordingly. You need this flexibility to ensure the relevance of your information materials for your target audiences,” continues Ms Malakou.

One example of what this meant in practice relates to work in schools to raise awareness of the need to conserve Greece’s freshwater fisheries. “We found that in order to do this properly we first needed to do more preparatory work with the children than we expected,” recounts Ms Malakou. “This was because our early pilot activities showed that the children did not tend to associate fish with freshwater. Greece has a strong maritime culture and so when children thought of fish they thought about the sea, rather than lakes or rivers. We therefore needed to adapt our environmental education materials and invest more emphasis on explaining that work to protect fish was not only needed in the sea.”

The SPP continues to build on the progress achieved during the LIFE Information and Communication project, and the organisation remains keen to share its experiences with other organisations interested in the scope and potential of this strand of LIFE as a nature conservation tool.

Project number: LIFE09 INF/GR/000319

Title: PROM.SUS.FIS.PR.PRESPA - Halt the decline of fish biodiversity, in the Prespa basin, by promoting sustainable fishery practices in compliance with EU policy

Beneficiary: Society for the Protection of Prespa

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Period: 01-Oct-2010 to 31-Mar-2013

Total budget: €715 000

LIFE contribution: €356 000





BEST PROJECTS

Denmark: Urgent action for remaining houting population

Found only in parts of Denmark, the houting is one of the EU's most endangered fish species. This project has restored four Danish rivers to help ensure its future survival.



Photo: ASTRALÉ EBG/Justin Toland

The project removed or bypassed obstacles to the free passage of the houting - the creation of this self-maintaining fish passage was one of the actions that restored access to some 118 km of river

The North Sea houting (*Coregonus oxyrhynchus*) is a salmonid with a characteristic pointed 'snout'. It is a priority species for conservation according to the EU Habitats Directive. Like salmon, the houting is anadromous, living and maturing at sea, but ascending the larger freshwater courses in autumn to spawn.

The species was once widespread throughout the entire Wadden Sea region (covering the Netherlands, Germany and Denmark). It was a commercially-important fish species spawning in most rivers. Today, it has declined severely (its entire population estimated in 2000, at just 7 000 adult spawners) with its occurrence restricted to the Danish Wadden Sea region, as well as areas of six rivers in Denmark, where it reproduces. The dramatic decline was a result of the advance of pollution, dike building and canalisation since 1910.

One of the main impediments to successful reproduction is the presence of (even relatively small) obstacles in rivers during the spawning migration, as houting are unable to pass weirs or make use of fish ladders. Silting of spawning grounds is also a problem. Furthermore, juvenile houting require large areas of reed beds or flooded meadows, where they forage for several months before their seaward migration. Previous restocking

attempts in Denmark have failed to provide lasting results because they were not followed up by habitat restoration.

Habitat comes first

The overall objective of the LIFE Houting project was to restore and maintain a favourable conservation status of the species in Denmark and thereby, the EU. To this end, it carried out restoration works on four of the six rivers, the Varde, Sneum, Vidå and Ribe.

Areas of these rivers that, in the past, provided ample spawning and nursery grounds for houting had been dammed and used for fish farms and the production of energy. Thus, specific aims included: the removal of weirs and dams; the construction of riffles¹ or meanders in order to facilitate upstream migration; and the decommissioning of certain power plants and fish farms.

The project was run by the Danish Nature Agency (part of the Danish Ministry of Environment), initially in partnership with

¹ A riffle is a short, relatively shallow and coarse-bedded length of stream over which the stream flows at slower velocity but a higher turbulence than it normally does in comparison to a pool. (<http://en.wikipedia.org/wiki/Riffle>)



Photo: ASTRALIE EEEG/Justin Toland

Restoring meanders has improved the suitability of four river systems for houting, salmon and other riverine species

the counties of Ribe and Sønderjylland (both part of Syddanmark Region since 2007). The LIFE team worked to ensure the main project actions – i.e. the removal of artificial barriers to migration and restoration of meanders, spawning grounds and shallow wetlands – were implemented with the broad cooperation of other stakeholders such as landowners and fish farm owners.

The team also implemented a national action plan for the houting, drawn up in 2003, to meet Denmark's European obligations regarding this particular priority fish species.

The project removed barriers to migration at eight fish farms, two hydro-electric dams and one former mill pond. It also reduced river water intake for other fish farms. These actions were complemented by the purchase of netting rights. The project's demonstration of practical river system restoration was based on compensation payments to the owners of fish farms and landowners, the voluntary selling of land and rights, and state-of-the-art technical solutions.

Specifically, on the River Varde, the project restored 15.5 km of highly degraded river with gravel and stone, restoring or creating more than 20 km of naturally-meandering river with a natural hydrological regime, to favour upstream fish migration. Restoration of some 29 ha of natural river habitat took place, including approximately 2 ha of spawning grounds for houting and other salmonids. Along the rivers Sneum and Vidå, the LIFE team created 114 ha of shallow water lakes as nursery areas for juvenile houting using a combination of hydrological and construction work; it also created 46 ha of wet meadows. In the case of the Vidå, houting can now reach stretches of the river that have not been accessible for 400 years. On the Ribe, an impassable dam and weir were demolished and two semi-passable jumps renovated prior to restoration of the river.

Monitoring of the genetics and dynamics of the houting population, together with studies of houting juvenile survival in restored nursery areas, led to the conclusion that

supplementary breeding programs are unnecessary at present - the population should be allowed to grow naturally.

Positive impact

As a result of the project, migratory fish have gained access to an additional 118 km of river and two Natura 2000 network sites have been enlarged with restored river stretches and wetlands. The project had a positive impact on the quality of the targeted river habitats. It also resulted in improved access to spawning areas for other salmonids, as well as improved conditions for the freshwater pearl mussel (*Margaritifera margaritifera*) and otter (*Lutra lutra*).

Another environmental benefit resulted from the reduced nutrient loads reaching the coastal area of the Wadden Sea. This will assist in meeting EU Water Framework Directive objectives by helping to restore the chemical water quality and natural water regime of the four rivers. Furthermore, because of a greater potential for production in the rivers, the project's actions have increased the value of the restored sites for recreational fishing of trout and salmon, both freshwater and coastal.

Finally, project manager Steinbring Jensen says he and his colleagues are, "very pleased," to be awarded LIFE Best Project status: "We really appreciate this 'pat on the shoulder' from the European Commission for doing a good job."

Project number: LIFE05 NAT/DK/000153

Title: Houting - Urgent actions for the endangered Houting "*Coregonus oxyrhynchus*"

Beneficiary: Danish Nature Agency, Waddensea (Naturstyrelsen, Vadehavet).

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Period: 01-Feb-2005 to 31-Dec-2012

Total budget: €13 386 000

LIFE contribution: €8 031 000



Poland: Restoring aquatic warbler habitats

Habitat restoration has stabilised the aquatic warbler population in Poland and helped bring this critically endangered passerine bird back from the brink of extinction.

The aquatic warbler (*Acrocephalus paludicola*) is the rarest songbird found in mainland Europe. It is a migratory species, which overwinters in western Africa and returns to Europe to breed. Once numerous in Central and Eastern European wetlands, populations are now acutely threatened. There are an estimated 3 500 singing males in Poland, which represents 17% of the world population and as much as 80% of the European Union population; only Belarus has a larger population. In Poland, aquatic warblers are restricted to a few fen mires and wet meadow sites. However, these habitats are themselves under threat from drainage, the decline of traditional agricultural practices and overgrazing.

Most of the aquatic warbler's 22 range countries in Europe and Africa have signed a Memorandum of Understanding, as part of the Convention on Migratory Species of Wild Animals (CMS). This commits them to implementing an international action plan for this species and its habitat. The aquatic warbler is also listed in Annex I of the Birds Directive, making it a priority species for European Community action. The LIFE Programme has funded much of the aquatic warbler habitat restoration work done in Europe.

The award-winning LIFE Aquatic Warbler project stabilised populations of the species at key sites in north-eastern Poland and along the Polish-German border through a programme of habitat protection, restoration and creation. The project's coordinating beneficiary, the Polish Society for the Protection of Birds (OTOP), achieved this in collaboration with local bird societies, the Biebrza National Park in north-eastern Poland, and the Royal Society for the Protection of Birds (RSPB) in the UK.

Previous studies have revealed that aquatic warblers prefer wet sedge vegetation that is less than 30 cm tall. The LIFE project implemented active conservation measures to achieve optimal habitat conditions within nine sites, or over 8 000 ha in Biebrza and in Pomerania in Germany. This encompassed the breeding sites of around 81% of the remaining Polish and German aquatic warbler populations.



Photo: Mateusz Malysiak

Aquatic warbler (*Acrocephalus paludicola*)

Innovative habitat management technology

Large-scale mechanised mowing on delicate wet peat soils was a particular challenge for the LIFE project. OTOPI describes how new management technology had been introduced for this purpose: The new 'ratrak'-harvesters are adjusted 'alpine piste-bashers' on caterpillar treads having very low ground pressure, which are able to mow large areas of aquatic warbler habitat without destroying the delicate peat soil; an effect akin to traditional hand scything. Using this and other methods and a combination of LIFE funds and payments through agri-environment schemes, large expanses (6 166 ha) of fen mires were managed by regular mowing.

Wetland vegetation was also kept short by grazing, which was successfully introduced on 510 ha. In addition, a total of 971 ha of aquatic warbler habitat was restored by removing trees, bushes and overgrowth from wet meadows and mires (314 ha LIFE-funded).

Water level management structures were established at one Polish project site, while in the Peene Valley in Germany the blocking of three ditches had a positive effect on 120 ha of potential aquatic warbler breeding habitat.

Population recovery

A monitoring programme conducted at the nine project sites with the help of volunteers, who have played a vital role in the project, showed that aquatic warblers responded positively to the management of formerly degraded habitat. Numbers remained stable for the overall population in the Biebrza Valley, the biggest site for the species in the EU. In this core management area, aquatic warblers re-occupied 336 ha of restored habitat and, from 2005 to 2010, the population increased by 20% in areas subject to active management.

The LIFE project also prevented the extinction of a genetically distinct remnant western population of aquatic warbler in Pomerania. This population had fallen to as low as 8-12 singing males; a 2012 census identified 36 singing males. Protection of this sub-population provides a source of birds for the potential recolonisation of a range that once extended as far as the Netherlands.

Besides aquatic warblers, OTOP noted that the large-scale mowing has resulted in the return of large numbers of meadow-breeding waders, especially in the Biebrza National Park. Here, the first breeding occurrences in Poland for 10 years were recorded for wood sandpiper (*Tringa glareola*) and jack snipe (*Lymnocyptes minimus*).

Installation of a water monitoring station at Peene Valley. Monitoring of water levels is crucial to maintaining the aquatic warbler habitat



Photo: Franciszka Tarnieberger



Photo: Lars Lachmann

The project restored almost 1 000 ha of wet meadow habitats for aquatic warblers by removing overgrowth

The LIFE project produced a national action plan for the conservation of the aquatic warbler in Germany, providing the basis for long-term habitat management. Its efforts in both Poland and Germany contribute to the implementation of the international CMS action plan for the aquatic warbler, as well as to the EU species action plan.

After LIFE

Awareness of the conservation needs of the aquatic warbler has been raised among relevant authorities and the public. The project oversaw the building of observation towers, platforms and hides in Biebrza National Park; one of which is generally regarded as the world's best place to observe aquatic warblers.

OTOP explains that, since 2009, the project has arranged for financial support to be given to farmers who utilise aquatic warbler-friendly land management in Poland, therefore enabling the continuation of the conservation work for a long period beyond the project. In order to further ensure the long-term management of habitats, the Aquatic Warbler project conducted feasibility studies on using hay cut from managed bird habitats for the production of carbon-neutral fuels and energy in Poland and Germany. This initiative is being advanced through another LIFE project (**LIFE09 NAT/PL/000260**).

Project number: LIFE05 NAT/PL/000101

Title: Aquatic Warbler project - Conserving *Acrocephalus paludicola* in Poland and Germany

Beneficiary: Ogólnopolskie Towarzystwo Ochrony Ptaków (OTOP) / Polish Society for the Protection of Birds

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Period: 01-Feb-2005 to 30-Nov-2011

Total budget: €5 457 000

LIFE contribution: €4 093 000



Finland: Achieving large-scale wetland restoration

The Kokemäenjoki-LIFE project restored some 440 ha at Lake Puurijärvi, Finland's largest ever wetland restoration. Other management and conservation activities carried out by the project are ensuring the protection of endangered wildlife.

Some of the most valuable habitats for endangered birds in Finland are found along the River Kokemäenjoki in south-west Finland, from the river's ancient estuaries to the present estuary, including Lake Puurijärvi, Preiviikinlahti and Kokemäenjoen suisto. Several species that are listed in Annex I of the Birds Directive – bittern (*Botaurus stellaris*), marsh harrier (*Circus aeruginosus*), corncrake (*Crex crex*) and white-tailed eagle (*Haliaeetus albicilla*).

The area is also home to two of the last few remaining breeding sites of dunlin (*Calidris alpina subsp. schinzii*) as well as the natural habitat sites for Siberian flying squirrel (*Pteromys volans*), which is listed in the Habitats Directive. It is thus vital that these sites are protected, and a LIFE project was set up to improve management plans and degraded habitats, as well as control negative human impact on the sites.

The Kokemäenjoki-LIFE project produced five management plans that cover eight areas along the River Kokemäenjoki, an area of 12 303 ha in total, including lake, river, mire,

semi-natural grassland and forest target habitats. In recognition that these areas are popular recreation sites, the project sought to include the views of visitors and landowners. It also produced supplementary inventories of fauna (for example, dragonflies) to inform the plans, and the target bird species, aquatic vegetation and land fauna were monitored in key habitats.

The Kokemäenjoen suisto estuary Natura 2000 site has suffered pollution from hazardous substances and, as a result, sediments at this site were analysed and the information used in the planning of restoration work. The estuary is part of the potential flood zone of the city of Pori and its surroundings (an area home to some 15 000 people out of a total population for the city of 80 000): flood protection is thus an important consideration for management planning. Research conducted during the project led to proposed measures for effective flood prevention.

The most challenging aspect of the project, however, was the Lake Puurijärvi restoration, according to Tapio Aalto, the

The project carried out a major wetland restoration in south-west Finland





Photo: ASTRALE EEG/Camilla Strandberg-Panellus

The project built birdwatching towers, walking trails and other infrastructure that helped raise public awareness

project leader. "During the project, when we made more detailed construction plans, it became evident that the bottom of the lake (the ground for the planned dam) was softer than originally assessed. This meant that we needed more construction than foreseen," he says.

Such additional reinforcements for the dam would add to the costs and potentially overstretch the budget. Construction efforts were further complicated by a harsh winter, making the excavation of the open water areas difficult. "All these factors affected the costs and also timetable of the project in many ways. We had to evaluate and modify restoration work during the project and apply for an extension," explains Mr Aalto.

The project was able to overcome these challenges, and national funds covered the additional cost of the restoration work. The beneficiary acknowledges the guidance of the European Commission and the patience of its partners and co-financiers for the success of this initiative. Lessons from this project, moreover, will benefit similar initiatives.

Restoration measures

Lake Puurijärvi had become overgrown and the aim of restoration was to raise the water level. By raising the level in the southern part of the lake by some 10 cm, a new open water area of approximately 30 ha was created. The project also excavated and dredged an open water area of some 17 ha in the northern part of the lake.

By building dams and filling drainage ditches, the project was able to restore some 156 ha of mire areas, whilst 40 ha of forest habitats were restored by creating small openings and thinning rowan stands and increasing the amount of decaying wood. In the Preiviikinlahti area, the project constructed three small islands for breeding birds. Work in protected areas in

Rajalanjärvi was targeted at wader species and consisted of the creation of five small ponds and mud depressions. To enhance breeding conditions for dunlin, LIFE funds were used to ensure that overgrown meadows were mowed and ditches filled.

Finally, the project developed new possibilities for the recreational use of the project areas. It constructed five bird-watching towers and platforms, created access paths and walking trails, and erected information boards. Such efforts helped raise public awareness of the need for nature conservation. Moreover, these actions are lessening the amount of disturbance generated by tourism in the region.

"We know that our project gave an essential push for conservation and preservation of nature values in these project areas," concludes Mr Aalto. "It was possible to connect different and new players in conservation work. I hope that after the project we will have a better base for promoting conservation in these areas. The restoration works at Puurijärvi and our management plans will provide useful experience and practices that can be applied to other areas too."

Project number: LIFE06 NAT/FIN/000129

Title: Kokemäenjoki-LIFE - From Ancient to the Present Estuary, Kokemäenjoki Wetland Chain

Beneficiary: Centre of Economic Development, Transport and the Environment for South-western Finland

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Period: 01-Aug-2006 to 31-Jul-2012

Total budget: €3 409 000

LIFE contribution: €1 704 000



Finland: Mapping marine habitats in the Baltic

As a first step towards improving the condition of priority marine habitats in the Baltic Sea, a Finnish LIFE project produced inventories and cartographic information to provide a detailed overview of protected areas.



Photo: Juho Lappalainen

Filamentous algae (Cladophora glomerata and Ceramium tenuicome) in the the eastern Gulf of Finland

Finland's fragmented coastline and archipelagos give rise to a diverse range of marine habitats: islands and islets, reefs, sand banks, glacial esker islands, elevated shores and lagoons. The comparatively young age of the Baltic Sea and the low salinity of its water mean that there are fewer species than in, for instance, the Atlantic Ocean. Nevertheless, its flora and fauna are worth conserving. Underwater marine and brackish-water species live in parallel with freshwater species and form unique ecosystems specific to the Baltic Sea.

Extensive eutrophication and increased levels of toxic substances, however, have affected these marine habitats. Whilst the designation of Natura 2000 network sites has allowed the Finnish government to establish an exclusive

economic zone in order to better protect areas outside its territory, only a few preliminary surveys of underwater habitat types had been conducted in these areas.

Moreover, maritime activity is increasing all the time. Without a clear knowledge of these marine habitats, it is difficult for spatial planners to site fairways, dredging and wind energy production areas where they can operate with minimum environmental impact.

As a result, the LIFE project, FINMARINET, was set up to produce inventories and maps of underwater habitat types and their flora and fauna in key marine Natura 2000 sites. The objective was to use this field-collected data in GIS distribution modelling for habitats and species.





The FINMARINET project was led by the Finnish Environment Institute (SYKE), a governmental research and development centre. It produced field inventories, including geological and biological inventories of the seafloor, and cartographic information. The project's six research areas extended from the Gulf of Bothnia in the north to the easternmost part of the Gulf of Finland – covering seven target areas with multiple Natura 2000 network sites and the adjacent exclusive economic zone waters. These target areas were selected because they covered a range of different maritime habitats – from almost freshwater areas to the outer reaches of the archipelago, which borders the Baltic Sea proper.

The geological inventories covered 787 km² of seafloor, combining acoustic-seismic methods with sediment samples taken at 107 sites and drop-video carried out at 106 sites. The biological inventory data was acquired from a total of 22 886 drop-video transects from a boat, 652 remotely-operated robot camera video transects in deeper water, 250 dive transects and 416 benthic samples. In fact, the project gathered more field data than any previous LIFE project in Finland.

Producing detailed maps

Following the data collection, the next step was to combine the geological and biological inventory data. The project used GIS and statistical modelling techniques to draw up geological maps and maps of habitats listed in Annex I of the Habitat Directive and EUNIS habitat types. It also predicted the distributions of key species and community types, identifying those areas that are particularly vulnerable and where biodiversity is most threatened.

The maps of species occurrence and of the marine Natura 2000 habitats in the project target areas delivered information that was not previously available. This information is being provided to the authorities to assess the adequacy of the networks of protected areas and to guide possible follow-up action. The maps are also freely available on the project's web-based information service, which is aimed at both experts and the general public.

The outcomes of the project have also enabled SYKE and its partners - Geological Survey of Finland, Metsähallitus Natural Heritage Services, University of Turku and Åbo Akademi University - to greatly develop their modelling capacities in order for them to be able to support similar activities in the future.

The results were also further distributed in two national seminars, two international seminars and seven press conferences, including one held underwater, a first for Finland. Moreover, public awareness was raised by promoting marine



Photo: Mats Westerborn

Red algae (Furcellaria sp.) was one of the species mapped by the project - here pictured in the western Gulf of Finland

biodiversity issues through technical publications as well as at seven training events and five visits for journalists.

Another positive outcome of the FINMARINET project has been to increase marine nature expertise regarding the Northern Baltic Sea. It also established productive national and international marine nature survey networks of excellence. An After-LIFE plan targets further improvements in the management of the Natura 2000 sites based on informed planning using FINMARINET data. The plan recommends that sites of particular environmental value are identified and activities are focused on these sites.

Project number: LIFE07 NAT/FIN/000151

Title: FINMARINET - Inventories and planning for the marine Natura 2000 network in Finland

Beneficiary: Suomen ympäristökeskus (SYKE)

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Period: 01-Jan-2009 to 30-Jun-2013

Total budget: €3 409 000

LIFE contribution: €1 704 000



Greece: Protecting seabirds in the marine environment

The ConShagAudMIBAGR project achieved a major step forward in the study of seabirds and their habitats in Greece, delivering inventories of 41 new marine Important Bird Areas (IBAs) and assessing and tackling the most important threats to two target seabird species.

More than one-third of all seabird species are considered threatened or endangered and several are among the most endangered bird species in Europe. Their main threats include: disturbance of nesting areas by tourists and predators; getting caught up in fishing lines and nets; eating litter in the marine environment; and chemical pollution of their natural habitats.

Protecting seabirds is a particularly significant challenge because of the often remote maritime habitats involved. Typically, the greater the distance from shore, the less data there are on bird populations and their distribution. The high costs and specialisms required have thus made it an ongoing challenge for environmental authorities across Europe to extend the Natura 2000 network into marine environments.

Target species in Greece

This LIFE project sought to address the challenges of protecting endangered seabirds in Greek waters. It specifically focused on two species found in the Aegean and Ionian Seas: Audouin's gull (*Larus audouinii*); and Mediterranean shag (*Phalacrocorax aristotelis desmarestii*) (see box).

Audouin's gull with radio transmitter ready for release



The populations of both species are threatened by predation of eggs and chicks by rats, competition with the superabundant yellow-legged gull (*Larus michahellis*), chemical pollution at sea and mortality from accidental by-catch. To address these threats, the LIFE project aimed at "concrete conservation actions for the [two seabird species] in Greece, including the inventory of relevant marine IBAs.

The project actions covered 17 of the most important Special Protection Areas (SPAs) for the two species in Greece. The specific project sites were uninhabited islets and islands where the seabirds breed, the surrounding sea where they feed, and the larger inhabited islands where major ports and towns are found.

Data collection

Specialist partners used a variety of research methods to increase knowledge and information about the target species. These included boat-based surveys and coastal counts of bird populations, ringing and telemetric tracking of individual birds and biological testing.

Boat-based surveys by project partners covered 10 258 nautical miles and were supported by the cooperation of

Audouin's gull (*Larus audouinii*)

Audouin's gull is a medium-sized seabird that spends most of its time out at sea catching small-sized fish at the surface of the water. The Aegean Sea is its main breeding area. The population in Greece halved to only 350-500 pairs in the past decade.

The Mediterranean shag rarely moves far from rocky coasts, diving into the water to catch fish close to the seabed. It breeds on steep rocky cliffs, islets, large caves and crevices. Its Greek breeding population is around 1 400 pairs, mostly in the Aegean Sea.

shipping companies who sent in records of observed seabirds. Together with 210 coastal counts, these efforts identified some 1 500 individual Audouin's gulls and over 8 000 Mediterranean shags in the Aegean and Ionian Seas.

The use of tracking devices on 32 individuals of each of the two target species - supported by GPS data loggers, radio transmitters, a GPS Bluetooth and geo-locators - improved knowledge and understanding of the birds' foraging and roosting sites and migration hotspots.

The Hellenic Centre for Marine Research (HCMR) analysed stomach contents, regurgitated food and faeces to assess the diet of the birds. Tissue samples were used to provide both DNA analysis and a toxicological analysis of levels of chemical pollution from heavy metals and other toxins and their estimated effects on the target species.

Data from 165 observation days on-board fishing vessels in both the Ionian and Aegean Seas were complemented by surveys of hundreds of fishermen. Although no birds were caught in fishing equipment during this time, the questionnaires revealed that many birds are affected each year.

Marking a gull's nest



Photo: HCS/Victoria Saravia

These findings supported the delivery of a set of mitigation measures to avoid accidental by-catch.

Definition of marine IBAs and threat control

GIS analysis of all the data collected and modelling supported the designation of 41 marine IBAs within the project area. The project submitted completed inventories of the designated marine IBAs to the Ministry of the Environment in a format that will enable their inclusion in the Natura 2000 network. This was one of the major achievements of the project.

The team used its monitoring data to identify that 83 (mostly) smaller islands should be prioritised for rat eradication. The project then used poisoned bait to successfully eradicate rats from nine complexes of islets. The team used labour-intensive bait stations to avoid negatively affecting non-target mammals such as hares.

Project data on 144 uninhabited islands and islets also enabled the identification of 20 priority islands for the implementation of control measures targeting the yellow-legged gull. The team implemented pilot actions treating the nests of the overabundant gulls on five sites. These prevented almost 100% of breeding in the treatment season and also reduced the use of those nests in the following year by 80%.

Limiting future threats

The project achieved a major step forward in the protection of seabirds and the extension of the Natura 2000 network into the marine environment in Greece. More specifically, its actions should improve the long-term conservation status of the two endangered seabird species targeted. The project has already reduced existing threats, particularly to nesting sites. The designation of the IBAs should also enable effective limitation of future threats, such as the construction of new wind farms in crucial breeding grounds.

Project number: LIFE07 NAT/GR/000285

Title: ConShagAudMIBAGR - Concrete Conservation Actions for the Mediterranean Shag and Audouin's gull in Greece including the inventory of relevant marine IBA

Beneficiary: Hellenic Ornithological Society

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Period: 01-Jan-2009 to 31-Dec-2012

Total budget: €2 358 000

LIFE contribution: €1 768 000



Portugal: Conserving nature in the cereal steppes

This LIFE Nature project has secured ongoing funding and won the backing of key interest groups, essential steps towards safeguarding valuable EU biodiversity.

Sustainability is one of the factors on which the LIFE Nature award-winners are judged; it is important that actions continue after LIFE co-funding ends.

To ensure an effective legacy, beneficiaries need to design and implement projects that deliver viable solutions to conservation challenges. This also helps to encourage the replication of results, since sustainability is often a measure of good value for money from public investment.

Portugal's Estepárias project typifies such good practice in its work to improve the long-term functionality of habitats for endangered and iconic bird species in the arable landscape of Baixo Alentejo. Project actions focused on improving the conservation status the great bustard (*Otis tarda*), little bustard (*Tetrax tetrax*), and lesser kestrel (*Falco naumanni*).

Each of these species has suffered inadvertently from human intervention over the last 100 years. Changing agricultural practices and the introduction of infrastructure to supply rural communities with electricity have both had adverse impacts on the functioning of the birds' favoured habitats. This in turn has affected the ability of the birds to maintain suitable population sizes, and thus survive.

The Estepárias project has helped to reverse this decline through a coordinated set of conservation actions that took place in the few remaining areas where significant populations of the target bird species remained. In these locations, the project put in place new and durable systems for reducing habitat fragmentation and improving crucial features such as feeding, breeding, and nesting environments. Habitat functionality was further enhanced by removing threats that previously hindered the birds' free movement between these vital habitat features.

Stakeholder support

The coordinating beneficiary, Liga para a Protecção da Natureza (LPN), recognised the importance of involving stakeholders in nature conservation actions.

Outreach and communication were therefore prominent in the project's effort to encourage stakeholders such as power supply companies to make their cables and pylons safer for birds (notably by increasing their visibility and reducing electrocution risks).

Awareness-raising actions also targeted children, who are tomorrow's land users, and other local residents. This work

Several species listed in Annex I of the Birds Directive are found in this semi-natural dry grassland habitat



increased appreciation of the birds' needs and also highlighted the rural development benefits that can be gained from improving an area's stock of biodiversity resources.

Farmers were another crucial group of stakeholders as agricultural practices were having a major influence on the availability of feed for the birds. Changes in farming methods over the past half century had also introduced new problems to which the birds had difficulty adapting, such as a network of wire fences that fragmented bustard habitats.

A combination of approaches was applied to working with farmers and landowners during the improvement of feeding zones, provision of increased access to watering points, and implementation of hunting agreements to reduce disturbance during breeding times.

LIFE funds enabled the beneficiary to purchase some 168 ha of land where 70% of Portugal's great bustard and lesser kestrel populations were concentrated. This allowed LPN to fully control how land was used in these parts of the project area. Elsewhere, it drew up agreements with farmers who consented to carry out work that would help to better facilitate nesting, breeding, and feeding for all three species.

To boost the lesser kestrel population, the project constructed two breeding towers in Natura 2000 network sites. One was on the acquired land at Castro Verde and another at the Mourão/Moura/Barrancos Special Protection Area. Built of stone and incorporating a wall of 80 nest boxes, the new towers were purposely designed to promote natural recolonisation of the vulnerable species across its former range, and thereby help enlarge the kestrel's distribution area in Portugal.

The project team took great care to ensure that farmers and other community members were consulted before the new towers were built, in order to explain their relevance and associated socio-economic opportunities.

Similar discussions took place to secure stakeholder support from project actions that sought to minimise problems caused by fences. This included studying the effectiveness of different fence modifications that could help young bustards to follow their parents from one part of a habitat to another. Younger birds cannot fly and barriers to bustard family movements had been linked to the disappearance of these birds from much of their former territory in the Iberian Peninsula.

The project installed 184 pass-ways in a total of 28 km of fences; it also completely removed 2 km of fencing in three great bustard breeding areas. The introduction of anti-collision material along a further 41km of fences gave the project team significant new conservation know-how.



One of the two breeding towers the project constructed to boost the lesser kestrel population

Agri-environment measures

All of the knowledge gleaned from the project fed into the development of a programme of agri-environment actions that were made eligible for ongoing funding support from the European Agricultural Fund for Rural Development (EAFRD). This provides the long-term security that is needed to help sustain LIFE's legacy of habitat improvements. EAFRD co-finance has also been helpful for sustaining recurrent forms of extensive grazing, crop rotation and game management.

LIFE support, "gave a significant contribution for the long-term conservation of these species and their unique habitat," believes project coordinator, Rita Alcazar.

"The LIFE Nature prize is an important recognition of the work carried out by all project partners and this award corroborates the importance of maintaining agri-environment measures co-financed by Portugal's Rural Development Programme for steppe bird habitat conservation," adds Ms Alcazar. "Such support directly affects both biodiversity preservation and climate change adaptation measures. Our award will also help reinforce the importance of conservation work by the power line company to reduce bird mortality risks," she concludes.

Project number: LIFE07 NAT/P/000654

Title: LIFE Estepárias: Conservation of Great Bustard, Little Bustard and Lesser Kestrel in the Baixo Alentejo cereal steppes

Beneficiary: Liga para a Protecção da Natureza

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Period: 01-Jan-2009 to 28-Dec-2012

Total budget: €1 604 000

LIFE contribution: €1 203 000



Portugal: Saving seabird colonies in the Azores

This pioneering LIFE project helped improve prospects for seabird recolonisation in the Azores (notably of shearwaters and petrels). It unveiled transferable techniques to survey seabirds in difficult conditions or inaccessible areas.

The Portuguese Azores islands used to be home to millions of breeding seabirds. Nowadays, their colonies have decreased drastically as a result of introduced predators such as goats, cats and rats, as well as habitat destruction. The loss of seabird habitats, primarily to make way for agricultural development, has also resulted in the spread of invasive exotic plant species (giant reed, tamarisk, cane grass and others). With the exception of the Cory's shearwater, seabird populations are confined to small islets and steep inaccessible cliffs.

The overall objective of the LIFE Safe Islands for Seabirds project was thus to create a safe environment for breeding seabirds, notably for petrel and shearwater species listed in Annex I of the EU Birds Directive (see box).

The project, which started in 2009 and was coordinated by the Portuguese society for the study of birds (SPEA) in partnership with the Regional Secretary of the Environment and the Sea, the council of Corvo and the Royal Society for the Protection of Birds (RSPB), consisted of a feasibility study to evaluate the possibility of controlling and eradicating introduced predators and invasive plant species. Several pilot actions were also carried out and different control techniques were tested.

SAFE ISLANDS FOR SEABIRDS was pioneering in several respects: it was the first time in Portugal that an operational plan to eradicate rodents on an inhabited island was prepared, and several actions were innovative (such as radar surveys of breeding seabirds, automatic recording of bird calls to estimate inaccessible colony sizes and 100% pest-proof fencing for breeding areas).

Locations and aims

Corvo Island, the smallest and westernmost of the Azores islands, was selected for its geographic location and habitat availability. The site offered the greatest potential for seabird recolonisation. The islet of Vila Franca do Campo was also targeted as it provided good conditions to test some

control measures for invasive plants and to attract seabird populations to breed.

For Corvo, the main objectives involved the implementation of innovative methodologies to increase the number, density and distribution range of seabirds on the island. Doing so required predator-free enclosures, exotic vegetation control and seabird monitoring and management. Another aim was to produce a complete alien mammals operational plan for the island, in collaboration with local stakeholders, with the demonstration of eradication techniques.

Specific goals for Vila Franca were to: evaluate the presence and if necessary eradicate, rats and mice; define preventive measures to avoid future recolonisation by rodents; build 150 artificial nests to improve seabird breeding conditions; and control invasive alien plant species over at least 50% of the territory.

The project showed that the large-scale restoration of seabird habitats was feasible and aligned with the ultimate goal of bringing more breeding seabirds back to the Azores. The LIFE team created GIS distribution maps of invasive mammals and plants for the island of Corvo and Vila Franca islet. The maps were used as the basis for operational plans to ensure their eradication from the targeted areas.

Little shearwater (Puffinus assimilis) fitted with a data logger prior to release



Targeted seabird species

Cory's shearwater (*Calonectris diomedea*) - 60% of the world population breeds in the Azores. It breeds in burrows and in other natural cavities in the soil or rocks, in islands and islets.

Manx shearwater (*Puffinus puffinus*) - looks like a small and darker Cory's shearwater with a black bill. In the Azores, it only breeds on the isles of Corvo and Flores. Its colonies are in rocky inaccessible cliffs, not easily accessible by predators like cats and rats.

Fea's petrel (*Pterodroma feae*) - a small petrel that only breeds in the Desertas Islands in Madeira. One bird of this species was captured in Corvo in the past, suggesting the possibility of a small breeding population.

Little shearwater (*Puffinus assimilis*) - the smallest shearwater of the North Atlantic. It breeds in most of the islands of Azores and stays around its breeding grounds almost all year long.

Madeira storm-petrel (*Oceanodroma castro*) and **Monteiro's Storm-Petrel** (*Oceanodroma monteiroi*) - the two storm-petrel populations that breed in the Azores were recently split into two distinct species: The winter population is the *O. castro*, and the summer population became *O. monteiroi*.

Invasive species control

A new biological reserve was successfully established on Corvo, with 100% pest-proof bio-security fencing extending for some 700 m, to prevent animals entering the secure area. The SAFE ISLANDS FOR SEABIRDS team also drafted a bio-security protocol and removed invasive alien species (both mammals and plants) from the new protected zone and two existing reserves.

The project demonstrated that eradicating rats was technically feasible even though total eradication was not deemed possible given the current economic (and political) climate. Field tests were, however, successfully conducted at three sites.

The project constructed artificial Cory's shearwater nests



Photo: Luis Ferreira

A cat neutering and tagging programme was also carried out. The project identified domestic cats with a microchip and most were sterilised. It also implemented several trapping campaigns for feral cats, which saw 60 animals caught, chipped, sterilised and released in areas free of bird nests. Importantly, the project team ensured that this procedure will continue through local nature conservation and veterinary organisations.

Burrowing birds

Native flora helps create optimal conditions for burrowing birds. Therefore, using the results of a survey of the vegetation of Corvo - carried out by the Azores University - the project collected approximately 35 kg of seeds of endemic flora. Mostly *Erica azorica* and *Myrica faya*, these were then distributed within the newly-created biological reserve and for propagation in a local nursery for subsequent transplanting to all project sites. In total, the project planted 10 800 plants on Corvo. In order to attract seabirds to the project sites after the rodent removal, 250 nest boxes were placed in the Corvo reserve and 150 in Vila Franca.

Importantly, the project carried out a census of seabird populations using combined data from automatic recorders, radar and direct field observations. The nocturnal burrow-nesting behaviour of the target seabirds made surveying difficult. Nevertheless, it is estimated that several hundred Cory's shearwaters were saved during the project's 'SOS Caggarro' campaigns. A breeding pair was also tracked online for the first time, and viewed by more than 25 000 people in 70 countries.

"This project had a strong local impact and revealed several techniques that can be used successfully elsewhere to survey seabirds in difficult conditions or inaccessible areas," concludes project manager, Pedro Geraldes. "It was the first time in Europe that a 100% pest-proof fence for invasive species was built and it proved a good solution for some areas and species," he says.

Project number: LIFE07 NAT/P/000649

Title: SAFE ISLANDS FOR SEABIRDS - Safe islands for seabirds/ Initiating the restoration of seabird-driven ecosystems in the Azores

Beneficiary: The Portuguese society for the study of birds (SPEA)

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Period: 01-Jan-2009 to 31-Dec-2012

Total budget: €1 058 000

LIFE contribution: €507 000



Cyprus: Using a PMR approach to conserve threatened plants

With LIFE's support, the Plant Micro Reserve (PMR) approach has been implemented for the first time in Cyprus. Special in-situ and ex-situ conservation measures are helping to conserve threatened native plants and habitats.

Four rare and vulnerable plant species and two threatened habitat types found only in Cyprus are considered a priority for conservation under the Habitats Directive.

The main objective of the LIFE PLANT-NET CY project was to improve the conservation status of the following priority plants – Troodos rockcress (*Arabis kennedyae*), Lefkara milk-vetch (*Astragalus macrocarpus* subsp. *Lefkarensis*), Akamas centaurea (*Centaurea akamantis*) and Cyprus bee orchid (*Ophrys kotschy*) - and the habitat types, "Cedrus brevifolia forests," (*Cedroretum brevifoliae*) and "scrub and low forest vegetation of *Quercus alnifolia*". To achieve this goal, the coordinating beneficiary and project partners set out to establish and manage a network of five PMRs in four Natura 2000 sites: Chersonisos Akama, Periochi Asgatas, Periochi Miterou and Koilada Kedron – Kampos (where two PMRs were established).

The PMR concept - initially developed in Spain in the 1990s with LIFE programme support - involves the conservation of small land plots of high value in terms of plant richness, endemism and rarity.

The PLANT-NET CY project focused on the intensive monitoring and effective conservation of a significant part of the total population (20%-85%) of the targeted species and habitat types. Specific aims were to: reduce the threats arising from recreation activities and disturbance of natural habitats; identify the most appropriate legal status for PMRs in Cyprus; improve the quantity and quality of natural populations; reduce the negative impacts of fire on certain populations/habitats; promote ex-situ conservation activities; and increase public awareness.

The project was carried out by a consortium that included two governmental bodies – the Department of Environment (the beneficiary) and the Department of Forests in the Ministry of Agriculture, Natural Resources and Environment; and two universities – Frederick University (Nature Conservation Unit) and the University of Athens (Faculty of Biology). Two NGOs were also involved, the Federation of



Photo: Iro Kouzali

Planting Akamas Centaurea (*Centaurea akamantis*)

Environmental Organisations of Cyprus and the United Nations Development Programme-Action for Cooperation and Trust (UNDP-ACT).

Adopting a four-pillar strategy

The project was implemented around four main types of action: preparatory; conservation; dissemination; and management. The preparatory actions were considered fundamental to gathering the necessary scientific information to develop the project. Such actions included: compiling inventories of the localities of the targeted species and habitats; holding meetings with local communities to determine the boundaries for each of the PMRs; organising detailed mapping of each PMR; and preparing monitoring and management plans.



Following the preparatory phase, various conservation actions were started. These were the core actions of the project and contributed to achieving its overall objective, namely improving the conservation status of the targeted species and habitats. This phase included monitoring and conservation measures introduced in accordance with monitoring and management plans.

The conservation measures took place both within and outside the PMRs. For example, in the Periochi Mitsierou micro-reserve, which was dedicated to the conservation of the rare and endemic Cyprus bee orchid, the project implemented hand pollination in order to increase the (normally very low) success rate of reproduction (linked to the rarity of the plant's insect pollinator). Every spring for four years, the project team carried out an artificial transfer of pollen for 70 plants. This resulted in the production of 837 capsules (fruits) and around 10 million seeds.

One of the most important of the project's ex-situ results was the first successful germination of Cyprus bee orchid seeds in laboratory conditions. The methods identified formed the basis of a protocol describing the procedure for seedling production under controlled conditions.

The project's dissemination actions were focused on three different audiences: the scientific community; interested stakeholders; and the general public. The beneficiary took steps to promote the involvement of local communities in the decision-making process, as well as in the implementation of selected conservation measures. Educational activities relevant to the PMR approach featured in a guide for primary school teachers on the implementation of the national curriculum for environmental education and sustainable development.

Collecting Cyprus cedar (*Cedrus brevifolia*) cones



Photo: Nikolaos-George Eliades



Photo: Marinos Andreou

Pollinating the Cyprus bee orchid (*Ophrys kotschyi*) by hand

Legal protection

The LIFE project's implementation of specific management measures has enhanced the population of the targeted species and has improved the conservation status of those species and the targeted habitat types. Moreover, a significant outcome was the recognition of the PMRs as areas of great value and their declaration as, "natural micro reserves," by a ministerial order through the Cyprus forestry legislation (in 2012). This development contributes to the protection of those species and habitats, as well as the PMR network in Cyprus in its entirety.

Project manager Eleni Stylianopoulou says that winning the Best LIFE Environment project award has been, "a validation" of the consortium's efforts in meeting the project's objectives and it provides an incentive to aim higher and achieve even greater results in future. "The LIFE programme has been a very valuable tool that has provided us with the instruments, both financial and organisational, to make changes, restore and protect nature and take action in conserving our natural heritage for future generations," she concludes.

Project number: LIFE08 NAT/CY/000453

Title: PLANT-NET CY - Establishment of a Plant Micro-reserve Network in Cyprus for the Conservation of Priority Species and Habitats

Beneficiary: Department of Environment, Ministry of Agriculture, Natural Resources and Environment

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Period: 01-Jan-2010 to 30-Jun-2013

Total budget: €1 550 000

LIFE contribution: €1 070 000



Germany: Creating green corridors for the wildcat

With its wide-reaching communications campaign the Netze des Lebens project was seen over 320 million times, considerably raising awareness about the importance of connecting forest habitats through green corridors for the wildcat and other species.



Photo: Thomas Stephan

European wildcat (*Felis silvestris*)

Over the last few hundred years the landscape in Europe has changed from large areas of forest habitat to a kaleidoscope of roads, residential areas and industrial agriculture. This habitat fragmentation has contributed to the loss of biodiversity, particularly with regards to species that need large connected semi-natural, well-structured forest habitats for their long-term survival. One such species is the European wildcat (*Felis silvestris*).

There are an estimated 5 000-7 000 wildcats in Germany, where the fragmentation of its natural forest habitat has restricted the species to certain regions. "The cat population is, amongst other things, threatened by inbreeding and genetic depletion because they are reluctant to move into or across agricultural areas to find new territories," explains project leader Mark Hörstermann of BUND (Friends of the Earth Germany).

In order to safeguard Germany's remaining wildcat populations, it is necessary to create green corridors by planting

trees and bushes to connect isolated forest areas. Recognising this, in 2004 BUND launched 'safety net for the wildcat', a project with the ambitious aim of creating a 20 000 km-long network of forests: a target that cannot be achieved without the help of politicians, local decision-makers and citizens working for the cause.

Making connections

In January 2010, BUND launched a LIFE Information & Communication project, Netze des Lebens ('Biotope Networks - Networks of Life'). The project aimed to build on the work of the Safety Net project and deliver an extensive information campaign to raise awareness in Germany, Austria and across Europe of the significance of biotope networks for biodiversity. It aimed to reach a large number of people through activities with high demonstration value, and initiatives that clarified wildcat biology and the need for green corridors.



The project was coordinated by BUND's head office, working in partnership with seven other organisations: the Bavarian Bund Naturschutz, the BUND state associations of Baden-Württemberg, Hesse, Lower Saxony and Thuringia, the Helmholtz Centre for Environmental Research (UFZ) GmbH and Thayatal National Park GmbH in Austria.

Project partners developed and implemented 28 different communication activities around the wildcat that addressed a number of target groups: local decision-makers and politicians; inhabitants of and visitors to planned corridor regions; and school children and teachers. The wildcat was chosen as the focus for the campaign because it is a biodiversity indicator for forests and because of its high level of public appeal – ideal for optimising publicity around the campaign. The communication strategy was implemented across Germany and in the Austrian part of the Thayatal National Park.

“Almost all of the activities were carried out very successfully and the resonance was very positive,” recalls Mr Hörstermann, adding, “we were very pleased with the results.” The project partners had hoped to attain 120 million contacts through their actions and the resulting media coverage. In fact, they estimate that the project had made over 324 million contacts by its close. Initiatives included: the development of destinations for wildcat-oriented daytrips; wildcat races; tree-planting events; stakeholder conferences; the creation of a platform of wildcat experts; themed activities and computer games for children; and the construction of a wildcat enclosure in Bavaria.

Just as important as the individual communication campaigns was the part of the project dedicated to paving the way for the creation of the habitat network. “Using the document ‘The Pathway Plan for the Wildcat’ produced by BUND in 2007 as a basis for planning decisions aimed at protecting biodiversity in Thuringia and Hesse, we laid the foundations for the creation of over 1 000 km of connected

Planting green corridors at the Infra Eco Network Europe (IENE) conference 2012



Photo: Christiane Böhm



Photo: Thomas Stephan

Children collecting wildcat fur, one of a range of educational activities developed by the project

habitats,” states Mr Hörstermann proudly. Some 200 km of these connected habitats were constructed concurrently with the LIFE project.

Great achievements

The Netze des Lebens project played a pivotal role in changing public perceptions of green corridors, particularly in Germany and Austria. “The wildcat is one of the species that shows a real improvement in conservation status in the recent national habitat report and that is thanks to this LIFE project and other projects,” said Frank Klingenstein from the German Federal Environment Ministry, speaking at the LIFE Nature Best project awards in Brussels in April 2014.

BUND intends to continue to prioritise biotope defragmentation in its work, specifically within the ‘wildcat leap’ project that began in 2011. The project, sponsored by the German Federal Environment Ministry, will continue the public relations work of LIFE Netze des Lebens, create six additional corridors to further reconnect forests, carry out genetic stocktaking of the wildcat and develop a network of volunteers. “We are now using federal money to create some of the corridors that were planned in the LIFE project,” Mr Klingenstein explained. “LIFE helped to plant the seeds and we are now using national funds to harvest the fruit.”

Project number: LIFE08 INF/D/000032

Title: Netze des Lebens - Biotope networks - networks of life: promoting a forest corridor system with a European perspective

Beneficiary: Bund für Umwelt und Naturschutz Deutschland e.V. (BUND)

Contact: Mark Hoerstermann

Email: mark.hoerstermann@bund.net

Website: www.bund.net/biotopvernetzung

Period: 01-Jan-2010 to 31-Dec-2012

Total budget: €1 936 000

LIFE contribution: €965 000



Available LIFE Nature publications



LIFE Nature brochures

- LIFE and Invasive Alien Species** (2014 – 80 pp. - ISBN 978-92-79-38307-6)
- Long-term impact and sustainability of LIFE Nature** (2014 – 60 pp. - ISBN 978-92-79-34698-9)
- LIFE and human coexistence with large carnivores** (2013 – 76 pp. - ISBN 978-92-79-30401-9)
- LIFE managing habitats for birds** (2012 – 80 pp. - ISBN 978-92-79-27587-6)
- LIFE and invertebrate conservation** (2012 – 56 pp. - ISBN 978-92-79-23822-2)
- LIFE preventing species extinction: Safeguarding endangered flora and fauna through ex-situ conservation** (2011 – 60 pp. - ISBN 978-92-79-20026-7)
- LIFE and European Mammals: Improving their conservation status** (2011 – 60 pp. - ISBN 978-92-79-19266-1)
- LIFE building up Europe's green infrastructure** (2010 – 60 pp. - ISBN 978-92-79-15719-6)
- LIFE improving the conservation status of species and habitats: Habitats Directive Article 17 report** (2010 – 84 pp. - ISBN 978-92-79-13572-9)
- LIFE and Europe's reptiles and amphibians: Conservation in practice** (2009 – 60 pp. - ISBN 978-92-79-12567-6)
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LIFE for birds: 25 years of the Birds Directive: the contribution of LIFE-Nature projects (2004 – 48 pp. - ISBN 92-894-7452-1)

Other publications

- Nature & Biodiversity Projects 2013 compilation** (2014, 100 pp. - ISBN 978-92-79-37956-7)
- Best LIFE Nature Projects 2012** (2013 - 36 pp. - ISBN 978-92-79-33177-0)
- Nature & Biodiversity Projects 2012 compilation** (2013, 100 pp. - ISBN 978-92-79-29476-1)
- Best LIFE Nature Projects 2011** (2012 - 24 pp. - ISBN 978-92-79-28217-1)
- Nature & Biodiversity Projects 2011 compilation** (2012, 83 pp. - ISBN 978-92-79-25249-5)
- Best LIFE Nature Projects 2010** (2011 - 40 pp. - ISBN 978-92-79-21315-1)
- Nature & Biodiversity Projects 2010 compilation** (2011, 71 pp. - ISBN 978-92-79-20031-1)
- Best LIFE Nature Projects 2009** (2010 - 44 pp. - ISBN 978-92-79-16826-0)
- Nature & Biodiversity Projects 2009 compilation** (2010, 91 pp. - ISBN 978-92-79-16139-1)

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

The LIFE programme is the EU's funding instrument for the environment and climate action

Period covered 2014-2020

EU funding available approximately €3.46 billion

Allocation of funds Of the €3.46 billion allocated to LIFE, €2.59 billion are for the Environment sub-programme, and €0.86 billion are for the Climate Action sub-programme. At least €2.8 billion (81% of the total budget) are earmarked for LIFE projects financed through action grants or innovative financial instruments. About €0.7 billion will go to integrated projects. At least 55% of the budgetary resources allocated to projects supported through action grants under the sub-programme for Environment will be used for projects supporting the conservation of nature and biodiversity. A maximum of €0.62 billion will be used directly by DG Environment and DG Climate Action for policy development and operating grants.

Types of projects Action Grants for the Environment and Climate Action sub-programmes are available for the following:

- > "Traditional" projects – these may be best-practice, demonstration, pilot or information, awareness and dissemination projects in any of the following priority areas: LIFE Nature & Biodiversity; LIFE Environment & Resource Efficiency; LIFE Environmental Governance & Information; LIFE Climate Change Mitigation; LIFE Climate Change Adaptation; LIFE Climate Governance and Information.
- > Preparatory projects – these address specific needs for the development and implementation of Union environmental or climate policy and legislation.
- > Integrated projects – these implement on a large territorial scale environmental or climate plans or strategies required by specific Union environmental or climate legislation.
- > Technical assistance projects – these provide financial support to help applicants prepare integrated projects.
- > Capacity building projects – these provide financial support to activities required to build the capacity of Member States, including LIFE national or regional contact points, with a view to enabling Member States to participate more effectively in the LIFE programme.

Further information More information on 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/life.htm>

Contact

European Commission – Directorate-General for the Environment – B-1049 Brussels (env-life@ec.europa.eu).
 European Commission – Directorate-General for Climate Action – B-1049 Brussels (clima-life@ec.europa.eu).
 European Commission – EASME – B-1049 Brussels (easme-life@ec.europa.eu).

Internet <http://ec.europa.eu/life>, www.facebook.com/LIFE.programme, twitter.com/life_programme, www.flickr.com/life_programme/.

LIFE Publication / Best Nature projects 2013

