



LIFE III

focus



LIFE and European forests



European Commission



European Commission Environment Directorate-General

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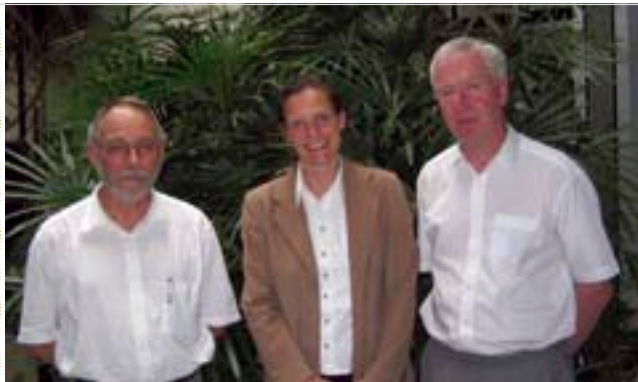
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Foreword



Michael Hamell, Head of Forest Unit (near left) with Anne Louise Friedrichsen, LIFE Desk officer, and Joost Van De Velde, Agriculture, Forests and Soil Policy officer.
European Commission DG Environment

Forests are one of Europe's most important renewable resources. Over a third of the EU-25 territory is covered by forest and other wooded land. We depend on our forests for many vital functions:

The best known forest product is of course timber, from which sawn wood, panels, paper or simple fuel are derived. But a host of non-wood products such as cork, forest fruits and berries, mushrooms and truffles, honey, game meat and pelts, decorative foliage and Christmas trees, and medicinal plants are sometimes just as important to local people's livelihoods. The forest sector, including wood processing, is one of Europe's most important economic sectors employing some 3.35 million people and generating a turnover of € 355.6 billion per annum.

Forests also play an essential environmental role. They are a key repository of biological biodiversity; and compared with other ecosystems, they are home to the largest number of mammals, birds, reptiles and amphibians on our continent. They also help to enhance the landscape and to regulate climate, water and soil.

In addition, forests and woodlands offer recreational opportunities. In many regions, they are essential to the attractiveness of tourism in areas of outstanding natural beauty. Because they are one of the last points of contact between humans and nature in an increasingly urbanized society, the protection and maintenance of forests is firmly supported by EU public opinion. People are well aware that forests can have positive effects on their health and cultural well being – helping to reduce stress and providing healthy exercise opportunities in tranquil surroundings.

The absolute forest cover in Europe has been steadily increasing in recent years. This is partly due to afforestation programmes and natural regeneration on abandoned agricultural or formerly grazed land. However, much of present commercial forestry is using exotic species that are of low ecological interest. The changes that forests have undergone in the past few decades such as intensified silvicultural practices, the use of exotic species and increased uniformity have reduced the environmental quality of Europe's forests.

The condition of EU forests has been systematically assessed over the past 20 years under «ICP Forests» a pan-European monitoring structure set up by UNECE and co-funded by the European Community. According to analysis of ICP data by the European Environment Agency (EEA), almost a quarter of trees sampled in 2001 were rated as “damaged”, while forest fires in the south continued to pose problems. The EEA also reports 40% of threatened bryophytes and 30% of breeding birds that are considered to have an unfavourable status are forest-related.

Since 1992 the LIFE-Nature Programme, alongside other Community financial instruments, has funded projects aiming to restore, preserve or halt the decline of forest biodiversity in Europe in the context of the Community-wide Natura 2000 network of special conservation areas. This publication will explore how LIFE has contributed to the integration of nature conservation and the protection of biological diversity in forest management without impinging too much on economic and other social or cultural demands.

The range of actions undertaken by LIFE is as diverse as Europe's forests themselves. Many projects involve initial one-off restoration actions in order to bring the forest back up to its original high conservation state. Some explore innovative ways of combining conservation concerns with economic activities. While others focus on wildlife management issues – re-establishing or creating for instance, suitable habitats and corridors for woodland species. In several chapters we examine through a variety of successful LIFE case studies how various options (implementation of management plans, sustainable forest management, greater integration of biodiversity issues and/or strict protection) have been put into practice by foresters and biologists.

It has always been a challenge for LIFE, as it will continue to be for its successor LIFE+, to find ways of safeguarding biodiversity with the active collaboration of Europe's private and public forest owners, nature conservation authorities, NGOs and other stakeholders. If we want this collaboration to continue and to be beneficial not only for nature, but also for our environment and for society as a whole, this collection of examples should serve as a welcome source of inspiration.



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Background to EU forest sector

Forests are one of Europe's most important renewable resources. Over a third, or approximately 160 million hectares, of the EU-25 territory is covered by forest and other wooded land, the majority of which is available for wood supply and is used to varying degrees.



The extent of forest cover varies considerably between Member States:

- Austria, Finland, Sweden and the three Baltic states of Estonia, Latvia and Lithuania are heavily forested and have substantial forest products industries based predominantly on coniferous forest;
- France, Greece, Italy, Spain, Portugal and Cyprus have Mediterranean woodland, managed primarily for protection and where fire is potentially a serious threat. France and Italy in particular, also have large areas of temperate forest and mountain forests, including coppice areas, farm woodlots and community forests;
- Belgium/Luxembourg, France and Germany have a mixed ownership structure and a range of forest types with production being significant but not always the primary aim in any forest;
- Denmark, Ireland, the Netherlands, Hungary and the UK have predominantly artificial forest, based on plantations, although the objectives of management have been widened in the last decade to encompass service values;
- SW France, N Spain and parts of Portugal have large areas of industrial wood plantations, mainly destined for pulping;
- Poland, the Czech Republic, Slovakia and Slovenia have coniferous, broadleaved and mixed forests that have mostly been subject to age class management for sustainable timber output. In these countries, the stocking rate is generally higher than in W. Europe, and the tree species used are generally closer to the natural habitats than in the EU-15.
- Malta is almost devoid of forests but has an ambitious re-vegetation plan.

Since the 1960s the absolute forest cover in Europe has been steadily increasing. This is partly due to afforestation programmes and also to regrowth in semi-natural areas after abandonment of cultivation or grazing. However, this increase is not always positive for biodiversity, and the overall expansion masks a serious decline in priority forest ecosystems. The changes that forests have undergone over the past few decades – such as intensified silvicultural practices, the use of exotic species and increased uniformity – have reduced the environmental quality of forests.



Forest cover in the EU-25

The condition of EU forests has been systematically assessed over the past 20 years under “ICP Forests” a pan-European monitoring structure set up by UNECE (United Nations Economic Commission for Europe) and co-funded by the European Community. According to analysis of ICP data by the European Environment Agency (EEA), almost a quarter of trees sampled in 2001 were rated as “damaged”¹, while forest fires in the south continued to pose problems. The EEA also reports 40% of threatened bryophytes and 30% of breeding birds that are considered to have an unfavourable status are forest-related². And a report from the World Wildlife Fund warns that Europe’s forests show a “dramatic and continuous loss of biodiversity, forest health, genetic diversity and naturalness”³.

1 The most important causes of damage include weather extremes, insects and fungi, and air pollution.

2 EEA: Environmental signals 2002 (http://reports.eea.europa.eu/environmental_assessment_report_2002_9/en/signals2002-chap14.pdf)

3 State of Europe’s Forest Protection, WWF European Forest Programme, Vienna April 2003.

The accession of the 10 new Member States in 2004 has brought other changes according to a recent report by the European Commission⁴. In the EU-15, some 35% of forests were publicly owned and around 65% was in private hands: this ratio has changed to 40% and 60% respectively. The average size of a publicly owned forest in the EU-25 is more than 1,000 ha while the privately owned forests have an average size of 13 ha. But this figure varies considerably from country to country, with the vast majority having less than 3 ha. As the owners of small forest properties often lack the skills or the investment capacity to make use of their forests, these changes may have implications for efficient forest management.

The forestry sector, including wood processing, is one of Europe’s most important economic sectors employing some 3.35 million people and generating over € 355.6 billion per annum (2001)⁵. The EU is the world’s second largest paper and sawn wood

4 Source: European Commission “Staff Working Document on the implementation of the EU Forest Strategy” (2005).

5 Figures are for “primary production” (forestry) and “first transformation” (including sawmilling/panelmaking/pulp & paper etc.).



Photo: Peter Van Ophoven/UNEP/Still Credits

Silhouette of a stag against flames of a forest fire.

producer and, with 1.7 million ha of cork oak forests, is the No. 1 producer of cork, accounting for 80% of world-wide production.

Forests also produce many other products such as resins, decorative foliage and Christmas trees, medicinal plants, mushrooms and fungi, and forest fruits and berries. In addition, they perform a number of other important functions ranging from tourism and recreation to regulating climate, water and soil.

Where have all the natural forests gone?

Very few areas remain of “forest undisturbed by man”⁶ (less than 1%). These are defined by the “improved pan-European indicators for sustainable forest management” of the Ministerial Conference on the Protection of Forests in Europe (MCPFE) as:

6 Other commonly-used terms include: natural, virgin, old growth, pristine ...

“Forest/other wooded land which shows natural forest dynamics, such as natural tree composition, occurrence of dead wood, natural age structure and natural regeneration processes, the area of which is large enough to maintain its natural characteristics and where there has been no known significant human intervention or where the last significant human intervention was long enough ago to have allowed the natural species composition and processes to have become re-established (TBFRA 2000).”

Total forest area by EU country

Country	Total forest area ('000 ha)
Austria	3,924
Belgium	672
Denmark	538
Finland	22,768
France	16,989
Germany	10,740
Greece	6,513
Ireland	591
Italy	10,842
Luxembourg	89
The Netherlands	339
Portugal	3,467
Spain	25,984
Sweden	30,259
United Kingdom	2,489
Cyprus	280
Czech Republic	2,630
Estonia	2,162
Hungary	1,811
Latvia	2,995
Lithuania	2,050
Malta	0
Poland	8,942
Slovak Republic	2,031
Slovenia	1,116
TOTAL EU-25	160,271

Source: TBFRA 2000 (UNECE/FAO)

Over the centuries these forests have been cleared to make way for agriculture or to be replaced by commercial plantations with exotic species. Most of the undisturbed forests are located in Sweden and Finland (5.5 million ha). Outside the Nordic countries, only relatively small remnants remain, such as the 'Rothwald' wilderness area in the Austrian Alps (LIFE97 NAT/A/004117) as well as remnants in remote areas of Estonia, Latvia and Poland.

Old or semi-natural woodlands have also declined as traditional forestry

practices, such as selective cutting, coppicing and grazing by livestock have made way for mono-functional timber-based forestry. The situation is further exacerbated by the severe fragmentation of the remaining forest resource and the loss of associated habitats such as pastures, hedges, river belts, stream banks etc., which would have allowed woodland species to move through the landscape by means of 'ecological corridors'⁷.

⁷ Source: DG Environment website "Good practices in managing Natura 2000 sites".

Forest protection is a constant concern

The Temperate & Boreal Forest Resources Assessment 2000 (UNECE/FAO) identified biotic factors and grazing as main causes for forest damage in the EU. Other major factors affecting forests are air pollution, storms and forest fires. While EU legislation has led to considerable improvement of air quality in Western Europe over the past 20 years, deposition of air pollutants is still a concern for European forests and most sites with the highest acid inputs (which comprise nitrogen as well as sulphate deposition) are now situated in central European forests. Several heavy storms within a relatively short period, for example, at the end of 1999 in France, Switzerland and southern Germany, have caused severe damage to more than one million ha of forests. Forest fires are the most important damaging factor in the Mediterranean countries, where between 300,000 to 500,000 ha of forest and other wooded land is burnt annually.

Trees uprooted by high winds: Champagne Ardenne, France (1999).



Photo: Nigel Dickinson / Still Credits



Remedying the mistakes of the past in England's New Forest (LIFE97 NAT/UK/004242)



Bruce Rothnie

At the end of the First World War, England's Forestry Commission primarily managed the 50,000-ha New Forest in the county of Hampshire for timber production. Habitat management was not a priority. Afforestation with non-indigenous species has resulted in a legacy of conifer plantations that are out of keeping with the natural characteristics of the New Forest's heathlands, woodlands¹ and wetlands. Today, while timber extraction continues, the Forestry Commission is working with other LIFE partners to address habitat management and to remedy the mistakes of the past (see p.56 for details).

Bruce Rothnie, the Forestry Commission's planning and recreation manager, notes that the figure today for timber production in the New Forest is around 60,000 to 80,000 tons per year (approximately 85,000 to 115,000 m³). However, he says that due to cheap imported woods, the value of that timber over the last decade has fallen to around 30% of its original value. "Timber is sold on a world market and when imported timber can arrive on the dockside cheaper than we can get it out of the gate, you can see why we are not in a strong bargaining position in terms of having an influence on that price," he says.

Despite this fall in price, he emphasises that due to all the benefits to forests and woodlands from timber processing, either through biodiversity gains or public access and enjoyment, some form of commercial forestry "will always be vital". To maintain this, the Forestry Commission locally has drawn up long-term contracts with local timber processors to secure their activities in the area and to ensure the Forestry Commission has the infrastructure to help it to manage the forests. Says Rothnie: "This is something that is not always appreciated – that a lot of conservation gains or management of conservation needs to be underpinned by that level of business."

¹ UNECE/FAO definition of "other wooded land": Land either with a crown cover (or equivalent stocking level) of 5-10 percent of trees able to reach a height of 5 m at maturity in situ; or a crown cover (or equivalent stocking level) of more than 10 percent of trees not able to reach a height of 5 m at maturity in situ (e.g. dwarf or stunted trees); or with shrub or bush cover of more than 10 percent.

Why does this matter?

Forests are a key repository of biological diversity and the species, communities and ecosystems they form play a central role in the functioning of the biosphere. Because of their structural complexity, they provide ideal habitats for a particularly rich array of plants, birds and animals (see below). Large carnivores, such as bear and lynx, whose populations have been declining over recent dec-

ades, are very dependent on wooded landscapes. Invertebrates, including insects associated with dead wood and soils, are a major component of forests biodiversity and biomass.

Managing Europe's forests today means reconciling the different and often conflicting economic, social and ecological demands. This publication will explore how nature conservation and the protection of biological diversity can be integrated

into forest management without impinging too much on economic and other social or cultural demands. Indeed, as illustrated in several LIFE project examples featured in the following pages, pursuing conservation targets in forests can actually make forests more attractive for some purposes e.g., for recreation and for leisure.

We also aim to show through different LIFE case studies how these various options (implementation of management plans, sustainable forest management, greater integration of biodiversity issues and/or strict protection) have been put into practice across Europe. The challenge for LIFE today, and subsequently for its successor LIFE+, is to find a way forward with the active support of Europe's private and public forest owners, nature conservation authorities, NGOs and other stakeholders that will benefit nature, the environment and society.

Forests are important for protected species and habitats

- > Of 181 bird species listed in Annex 1 of the Birds Directive, 65 are forest-related (36%) of which seven are considered a priority;
- > Of 41 mammal species listed in Annex II of the Habitats Directive, 25 (61%) are forest-related, of which eight are considered a priority;
- > Of 198 habitat-types listed in Annex I of the Habitats Directive, 59 are forest-types (30%) of which 21 are considered a priority.

Source EEA "Environmental signals 2002"

Photo: E. Marek



Protection of EU forests and Natura 2000



Forest policies in the EU are implemented by Member States within a framework of established ownership rights and supported by regional and national laws and regulations based on long-term planning. While forests are not specifically addressed at EU-level, their protection and conservation falls within the scope of a number of specific Community environmental issues such as the EU Birds and Habitats Directives, Natura 2000, Biodiversity Strategy and the implementation of the Climate Change Convention. For forest products, in particular wood (as well as cork and resins), the rules of the internal market apply, including the normal EU competition rules on state aids, mergers and cartels.

An EU Forestry Strategy was adopted in 1998. This calls for the application of SFM (Sustainable Forest Management) and the 'multifunctional' role of forests in line with the principle of subsidiarity. The idea is that every administrative decision should always be made at the most appropriate level, taking into account specific local circumstances. This approach seeks to establish a clear framework of forest-related actions at an EU-level. It also aims to improve the links and co-ordination between different policy areas, as well as coherence with the forest policies of the Member States.

The Directorate-General of the Environment's interpretation guide "Natura 2000 and forests – Challenges and opportunities"¹ provides guidelines for site management negotiations with forest owners and operators. These recommend that provided forestry practices don't result in a decline in the conservation status of habitats or species, and are not contradictory to national conservation guidelines, then this form of economic activity can be continued. They also focus on what to do in the situation where this is not the

¹ Available online from LIFE homepage (see 'infoproducts' – nature)
<http://ec.europa.eu/comm/environment/life/home.htm>



Photo: Christoph Leditznig

View of the 1,878-metre Dürrenstein peak. The Austrian Natura 2000 site comprises 460 ha of true primeval forest.

case, and several LIFE-Nature forest management projects are concerned with the need to change management practices in a more sustainable way. DG Environment has also put forward key pointers for Member States for sustainable forest management on Natura 2000 sites. These recommend that:

➤ It is preferable to designate perimeters with a sufficient extension to allow conservation objectives to be

integrated into existing management plans, rather than to designate small plots corresponding exactly to the descriptions in the habitats reference guide.

➤ Conservation of habitats and species at the level of an entire site should be the result of measures in favour of habitats and species for which the site was designated, leading to a stable 'biodiversity offer' for the whole site.



Protecting Europe's forests – EU Policy Framework

> **Habitats Directive¹** – aims to protect wildlife species and their habitats. Each Member State is required to identify Sites of Community Interest (SCIs) and to establish necessary conservation measures including management plans if needed, combining long-term preservation with economic and social activities, as part of a sustainable development strategy. These sites, together with those of the Birds Directive, make up the Natura 2000 Network.

> **Birds Directive²** – requires Member States to preserve, maintain or restore biotopes and habitats for wild bird species through the creation of Special Protection Areas (SPAs).

> **Natura 2000 Network** – the cornerstone of EU policy for the conservation of biodiversity. The network of areas, selected and protected for their high nature conservation, comprises more than 20,000 sites, covering close to 20% of EU territory. It is co-financed through the LIFE programme and other Community financial instruments.

> **The Sixth Environment Action Programme (6th EAP)³** – the framework for all DG Environment actions, setting out the EU's environmental policy agenda until 2010 and highlighting nature and biodiversity as a top priority.

> **EU Forestry Strategy** (adopted in 1998) – see p.13.

> **Communication on a European Biodiversity Strategy⁴** (adopted 1998) – aims to anticipate, prevent and attack the causes of significant reduction or loss of biodiversity at source. This will help both to reverse

present trends in biodiversity reduction or losses and to place species and ecosystems, including agro-ecosystems and forests at a satisfactory conservation status, both in and outside the EU.

> **Forest Focus Regulation (adopted 2003)⁵** – a Community scheme for harmonised, comprehensive and long-term monitoring of European forest ecosystems. It concentrates in particular on protecting forests against air pollution and fire. To supplement the monitoring system, new instruments relating to soil monitoring, carbon sequestration, biodiversity, climate change and protective functions of forests are to be developed.

> **European Forest Information and Communication System (EFICS)⁶** – a Europe-wide scheme to collect comparable and objective information on the structure and operation of the forestry sector in the Community, and also to facilitate the implementation and monitoring of the Community forestry provisions in force.

> **Action Plan on Forest Law Enforcement, Governance and Trade (FLEGT)⁷** – the EU's response to the problem of illegal logging and trade in associated timber products. It sets out a range of measures, the most important of which is building partnerships between the EU and timber-producing countries to prevent illegally produced timber from entering the EU-market.

> **Communication and Commission Staff Working Document on the implementation of the EU Forestry Strategy (2005)** – see p.13.

5 Council Reg (EEC) No 2152/2003 OJL 324, 11.12.2003, p.1

6 Council Reg (EEC) No 1515/89, extended by Council Regulation (EEC) No 400/94.

7 COM (2003) 251 Final.

http://ec.europa.eu/development/body/theme/forest/initiative/docs/Doc1-FLEGT_en.pdf#zoom=100 Ref



> **EU Forest Action Plan** – (adopted on 15 June 2006) see p.13.

> **Thematic Strategy on the Sustainable Use of Natural Resources⁸** – the Commission has proposed an ambitious strategy for natural resources used in Europe. The aim is to reduce the environmental impacts associated with resource use and to do so in a growing economy.

> **Malahide Message** – the stakeholder conference, held on 24-27 May 2004 in Malahide, Co. Durham, Ireland brought together experts from the key sectors affecting biodiversity, from the Commission, Member States and society. It prepared a "Message from Malahide" stressing the need for urgent action to achieve 2010 targets.

> **Communication on "Halting the loss of biodiversity by 2010 and beyond"** (adopted on 22 May 2006)⁹ – spells out what needs to be done to halt biodiversity loss in the EU by 2010 and beyond and to meet the international commitments to reduce biodiversity loss worldwide. It provides an EU Action Plan that proposes concrete measures and outlines the responsibilities of EU institutions and Member States, respectively. It also specifies indicators to monitor progress, and a timetable for evaluations.

8 COM(2005)670 Final.
<http://ec.europa.eu/environment/natres/index.htm>

9 COM (2006)216 Final.
http://eur-lex.europa.eu/LexUriServ/site/en/com/2006/com2006_0216en01.pdf

1 Directive 92/43/EEC.

2 Directive 79/409/EEC.

3 'Environment 2010: Our Future, Our Choice' - Decision No 1600/2002/EC of the European Parliament and of the Council of 22 July 2002 [OJ L 242 of 10.09.2002].

4 COM (98)42.



Photo:
Christoph Leditznig



Photo: K. Raptopoulou

The Vai palm grove on the island of Crete features the unique (in Europe) habitat type, 'Palm groves of Phoenix' (Phoenix theophrasti). Inset: Silver washed fritillary (Argynnis paphia).

Forest types included in Natura 2000

Listed in Annex I of the Habitats Directive are more than 70 different forest habitat types, of which many are classed as priority. They make up a third of all the habitats covered by the directive. The large number of habitat types in Annex I however, does not imply an abundant resource. On the contrary, it goes to confirm their generally rare and residual nature.

Over 50% are restricted to just one or two countries (and in some cases to just one or two locations). Typical examples include Fennoscandian wooded pastures found only in Finland and Sweden, Canarian endemic pine forests, Nebrodi fir forests of Sicily and the Palm Groves of Phoenix, found only in Crete (LIFE98 NAT/GR/005264) and Turkey. Only a handful of the more 'common' and well known forest types such as alluvial forests, oak

woods, coniferous and a variety of beech forests are present in the majority of Member States.

To help select sites for Natura 2000, Member States and the Commission agreed that they should focus on the forests that:

- > contain native species and have a high degree of naturalness;
- > consist of tall trees;
- > contain old and dead trees;
- > extend over a substantial area; and
- > have benefited from continuous sustainable management over a significant period.

These principles indicate that preference should be given to the autochthonous forests with little human interference and/or to those already subject to sustainable management practices favouring biodiversity. It is estimated that two thirds of the sites included in the Natura 2000 network have at least one forest habitat type, which suggests they tend to form

part of a complex matrix of habitats within a larger area².

Role of National Forest Programmes

The aim of National Forest Programmes (NFPS), an outcome of the follow-up process of the Rio Earth Summit in 1992 (<http://users.aber.ac.uk/ojc3/rio.htm>), is to set up a practical political and social framework for the conservation, management and sustainable development of all types of forests. The aim was also to increase the effectiveness and efficiency of both public and privately owned forestry operations. Biodiversity plays an important role in many NFPS.

According to the 2003 study "Natura 2000 and Forests – Challenges and Opportunities" more than 120 countries have developed or updated their

² Source: DG Environment website "Good practices in managing Natura 2000 sites"



Syöte national park, Finland.

NFPS in recent years. The tangible results of these processes, according to the interpretation guide, include new forestry policies and improved legislation, institutional reforms, redefinition of the role of the State in forestry development, decentralisation of forest management responsibilities, transfer of power to communities and local groups, and greater transparency and participation in decision-making processes.

In 1990, the Ministerial Conference on the Protection of Forests in Europe (MCPFE)³ was set up to promote the sustainable management of Europe's forests. Participating countries are responsible for the national and regional implementation of recommendations made at these conferences⁴. Resolutions cover protection, conservation and sustainable development of Europe's forests and lay down guidelines for achieving these objectives.

Forest Certification

Forest certification is a market tool to promote sustainable forestry and it also helps to raise awareness among the general public of the issues. Most of the forests that are certified in the EU come under the scheme of the Forest Stewardship Council (FSC), or the Programme for the Endorsement of Forest Certification schemes (PEFC). At present, the EU-market for wood products designated as originating from certified forests is still small and concentrated in a limited number of Member States. It mainly covers high-quality products from selected sectors such as furniture, paper and window frames.

Photo: Iso-Syöte

³ www.mcpfe.org

⁴ The MCPFE conferences: 1st MCPFE, Strasbourg - 1990 (pollution), 2nd MCPFE, Helsinki - 1993 (management), 3rd MCPFE, Lisbon - 1998 (biodiversity), 4th MCPFE, - 2003 (NFP - Biodiversity).



Photo: Christoph Leditzing

Up to 650 species of mushrooms have been found in the 'Wilderness Area Dürrenstein', Austria.

Individual Forestry Measures in Member States

There is no consolidated overview of forest measures carried out in the Member States. But there are a number of ongoing measures that have been adopted by many LIFE projects. These include:

- > investments to improve the so-called 'multifunctional' role of forests – afforestation programmes and improvements to harvesting, processing and marketing of forestry products;
- > afforestation of agricultural land – a system of EU aid for forestry that will hopefully result in improvements in forest resources, encourage more environmentally friendly forms of countryside management and help to combat the greenhouse effect;
- > improvement of protection of natural heritage – to maintain and improve the ecological stability of forests where the protective and ecological role of the forests are of public interest, and where the costs of maintenance and improvement measures for the forestry exceed the income from forestry; and
- > vocational training of farmers and forest holders – to encourage the application of sustainable management, methods and practices.

LIFE, LIFE+ and Europe's forests

Launched in 1992, LIFE (The Financial Instrument for the Environment) is one of the spearheads of Community environment policy. LIFE co-finances environmental initiatives in the EU, third countries bordering the Mediterranean and the Baltic Sea, and candidate countries. It consists of three thematic components: LIFE-Nature, LIFE-Environment and LIFE-Third Countries.

The first phase of the current LIFE programme, which draws to a close at the end of 2006, was "LIFE I" (1992-1995), which had a budget of € 400 million. The second phase, "LIFE II" (1992-1995), was allocated a budget of approximately € 450 million, and the third phase "LIFE III" (2000-2004) had a budget of € 640 million. LIFE III was extended (2005-2006) by Regulation (EC) No 1682/2004 of 15 September 2004 with a budget of € 317 million.

LIFE-Nature and Forestry

LIFE-Nature is dedicated specifically to the implementation of the Birds and Habitats directives. It is the most important financing mechanism for forestry projects within the LIFE programme. Forest projects that have been funded under LIFE-Nature since 1992 include 209 actions aimed at the conservation of natural habitats and of wild fauna and flora that is extensively targeted at the operation of the Natura 2000 Network. Typically, these include projects focusing on forest management, enhancing biodiversity and more ecologically friendly forms of forestry. Achieving a balance between nature conservation and the economic aspects of land-use and of farmers and landowners rights are other key objectives.

LIFE-Environment and Forestry

Here the scope is much wider as the category encompasses more technically oriented projects focusing on

environmentally innovative actions for industry. Since 1992, the 39 LIFE-Environment projects that have covered forestry have looked at broader issues not directly related to Natura 2000, such as ways of improving the environmental efficiency of forest industries, for measuring and controlling emissions, and for setting standards to integrate biodiversity concerns.

LIFE-Third Countries and Forestry

LIFE-Third Countries' projects provide technical assistance in the establishment of environment-related administrative structures, nature conservation actions and demonstration actions to

promote sustainable development. Since 1992, this part of the LIFE programme has financed a small cluster of projects focusing on issues such as forest fires (Lebanon), forest pollution (Russia) and conservation of forest biodiversity (Russia).

LIFE+ the future of LIFE

The LIFE+ (LIFE plus) programme (2007-2013) will replace the LIFE III programme and also the Forest Focus scheme. The current environment, nature and third countries' strands will be phased out and LIFE+ will support instead "Nature and biodiversity," "Environmental policy and governance," and "Information and communications".

LIFE-Environment project beneficiary Dr. Carlos Colinas (left) with Francisco Rovira, director of the Forest Technology Centre of Catalonia (CTFC) - LIFE96 ENV/E/000512.





The “Nature and biodiversity” strand will contribute to the implementation of Community policy and legislation on nature and biodiversity, with particular reference to the Birds and Habitats directives, and it will support further development of the Natura 2000 network. This strand will also work to build up a knowledge base for evaluating Community nature and biodiversity policy, and it will support development of monitoring tools in this respect, as well as working for better environmental governance and broadening stakeholder involvement.

The other two strands of the LIFE+ programme “Environmental policy and governance” and “Information and communications” will focus on supporting policy as expressed through the 6th EAP and raising awareness on environmental issues including conferences, training and publications and crucially, to raising public awareness about forest fire prevention.

DG Environment research on LIFE Forest projects (1992-2005)

The majority of the LIFE project case studies featured in this publication have been selected as part of a comprehensive review of forest-related LIFE projects carried out between 1992 and 2005 by DG Environment’s Agriculture, Forests and Soil Unit (DG ENV, B1). From a total of 248 LIFE nature and environment projects broadly connected with forest or forest management issues, the study identified 129 of these that were/are, (as a number are still ongoing) of particular interest. Projects were identified using keywords from the LIFE projects database (March-May 2005).

Under the LIFE-Nature strand, the study identified 108 projects covering



Photo: Iso-Syöte

Hikers in Syöte national park, Finland using pathway constructed by the LIFE project (LIFE99 NAT/FIN/006268).

forest management, forest restoration and conservation, and species protection, of which 38 were commended. Under LIFE-Environment, the study identified 21 projects of interest, covering non-timber products and services (NT&S), sustainable forest management (SFM), water and forests, and bio-energy, of which 12 were commended.

LIFE-Nature project case studies

The following LIFE-Nature case studies are featured in this brochure:

- > LIFE supporting forest restoration – Atlantic oak woods (LIFE97 NAT/UK/004244), Kalkalpen national park (LIFE99 NAT/A/005915), eco-tourism and the protection of natural boreal forests of Syöte (LIFE99 NAT/FIN/006268), and wet woods restoration, Scotland (LIFE98 NAT/UK/005431).
- > Breathing LIFE into forest biodiversity – grouse in the Black Forest, (LIFE98 NAT/D/005087), saving the hermit beetle (LIFE97

NAT/S/004204), and the Bosco Fontana nature reserve (LIFE99 NAT/IT/006245).

- > Managing forests for LIFE – in Burgundy (LIFE99 NAT/F/006314) and in the Dürrenstein wilderness area (LIFE97 NAT/A/004117).
- > Building partnerships for LIFE – in the New Forest (LIFE97 NAT/UK/004242), in Crete to protect the unique Vai palms (LIFE98 NAT/GR/005264) and forging links with landowners to protect western taiga in Bollnäs (LIFE97NAT/S/004200).

LIFE-Environment project case studies

The following LIFE-Environment case studies are featured in Managing forests for LIFE:

- > Under ‘NT&S’: fungi in forest plantations (LIFE96 ENV/E/000512).
- > Under ‘SFM’: coppice management (LIFE99 ENV/IT/000003).
- > Under forest management: urban forests (LIFE00 ENV/S/000868).
- > Under ‘Bio-energy’ – BIOSIT (LIFE00 ENV/IT/000054).

The EU Forestry Strategy

The EU Forestry Strategy aims to coordinate Member State forestry policies at an EU level. The strategy involves a framework for Community action, which addresses biodiversity concerns in three areas: conservation; sustainable use; and the benefits arising from the use of forests' genetic resources. As there are only a few forest areas in Europe that are not used commercially the key action for the protection of biodiversity is to find appropriate forest management systems that take these biodiversity concerns sufficiently into account.

The strategy, as outlined in the Council Resolution (October 1998) followed a Commission Communication on a Forestry Strategy for the European Union¹ identifies the following guidelines for forest managers for the conservation of biodiversity. These include:

- > Using appropriate ecological site-adaptation measures via diverse silvicultural techniques combined with associated measures, for example respect for dead wood and for other important micro-habitats present in forests.
- > Maintaining healthy forest ecosystems by improving their capacity to regenerate, resist and adapt.
- > Restoring traditional management of those silvo-pastoral systems with high levels of biodiversity that might be lost if these areas were abandoned, for example in the Mediterranean regions.
- > Improving harvesting techniques to try to limit related damages.
- > Carrying out measures in a way that does not have a negative impact on ecologically interesting or noteworthy sites, ecosystems and habitats.

The strategy also called for the establishment of protected forest areas to complement the sustainable management of forests, in particular via the Natura 2000 Network. The objective for these protected areas

was to contribute to the enhancement of biodiversity and species protection as well as the social and economic benefits of forests.

In March 2005, the Commission unveiled its Communication on the implementation of the EU Forestry Strategy². Together with the accompanying Commission Staff Working Document these provide a detailed review of the activities implemented in the context of the EU Forestry Strategy since its implementation in 1998.

The review, which was prepared in close consultation with the Member States, showed that forests can provide multiple benefits to modern society and the public increasingly appreciates these benefits. It found that there had been progress in the sustainable management of the forests in the EU over the last few years but that the policy context is changing and therefore a "more pro-active approach to governing the Union's forests" is needed for the future. It highlights that the competitiveness and the economic viability of forests in the "EU Forestry Model" is under increasing pressure. There are about 15 million private forest owners in the EU who provide a wide range of environmental and social goods and services to society. These rely largely on wood sales for revenue. At the same time the forests are crucial for

the fulfilment of the EU commitments to halt the loss of biodiversity and to mitigate climate change. Following this review, in an effort to step up its involvement on forestry, the Commission adopted on 15 June 2006 an EU Forest Action Plan³. The plan developed with the Member States and with stakeholders proposes 18 key actions to be undertaken for the period 2007-2011. After this an evaluation will set the scene for further actions.

Meanwhile, the Commission has completed its process of consultations and discussions with all interested parties. Carried out between June 2005 and March 2006, this involved external expert seminars, a series of meetings with Member State forest administrations (Standing Forestry Committee), forest sector stakeholders (Advisory Group on Forests and Cork), individual contributions from environmental NGO's and finally three working groups of experts designated by the Member States. At the same time, DG Environment services have been kept informed of, and consulted on, the progress of this work. Thus the present draft Forest Action Plan results from a process of extensive consultation that has achieved a high degree of consensus among the man parties involved.

¹ COM (1998) 649 final of 3 November 1998.

² COM (2005) 84 final of 15 March 2005.

³ COM (2006) 302 final (http://ec.europa.eu/agriculture/fore/action_plan/index_en.htm).



Sustainable Forest Management – a view from the European Landowners Organization

Sustainable Forest Management, possibly combined with voluntary conservation efforts, allows foresters to sustain biodiversity while continuing to earn a living from forestry, fishing, hunting and outdoor activities. It is even likely to increase their earnings, according to Thierry de l'Escaille, Secretary General of the stakeholder group, the European Landowners Organization.

Sustainable Forest Management (SFM) practices make a positive contribution to the creation and maintenance of some of Europe's most valued habitats. SFM takes a long-term approach, which in forestry often means several hundred years. SFM takes into account the local growing conditions and ensures that tree species fit the ecological conditions. Clear cuts are avoided, which means that the development of ecosystems is not suddenly disrupted. Furthermore, with SFM, the spatial and structural elements of the forest are diversified, e.g. through open spaces, varied canopy structure and presence of dead wood. In this way, SFM maintains the long-term ecological balance of the forest ecosystem and thus prevents destabilisation of the system and loss of productivity in the long run.

Sustainable forest management is also instrumental in the creation of enduring rural livelihoods and a viable socio-economic community in rural areas. Strong partnerships are often built between local actors dealing with SFM, enabling local communities to tackle global challenges while offering protection of Europe's biodiversity. To encourage wider application of SFM, solutions should be found to minimise potential conflict of interests and to balance the difficult choices between 'economic use only' and 'strict protection only'.



Photo: ELO

Thierry de l'Escaille, Secretary General of the stakeholder group, the European Landowners Organization.

The ELO believes that the future of Europe's forests is dependent on the individual management decisions of its millions of private land/forests owners. Therefore, the elaboration of tools such as the EU Forest Action Plan or National Forest Programmes needs to be based on faithful collaboration and partnership with private owners. The involvement of private owners in SFM schemes by Member States fosters trust and personal commitment from private forest owners. It might lead to temporary additional work for the national forest agencies and local authorities. However, when early discussion between local authorities and owners take place, conflicts of interest are avoided at an early stage in a vast majority of cases.

Implementing SFM using a restrictive and prohibitive approach offers some advantages in terms of control, but it risks creating a counterproduc-

tive atmosphere. Specific economic incentives are in this case an effective approach, often chosen by Member States to support stricter conservation measures.

Natura 2000 is in effect more inclusive than the classical 'top down' approach to nature conservation. It encourages people to take note of our common heritage and allows for certain economic activities to take place in the designated areas, rather than strictly prohibiting activities. The designation of a Natura 2000 site in a forest constitutes a reward for ongoing management and generally only minor adjustments of the management approach are needed to ensure its compatibility with the specific needs of species and habitats for which the site is designated. In this context, it should be stressed that the existence of endangered species in forests is often the result of traditional land use and forestry practices. It is obvious that such land uses should be encouraged and supported when implementing Natura 2000 on the ground.

The principle of SFM is enshrined in the Habitats Directive, requiring that conservation measures take account of economic, social and environmental aspects. However, this applies only to Natura 2000 sites. An EU-wide approach to SFM is needed to ensure a balanced approach to forestry also outside the Natura 2000 Network.

LIFE supporting forest restoration

This section provides examples of forest and forestry projects co-financed by LIFE-Nature that were particularly successful in the restoration of targeted sites to a favourable conservation status. Preservation of biodiversity in forests across Europe calls for a careful balance between two main nature conservation strategies¹ – ‘integrative’ and ‘segrative’. In the following pages and throughout the publication, we aim to show through numerous examples how these strategies work in practice.

Forestry in Europe has, in the past, mainly followed an ‘integrative’ strategy seeking to maintain and preserve forest and woodland areas through Sustainable Forest Management (SFM), which may also encompass some form of economic activity. However, not all the objectives of nature conservation can be reached through SFM. Therefore, setting aside areas exclusively for nature conservation purposes has to be considered for especially rare or valuable habitats whose

conservation status would otherwise decline.

The most frequently used EU funding for restoration (and management) of forest and woodland areas is provided by the LIFE-Nature programme. Since its inception in 1992, LIFE has co-financed projects selected on the basis of merit. Such projects must also support implementation of the Birds and Habitats Directives.

As illustrated by the case studies in this section – together with other examples featured elsewhere in this publication – measures implemented under LIFE need to be sustainable over the long term. This is the reason for the “Life after LIFE” sections, which are mainly based on a series of ex-post follow-up reports carried out throughout Europe by the LIFE *external monitoring team*.

¹ Source: “Natura 2000 and forests - Challenges and opportunities”
<http://ec.europa.eu/comm/environment/life/home.htm>





UK: Lasting legacy for Atlantic oak woods restoration

LIFE-Nature co-funding provided the incentive for this project's wide-ranging, coordinated and strategic approach to the restoration of a large proportion of the priority Atlantic oak woods at seven United Kingdom sites, four of which are Natura 2000 sites – two in Scotland, and one in both England and Wales. Of particular note was the project's pioneering use of local operational planning teams to ensure that wider issues, such as designating the Natura 2000 sites and monitoring their condition, were combined with more local issues of woodland management and the economics of the forests.

Old sessile oak woods with holly (*Ilex aquifolium*) and hard-fern (*Blechnum spp.*), colloquially known as Atlantic oak woodlands, are an Annex I habitat type virtually restricted to Britain and Ireland. In Britain they are restricted to sites in the west of the country, many of which have been subject to management – including forestry practices – that have degraded their nature conservation interest. These ancient oak woodlands are threatened by “underplanting” and replacement of broadleaved deciduous species by exotic conifers, invasive plants such as rhododendron (*Rhododendron ponticum*), increased browsing by deer (which reduces natural regeneration) and in some cases by a high number of visitors.

The project focused on improving the habitat condition in seven of the most extensive Atlantic woodlands in Britain from Loch Maree in the far northwest of Scotland, through the popular Loch Lomond woodlands within easy reach of Glasgow, to Borrowdale woods in the Lake District and Meirionnydd oak woods in northwest Wales. Combined, these woodlands cover nearly 4,900 hectares of Atlantic oakwood habitat.

The project was implemented by the project beneficiary, Highland Birchwoods – a small not-for-profit organi-



Photo: Highland Birchwoods

Old sessile oak woods with holly (*Ilex aquifolium*) and hard-fern (*Blechnum spp.*), known as ‘Atlantic oak woodlands’.

sation founded in 1992 to help halt the decline of Scottish native forest habitats – on behalf of the Caledonian Partnership. The partnership includes voluntary conservation organisations and government forestry, conservation and research agencies with wide experience of native woodland restoration.

The project had four main objectives: 1) restore a significant proportion of the Atlantic oak wood habitat within candidate Special Areas of Conservation (SACs) in the UK to “favourable condition”; 2) undertake scientific research to underpin the development of strategies for the manage-

ment of grazing in Atlantic oak woods; 3) establish standardised integrated management and monitoring plans for each SAC, to ensure the maintenance of favourable condition in the future; and 4) disseminate the information and expertise gained through the project to the widest possible audience. This would further the development of an integrated approach to woodland habitat conservation.

What did LIFE do?

The project focused on seven sites: five in Scotland – Loch Etive Woods (1,691 ha), Loch Lomond Woods (1,458 ha), Loch Maree complex (223 ha), Loch

Sunart Woodlands (3,161 ha), and Taynish Woods (385 ha); one in Wales – Meirionnydd Woodlands (461 ha); and one in England – Borrowdale Woodland Complex (668 ha). At each of the sites a set of management targets was established based on the main perceived threats. Actions targeted the clearance of around 690 ha of exotic conifers and broadleaves, treatment of around 405 ha to eradicate rhododendron and treatment of a further area of over 370 ha to control bracken. Another important activity was to control grazing – particularly by sheep, deer and feral goats – through the construction of more than 60 km of stock fencing and the culling of deer.

What did LIFE achieve?

In terms of restoration work carried out on the seven sites, the overall targets were generally exceeded. The final results included the removal of exotic conifers from 688 ha over the seven sites, the eradication of the invasive rhododendron scrub from 405 ha at five sites and control of bracken over 373 ha at four sites. Regeneration measures were also undertaken over 35 ha at three sites and re-structuring operations were successfully implemented over 14 ha at two sites.

Control of the grazing habits of the deer was introduced by the erection of more than 61 km of fencing on three sites and by more than 14 km of stock fencing on six sites. More than 140 ha of land was made deer-proof on four sites and integrated deer management strategies were implemented at five sites. In addition, almost 8 km of roads and tracks were constructed at three sites to protect the habitat during restoration operations.

The practical works were supported by the production of “site management statements” including condi-

tion assessments, management plans, surveys, deer-management strategies and applied research. The research helped reveal some of the complexities of oak wood habitats. At a number of sites, the oak woods (for which the sites were designated), were found to have been produced by product selection over several centuries. Charcoal burning and the popularity of oak products has favoured oak woods, and some ‘natural’ oak woods were found to have been planted. According to the beneficiary, this finding has important management consequences, as it showed “hands off conservation” in favour of predominantly oak-based habitats may not necessarily be the best approach in the long term.

Deer management

The project made a significant contribution to the debate over the long-term reduction of numbers of deer in Scottish SACs. The project’s deer-management strategies identified best practices for the future, which are backed up by a document “Deer Management Requirements for the Delivery of Natura 2000 Objectives in Atlantic oak woods”. Coming up with a definitive policy for resolving this problem, however, rests with the Deer Commission for Scotland in partnership with the Forestry Commission and Scottish Natural Heritage.

On the issue of the intensive programme of deer fencing and culling,



Photo: Highland Birchwoods

Schoolchildren enjoy a ‘green-day’ outing to Borrowdale.

undertaken on four sites, the most significant progress was at Loch Lomond and at Loch Sunart. At Loch Lomond, for example, the deer cull brought numbers down from 39 per km² to 10 per km². At Loch Sunart the deer-management strategy was also well advanced at project closure. These achievements helped to justify the cost of erecting more than 40 km of fencing over the whole SAC, with the cooperation of private landowners.

Borrowdale woods before the restoration work.

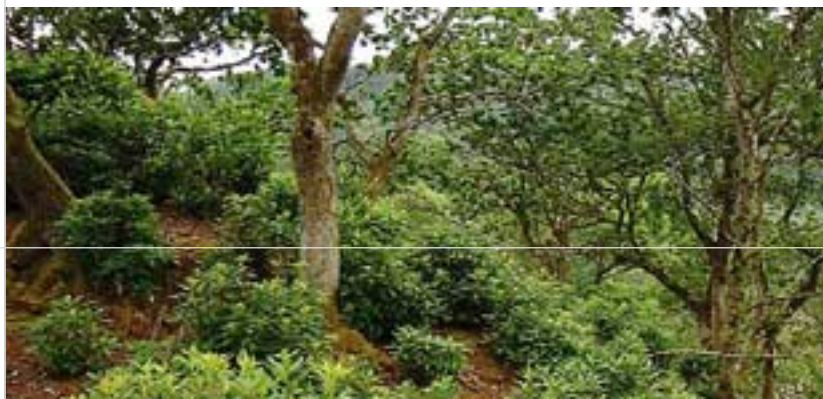


Photo: Highland Birchwoods



Photo: Highland Birchwoods

Burning the invasive rhododendron.

Removing rhododendron

The project also tackled the large-scale removal of rhododendron at a number of the sites where in future only “mopping-up exercises” would be required. Regarding the long-term effect of the project actions, the work is being continued through a 10-year management plan, which was launched in 2001 and covers monitoring plans for all the sites and sub-sites. The aim is to provide the necessary framework for future management.

Life after LIFE

A follow-up ex-post study of the project was carried out in April 2006 by the LIFE external monitoring team. The study focused on Scotland, in particular the Sunart SAC area, where an extensive post project conservation programme was initiated.

In future, only “mopping-up exercises” are needed for the rhododendron.



Photo: Highland Birchwoods

Within the Sunart area at least, the project has led to the establishment of the Sunart Oakwood Initiative (SOI), a wider woodland conservation programme, which has been taken up by many landowners, local communities and conservation organisations. In terms of its conservation impact, the project achieved rhododendron, bracken and conifer felling on 644 ha of land (with two public owners and 18 private owners). Subsequently the SOI has achieved rhododendron and bracken clearance on a further 145 ha of land (under 31 private owners) with Forestry Commission for Scotland funding. Furthermore current applications under the new Sunart Woodland Scheme already involve 3.74 ha of rhododendron control and 644 ha of deer control.

The project pioneered the use of “local operational planning teams”, which although time-consuming and initially problematical, proved to be extremely worthwhile in the long-run. Consequently the approach was fol-

lowed in two other Caledonian Partnership LIFE projects: “Woodland Habitat Restoration: Core sites for a forest habitat network” (LIFE00 NAT/UK/7074) and “Urgent Conservation Management for Scottish Capercailie” (LIFE02NAT/UK/8541) and has been adapted by others.

The applied research outputs from the project, including models for oak woodland management have also been widely referred to by other woodland management projects in the UK and elsewhere.

Conclusions

This LIFE project was very successful in achieving its key objectives and has left a lasting legacy of knowledge and enthusiasm for Atlantic oak woodland conservation. According to the beneficiary, this has provided the incentive for the development of wide-ranging, coordinated and strategic woodland restoration activities covering a significant proportion of the priority Atlantic oak wood resource in the UK.

Project number: LIFE97 NAT/UK/004244

Title: Restoration of Atlantic oakwoods

Target habitats: Old sessile oak woods with Ilex and *Blechnum* (91A0), *Caledonian forest (91C0), *Bog woodland (91D0), Northern Atlantic wet heaths with *Erica tetralix* (4010)

Beneficiary: Highland Birchwoods, on behalf of the Caledonian Partnership

Contact: Phil Baarda (Highlands Birchwoods)

Tel: +44 (0)1463 811663

Email: phil.baarda@highlandbirchwoods.co.uk

Website: www.highlandbirchwoods.co.uk, www.caledonian-partnership.org.uk

Site details: (for Sunart SAC)

“Sunart Oakwoods and Wildlife Hide”, Greenwood, Ardslnish by Glenborrodale, Acharacle PH36 4JG, Scotland

Tel: +44 (0) 1967 402165

Website: www.sunartoakwoods.org.uk

Period: 01-April-1997 to 31-Aug -2001

Total budget: € 3,406,000

LIFE contribution: € 1,703,000

* denotes priority habitat



case 2

Austria: Rejuvenation of the natural forests of Kalkalpen national park

This Austrian LIFE-Nature project illustrates large-scale restoration incorporating sustainable forest management and a well-conceived management plan. It involved the active cooperation of a broad selection of stakeholders and also piloted and applied new forest restoration techniques to transform former spruce monocultures into more mixed mountain forests.

The 21,000-hectare Kalkalpen national park, located in the Upper Austrian Alps, is part of the largest unbroken forest area in the country. In the late 19th and early 20th centuries this karst region, famed for its many natural springs, was a source of wood for the metal industry. But with the decline of the industry, many of its more remote mountain forests have remained relatively undisturbed in recent years. This has enabled the preservation of major forest habitats – notably of various types of mountain beech forest and their associated species, including four species of grouse (*Tetrao tetrix*, *T. urogallus*, *Bonasa bonasia*, *Lagopus mutus*) and the white backed woodpecker (*Dendrocopos leucotos*) as well as the priority Annex II beetle (*Rosalia alpina*). More recently, the lynx has re-colonised the area.

Forestry activities ceased when the national park was designated in 1997. The idea was to allow mixed forests to develop in place of non-native spruce plantations. However, this rejuvenation task was complicated by the fact that the earlier planting of conifer forests had proved unsuitable for local conditions altering the soil superstructure and water balance. Overpopulation by large game animals made the natural forest restoration task more difficult and the wet biotopes and springs of the Alpine pasturelands were also suffering from trampling damage caused by the large game.



Photo: National Park Kalkalpen

Novel bark cutting technique used to guard against bark beetle infestation.

What did LIFE do?

Working closely with the main land-owner, the Austrian Federal Forest AG, the project was implemented by the project beneficiary, the national park authority for Kalkalpen, (*Nationalpark Oberösterreichische Kalkalpen*) which works closely with foresters, farmers and municipalities in the area. The project area covered over 6,000 ha. Its overall objective was to convert land that had previously been planted with non-native forest trees into semi-natural mixed forests. To achieve this, a management plan was drawn up for some 260-ha that included the cutting back of spruce trees in

an innovative way – that is instead of large-scale clear-cutting individual trees or groups of trees were cut back to encourage natural rejuvenation. Part of the cut-down timber was cleared away (and the money was put towards the project – helping to keep down the EC contribution to 37% of total costs). But, as dead logs and snags have multiple ecological functions in forest ecosystems, not all the spruce timber was removed.

The key for the beneficiary was to encourage the regeneration of a species-rich mixed mountain forest, while at the same time preventing a major outbreak of bark beetle (*Ips typographus*).



The bark beetle attacks the bark of weak standing trees, but it is also particularly efficient at infecting young cut spruce trees that are lying on the ground. This was remedied by treating the bark with a technique, which was new to Austria, to prevent infestation.

The problem of overpopulation of large game animals across the national park was addressed by regular hunting by professional huntsmen, keeping intrusion, notably by red deer, roe deer and chamois, to a minimum. Wetlands and springs were leased and fenced off to shield them from inappropriate exploitation and the forest road and track network was reduced to limit the rise in tourist traffic.

What was the outcome?

Forestry work

The results for the project's forestry work were better than foreseen. There was more cutting of young spruce strands than originally foreseen (more than 220 ha compared with 100 ha). The cutting plan was adapted to each forest section and here the costs per ha were lower than expected. There was also more cutting in mature stands of spruce, than originally planned (almost 13,000 cubic metres of timber were cut on 162 hectares). More than 4,000 m³ of dead wood remained in forest stands. Where necessary some of the forest sections were treated by the new technique to prevent bark beetle infestation. Other forestry work included the removal of more than 100 km of forestry roads – (more than foreseen), the completion of a GIS mapped assessment of erosion risk on slopes and an ecological survey of the forestry work. New, nature-friendly quality criteria drawn up for the forestry work was, and continues to be applied to all works subcontracted by the beneficiary. This title proved successful and was widely disseminated

nation-wide during the course of the project.

Wildlife

The management of game (by controlled hunting) was also successful. More than 700 roe deer, red deer and chamois were culled in the area and game documentation (inventory, mapping, records) was carried out. In order to assess browsing pressure of game on natural tree regeneration, fences were erected to monitor browsing of young trees by game in 105 control areas. Monitoring will continue every three years. Much habitat and vegetation mapping was also completed (GIS mapped), and a study of the suitability for Tetraonidae (grouse) species was made. The monitoring showed a decreasing population of capercaillie (maximum 25 individuals) and black grouse (maximum 38); stable population of hazel grouse (maximum 300); and strong predation (e.g., by golden eagle). This research led to an enlargement of the SPA during the course of the project. Finally, documentation was carried out on lynx and bear.

Community involvement

Dissemination activities included the hosting of several well-attended information meetings and the erection of information panels placed at strategic spots throughout the park. The team also published a brochure on nature management in the park: “*Naturraummanagement im Nationalpark Kalkalpen*”, together with a book about the project area “*Verborgene im Bergwald*” (7,500 copies).

Conclusions

As well as providing very promising results, this LIFE-Nature project was particularly successful in gaining the support of the nearby community with more than 3,000 locals attending an information meeting held at the beginning of the project. Many foresters, forest workers, ecologists, conservationists and other stakeholders attended each of the four seminars hosted during the LIFE phase. Significantly, the management planning in forested areas carried out under LIFE still continues.

Project number: LIFE99 NAT/A/005915

Title: Management of Natural Forests in the National Park Kalkalpen

Key habitats: *Asperulo-Fagetum* beech forests (9130), Medio-European limestone beech forests of the *Cephalanthero-Fagion* (9150), *Bog woodland (91D0), Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) (91E0), *Acidophilous Picea* forests of the montane to alpine levels (*Vaccinio-Piceetea*) (9410), *Alpine Larix decidua* and/or *Pinus cembra* forests (9420), *Petrifying springs with tufa formation (*Cratoneurion*) (7220)

Beneficiary: Nationalpark Oberösterreichische Kalkalpen GmbH, Erich Mayrhofer, Project Manager

Tel: + 43 7584 3651

Email: natur@kalkalpen.at

Site details: National Park Centre Molln, Nationalpark Allee 1, A - 4591 Molln.

Tel: +43 (0)7584/3651

Email: nationalpark@kalkalpen.at

Period: 01-Feb-1999 to 31-Jan -2003

Total budget: € 3,425,000

LIFE contribution: € 1,240,000

Website: <http://www.kalkalpen.at/>

* denotes priority habitat



case 3

Finland: Eco-tourism and the protection of the natural boreal forests of Syöte national park

This Finnish project, set in the natural or old-growth boreal forests of Syöte, in the regions of Ostrobothnia and Lapland, managed to successfully combine forest protection and other restoration measures with the development of sustainable tourism. At the same time, the project team led by the project beneficiary, the state Forest and Park Service, managed to win over an initially sceptical local population to their nature conservation cause.

The LIFE project area comprised a cluster of four relatively untouched enclaves within the Syöte national park and three sites outside the park, Soiperoinen, Kaunislampi and Iso-Paise. As well as the priority habitat, boreal forests, the project area, which covered over 30,000 hectares, included Aapa mires with scattered remnants of herb-rich forest and endangered alkaline fen. Three of the country's large predators - bear (*Ursus arctos*), wolverine (*Gulo gulo*) and lynx (*Lynx lynx*) - can be found in the region, which is also the northernmost point in the range of the flying squirrel (*Pteromys volans*). In addition, up to 250 pairs of capercaillie live in the area. The endangered marsh saxifrage (*Saxifraga hirculus*) and Lapland buttercup (*Ranunculus lapponicus*) are also to be found here.

Owing to high unemployment¹, the local population had mixed feelings about nature conservation at project launch. Nature tourism, however, was on the rise, and was further boosted by the establishment of the Syöte national park in 2000. It was clear that some form of regulation of such activities as hiking, riding, mountain biking, fishing,

¹ Seasonally-adjusted unemployment rate (August 1999) - 25% [Finnish Labour Force Survey].

husky and reindeer safaris would be needed, if the area's ecological value was to be preserved.

What did LIFE do?

The project objectives consisted of the planning of land-use in the seven sites and to prepare a specific plan integrating nature conservation and the development of tourism activities in the area. The plan would provide a basis for practical action and guidelines for various types of land-use, ensuring the preservation of biodiversity. For example, the living conditions of species thriving in burnt-over areas (such as the *Stephanopachys linearis* beetle) were improved by means of controlled forest fires.

The state owned 95% of the future national park area at the beginning of

the project and purchased the remaining privately owned land with LIFE co-financing, in order to ensure coherent land management.

Since eco-tourism played a key role in the project area, the project team involved the local population and tourist businesses in preparing and carrying out a special eco-tourism plan. The idea was to prepare a set of common concepts and rules for tourism in the area. Courses were offered to entrepreneurs on sustainable nature tourism, and a manual was prepared to assist them. The nature tourism guide for entrepreneurs "*Matkailuyrittäjien luonto-opas*" was published in Finnish and English.

The project also published a handy guidebook (Finnish only) that targets the nature values and history of the

View over the old-growth boreal forests of Syöte.



Photo: Iso-Syöte



area and outlines the broad 'rules' of sustainable nature tourism. It also provides information on nature conservation generally, as well as specific to the Syöte project sites.

Updating the guiding system and construction of recreational structures to create a consistent image of the Syöte park also formed an important part of this project. (Note, due to administrative changes, similar types of activities would not be funded under LIFE III) To aid this task, guiding and recreation plans were drawn up and measures implemented. The guiding plan involved the erection of information points, information boards and signs along the hiking and skiing trails. This was closely associated with a waste management plan to reduce amounts of waste and to promote waste sorting and recycling in the area. The recreation plan was used as a basis for developing the existing trails and services and for creating new ones, such as a nature trail for people with disabilities, a nature trail describing the ecology of game animals and a cross-country ski route for children.

Species-specific protection plans were prepared and implemented for some of the threatened species in the conservation areas. For example, a number of artificial nests were built to encourage the habitats of the golden eagle and 200 nesting boxes were constructed to encourage the flying squirrels.

Regular community meetings were held during the course of the project to ensure that local population was able to participate in and influence its progress. Information meetings and openings were also arranged for new and repaired recreation facilities.

What was the outcome?

Following surveys of the project area, management plans were success-

fully completed for the seven sites to ensure the protection of habitats and species. These plans provide a basis for practical protection measures and provide guidance on other forms of land-use in the area, such as use for recreational and hiking purposes.

A key achievement was the project's success in gaining support of the local community. According to the project's final report: "Attitudes of entrepreneurs and other local people changed to become more positive after they received more information and realised that nature conservation can be a strength to a region."

Habitat types under the Habitat Directive benefited directly from project's active management actions, and all 16 habitat types benefited from passive management, that is habitat types were left to develop naturally in the areas where land was purchased, and from such actions as channelling visitor access, and preventing and stopping erosion through boardwalks.

According to the beneficiary, the LIFE project also enabled the Syöte national park to be developed more effectively and rapidly. For example,

it encouraged land-use planning over a large-scale and the studies undertaken on specific themes created a good grounding for the preparation of the area's seven management plans. The beneficiary became a partner in the 2002-2005 LIFE co-op project² "Grouse and tourism in Natura 2000 areas" (LIFE02 NAT/CP/D/000004).

Conclusions

This project illustrates that both nature conservation and possibilities for different sustainable livelihoods can co-exist within and around Natura 2000 sites. The development of a nature tourism plan was one of the successes of the project, as it did a lot to win around local support for nature conservation. It provided a way forward for developing tourism in a sustainable way, from both an economic and an ecological perspective. In short, the project promoted sustainable tourism - an activity of vital socio-economic importance to the region.

² EU LIFE co-operation projects were introduced in 2002 with the objective of sharing experiences between LIFE projects.

Project number: LIFE99 NAT/FIN/006268

Title: Combining protection with other forms of land-use in the natural boreal forests of the Syöte area

Key habitats: Fennoscandian herb-rich forests with *Picea abies* (9050), *Aapa mires (7310), *Western taiga (9010), Natural dystrophic lakes and ponds (3160)
Beneficiary: Metsähallitus (Finnish Forest and Park Service) for Ostrobothnia region

Site details: Syöte Visitor Centre, Erätie 1, 93280 Syöte, Finland

Tel: +358 205 64 6550

Fax: +358 205 64 6551

Email: syote@metsa.fi

Period: 01-Apr-1999 to 30-Nov-2002

Website: www.metsa.fi/natural/projects/index.htm (see "Syöte LIFE 1999-2002")

Total budget: € 1,529,000

LIFE contribution: € 764,000

* denotes priority habitat



case 4

UK: Bringing back LIFE to Scotland's rare 'wet woods'

Famed for its Highlands, Scotland does not immediately conjure up images of vast tracts of native woodlands. Yet it harbours significant numbers of priority forest habitat types listed in Annex I of the Habitats directive, including two priority habitats known collectively as 'wet woods'. This LIFE-Nature project took a comprehensive approach to their conservation by targeting three of Scotland's remaining bog woodland sites and two of the country's three residual alluvial forest sites.

Bog woodlands occur under rare combinations of physical circumstances and typically have scattered trees across the surface of the bog, forming open woodland in a relatively stable ecological relationship, without the loss of bog species. In Scotland, they normally form part of the mosaic of natural forest types within the wider Caledonian Pinewood habitat and are important for a number of bird species listed in Annex 1 of the Birds Directive including Scottish crossbill (*Loxia scotica*), osprey (*Pandion haliaetus*) and capercaillie (*Tetrao urogallus*). Residual alluvial forests are often dominated by *Alnus glutinosa*. They are found on floodplains in a range of situations from islands in river channels to low-lying wetlands alongside these channels. The habitat supports otter *Lutra lutra* (listed in Annex II of the Habitats Directive) and a wide range of Annex I (of the Birds Directive) species including kingfisher (*Alcedo atthis*) and osprey.

The project focused on five locations: Conon Islands, Monadh Mor, Pitmaduthy Moss, Cairngorms; and Abernethy (Mondhuie, Garten Wood, Dell Wood and North Abernethy, which despite being the best examples of these priority habitat types in Scotland, had all been affected by management of the hydrological systems upon which they depend. Bog

woodland sites had been drained for agricultural and forestry use while land-uses within their immediate water catchment had affected the quality of the water coming into the bog. Residual alluvial forests had been heavily affected by engineering works to prevent flooding, and, water use and drainage upstream had altered the water-quality and seasonal flooding patterns. In addition, many areas had been cleared for arable farming and grazing or planted with plantation forests.

The project was steered by Scottish Natural Heritage, the project beneficiary, working with four partners: Forest Enterprise, Highland Birchwoods Ltd, RSPB, Forestry Commission. It entailed close collaboration between the public agencies and landowners, to encourage the return of more natural hydrological systems at these sites. Appropriate land management was promoted on adjacent areas through the restructuring of surrounding plantation forests and the creation of buffer zones of native woodlands. Exotic shrubs were removed or controlled to allow the regeneration of natural communities. Grazing pressure was reduced by stock fencing. Management agreements with landowners enabled the reclamation of key demonstration floodplain sites for conservation.

What did LIFE do?

The overall objective of the project was to restore significant areas of the wet wood habitats, on or adjacent to the candidate Special Areas of Conservation (cSACs), to a more favourable condition. Other objectives were to undertake scientific research to further knowledge of restoration, management and monitoring plans for the habitats, and to support the ongoing work of developing partnerships between public agencies and private landowners. The information gathered during the project was disseminated through the existing network of partner institutions to encourage an integrated approach to the conservation of wet woods. The project also provided guidance and examples of best practice to help promote the management of these habitats in Scotland and in the rest of Europe.

Hydrological intervention aimed at the restoration of the natural water table was carried out at over six sites (363 ha). This included the filling in of plough lines and the construction of small dams in key drains. Woodland habitat restoration involved clear-felling, removal of non-native trees and thinning.

¹ A UK term that equates to pSCI (proposed Site of Community Importance)



Photo: Neil Wilkie / SNH

Forestry Commission land at Inshriach – October 2001.

A research working group was established to coordinate research studies. These studies helped the working group to draw up precise management solutions for each site. The working group also provides technical support to local operational planning teams, who carried out the LIFE work at local level.

Key studies were carried out including hydrological reports for the sites at Monadh Mor, Inshriach (Cairngorms), Abernethy and Pitmaduthy, which assessed the condition of the bog woodland and identified short-, medium- and long-term management scenarios. These reports examined whether the management actions to be undertaken were sound and were therefore useful to inform and support management. Two studies were also commissioned on the complex subject of bog wood classification. A further study addressed the age structure of Scots bog pine woodland.

The project also supported a more targeted approach to monitoring with a 'baseline survey' of potential bog woodland habitats following removal of lodgepole pine and Sitka spruce plantation at Mondhuie, Abernethy Forest Reserve. This survey sets out a detailed methodology for assessing re-vegetation.

Dissemination activities were largely targeted at professionals a joint conference was staged in October 2001

with the Atlantic Oakwoods LIFE project (LIFE97 NAT/UK/004244). The conference and site visits which was attended by more than 100 participants from across the UK, as well as Finland and Sweden, helped to raise awareness of the more marginal wooded habitats in Scotland.

Raising general public awareness of the specific value of wet woods was not easy as the specific sites are generally part of a wider mosaic of habitats. However the proximity of long-distance walking routes, footpaths and cycle-ways on some of the project sites provided stopping places to encourage visitors to "stop, look and think". This was achieved at Monadh Mor and Inshriach where viewing areas enabled visitors to see for themselves areas of bog woodland. An audio-visual display was also provided at the Forestry Commission Glenmore Visitor Centre (Cairngorms).

What was the outcome?

The project was very successful, achieving 98% of its target for hydrological restoration (363 ha at six sites)

and well over the target for habitat restoration (180-329 ha at six sites).

Part of the project's success is attributed to the use of local operational planning teams to coordinate action at a local level. This also helped to bring project much closer to the local communities and the sites. Technical support from the array of research studies that were co-ordinated by a research working group was also key to the project's success. This increased the overall level of knowledge of these poorly understood habitats and helped to draw up precise management prescriptions for each site and condition monitoring protocols for the habitat.

Conclusions

The project has helped to raise the profile of bog woodland as special 'pockets' within the wider wooded landscape and to highlight the potential value of the sites within an overall mosaic. For alluvial woodlands the project helped to stress the value of these natural habitats in the context of river catchment and fisheries management.

Project number: LIFE98 NAT/UK/005431

Title: Wet Woods Restoration Project

Target habitats: *Bog woodland (91D0), *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) (91E0)

Beneficiary: Scottish Natural Heritage

Site contact details: Glenmore Visitor Centre, Scotland (Aviemore is the nearest main town).

OS Grid Reference: NH978098

Contact: Recreation Ranger

Tel: + 1479 861220

Email: invernessfd@forestry.gsi.gov.uk

Period: 01 Oct 1998 to 31 May 2002

Website: www.wetwoods.org/

Total budget: € 1,005,000

LIFE contribution: € 503,000

* denotes priority habitat



The changes that forests have undergone over the last few centuries have brought a great number of species to the verge of extinction, reports the DG Environment Natura 2000 interpretation guide "Natura 2000 and forests – Challenges and opportunities". According to the 2003 study, many species are about to disappear from several European countries. This



is especially true for organisms at the top of the food chain such as large carnivores and birds of prey.

Breathing LIFE into forest biodiversity

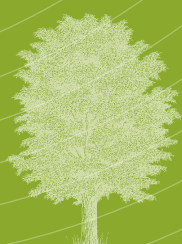
Annex I of the Habitats Directive lists 59 forest habitat types that are rare or residual and/or host species of Community interest. They are grouped into the following six forest habitat categories of European conservation interest:

- > Western taiga
- > Oak and beech forests
- > Deciduous Mediterranean forests
- > Sclerophyllous Mediterranean forest
- > Temperate mountain conifer forests
- > Mediterranean and macronesian mountain forests

The directive also identifies some 200 animal and more than 500 plant species as being of Community interest. Many of these species are directly or indirectly associated with forests. The Birds Directive lists in its Annex I over 180 bird species for which special protection areas (SPAs) have to be designated by a procedure of direct notification from Member States to the Commission. A considerable number of these species are also associated with forest habitats, either directly (woodpeckers, grouse, finches and warblers) or in connection with varying landscapes and features such as small wetlands (waders and shorebirds) and forest edges (owls and other birds of prey).



Photo: E. Marek





Germany: LIFE and the grouse in the Black Forest



Photo: E. Marek

The shy capercaillie (*Tetrao urogallus*), and its even more reclusive cousin, the hazel grouse (*Bonasa bonasia*), are two forest-dwelling birds that are endangered in central Europe. Their populations have been falling rapidly, not only in the southern Black Forest around the Feldberg massif – the LIFE project location – but also in other ranges such as the Jura and the Vosges. This successful project was able to develop forestry practices more compatible with their requirements. Crucially, it succeeded in implementing sustainable and economic solutions for the grouse that are acceptable to all sectors – forestry, hunting, tourism and nature conservation.

At 1,493 metres, the Feldberg is the highest mountain in Baden-Württemberg and a popular year-round destination for hiking and other outdoor sports. To serve the two million plus annual visitors, a dense network of hiking tracks, cross-country and downhill ski runs has been created. Simultaneously the Feldberg area is, because of its altitude, one of the last refuges of sub-Alpine fauna and flora outside the Alps themselves. It is also the habitat of the capercaillie and hazel grouse – both indicators of high structural diversity in boreal or montane forest habitats.

Paradoxically in the Black Forest, changes in forestry practices, with a move towards reduced intervention to allow more natural forests, have worked against these birds. Restrictions in exploitation (that traditionally encouraged forests of

varying ages and structures) have made the forests denser and more uniform. As a result, the light and open woodlands full of clearings and patches of berries and other undergrowth, so loved by the capercaillie, were becoming lost. The situation for the hazel grouse is similar, as the habitat needs of this species are equally in conflict with normal forestry practices. This habitat loss, together with increased disturbance from year-round tourism, meant the bird populations were declining fast.

What did LIFE do?

The project's main objective was to achieve and maintain populations that would be viable in the longer term and to augment the unique forest habitats around the Feldberg – a Natura 2000 area of over 80 square kilometres, 80% of which is forests (50% state-owned, 38% regional forests and 12% privately-owned). The forests mainly consist of spruce and beech trees in varied combinations. These mixtures are mainly enriched by fir trees and, in younger forest stands, through a variety of deciduous trees.

Capercaillie (*Tetrao urogallus*) – female.

The project beneficiary was Baden-Württemberg's Forest Research Institute (FVA) – specifically, the institute's 'Landespflege' (land management) department coordinated by project leader, Dr. Rudi Suchant.

Drawing on a model already successfully applied in the central Black Forest, the "Rohrhardsberg" project, and aided by experienced colleagues from a similar LIFE project in the French Jura (LIFE92 NAT/F/012700) the team set out to implement an integrated management strategy for the grouse that would take into account the interests of forestry, hunting, tourism and nature conservation. The idea was that all parties would collaborate from the

beginning. Instead of unilateral bans, clever visitor guidance and well-targeted alterations to forest structures would improve the prospects of survival for the grouse and act as a model for other projects.

According to the beneficiary, collaboration was crucial to the project's success: "With the LIFE project we were able to persuade people to look at grouse protection, not in terms of protecting one area while using another instead, but to identify which areas can be used in which ways. This was the key to integrating different interests of hunters, forest owners, tourists etc., that they work together and not against each other."

The team first carried out inventories and mapped, using geographical information systems (GIS), the forest structure, the presence of the species and the dense network of hiking and skiing tracks throughout the area. Based on this data, conflict areas were identified and priority areas for measurements were defined. A network of volunteers and professionals was established to help to carry out these tasks. The network included representatives of the different stakeholder groups including hunters and foresters, as well as conservationists.

Armed with this data, each stakeholder group was contacted, to find out what solutions could be found to manage

*Capercaillie (Tetrao urogallus).
Below: hazel grouse (Bonasa bonasia)
in the Black Forest.*



Photo: E. Marek



Photo: Forest Research Institute (FVA) Freiburg

Grouse species

Grouse are considered to be indicator species for habitat quality. Capercaillie has also been proven to act as an umbrella species for several endangered mountain birds... often characterised by a comparatively close habitat affinity, which makes them highly sensitive to habitat changes¹.

Capercaillie

The forest-dwelling capercaillie (*Tetrao urogallus*) is a shy, homing bird, requiring a complex mosaic of forest habitats to survive. In winter, it seeks open forests where it lives on a meagre diet of conifer needles. In springtime, the males congregate at certain forest clearings used every year for courtship displays. The females lay their eggs in hollows in the ground (May-June). However, many newborn chicks die if the weather is too cold or wet. An estimated 80% of chicks do not survive their first winter. The capercaillie's favoured habitats are open forests with clearings with low-lying vegetation bearing grains and insects for the young. In autumn, the birds move to areas where the forest floor is rich in their favourite food source – bilberry.

Hazel grouse

The smaller relative of the capercaillie, the hazel grouse (*Bonasa bonasia*), also inhabits the mixed coniferous-deciduous forests in the boreal or montane regions but prefers the younger succession stages. It shows fairly narrow habitat requirements for habitat structure: close interspersed of feeding trees and cover – mainly provided by conifer trees – is crucial. During snow, hazel grouse feed on catkins and buds of deciduous trees such as *Alnus*, *Betula*, *Corylus*, *Sorbus*, *Fagus*, and *Chosenia*. In snowfree times, the birds feed on a variety of shrubs, herbs, and grasses. In contrast to the capercaillie, hazel grouse is monogamous and territorial. Hazel grouse avoid open areas and are particularly vulnerable to forest fragmentation.

¹ Source: "Grouse and Tourism in Natura 2000 areas – Guidelines for an integration of nature conservation and nature use" by Rudi Suchant and Veronika Braunsch.



the visitors appropriately. Regarding forest management, foresters, hunters and other interested parties were taken on field trips to capercaillie 'hot spots' for on-site discussions on the conservation of the species. This was followed by the implementation of a plan of habitat restoration carried out by the foresters, with back-up and support from the project team.

Dr Suchant notes that the habitat restoration methods varied considerably – depending on individual foresters. For example, he says that some foresters opened the forests very lightly – in small patches, while others opted for substantial clearance, by up to 100 metres. "This was not a 'top-down' approach, but it was left very much up to the foresters themselves to decide," he says.

This same approach was taken up with the tourism sector, and further developed with international partners in the form of guidelines for grouse protection in the 2002-2005 LIFE co-op project: "Grouse and tourism in Natura 2000 areas" (LIFE02 NAT/CP/D/000004). Rather than imposing restrictions on skiing or hiking trails unilaterally, meetings were held with the stakeholders to agree upon alternative routes away from the sensitive capercaillie areas. This meant that if one trail was taken out of use, it would be replaced elsewhere or another trail



Project leader Dr. Rudi Suchant with team member Veronika Braunisch.

would be improved. These measures required an updating of local maps, which was done together with the "Schwarzwaldverein" (local hiking and tourist association).

Another focus group was the forestry workers. To supplement their practical knowledge of nature and the forests, special training and information was offered about the grouse and its needs. The same went for private forest owners, hunters and ornithologists, who participated in the monitoring of the birds. In addition, tourists and locals were kept informed on the targeted birds and the project by a variety of dissemination tools. These included several information leaflets and information panels on-site.

What was the outcome?

This integrated approach paid off and at the end of the LIFE phase (April 2002) a management plan had been produced

and implemented, with the support of all stakeholder groups, for the integration of visitor guidance and the zoning of forestry work. Its main conclusion was that not 100% but 30% of the area inhabited by capercaillie – and therefore also of the special protected area (SPA) – must provide optimal habitat conditions for the grouse and that this proportion could be moved over time, allowing a dynamic management of the area.

This was also one of the main reasons for the acceptance of the forest management techniques by the key stakeholder groups, (who subsequently gave their support for a planned expansion of the Natura 2000 site to incorporate 80% of the capercaillie population in the Black Forest). According to the beneficiary, this needn't cost a great deal because much of the work can be done as part of normal forest management practices and some income is also generated from the sale of the timber from the removal of mature stands.

In terms of the ecological results, habitat improvement work was carried out for the birds on almost 300 ha. Although the area covered was small in relation to the overall project area, according to the beneficiary the key factor was that the work provided an indication of improvements of the forest habitat that could be implemented on a larger scale over a longer timeframe. The management techniques for habitat improvement in favour of the grouse have already been integrated in the regional forestry guidelines for managing young dense stands in forests.

What does this mean for the Black Forest grouse?

According to Institute data, the capercaillie population for the whole Black Forest, which has been declining



Photo: FVA

Cross-country skiers in the Feldberg area.

since the 1900s, (when there were around 3,500 males), and dramatically dropped since the 1980s (when there were around 500 males) has now levelled off at around 300 males and in 2004-2005 actually showed a small increase. "We could say this was because we had a good LIFE project that had recently closed!" jokes Dr Suchant, explaining that, in reality, the increase was due to the weather - the warm summer of 2003 encouraged much better reproduction. "I'm also convinced that the LIFE project together with the other improvements to the habitats that we have been carrying out over the last 10-15 years in other parts of the Black Forest have played a role in this," he adds.

Another key result concerned the people: "Foresters and forest workers started to think about nature protection and the needs of the grouse, as part of their work." Indeed, as a measure of the project's continuing success, most of the area's foresters are firmly committed to managing their forests in a manner that does not harm capercaillie. Monitoring of the birds by hunters and foresters is also still ongoing: this work is two-thirds' voluntary, with the rest funded by the Federal State of Baden-Württemberg.

The project was also successful in terms of overall landscaping - providing a model with which to test applications concerning grouse protection for use on a wider scale: in other areas of the Black Forest and internationally e.g., the recently-closed LIFE co-op project, and as part of an ongoing, large-scale Federal nature conservation programme "*Vorhaben gesamtstaatlich repräsentativer Bedeutung*" for the entire Black Forest area.

Life after LIFE

This integrated approach provided the basis of the more recent LIFE co-op

project (LIFE02 NAT/CP/D/000004). Using the results of the earlier project, the new LIFE team was able to develop tourism guidelines on a broader scale. "It is clear that in order to provide a sustainable habitat you have to look at the whole population of these birds requiring areas of at least 30,000 ha in size. You cannot simply spend a lot of money for four years in a comparatively small area and then afterwards do nothing," says Dr Suchant.

Sustainability of actions

The follow-up project provided the funding to extend the scope of the original project. But right from the start of the earlier LIFE project, all participants were clear that the actions started by the LIFE-funded phase would need to be continued otherwise natural succession would soon have filled the forest clear cuts. Says Dr Suchant: "We knew right from the offset that continued management of the sites would be needed and that consequently sustainability could be measured by continuation of measures". On this score, he says the project was "very successful" con-

vincing people, mainly foresters, but also tourism stakeholders to continue to take capercaillie aspects into account in their daily work.

Finally, an expert networking group was formed after this project, which continues to meet every year, in a different European capercaillie region. These meetings bring together mostly German-speaking experts, as well as the local stakeholders in the host country. The next meeting will be held on 6 November 2006 in Thuringia.

Conclusions

The LIFE programme enabled the work, which had been carried out locally for more than 15 years by the FVA Institute in Freiburg, to be combined with the objectives of nature protection to improve the grouse habitat requirements throughout Europe. According to the beneficiary, this political background proved very useful providing a "European added-value" to their efforts on the ground to convince the local municipalities of the necessity of the restoration measures.

Project number: LIFE98 NAT/D/005087

Title: Integrated Habitat Protection for the Grouse in the Black Forest

Key species: *Bonasa bonasia*, *Tetrao urogallus*

Beneficiary: Forstliche Versuchs und Forschungsanstalt Baden-Württemberg (FVA), (Baden-Württemberg Forest Research Institute)

Contact: Dr. Rudi Suchant

Tel: + 49 761 4018

Email: rudi.suchant@forst.bwl.de

Site details: Visitor centre of Feldberg, Baden-Württemberg, "Haus der Natur", Dr.-Pilet-Spur 4, 79868 Feldberg
<http://www.naturschutzzentren-bw.de/servlet/PB/menu/1065638/index.html>

Period: 01-May-1998 to 30-Apr-2002

Website: www.fva-bw.de/forschung/auerhuhn-life/index.html

www.grouse-tourism.de (LIFE co-op project "Grouse and Tourism in Natura 2000 areas")

Total budget: € 229,000

LIFE contribution: € 114,000



case 2

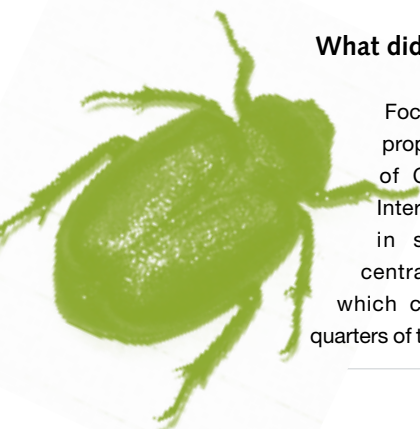
Sweden: Saving the hermit beetle a national symbol for old oak trees

This project made a significant contribution to preserving and raising awareness of the threatened hermit beetle (*Osmoderma eremita*) in Sweden, helping to increase knowledge of the status and management needs of this fascinating little creature and bringing 75% of the project sites harbouring the beetle, mainly among old oak woods, to favourable conservation status. The long-term management of the sites was also guaranteed through land purchase, national legal protection and agri-environmental agreements.

The endangered hermit beetle alias *Osmoderma eremita* survives today in only a handful of EU countries. Sweden is thought to host 20-30% of the known EU population and has a particular responsibility for its survival. Its demise is mainly due to its sedentary lifestyle: it spends most of its brief existence as a larva, feeding off soft rotting wood, and when it develops into an adult after 3-4 years, it seldom flies more than 300 metres away from its host tree. Because of its hermitic lifestyle, the beetle is often difficult to spot, though it can sometimes be more easily located through its strong scent that is reminiscent of leather. Its survival is threatened by the fragmentation of habitats, which leads to greater distances between suitable host trees, the lack of successors to the old hollow trees and overgrowth of open oak-wooded pastures and predation by for example, red ant.

What did LIFE do?

Focusing on 45 proposed Sites of Community Interest (pSCIs) in south and central Sweden, which cover three quarters of the Swedish



An ancient old oak tree: of the type favoured by the hermit beetle (*Osmoderma eremita*).

hermit beetle population, this project offered a strategic programme for the conservation of the species in the country. The project was jointly run by the Swedish Environmental Protection Agency (SEPA), and a number of county administrations. This ensured that an overall strategy for the species, set by SEPA, was implemented and adapted according to local circumstances. Because so little was known about the species, the project team first identified the precise management needs for its conservation and then developed individual management plans for each of the sites. Negotiations were then undertaken with the landowners to either buy the land or pay compensation in order to protect the valuable trees.

The next step was to establish nature reserves (or accepted alternative measures such as biotope reserves or consultation areas) for all the sites, and to carry out a large-scale restoration programme to bring the sites back up to a level suitable for the species and to enable their long-term management through agri-environment payments (under Regulation 2078/92). The clearance operations were interesting in themselves – they were contracted out to special clearance teams recruited from job creation schemes (some 140 trainees were recruited for the scheme). At the same time, efforts were made to raise awareness of the species among local communities and to carry out an inventory to identify further sites within Sweden.

What was the outcome?

The project was very successful. At the end of the project (June 2002), the majority of the sites had been secured as nature reserves. (A total of just under 1,000 ha across 24 sites had been either bought or compensated for.) Satisfactory assurances



The mulm of an oak tree: the hermit beetle lives in the mulm, or soft rotting wood, found in old hollow oak trees.

for the long-term sustainability of the project's results were also achieved for an additional nine sites, making a total of more than 2,000 ha across 33 sites where appropriate conservation management was guaranteed. This total doesn't include the 13 sites that already benefited from a national legal protection status at project start.

A number of actions on land clearance and the fencing of areas were also undertaken. The project cleared just fewer than 700 ha across 39 sites, better than originally foreseen, and the target for fencing was also surpassed, bringing the total to 60 km across 39 sites. After the clearing and fencing, followed by temporary grazing contracts at some sites, the agri-environmental agreements were signed covering a total area of more than 800 ha across 39 sites.

Extensive information and dissemination activities were also carried out in order to further the knowledge of the species in Sweden and elsewhere in

the EU. The conservation programme for the preservation of the species was officially adopted by SEPA and formed the basis of conservation action in Sweden. It was further backed up by individual management plans for at least 37 sites that harbour the species and are thus protected by the project. An information booklet, "The Hermit Beetle - Ecology and Habitat Management", (published in Swedish and English), was distributed to landowners and other stakeholders. An international seminar was held on August 3-4, 1999, in order to share the management experience gained

Osmoderma eremita

The hermit beetle lives an obscure life deep inside old hollow broadleaf trees, especially oaks. Together with other beetles it performs an important role in the decomposition of the trees. But most importantly, the species is an indicator of valuable habitats. Wherever it occurs there is also a host of other threatened insects, lichens fungi etc.



Project manager Kjell Antonsson at an oak tree: the hermit beetle likes to burrow deep inside the hollow trunks of ancient oak trees.

through the project. Furthermore, a report was produced on results of detailed field inventories to identify additional sites for the species. As a result of this survey another 50 sites

SEPA the landowner

One of the methods of securing biological biodiversity in Sweden is to purchase land and water areas of outstanding environmental or recreational interest as nature reserves or national parks, (or, as was the case in this project, to pay compensation to landowners for restrictions on land use). The Swedish Environmental Protection Agency (SEPA) is the agency that decides, after consulting the county administrative boards, which sites will be invested in for nature conservation. SEPA becomes the landowner in cases where land is purchased for nature conservation.

were found, indicating sufficient numbers to assure the survival of the species in Sweden.

Life after LIFE

A follow-up ex-post study of the project was carried out in March 2006 by the LIFE external monitoring team. It concluded that the hermit beetle has proven to be a popular choice for conservation, gaining a huge amount of public interest both during and after the project. The project and the work of the hermit beetle has developed into a national symbol for the protection of old oak trees and today forms a natural part of the country's preservation of old broadleaf trees and forests.

Due to the huge amount of positive publicity during the LIFE phase,

project manager Kjell Antonsson, has become known throughout Sweden for his expertise on the preservation of *Osmoderma eremita*. His dissemination work continues today with lectures both in Sweden and in other parts of Europe. The brochure on the ecology and habitat management of the hermit beetle, published during the project, is still used as the main source of information. It is available from the website, which is still running.

Before the launch of the project, most nature reserves in Sweden were connected to the taiga area. During this project, 39 new nature reserves were established in Sweden all in the area where deciduous forests are in the majority. According to the beneficiary, this trend has

continued and new nature reserves protecting the habitats where the hermit beetle lives have been established.

A report on the situation for the beetle in Europe was to be carried out as part of the LIFE project. (Although started, this objective was not completed during the lifetime of the project.) The study: Animal Biodiversity and Conservation 28.1 "Osmoderma eremita (Coleoptera, Scarabaeidae, Cetoniinae) in Europe" is based on data on the beetle from 2,142 localities across 33 countries. Published in 2005, it has been completed with the help of around 30 researchers from across Europe, and has proved a big success for the LIFE project in Sweden and the rest of Europe.

Meanwhile, land clearance and thinning actions started under LIFE have continued with a variable intensity in 36 of the project sites. Fencing has also continued in some areas and agri-environmental agreements are now in place for 43

Project number: LIFE97 NAT/S/004204

Title: Preservation of the beetle, *Osmoderma eremita* in Sweden

Target species: *Osmoderma eremita*

Target habitats: *Asperulo-Fagetum* beech forests (9130), Sub-Atlantic and medio-European oak or oak-hornbeam forests of the *Carpinus betuli* (9160), **Tilio-Acerion* forests of slopes, screes and ravines (9180), *Old acidophilous* oak woods with *Quercus robur* on sandy plains (9190)

Beneficiary: Swedish Environmental Protection Agency (SEPA) – administered by Östergötland County Administration

Contact: Kjell Antonsson

Tel: + 46 13196201

Email: kjell.antonsson@e.lst.se

Period: 01-Jul-1997 to 30-Jun-2002

Website: <http://www5.e.lst.se/laderbagge/index.htm>

Total budget: € 3,713,000

LIFE contribution: € 1,856,000

* denotes priority habitat

of the project areas. In some areas there have been other activities such as visitor centres, oak plantation and tree mapping.

Finally, the project administrator, the county of Östergötland, is the ben-

eficiary of a new LIFE-Nature project, (LIFE05 NAT/S/000108), which is concerned with the restoration of natural meadows and pastures, dependent on haymaking or grazing in Natura 2000 habitats across 41 sites. These are many of the sites where *Osmoderma eremita* is, or has been, present.

Conclusions

The project is an excellent example of LIFE-Nature supporting a short-term, labour-intensive initiative to bring a specific species up to a level where its long-term conservation status could be assured, in this case at the national level. The project has also had some pan-European influence instigating a major study (completed in 2005) to increase understanding of and provide inspiration for the protection of *Osmoderma eremita* across Europe.

Osmoderma eremita was originally distributed over most of Europe. Now the fascinating species is drastically reduced and only occurs locally in small areas.





Italy: Bosco Fontana an award-winning LIFE project

The award-winning Bosco della Fontana project in Lombardy, Italy, contributed to the conservation of the last remaining plain forest habitat in the river Po basin and, in particular, the conservation of its stock of dead wood, ageing trees and the priority saproxylic fauna. In 2003, it was the winner of the WWF Golden Panda award in recognition of its biodiversity conservation activities¹.

¹ The WWF (World Wildlife Fund) makes annual awards for outstanding contributions to, or achievements in, conservation.

The Bosco della Fontana nature reserve in Lombardy is the last and most important fragment (235 hectares) of the original oak-hornbeam forest in the Po valley. Today, like most forests in the area, the reserve is beleaguered by a network of roads, the advances of urbanisation and the pressure of intensive agricultural crops. Because of its unique habitat, it is included in the list of forests of Community importance for the conservation of saproxylic insects, which live on dead wood and decaying trees.

The Natura 2000 site also includes some important woodland habitats such as remnant alluvial forests of

Alnion glutinoso incanae, the *Stellario-Carpinetum* oak woods and mixed oak, elm and ash woods. The area also has numerous species of birds of Community interest, such as four species of woodpecker, and a large population of the rare Black Kite (*Milvus migrans*). The reserve is also home to *Cerambix cerdo* and *Lucanus cervus*, two rare saproxylic invertebrates – listed as priority species in the Habitats Directive.

Over the last century, the quality and size of the forest had deteriorated in terms of the quantities of dead wood available, because of the mass removal of wood and the introduc-

tion of the red oak (*Quercus rubra*) – an alien species from North America introduced in the 1950s – which was beginning to take over the native tree flora. The problem was so serious that, according to scientists from the National Centre for the Study and Conservation of Forest Biodiversity (CNBF), Verona, it would take between 30 and 40 years to restore the natural dynamics of the forest habitats. This factor, together with a lack of open spaces, which the saproxylic species need for feeding and reproduction, was restricting the numbers of these invertebrates.

The principal objective of the project therefore was to conserve the last remaining plain forest habitat in the Po basin and in particular its stocks of dead wood, ageing trees and the saproxylic fauna which depends on them. Another objective was to help to extend this aspect of conservation to forests managed for commercial purposes.

What did LIFE do?

The project was implemented by the State Forestry Service, which is responsible for the management and conservation of a number of Italy's nature reserves. The first task was to introduce measures to remove the non-indigenous tree species, to

Permanent sample plots were established to monitor the forest dynamics.





Artificially opened gaps helped to increase the quantities of the dead wood.

restore the quality of the forest habitat and to increase the quantities of the dead wood and open spaces. This in turn would improve the habitat for saproxylic fauna.

Based on an initial monitoring study carried out in 1995, scientists from the CNBF found equal numbers of the rapidly-spreading red oak trees to London plane trees (*Platanus hybrida*) on the reserve – around 1,400 apiece. Unlike the red oak, the latter were found not to be spreading at Bosco della Fontana. It was therefore decided to ‘recycle’ both the red oak and plane trees, transforming them into coarse woody debris (CWD) and ‘micro-habitats’ for the saproxylic fauna. This was done by uprooting and breaking the individual red oaks and forming so-called ‘habitat trees’ with the plane trees. Incisions were then made in the ‘habitat trees’ in order to create micro-habitats suitable for nesting birds and insects.

The researchers calculated that within 20 years, 33 cubic metres of CWD and

eight habitat trees per hectare would be functioning. Following the habitat management guidelines of the reserve, some of the artificially opened gaps were replanted, while the others were left to natural evolution (approximately 30%) for colonisation by the flowers needed for feeding the adult stages of the saproxylic insects. Other innovative techniques employed included the use, for the first time in Italy, of explosives to create dead wood.

In addition to helping restore the habitats of Community interest, the planting of *Quercus robur* saplings was carried out. At the same time, an intensive public awareness campaign was launched. This included dissemination of the findings at meetings with forest managers, the hosting of seminars for university students and speeches at conferences and seminars under the auspices of the Natura 2000 network. Tools used included a LIFE nature trail, which included some habitat trees, live woodpecker watching by closed-circuit television, and observation of the saproxylic insects with stereo-microscopes.

What was the outcome?

The project met its objectives and proved to be one of the first really successful experiences of the management of alien species among Italian LIFE-Nature projects, with a scientifically and methodically sound base. The benefits of this approach were numerous – but most importantly, alien trees, which would otherwise have been removed, were used as biomass in the forest ecosystem or for habitats for saproxylic fauna.

The results of the monitoring activities were also outstanding, both in terms of data collected (e.g. more than 2,500 species of insects were identified, and a greater number of birds than was previously known were found to be present in the reserve) and of the innovative methodology developed. In summary, at the end of the project the beneficiary showed that the techniques used to eliminate exotic tree species and to create dead wood could also improve the conservation of forest habitats of EU interest and of the saproxylic fauna.

A key output was the publication of a bilingual study (Italian/English) that describes the essential role of dead wood and hollow trees in maintaining the biodiversity of European forests. “Techniques for re-establishment of dead wood for saproxylic fauna conservation” by the National Forest Service and the CNBF also presents an overview of new methods for the artificial reconstruction of dead wood micro habitats. The study is available online from the LIFE website ‘infoproducts’ section (see Nature, Italy).

It is the first practical manual on this subject written with the aim of providing managers with technical information on the re-establishment of dead



wood as a base component for the conservation of biodiversity.

Life after LIFE

A follow-up ex-post study of the project was carried out by the LIFE external monitoring team in March 2006. It showed that despite the ending of LIFE programme funding, the beneficiary has continued its work to eliminate the alien tree species to produce CWD and 'Habitat trees'.

Concerning the creation of CWD, the number of trees eliminated after the end of the project and the methodology used are illustrated in the table top right.

The same numbers of interventions are planned on an annual basis until all the alien tree species have been eliminated. The annual number of trees to be removed is now dependent on state funding. However, since the last inventory (1995), it is planned that around 1,400 m³ of *Quercus rubra* (CWD) and 1,700 m³ of *Platanus hybrida* (habitat trees) should be created by 2016. The newly formed shoots of the dead trees will also continue to be removed over the same timescale. Regarding the creation of the

The vitality of the felled Quercus rubra: new sprouts beneath the artificial girdling.



Species	Trees killed with ring-barking		Trees killed with artificial wind-throw	
	No.	Volume (m ³)	No.	Volume (m ³)
<i>Juglans nigra</i>	1	1,11625	15	40,0861
<i>Platanus hybrida</i>	1	2,03145	4	11,53
<i>Quercus rubra</i>	95	117,6727	84	160,81
Total	97	120,8204	103	212,4261

'Habitat trees', a total of 24 new artificial cavities for bats have been produced.

The project's dissemination activities also continue apace: an awareness-raising campaign, launched during the LIFE phase, continues to be run for local schools, and the project's results and activities continue to be widely promoted – for example, at the 2004 Green Week and at the 183rd anniversary of the National Forestry Service, held in Rome (6-9 October 2005), at scientific conferences, in reports and in exchanges with universities and other research institutes and forestry administrations. Thanks to the visibility given to these results, the beneficiary is also associated with other EU projects (Interreg Italy-

Slovenia III: Conosci il Carso; and a second Italian LIFE project looking at the conservation of Natura 2000 sites managed by the State Forest Service (LIFE04 NAT/IT/000190).

Conclusions

According to the earlier-mentioned dead wood study, the Bosco Fontana project can be summed up in three words: "innovative, demonstrative and exportable". The project was "innovative" in its use of new technologies to create the 'habitat trees'. It was "demonstrative" in terms of the scale of the activity carried out; and it was "exportable" as the techniques and procedures adopted and/or developed can now be used in similar situations throughout the Natura network.

Project number: LIFE99 NAT/IT/006245

Title: Bosco Fontana: urgent conservation's actions on relict habitat

Key species: *Cerambyx cerdo*, *Lucanus cervus*

Key habitats: Sub-Atlantic and medio-European oak or oak-hornbeam forests of the *Carpinion betuli* (9160), *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) (91E0)

Beneficiary: Ministero delle Politiche Agricole e Forestali - Corpo Forestale Stato Gestione (State Forestry Service)

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Site details: Bosco Fontana website (Italian only – click on 'informazione') provides details of visiting hours, special guided tours etc to the Bosco della Fontana reserve at: www.corpoforestale.it/aes/Ricerca/boscofontana/index.htm

Period: 01-Oct-1999 to 31-May-2003

Total budget: € 666,000

LIFE contribution: € 326,000

* denotes priority habitat



Managing forests for LIFE

This section highlights the way LIFE-Nature and LIFE-Environment projects have contributed to the sustainable management of Europe's forests. It is divided into two parts: Part I focuses on LIFE-Nature projects and the importance of management plans to their success; Part II focuses on LIFE-Environment projects, examining some non-conventional forest-sector activities in the fields of non-timber products and services, aspects of the sustainable economic development of forests and forest 'health' related issues. The use of forests or wood for the production of energy from renewable sources, including biomass is also featured.



Most LIFE-Nature projects have developed management plans. These combine actions aimed at the conservation of habitats and species with agri-environmental measures and other measures such as water and soil quality aimed at improving the forest environment. The information contained in the project's management plans is of interest to all those concerned with the sustainable management and administration of forest areas – both in EU countries and elsewhere. For this reason, LIFE projects are actively encouraged to publish and promote these manuals nationally and internationally.





LIFE Forestry – the old-fashioned way

This section also takes a look at some traditional forestry practices that are enjoying a small renaissance in some parts of Europe. The aim is not as some fear to force a large-scale reversion to forestry practices that were abandoned years ago because they were unprofitable, but rather to explore whether such techniques may still have a role to play alongside modern forestry under certain exceptional conditions.

Coppicing

Coppicing is the traditional method of woodland management, whereby young tree stems are cut down to near ground level. This encourages vigorous re-growth and ensures a sustainable supply of timber for future generations. Many species of flora and fauna have developed under the coppice management system and are only found in such coppiced areas. Coppice woodlands (LIFE99 ENV/IT/000003) also offer a wide range of habitats. On the downside, the method is labour-intensive employing 10 times more manpower than modern forestry systems.

Pollarding

Pollarding is the woodland management method of encouraging lateral branches by cutting off a tree stem two metres or so above ground level. If the practice is carried out regularly, over the years the tree trunk expands or becomes swollen and multiple new side and top shoots will grow on it. The main benefit of this type of practice, compared with coppicing, can be found in wood-pastures and grazing areas where growth from the ground upwards is

less suitable. Pollarding above head height also protects valuable timber from being damaged by animals such as rabbits and deer.

Agroforestry with grazing

Agroforestry with cattle, pigs and even ponies, as in the UK's unique New Forest project (LIFE97 NAT/UK/004242) is enjoying something of a small renaissance among the sustainable farming movement in Europe. It is based on traditional farming methods, which integrate trees with farming such as lines of trees with crops growing between them, hedgerows, 'living' fences, windbreaks, pasture trees, woodlots etc. It increases biodiversity, supports wildlife, provides firewood, fertiliser, forage for the grazing animals, and improves the soil and water. On the downside, like other methods it is costly, labour-intensive and not suited to the single-crop production lines favoured by large, modernised farms.

Charcoal-making system from a coppiced wood, Italy (LIFE99 ENV/IT/000003).



Agroforestry with ponies in England's New Forest (LIFE97 NAT/UK/004242).



case 1

France: Managing the fine forests and linked habitats of Burgundy

This awarded project introduced sustainable methods for the management of forests and linked habitats in the region of Burgundy by striking a balance between their economic, social and environmental functions. The key to its success was the close cooperation between the beneficiary, the Burgundy office of ONF, the public authority responsible for managing French state-owned forests, and a regional nature conservation NGO. Although the majority of the LIFE work was carried out in the public forests of nine pSCIs, it led to the development of a forest management strategy that is equally relevant to privately owned forests.

The 11,000 hectares covered by the project's nine proposed Sites of Community Interest (pSCIs) includes 7,500 ha of public forests hosting beech, oak, maple, box and juniper pioneer vegetation, etc., and associated open habitats such as calcareous grasslands and meadows, scree and limestone pavements. The area contains 20 habitat types of Community interest, six of which have priority status, and 17 species that are listed in Annex II of the Habitats Directive, including the rare *Cypripedium calceolus* orchid, the *Ligularia sibirica* Iris, and the *Callimorpha quadripunctaria* butterfly species.

These woodlands were suffering as a result of the economic demands of intensive and standardised forestry production and neglect. In order to conserve at least some of their natural habitats, changes needed to be made to forestry management methods. Through actions ranging from the maintenance of open habitats to the preservation of old trees, plants could be nurtured at every stage of their growth.

The project was implemented by the *Direction Régionale de l'Office National des Forêts de Bourgogne*, the Burgundy region of the ONF (*Office National des Forêts*) the

national authority, in charge of the management of public forests, in close cooperation with the regional conservation NGO, *Conservatoire des Sites Naturels Bourguignons*.

What did LIFE do?

Although the majority of the forestry management work was carried out in the public forests of the nine pSCIs¹, more than 500 ha of private forest habitats of special interest were also included in order to facilitate a management strategy that would ultimately benefit both public and private forests. Forest management plans and restoration work programmes were drawn up for all these sites, and arrangements were made to compensate the private owners for any operating constraints. Limits on public use were also imposed and guidelines were drawn up to protect those forests with the most outstanding features.

¹ FR 2600971, FR 2600972, FR 2600973, FR 2600974, FR 2601000, FR 2601002, FR 2600959, FR 2600956, FR 2600958

Maintenance work to restore the Côte Dijonnaise site at Fixin (FR 2600956).





Forest management plans in France

Management plans are compulsory in the French forestry system for all forests except for small private ones (less than 25 ha). The *Office National des Forêts (ONF)* prepares these plans for state forests. For privately owned forests the situation is more complex. Such forests are often divided among several owners, and if they do not have 25 ha or more, they are not obliged to draw up management plans.

What was the outcome?

Thanks to the active cooperation between the forestry service and its NGO partner, the *Conservatoire*, the project was very successful. In total, it resulted in the production of five management plans, “*documents d’objectifs*”, for its Natura 2000 sites. Along with the mobilisation of local stakeholders, these efforts reinforced the implementation of Natura 2000 at the regional scale.

In terms of implementation, the ONF was directly responsible for actions

related to forest habitats and species, while the *Conservatoire* was in charge of actions on dry grasslands sites. However, there was an interesting knowledge transfer. Among annexe II species, knowledge of the isolated populations of *Cypripedium calceolus* and *Liguria sibirica* increased considerably and an appropriate management plan has been developed. Foresters also now know the best level of tree-clearing to maintain and improve the ecological conditions for the yellow lady’s slipper orchid, for which a new reserve has been proposed at the *Forêt Domaniale de Chatillon*.

Forest habitats

Regarding forest habitats, from the pilot trials carried out the project team developed new guidelines on how to manage and maintain a nucleus of older trees, in order to favour the biodiversity linked to dead wood. These pilot measures have been implemented and endorsed in the public forests, and the guidelines have been distributed to the owners and

managers of all the public and private forest in the project area.

The comprehensive restoration and management activities also had a positive effect on the local inhabitants and stakeholders, who became more involved in the conservation of their sites. For example, a number of sites have been proposed as part of local tourist routes. The project has also confirmed the job of one local shepherd and helped nine more shepherds to develop their activities.

Finally, the knowledge of dry grasslands was also significantly improved by the management activities. An inventory was carried out covering 1,700 ha of the 3,000 ha of this habitat type in the Burgundy area. This enabled the project to identify global trends and make conservation proposals at a regional scale. Detailed studies were undertaken for the management and restoration of each site. The land purchase proved to be more difficult than was foreseen. Only 25 ha were purchased (compared with the envisaged 120 ha). However, this difficulty was largely compensated for by land leases covering 180 ha and agreements with 17 municipalities covering 1,230 ha.

Life after LIFE

A follow-up ex-post study of the project was carried out in March 2006 by the LIFE external monitoring team. It showed that following project closure (December 2003), the five management plans have been validated, or are in the process of being validated, at either prefecture or ministerial level, and the implementation requirements of Natura 2000, which were initially unpopular, have become well integrated into the foresters’ work.

Forestry work at the Fixin site (FR 2600956).



Four more management plans have subsequently been drawn up. In addition a new reserve was created in October 2004, in the communes of Gevrey-Chambertin and Brochon – the *Réserve naturelle de la Combe Lavaux-Jean Roland*.

The beneficiary has also maintained the substantial communication activities started under the LIFE phase. For example, several guides and booklets have been recently published including: “*Guide des bonnes pratiques agricoles sur la vallée du Rhin et Côte de Beaune*” (2,000 copies); and the “*Cahier de recommandations sylvicoles*” for the forest of Chatillon (1,000 copies). Two conferences, plus internal seminars for ONF forest workers have also been organised.

In 2004, the project won the 1st prize in the “*Trophée Valvert*” award for the environment for the management plan for one of the nine sites (FR 2600971) at Chassey-le-Camp (Saône-et-Loire).

Conclusions

Thanks to an active cooperation between the beneficiary and its project partner, the *Conservatoire*, the project globally achieved its objectives and most of the expected results. For example, knowledge of isolated populations of *Cypripedium calceolus* and *Liguria sibirica* has increased considerably. Regarding habitat conservation, the study of the dry grassland proved particularly noteworthy, enabling identification of global trends and the drawing up of conservation proposals at a regional scale. And regarding forest habitats, the project developed new guidelines to identify the biodiversity linked to dead wood and how to manage and maintain the nucleus of old trees.



Val des Choues pond (FR 2600959) before (top) and (below) after the LIFE restoration work.

Project number: LIFE99 NAT/F/006314

Title: Forests and linked habitats in Burgundy

Key species: *Cypripedium calceolus*, *Liguria sibirica*, *Callimorpha quadripunctaria*.

Key habitats: *Asperulo-Fagetum* beech forests (9130), Medio-European limestone beech forests of the *Cephalanthero-Fagion* (9150), Sub-Atlantic and medio-European oak or oak-hornbeam forests of the *Carpinion betuli* (9160) **Tilio-Acerion* forests of slopes, screes and ravines (9180), *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) (91E0)

Beneficiary: Direction Régionale de l'Office National des Forêts (ONF) de Bourgogne

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Period: 01-May-1999 to 31-Dec-2003

Total budget: € 2,049,000

LIFE contribution: € 1,024,000

* denotes priority habitat



Austria: Preserving the primeval ‘Rothwald’ forest

Few areas of truly ‘natural’ forests remain in central Europe. In this well-implemented and successful project, located in the ‘Rothwald’ wilderness area of Lower Austria, LIFE-Nature funding was used to help create the largest primeval forest reserve in the Alps. This is not a typical LIFE case study. (Due to its rarity and habitat value, the project area was set aside exclusively for nature conservation.) Nevertheless, it is particularly noteworthy, exemplifying a management strategy that is clearly based on the suggestions of the Galway seminar. The resulting management plan for the site has been officially endorsed by the Lower Austrian Government.

The largest remnant of primeval forest in the Alps, known as the ‘Rothwald’, covers the southeastern slopes of the 1,878 metre Dürrenstein mountain in Lower Austria. The Natura 2000 site comprises 460 hectares of true primeval forest that has never been exploited for forestry. Any trees or branches that fall simply remain on the ground, and there are no tracks. Consequently the area harbours some 10 different spruce, fir and beech forest habitat types, as well as bear, lynx, golden eagle (*Aquila chrysaetos*), black grouse (*Lyrurus tetrix*) and white-backed woodpecker (*Dendrocopos leucotos*). Representatives of severely threatened saproxylic fauna, such as the gorgeous blue beetle *Rosalia alpina*, also survive in this refuge.

Since 1942, an area of 277 ha of the Rothwald has been under strict protection. But the rest of the primeval forest was threatened by the absence of full protection against forestry, the influence of adjoining production forests (invasion of non-indigenous plant species, spread by pollen) and excessive densities of game animals, which hindered the rejuvenation of the principal tree species. A lack of any conservation-oriented management and pressure from rising visitor numbers presented other problems.



Photo: Christoph Ledtzing

Project work included the mapping of small owls, such as this Eurasian pygmy owl, *Glaucidium passerinum*.

The project was implemented by the nature protection unit (*Abteilung Naturschutz*) of the government of the Lower Austria region, which covers the north-eastern lowland surrounding Vienna and bordering the Czech Republic, Slovakia and Hungary. (There are also other parts in Lower Austria.) Its main objective was to secure the entire primeval forest and create a 700 ha surrounding buffer zone where there is no forestry exploitation. Private owners were paid one-off compensations to end all forms of use of this land. Compensation for ending forestry headed

the list, but hunting was also adapted to the site’s ecological requirements. These measures went hand-in-hand with the establishment of a strict nature reserve, the compilation of an inventory of species and habitats, and the creation of a management plan.

What did LIFE do?

The main and most expensive measure was the compensation of the private owners of 874 ha in the Rothwald for giving up exploitation (only limited hunting is allowed) of



Photo: Christoph Leditzing

Primula auricula found on the south-facing slopes.

their land (in effect, purchasing the land) and implementing a strict legal protection, that is, creating a nature reserve, the first wilderness area in Austria according to IUCN – the World Conservation Union. This land adjoined 300 ha of land that already had reserve status. It was the first time in Austria that a large privately owned mountain forest was compensated in order to prevent forestry.

LIFE also financed inventories of the project area covering otters, bats, large birds of prey, black storks, grouse, woodpeckers, xylobiontic beetles, dragonflies, butterflies, hoverflies, bees, wasps, ants and mushrooms. A mapping of Annex I habitats was also carried out. Additional studies investigated the recreational pressure on the study area, the effect of game densities on forest regeneration and the use of remote-sensing techniques for the future monitoring of Annex I habitat types in the pSCI Ötscher-Dürrenstein.



Photo: Christoph Leditzing

The shooting of roes has been abandoned since 2005.

What was the outcome?

At the end of the LIFE phase (June 2001) the Lower Austrian government decided to take out of use an additional area of 1,236 ha (Hundsau) through compensation payments financed by the Lower Austrian nature conservation budget. As a direct result of the LIFE project, therefore, a forest nature reserve of 2,387 ha was created.

Concerning the inventories, the data gathered confirmed the extraordinary biological value of the local old-growth forests, especially for the Annex I birds

white-backed woodpecker and grey-headed woodpecker (*Picus canus*) and for several taxonomic groups of wood-living beetles, including the two Annex II species *Rosalia alpina* and *Cucujus cinnaberinus*. Forty-five indicator species of Diptera were found, 26 of which were relict species exclusively linked to very old forests with large quantities of dead or decaying wood. Furthermore, 650 species of macroscopic fungi were found in the forests, with an abundance of rare and declining species.

Management report

Based on these studies and inventories, a management plan was drawn up providing recommendations and guidelines for the set-up of site administration, species and habitat management, regulatory hunting, visitor guidance, research and monitoring. The structure of the management plan was based on the guidelines for establishment of management plans for Natura 2000 areas discussed at the 1996 Galway seminar (see left). Based on the premise that the wilderness area

Galway seminar

The Galway seminar on management planning for N2000 sites was held on 6 November 1996. It examined different approaches to management plan preparation and implementation in Member States and recommended that an ideal management plan should contain the following elements:

- > policy statement with reference to Article 6 of the Habitats Directive
- > site description, including a historical land use analysis
- > statement of objectives, including long term and short term goals
- > statement of the constraints, including identification of the actors involved
- > a realistic list of actions to implement, with time schedules and financial planning
- > a detailed consultation process; monitoring and evaluation.

Source: Natura 2000 newsletter: Issue 3 April 1997.



Photo: Christoph Leditznig

Spotted woodpecker, dendrocopos, profiting from the deadwood.

should be left to natural succession wherever possible, it mainly covers: (1) the set-up and the roles of a permanent site administration; (2) game management within and around the wilderness area; (3) regulation and control of the access to the area; and (4) prescriptions for monitoring and future research priorities.

A key feature of the management plan is that it should be able to be adapted to suit certain conditions – so that, for example, in the event of a serious outbreak of bark beetles that might severely threaten adjacent spruce forestry areas, certain measures could be implemented. Similarly, anti-erosion measures could be implemented locally, in the event of a windfall area increasing the risk of a snow or mudslide, which could threaten houses further down the slopes.

In June 2001, the management plan was approved by the Lower Austrian government as the binding document for the future management of the Wilderness Area Dürrenstein (2,387 ha).

Life after LIFE

A follow-up ex-post study of the project was carried out in April 2006. It concluded that the project's most important result has been its contribution to the creation of Austria's first and only conservation area, recognised as a category I conservation area by the World Conservation Union. The area has also gained increased acceptance and support by the public for nature conservation in the region and the increased interest of the scientific community.

The management plan and the results of the inventory studies, which were financed by LIFE, were instrumental in convincing the regional government to approve financing of the protected area administration (and compensation payments for the Hundsau part of the wilderness area). On 26 June 2001, the Lower Austrian government agreed to the allocation of an annual budget of €109,000 to fund the on-site administration of three staff: two rangers (who carry out site surveillance) and one administrator.

The establishment of a permanent site administration for such a protected area (that was not a national park) was new for Austria. The reserve administration is in charge of all matters regarding the wilderness area and pSCI/SPA (practical implementation of the management plan, visitor guidance, surveillance, coordination of research and monitoring including Article 17 Habitats Directive monitoring, local contacts).

Conclusions

As a direct result of this LIFE project, a forest nature reserve of 2,387 ha, the Wilderness Area Dürrenstein, was created. Annex I forest habitat types cover 55% of the Rothwald wilderness area, which includes the largest existing remains of undisturbed mixed mountain beech-spruce-fir forest in the Alpine region (ca. 460 ha). In addition, some 700 ha (1,927 ha including Hundsau) of formerly exploited mountain beech forests are now being left to natural succession.

Project number: LIFE97 NAT/A/004117

Title: Wilderness area Dürrenstein - Niederösterreich (Lower Austria)

Key habitats: *Asperulo-Fagetum* beech forests (9130), Medio-European sub-alpine beech woods with *Acer* and *Rumex arifolius* (9140), Medio-European limestone beech forests of the *Cephalanthero-Fagion* (9150), **Tilio-Acerion* forests of slopes, screes and ravines, *Acidophilous Picea* forests of the montane to alpine levels (*Vaccinio-Piceetea*), **Petrifying springs with tufa formation (Cratoneurion)* (7220)

Beneficiary: Amt der NÖ Landesregierung- RU5 Naturschutzabteilung

Contact: Dr Christoph Leditznig

Email: Christoph.Leditznig@wildnisgebiet.at

Site contact details: Registration for guided tours: Tourismusverein Göstlinger Alpen

Tel: + 43 7484/5020-19

Email: info@goestling-hochkar.at

Period: 01-Jul-1997 to 30-Jun-2001

Website: www.wildnisgebiet.at/

Total budget: € 7,400,000

LIFE contribution: € 4,450,000

** denotes priority habitat*



case 3

Spain: LIFE funds breakthrough fungi research to boost forest economy in Pyrenees

Forests in the Spanish Pyrenees face mounting pressures to become more economically viable, as the low returns from wood production continue to exacerbate the problems of an already declining population. These areas are therefore searching for new ways of revitalising the local economy in order to stabilise the population, while maintaining and protecting the fragile environment and its rural surroundings. New viable economic sources need to be found that will develop into a sustainable development strategy. An innovative solution explored by this LIFE-Environment forestry project was to introduce trees inoculated with edible mushrooms or truffles in forest plantations.

The idea was to ensure the profitability of forests, without impinging on other uses of the area for wood, tourism and recreation for example. Although the practice of inoculating trees with edible fungi was relatively common in France and Italy, when the project was launched (January 1997), it was considered innovative in Spain. As such, the project team – led by the beneficiary, the Catalonia Forestry Technology Centre (CTFC) and supported by project partner, the University of Lleida – faced a major struggle in convincing the region's landowners of these advantages. This reluctance was partly due to concern over the high start-up costs and also due to concern over the length of time before returns would be seen. Financial and other support from the LIFE programme was therefore crucial in getting this project off the ground.

The project's main objective was to demonstrate to the forestry sector the advantages of forestation using trees inoculated with specially selected, high-quality mushrooms or truffles. This was done by comparing the outputs from current mushroom production units in the area with plots specially planted with mycorrhizal



Photo: CTFC

Mycorrhizae of Tuber melanosporum under the microscope.

plants. Other key objectives were to convince local landowners to join the project and to disseminate the project findings in order to encourage replication of the results.

What did LIFE do?

The project team was based at the forestry centre in the historic Catalan city of Solsona in the Pyrenean

Mycorrhizae or 'fungus-roots'

Mycorrhizae are organs formed by plant feeder roots and mycelia of certain fungi. The majority of large fleshy mushrooms collected in pine and oak forests of the temperate regions are sporocarps of mycorrhizal fungi. They are connected to their underground network of mycelia and to the living trees, with both partners benefiting from the association. In order to cultivate and harvest these fungi, it is important to provide conditions favourable to both the trees and the fungi.



foothills. Housed in a former Catholic seminary, the centre was founded 10 years ago (just ahead of the launch of the LIFE project). Its aim is to promote forestry training, research and technological development for the region, which covers some 40,000 hectares of Mediterranean pine and oak forests. The project was coordinated by Dr Carlos Colinas, a research scientist specialising in both fungi and forest diseases. This was initially planned as a two-year project with distinct phases: an initial territorial study, selection of the pilot plots, acquisition and planting of the mycorrhizal trees, monitoring of their growth and final evaluation. However, due to the innovative nature of the project in Spain and early setbacks concerning the planting and demonstration phases, the project requested and received an extension into a third year.

Dr Colinas explains that to understand these setbacks, it is necessary to comprehend the hardships faced by the region's landowners. Firstly, he says these are not high-yield forests. Although they are commercialised, the forestry sector cannot compete with prices of imported woods. Secondly, the region is very dry, and this water scarcity limits tree-growth. Moreover the forested areas are under constant threat from forest fires. Thirdly, the region faces unprecedented depopulation. The problem is particularly acute in farming (mainly crops, but also cattle and pigs), where the shortage, especially of the younger male descendants of the land – who have quit the countryside to live in towns and cities – has left many rural farms dependent on a dwindling and rapidly ageing workforce.

Why fungi?

A shortage of labour was the main reason for the choice of mushrooms.



In the laboratory: (left to right) Dr. Juan Martínez de Aragón, Dr. Antoni Olivera, Christine Fischer, Dr. Carlos Colinas.

The scheme offered the possibility of reasonable financial returns from the forested areas in the longer term (upwards of 10 years), but which could be managed by a relatively small workforce. It was also expected to be popular among the local community, as the region is renowned for its fungi: mushroom-picking attracts hundreds of visitors to the forests in the autumn and, along with the celebrated Catalan sausages, are sold at the many regional markets.

The project was carried out in three phases. In the first phase, a draft study was made of the physical environment – measuring climatic, soil and botanical variables in order to locate suitable plots of land to carry out the experimental phase. Due to the initial scepticism and inherent conservatism of the local landowners, this phase was much more problematic than first envisaged. “This was really a technology still at the development phase... it was a very difficult time,” says Dr Colinas. Considerable marketing and publicity efforts were undertaken to ‘sell’ the project to forest owners. This involved meet-

ings and talks with the aim of reaching landowners who could be targeted as ‘leaders’ in their respective geographic areas, and benefited from extensive media coverage in the local newspapers and television.

The second phase, involved the purchasing of the inoculated plants from commercial nurseries. This also met with problems: due to the limited commercialisation of these products, only a small number of nurseries could provide quality seedlings. Christine Fischer, who is responsible for plant evaluation, says: “I started by visiting the nurseries that were offering commercialised seedlings [of young native tree species e.g. of *Quercus ilex*, *Pinus sylvestris*]. There were lots of nice pictures showing the mushrooms you were going to harvest. But I realised this was by no means a done deed... The process of inoculating seedlings with fungi is very complicated and not very well understood. We quickly realised that rather than just looking at the plants, more reliable methods of evaluating their quality were needed.”

Improving prospects

She started obtaining samples from the nurseries and examining their root tips microscopically to check for the level of colonisation by the inoculated fungus and other possible contaminants. This was a key aspect of the project: “We were trying to educate farmers and landowners to demand high-quality products. We needed to show them how to identify quality seedlings and to communicate their needs to the nurseries,” says Fischer. She admits this evaluation process didn’t always go down too well with the nurseries, and indeed some refused to cooperate, which she says is unfortunate, as the production of quality seedlings is in “all our interests”.

A further unforeseen problem was caused by a major fire in July 1998, which destroyed over half (26,000 ha) of land in the project area. Dr Juan Martínez de Aragónok, responsible for sampling natural mushroom productivity and other data analysis, says: “With the fire came an end to forest tourism¹, so the question was could we find another economic alternative? Going against ‘the rules’ (that is by planting on forest land that had been burnt) the team was subsequently able to turn this disaster to its advantage by focusing on the new opportunities to repopulate the burnt woodland areas with plants inoculated with the edible fungi. Four years on, trials of the plots specially planted with mycorrhizal seedlings have produced 36% of the mycorrhizae with the desired fungus showing, he says, that the forests “can be transformed”.

¹ According to forestry centre data 18,000 ‘forest tourists’ visit every year the Solsonès County during the three-month mushroom-picking season. In addition, the value of mushrooms is estimated at € 790,000 – € 830,000 per annum. This figure is similar to the value of the wood extracted from the forests.

The final phase involved four different plantings according to different climatic conditions: in autumn 1997, spring 1998, autumn 1998 and spring 1999. The project successfully carried out the planting of *Tuber melanosporum*, *Amanita caesarea*, *Boletus edulis* and *B. aereus*, *Lactarius deliciosus*, and *Hygrophorus latitabundus* on different host tree species. In the following year, the progress of the targeted mycorrhizae was monitored, in order to know if the desired fungi were proliferating below ground in the root systems of the young trees. The mushroom output was estimated in the hills near the project plots in order to make comparisons with the plots planted with mycorrhizal plants.

What was the outcome?

Overall the project managed to meet its initial objective, despite start-up problems. In the period 1997-1998, six mushroom or truffle species were planted in 29 plots, which led to a total of 14 ha under cultivation in the four autonomous regions of Aragon, Valencia, the Basque Country and Catalonia. The project team was particularly successful in creating and maintaining the interest of landowners, despite their initial reluctance. These



Under the microscope: Christine Fischer evaluates the seedlings.

landowners went on to create their own information network, supported by a website, which enabled them to access information and join discussion groups on particular issues. The forestry centre also continued with meetings and conferences which led to the foundation in August 1999 of an association for edible mushroom growers in the region *Associacio LIFE de productors de bolets i tofones*.

Life after LIFE

LIFE was always a long-term project that would require an investment of both funds (estimated net cost is € 5,000/ha) and time. Ten years after project launch, this investment is just beginning to be realised, following the appearance in January 2006 of the project’s first truffle,

Signs of LIFE: planting was carried out on land that was destroyed by fire in July 1998.





LIFE helped to fund the heavy machinery used to prepare the soil for planting.

Tuber melanosporum, planted by landowner Carlos Tudel in 1998. Although it will be a further three to five years before this plantation goes into full production - producing an average annual yield of € 6,000/ha, or an annual equivalent cash flow of € 2,691/ha² - this is a major breakthrough for the project, creating a good deal of excitement in the local community and heralded by the local and regional press and TV.

From 14 ha planted at the end of the LIFE phase, there are now 100 ha planted with a further 40 ha set to be planted later in 2006. Dr Colinas forecasts that over the next few years more of these plots, especially those planted with what has proved to be the more promising *Tuber melanosporum* black truffle, will start to bear fruit. Unfortunately the next few years will also be a period when the team learn that certain plots have failed: "This will be a difficult time. We always

² Estimated annual equivalent cash flow is calculated over the average 35-year production period (including start-up costs).

knew that," he says, adding that at project launch knowledge of commercial inoculation methods and of site selection was fairly limited. "Thanks to LIFE we have made major steps forward in research and analysis of the seedlings sold. We also now know a good deal more about other influencing factors, [climate, terrain, soil quality, irrigation needs etc]. So we now have a better chance of success," he says.

Another significant milestone was the completion in May 2006, of detailed mapping of the region's truffle growing potential indicating areas with good prospects and those needing irrigation. This data is available to all the members of the edible mushroom growers' association. Launched in 1999 with just six landowners, the original pilot farmers, the growth of the association has been impressive. Current membership stands at 80, with 20 new landowners joining every year.

An important dissemination tool is the project website (published in Spanish, Catalan and English), which was launched during the LIFE phase and which continues to flourish - registering a total of 65,000 hits for the Spanish-language site and a further 1,900 hits for the English version.



Photo: CTFC

Ascoma (fruitbody) of a prized *Tuber melanosporum*.

Finally, Dr Colinas says there is still a good deal of research to do. But for the black truffle, "we are starting to see the light at the end of the tunnel".

Conclusions

Thanks to the groundwork set in place by LIFE, the beneficiary has confirmed that state government funding for follow-on research has been secured for at least another five years. The project offers an economically viable solution, which does not require intensive management, and which does not interfere with other uses of the forests. Most importantly, the region's initially sceptical landowners are slowly coming around to the economic possibilities offered by the project.

Project number: LIFE96 ENV/E/000512

Title: Introduction of fungi in forest plantations. Demonstration project.

Beneficiary: The Catalonia Forestry Technology Centre (*Centre Tecnològic Forestal de Catalunya*)

Contact: Project manager, Dr. Carlos Colinas.

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Period: 01-Jan-1997 to 01-Jan-2000

Website: <http://labpatfor.udl.es/plantmicol/plantmicoleng.html>

Total budget: € 512,000

LIFE contribution: € 209,000

Total budget: € 7,400,000

LIFE contribution: € 4,450,000



case 4

Italy: Innovative coppice management solutions in Umbria woodlands

This Italian LIFE-Environment project demonstrated a new approach to coppice management in the woods of the mountainous region of Umbria. The potential for reproducing and transferring the project methodology is high. This new approach to coppice management could be extended and reproduced in similar areas across Europe.

More than 60% of the forests in Italy and about 30% of the forests in Europe are managed using the traditional coppice system, a woodland management system for non-coniferous forests (see “LIFE forestry the old-fashioned way”, p38). The coppice differs from ‘high’ (seedling) forests in the way it is regenerated following harvesting. Coppice regeneration is carried out mainly through asexual reproduction, exploiting the capacity of certain forest species to generate sprouts or suckers at the base of the trunk stump once it is cut. With ‘high’ or seedling forests, regeneration takes place mainly by sexual reproduction through new plants that sprout from seeds.

Although coppicing has been practised in Europe for centuries, it has several limitations including: species with a low stump-sprouting ability tend to disappear; it produces low-value timber products (almost exclusively firewood, fencing and woodchips); it has limited tourism/recreational value; and it provides less efficient soil protection. Alternative methods in coppice management, which create a more complex and heterogeneous ecosystem and improve the different functional aspects (production, soil protection, landscape), are therefore needed. Various ‘natural’ forestry methods have been used to manage seedling forests in an alpine environment. Thus far, however, none had been applied to the coppice system.

The main aim of the ‘Summacop’ project was to examine areas of the woods of Umbria that were traditionally coppiced to see whether new intervention techniques in coppice-management could be introduced in line with sustainable and ecological criteria. The mountainous region provided the ideal project location – coppices, often with deciduous oaks, represent approximately 85% of Umbria’s wooded area. The project was implemented by the beneficiary, the Region of Umbria Council Office for Agriculture and Forests, together with seven partners – the Institute of Experimental Forestry, Arezzo, the universities of Florence and Perugia, and the mountain communities of Alto Chiascio, Monte Peglia and Selva di Meana, Subasio, and Valnerina.

What did LIFE do?

Specific objectives of the project were:

1. To conduct demonstration work on property owned by the regional government, covering a total survey area of some 180 hectares subdivided into four territorial areas – Selva di Meana, Alto Chiascio, Monte Peglia and Monte Subasio.
2. To verify the methods proposed, evaluating their efficiency in terms of wood production, soil protection, regeneration intensity and quality, the economic validity of



‘Summacop’ information panel.

the interventions, specific composition, and the effect on the landscape.

3. To disseminate the methods developed to public and private operators, particularly with regard to mountain communities and companies that exploit woodland resources.

The project methodology proposed forms of treatment that were differentiated across small areas. Within these areas, intervention was assessed based on the area’s ecological and structural characteristics, also taking into account the specific setting and the possible economic value of the valuable wood species present.

The silvicultural interventions adopted were a combination of coppicing with groups of standards, conversion to high forest, coppicing on small areas,



suspension of interventions, thinning (which was carried out on a selective basis and enabled the growth of hardwood trees which have a valuable production potential or in areas intended for tourism, educational and recreational use, in order to ensure safety).

The project team also went to considerable efforts to promote the project during and after the LIFE phase. Information and dissemination actions included the hosting of seminars and forums for public/private operators and for the communities of the region. In addition, a project book, CD-Rom and brochures were published. A website was launched, which explains the project methodology and results. Published in three languages (Italian, French and English) the website is still running.

What was the outcome?

On closure (September 2002), the project had met its main objectives: producing improvements in environmental, economic and social terms. A phytosociological survey indicated that the application of coppicing with groups of standards and on small areas can create conditions for the diversification of wood species. Increasing the vegetation strata has a positive effect on fauna by increasing the available habitats. The visual impact on the landscape is also lower than in traditional coppicing.

With regard to the economic aspects, the project demonstrated that the implementation of diversified interventions for coppice improvement is convenient and economically feasible for wood-cutting operators in the context of land improvement. A number of regional and park administrations and private forest owners expressed their intention of adopting the methodology. The activities carried out in the four demonstration areas also raised considerable interest among private operators, proving that it is possible to change the traditional coppice management, while guaranteeing productive aspects.

Life after LIFE

In May 2005, a follow-up ex-post evaluation of the project was carried out by the LIFE external monitoring team. This showed that the forestry interventions started by the LIFE project are being continued at least for several years managed by the mountain communities, and a plan is currently underway for further interventions based on the Summacop methodology. Negotiations are also in progress with the University of Florence for studies to be carried out in the project area. For example, a project is currently underway on harvesting techniques in pine-forest thinning.

The beneficiary also participated with a former partner, the University

of Perugia, in an Interreg IIIB Medoc project on structure and cooperation activities in Mediterranean forests (the beneficiary here is the Vesuvio National Park). This new project took into account the Summacop methodology and findings (RECOFORME projet).

Finally, the project results have been widely disseminated in Italy, at trade fairs, seminars and conferences. Moreover, the methodology is referred to in the influential scientific textbook: "Il Bosco Ceduo" by Ciancio and Nocentini. Other successes include promising moves towards the adoption of the methodology in forest management legislation and/or regulations in Italian regions. These include: amendments to the Tuscany Regional Forestry Regulation (48/R of 2003) and the proposed adoption of the use of group of standards as a better guarantee for the conservation of biodiversity (DGR 139 of 2005 and DGR 1803 of 2005 – Umbria Region).

Conclusions

Although this project was implemented at the borderline of LIFE's usual fields of intervention, the commitment by the beneficiary and its partners resulted in a well-managed and successful project. The particularly well-designed dissemination strategy allowed the project to reach large numbers of stakeholders and to be considered at a high scientific level that is not commonly the case in the forestry sector, (where scientists and professionals are sometimes reluctant to acknowledge the quality and advantages of innovative practices). This also confirms the importance attributed by the LIFE programme to all information and dissemination aspects of projects.

Project number: LIFE99 ENV/IT/000003

Title: Sustainable and multifunctional management of Umbria coppices

Beneficiary: Regione Umbria - Assessorato Agricoltura e Foreste

Contact: Francesco Grohmann

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Period: 29-Mar-2000 to 29-Sep-2002

Project website: (EN, FR, IT) www.regione.umbria.it/summacop/

Total budget: € 450,000

LIFE contribution: € 209,000



case 5

Sweden: Making urban woods and forests more people-friendly

This joint Swedish-French LIFE-Environment project focused on the health and recreational benefits of Europe's urban forest and woodlands. LIFE programme co-funding was used to establish four pilot forests located close to Stockholm and Paris. The principal objective was to demonstrate ways of making these areas more stimulating and attractive to an increasingly urbanised society, while at the same time increasing understanding among city dwellers of forest ecosystems.

The majority of Europe's city dwellers have become alienated from the woodlands and forests that for most of humankind's past have been its natural environment. Spending more recreational time in forests can have positive effects on health and well being, helping to reduce stress and providing healthy exercise in tranquil surroundings. By educating city dwellers about their nearby woods, the project hoped to further understanding of forest ecosystems and to raise awareness of the environmental consequences of certain actions, for example, littering.

Photo: Richard Karlsson



Young participant of a guided tour in the urban forest of Huddinge, Sweden.

Launched in 2001, "Urban Woods for People" was a collaboration between forestry organisations in Sweden and France and involved a number of municipalities, a national governmental authority and one non-governmental organisation from both countries. It was coordinated by the project beneficiary, the Regional Forestry Board of Mälardalen (Sweden). Its main goal was to demonstrate new means of increasing the recreational value of urban woodlands. The idea was to show that with proper planning and upkeep, these woodlands can be made both recreationally more stimulating and safe.

What did LIFE do?

The project assisted in the establishment of four pilot forests, (one of which

contained 14 woodland areas), located in suburban Stockholm and outside Paris. Environmental conditions were improved by tidying dirtied areas, protecting areas to be kept free of disturbance, and by channelling the flow of visitors along predefined trails.

The recreational and didactic value of an estimated 850,000 annual visits to the pilot areas was also improved. During the four-year project, more than 40 activities were carried out, including field trips, slideshows, training courses and conferences. Groups such as children, disabled and elderly people, as well as new residents (non-nationals) were especially targeted. For example, trails and paths were made more accessible

for wheelchairs, and in order to make the areas more attractive to children, simple side events and activities were provided. Efforts to broaden visitor groups in Sweden (through for example, promotional literature and posters published in several languages including Arabic) were particularly successful in boosting visitor numbers. Finally, more than 10,000 participants – twice the number expected – attended guided tours in order to get to know their local woodlands better.

What was the outcome?

To be successful, managing nature located close to urban areas requires a high degree of citizen involvement.



Blue print of the new entrance for the urban forest of Sénart, France.

In France, in the Sénart forest near Paris, the project brought together representatives from 14 municipalities and 150 different organisations to agree on long-term objectives for the forest's development. Around 50 meetings resulted in an agreed framework document regulating all activities within the forest. Though the process took over two years, the municipality, forest managers, NGOs and the community eventually agreed on the development objectives for the Sénart forest, and a consensus was reached on management operations and recreational activities that would earlier have caused conflict.

In Sweden, pressure on private land through public use for recreational purposes is sometimes considerable and can pose significant problems for landowners. The project created a new understanding of the attitude of owners to recreational use as well as a model for cooperation between forest owners, local authorities and the public.

Several locally based websites provided online information on both forest management issues and leisure activities. Following the success of these websites, other municipalities in Sweden and France have signalled their interest in replicating the concept of providing web-based information on their urban forests.

The project produced a number of publications¹ targeting administrators, forest managers, urban planners and others working with urban nature zones, but also a more general readership. These include, in Swedish, a book on management and silviculture, "*Vår tätortsnära natur – en bok om förvaltning och skötsel*" (2004) and on forest Nature and Health "*Natur och Hälsa*" (2005) and, in French, a book on the management of urban woodlands "*Gérer les forêts périurbaines*". A handbook on opening-up access to forests for disabled people was also published. According to the beneficiary, the latter publication has served as a model not only in Sweden but also in several countries in Europe.

¹ These publications are available either via www.svo.se/urbanwoods, www.svo.se/forlaget, or www.onf.fr.

Interest by the target groups for the dissemination material produced, including newspapers, the websites, manuals and press releases, was higher than initially expected. Forestry organisations and other bodies responsible for urban woodlands representing 23 countries were able to benefit from the project's results and conclusions.

Finally, a number of innovative tools and methods were developed for zoning forest areas, mapping noise, classifying trails and managing waste, as well as for disseminating good practices and lessons learned to urban wood managers in Sweden, France and other Member States

Conclusions

Generally, the participative management of public forests has focused on isolated patches of land. "Urban Woods for People" was particularly innovative in that it successfully involved several woods or forests spread over a relatively large territory and that it introduced new groups – children, disabled and elderly people, as well as new residents (non-nationals) to the pleasures of urban woods. The project's focus on planning and management of woodlands near urban areas, as well as its individual initiatives and participatory approaches, can be adapted and applied to other kinds of urban nature areas.

Project number: LIFE00 ENV/S/000868

Title: Demonstration of ways to increase people's recreational benefits from urban woodlands

Beneficiary: Regional Forestry Board of Mälardalen, Sweden

Contact: Johanna From

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Period: 01-Apr-2001 to 31-Mar-2005

Website: www.svo.se/urbanwoods

Total budget: € 3,103,000

LIFE contribution: € 1,498,000



case 6

Italy: GIS tool helps cut greenhouse gas emissions through biomass

Promoting the use of renewable energy instead of fossil fuels is one of the main action areas of the EU under the Sixth Environment Action Programme (6th EAP) to combat climate change. Using state-of-the-art technologies this Italian LIFE-Environment project implemented and validated an innovative GIS tool to promote the efficient management of forestry and agricultural land in order to optimise the use of biomass resources in thermal power plants.

The 'BIOSIT' project targeted the reduction of greenhouse gas emissions by designing, implementing and validating a GIS-based planning tool for biomass exploitation in thermal power plants. The main aim was to use the tool to optimise land-use development and planning for the effective exploitation of biomass resources in Tuscany. Other objectives were to reduce air pollution and CO₂ emissions, to develop tools for the implementation of biomass projects in a sustainable way and to improve the management of forestry and agricultural land in the region.

The project comprised a partnership between the Departments of Energetics (DE) – the project coordinator – and the Department of Agricultural and Land Economy of the University of Florence; and ETA Renewable Energies, a privately owned company specialising in research, design and construction of renewable energy plants.

What did LIFE do?

The purpose of the work was to bridge the gap between ongoing research through other EU supported projects, and the real-life widespread application of the methodologies and tools developed for planning. Over a three-year period the LIFE team carried out the following main tasks:



Using biomass resources as part of Tuscany's Regional Energy Plan.

- > Definition of a model for the evaluation of agro-forestry biomass potential and analysis of the biomass production and collection costs.
- > Design and implementation of the algorithm to compute the cost of the biomass delivered to the energy plant (considering production, collection, stocking and transport costs).
- > Design and implementation of the computer model to calculate the avoided CO₂ and other pollutant emissions (including emissions from biomass transportation).
- > Computations and evaluation of biomass potential and optimal locations.
- > Recommendation for the use of the GIS tool, and integration with the

Regional policy (Energy Plan, Community Structural Funds, etc.).

Biomass availability and current greenhouse gas emissions in the region were analysed, paying particular attention to the evaluation of agro-forestry biomass availability and costs. The possibility of introducing dedicated energy crops was also considered.

What was the outcome?

The project was very successful. The team promoted the efficient management of forestry and agricultural land, and the integration of agriculture with industrial activities – thus contributing



to sustainable and socio-economic development. In addition, it evaluated biomass productivity, as well as the optimal locations for biomass plants in Tuscany. The GIS tool was also used to calculate the expected CO₂ emission reduction from bio-energy. Integrated with a Regional Energy Plan, it was used to support local authorities (regional department, energy agencies) involved in environmental management and energy planning and to define and implement a strategy in support of clean and green energy production.

Through dissemination at a regional level, the beneficiary was also able to promote the efficient management of forestry and agricultural land, and the integration of agriculture with industrial activities, helping to contribute to sustainable and socio-economic development.

Finally, the long-term socio-economic impacts of bio-energy on employment are an important factor to take into account with this type of renewable energy. For example, in Europe it is estimated that biomass could potentially generate more than 400,000 new jobs in short rotation forestry and herbaceous crops¹. According to the beneficiary, an estimated 5,700 new jobs are expected to be created by the exploitation of biomass in Tuscany.

Life after LIFE

Project partner, ETA Renewable Energies, organised the "2nd World Conference and Technology Exhibition on Biomass for Energy,

¹ EUBIA (European Biomass Industry Association).

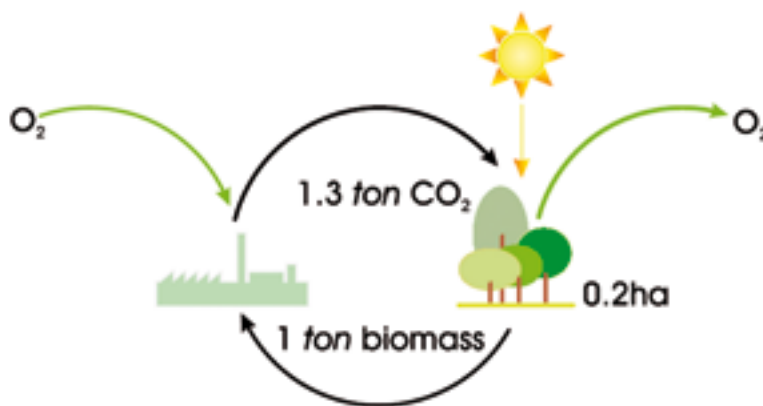


Diagram depicting innovative GIS model for proper planning of CO₂ emission reduction via bio-energy.

Industry and Climate Protection" held on May 10-14, 2004, in Rome. The BIOSIT project results were disseminated at this important international gathering. More recently, following the localisation of biomass resources in Tuscany, the beneficiary reports two more power plants are to be built in the Mugello area.

Conclusions

The project was particularly innovative in its practical application of the territorial data processing system (GIS) for planning policies regarding biomass exploitation. Prior to the launch of BIOSIT, GIS

use for biomass had always been applied by resources institutes and universities but never by the public bodies interested in achieving a real benefit from state-of-the-art technologies. The potential for reproducing the project methodology is considerable. (Biomass is one major option for CO₂ reduction.) However, the future development of the project methodology depends on the practical application by the regional authorities of the BIOSIT tools in their energy plans. All the necessary elements were made available by the LIFE project. The actual implementation now rests on the political willingness of the public administrators.

Project number: LIFE00 ENV/IT/000054

Title: GIS-based planning tool for greenhouse gases emission reduction through biomass exploitation

Beneficiary: Università' di Firenze Dipartimento di Energetica

Contact: Francesco Martell

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Period: 01-Oct-2001 to 01-Oct-2003

Website: (IT, EN) www.etaflorence.it/biosit/

Total budget: € 442,000

LIFE contribution: € 215,000



Photo: New Forest LIFE III Partnership



Building partnerships for LIFE

This section provides examples of forest and forest management projects co-financed by LIFE-Nature that were particularly successful in building long-lasting partnerships. Such partnerships provide a powerful tool for ensuring measures implemented under LIFE become integrated into local land-use policies and practices, rather than simply operating in isolation for the duration of the project.

There are many advantages of forming partnerships not least because they can provide the structured framework within which different public and private-sector stakeholder groups can learn to work together and to coordinate their activities. LIFE partnerships allow different parties – national administrators, forest owners, forestry operators, nature conservation NGOs and citizens working in or with forests – to have their say, to listen to other viewpoints and to learn to work together on nature

conservation issues. Such partnerships can also provide a forum upon which future management strategies can be negotiated and agreed upon in order to secure long-term objectives.

As demonstrated so successfully in the UK New Forest project (LIFE97 NAT/UK/004242), a successful partnership can bring together previously diverse organisations with their own core objectives to form an 'integrated partnership' able to consider the management of a site as a whole. This consortium of 10 partner organisations – from graziers and foresters to conservationists – was able to build on the experience of this large-scale restoration project to go on to launch a follow-up LIFE project (LIFE02 NAT/UK/008544) that targets the forest's wetland areas.



case 1

UK: LIFE continues to build partnerships in the New Forest national park

This LIFE II New Forest project brought together 10 partner organisations – from graziers and foresters to conservationists – that were able to enhance the conservation value of more than 4,000 ha of one of England's most famous forests, helping to restore vulnerable habitats and encouraging their associated wildlife. The experience, skills and knowledge gained by the partners have contributed to the long-term sustainable management of the Natura 2000 site and led to a follow-up LIFE III project, which closes at the end of 2006. Moreover, one of the project's key outputs, its management plan has been adopted as a model by a number of other LIFE-Nature projects.

Situated in densely populated south-east England, the New Forest is actually not new at all – it was originally created as a hunting forest by William the Conqueror in the 11th century. Today, the Natura 2000 site, covering 571 km², is probably best known as an area of ancient woodland and swathes of open forest grazed by roaming herds of New Forest ponies. But its EU nature conservation interest lies in its 13 habitat types (including the priority habitats bog woodland and alluvial forests) and the three species of the Habitats Directive and the five Annex I Birds Directive species present¹.

Only an hour's car drive away from London and sandwiched between two major conurbations of Bourne-



Photo: New Forest LIFE III Partnership

Entrance to the New Forest – one of England's most famous forests.

¹ The habitats support an exceptional variety of plants and animals, including the richest moss and lichen flora in lowland Europe, scarce flowering plants such as slender cotton-grass, wild gladiolus, pennyroyal and small fleabane and an outstanding community of invertebrates dependent upon the ancient forest trees and other grazed habitats. In addition, the New Forest has the largest number of Dartford warblers in Britain and internationally important populations of nightjars and woodlarks. Of particular note are the populations of southern damselflies, great crested newts and stag beetles. www.newforestlife.org.uk/.

mouth-Poole and Southampton, the forest is also a magnet to visitors and has an estimated 22 million day-visits per year. This popularity brings with it significant problems with recreational pressure causing erosion and disturbance. Moreover, afforestation with non-indigenous species has left a legacy of conifer plantations that are out of keeping with the natural character of the area. Other invasive species such as bracken and rhododendron threaten its integrity.

A "Strategy for the New Forest" was published in April 1996, recognising the European importance of the area and identifying a strategic framework for its conservation and enhancement. Launched in February 1997, the project grew from this initiative.

Guided by Hampshire County Council, the project beneficiary, the consortium of 10 organisations – English Nature, Forestry Commission, Hampshire County Council, Hampshire

Wildlife Trust, National Trust, New Forest Committee, Ninth Centenary Trust, Royal Society for the Protection of Birds, Verderers of the New Forest, Wiltshire Wildlife Trust - put together an ambitious programme to undertake a wide range of habitat management and restoration measures designed to tackle the key threats to the forest.

The main targets were to produce a management plan to cover the entire 29,000 ha that make up the New Forest Special Area of Conservation (SAC) to increase the land owned and managed for nature conservation purposes and to restore over 4,000 ha of the New Forest habitats to favourable conservation status. (Note at the time of the LIFE II project (1997-2001) the New Forest was a Candidate Special Area of Conservation (cSAC). In 2005, its SAC (Special Area of Conservation) status was confirmed.

Bryan Boulton, Hampshire Country Council contract manager for the LIFE II and LIFE III New Forest projects, says that one of the particular difficulties for the partnership concerned the "complexity of the structure" of the New Forest, which has a highly unusual legal history. For example, due to its 'cultural interest' the recently designated national park² is also on the UK's tentative list of World Heritage Sites. In addition, it has been a royal forest for over a thousand years, governed by ancient laws that among others have protected its land workers, known as commoners. These laws still exist today, implemented by a powerful body, the verderers (one of the project partners).

When you have a forest that is owned and managed by one body, it is rela-

² On March 1, 2005, the New Forest officially became a National Park to be administered by the newly set up National Park Authority. (www.newforestnpa.gov.uk)

Photo: New Forest LIFE III Partnership



Grazing animals of the New Forest



Jonathon Mycock

The richness of the wildlife and of the habitats of the New Forest, says Jonathon Mycock, LIFE III New Forest project manager, is a result of centuries of activities of pollarding and of coppicing the woodlands and of the animal grazing of the open heathland, which maintains the open landscape. Without the grazing, he notes: "The heathland becomes scrubbed over quite rapidly due to natural succession."

These grazing animals include some 4,000 ponies and around 3,000 cattle owned by the commoners - a distinct community with Rights of Common handed down, via their properties, from generation to generation. These rights permit 'depasturing' of 'commonable' animals (ponies, cattle, pigs, sheep and donkeys) on common land known as the Open Forest.

Today, the poor-quality land supports a special breed of New Forest ponies who roam freely year-round over extensive areas of the forest playing a vital role in keeping habitats free of scrub and controlling more aggressive species such as bracken and purple-moor grass. The ponies are rounded up in the autumn when the young ones are sold. The LIFE project assisted the verderers in introducing a New Forest Pony Premium Scheme to encourage the breeding of good-quality ponies that are well adapted to the rigours of their semi-wild existence. The breeding aims to accentuate the characteristics that enable the animals to survive year round, including thicker belly hair (to insulate them when grazing in the mires), broad hooves (which stops them sinking) and tough mouths and lips (for browsing gorse). The offspring of these ponies are now attracting much better prices when sold. This has also helped to defray some of the costs accrued by the commoners in depasturing their stock.

tively easy to implement changes. But any decisions concerning the New Forest have to be approved by a large number of organisations, Mr Boulton says. In addition, there are numerous other people who are interested in its future and who regard it as their forest: "Keeping all those people happy was really difficult. But it was vital and it was the key to the success of the project," he says.

What did LIFE do?

Much of the habitat restoration work involved clearance of the incredibly invasive rhododendron, the removal of planted and invasive conifers, introducing traditional broadleaved woodland management (such as pollarding), and repairing or controlling erosion. One of the more innovative elements of the project was the



action to secure the long-term viability of grazing animals in the New Forest. Since much of the New Forest's nature conservation interest is bound up with traditional grazing practices – especially by ponies and cattle – it was considered crucial that these should not decline.

A joint communications' programme was run by the partners for the duration of the project to raise awareness of the scheme's conservation importance and of the methods employed. Numerous leaflets, newspaper and magazine articles, newsletters, press releases and display panels were produced. Bryan Boulton notes that because

a number of the operations were quite different from those that the public had previously experienced (for example, the large-scale removal of conifer plantations), it was crucial from the beginning to get public support and engagement. "There is a general public view that planting trees is good and cutting them down is bad. So they wondered what we were doing, as a nature conservation organisation, cutting down trees," he says.

What was the outcome?

Practical conservation work has been the most visible and largest element of the work, and according to the ben-

eficiary, "significantly exceeded most of its original targets". Funding from the LIFE programme and the sharing of resources and expertise between the 10 partner organisations enabled large-scale conservation schemes to proceed at a much faster pace, allowing an estimated 20 years' worth of conservation work to be delivered in only four years.

This resulted in approximately 4,500 ha of forest being restored to more favourable conservation status. Not all the land was in public ownership. The project helped the National Trust to acquire a significant block of some 500 ha of privately owned land on the edge of the forest. The acquisition of this land, together with technical expertise and use of GIS monitoring equipment, also played an important role in delivering the project's conservation benefits.

These achievements were brought about as a direct result of a key output, the production of the New Forest Management Plan, which provided, for the long-term sustainable management of the forest, with conservation as its first priority. This four-part plan details management prescriptions for the different habitat types and species in the New Forest SAC. Endorsed by the partners and the main landowners, the plan today is used as the framework for many of the partner operations. For example, it forms the basis of the Forestry Commission's Forest Design Plan Process covering the operational planning of the site.

Intensive work programmes made possible by the LIFE funding also allowed the project partners to trial and develop many innovative, environmentally sound and cost-effective techniques for habitat restoration.

Photos: New Forest LIFE III Partnership



*Above right: nature conservation involved cutting down trees.
Above left and below: the richness of the New Forest habitats and species.*



Life after LIFE

The first New Forest project tackled some of the most obvious conservation problems over the 4,000 ha, such as invasive species, exotic plantations and erosion caused by visitors. It also produced the coordinated management plan for the whole area. Over the course of the five-year process, it became evident that the area's priority woodlands were in particular need of restoration.

Mr Boulton explains that at the end of the First World War, the Forestry Commission took on the management of the New Forest and began planting trees to make it a forest for commercial purposes. To do this they needed to drain areas that had not been planted in the past because they were too wet. "In LIFE II we started to try to bring back some of those areas. We found that despite cutting the trees down, it proved difficult to restore the original habitats, because the hydrology had been disrupted. So we started to do work on, for example, restoring valley mires [which had been drained in order to plant trees and to improve grazing for stock] and we found that the techniques we were using were interesting, but they needed to be scaled-up. That was a key lesson learnt from LIFE II and is now being built upon under the LIFE III project," he says.

With many of the initial partners on board once again, the follow-up project (LIFE02 NAT/UK/008544) is about the sustainable wetland restoration of the New Forest focussing on three of its six water basins: Lymington River, Avon Water and Hampshire Avon.

Another important lesson for the first project concerned the economy of the New Forest. The LIFE II funding came at a "critical time" for the New Forest when there was a significant downturn in the rural economy due to an outbreak



Photo: New Forest LIFE III Partnership

Much of the initial habitat work involved the clearance of rhododendron (mainly Rhododendron ponticum).

of foot-and-mouth disease in the UK in 2001, which resulted in a ban on all British milk, meat and livestock exports. Says Boulton: "The LIFE II project by investing in local traders and local businesses actually kept the New Forest going. We calculated there was about £5 million (€ 7.3 million) worth of spin-off from the investments of money from the LIFE project into the local economy due to the multiplier effect. This really kept the forest going."

Further Information about the LIFE II and LIFE III project can be obtained from the project website and from the New Forest's Lyndhurst visitor information centre (see contact details).

Conclusions

The LIFE II New Forest project was most successful in building partnerships. Previously, the consortium partners had been diverse organisations with their own core objectives. With the help of LIFE funding these 10 groups were brought together to form an 'integrated partnership' that for the first time considered the management of the New Forest as a whole, with nature conservation as its primary purpose. Moreover, the LIFE partnership learnt that engaging with the public, to increase awareness of their project's objectives and methodology, was going to be critical in delivering this work.

Project number: LIFE97 NAT/UK/004242

Title: Securing Natura 2000 objectives in the New Forest

Key species: *Caprimulgus europaeus*, *Coenagrion mercuriale*, *Lucanus cervus*, *Lullula arborea*, *Sylvia undata*

Key habitats: *Bog woodland (91D0), *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) (91E0),

Beneficiary: Hampshire County Council

Contact: Issy Whatmore, LIFE III Communications Co-ordinator

Tel: + 44 (0) 1962 845369

Email: issy.whatmore@hants.gov.uk

Site details: Lyndhurst Visitor Information Centre, The Main Car Park, Lyndhurst, Hampshire SO43 7NY

Tel: + 44 (0) 23 8028 2269

Website: www.thenewforest.co.uk/contact.htm

Period: 01-Feb-1997 to 30-Sep-2001

Website: www.newforestlife.org.uk/

Total budget: € 7,490,000

LIFE contribution: € 3,750,000

* denotes priority habitat



Greece: Conservation and sustainable tourism in unique Vai palm forest

This Greek LIFE project, set in the unique palm forest of Vai on the island of Crete, achieved very high restoration success, managing to double the surface of the rare habitat type ‘Palm groves of Phoenix’ (*Phoenix theophrastii*). Involving a broad group of partnerships with local stakeholders the project also came up with a much-needed sustainable tourism plan to protect the forest, which harbours 5,000 palms and attracts over 200,000 visitors a year.

The Vai palm forest, which stretches for almost one kilometre along a narrow valley that reaches down to a beautiful, golden beach in eastern Crete, is composed of one of the only two endemic palm species in Europe. (The other palms species, *Phoenix canariensis*, can be found in the Canaries.) *Phoenix theophrastii*, included in Annex II of the Habitats Directive, and also covered by the priority habitat type “Palm groves of Phoenix”, can be found in small clusters in other parts of Crete and in Turkey. However, it is only in the Vai forest that the species forms a grove. The forest is part of a broader site designated as a Specially Protected Area (SPA) and is an Aesthetic Forest according to Greek legislation. It is also part of a broader site proposed as a Site of Community Interest (SCI) according to the Habitats Directive.

Legend has it that the rare, almost tropical, forest began after Phoenician merchants arrived on the island and scattered the seeds of dates they were eating, and these produced the celebrated ‘vagia’ palm trees. At one time, the palms covered almost 300 ha. But in 1957 extensive land reclamation took place and most of the forest was destroyed. Since then it has decreased further so that, at the launch of the project (January 1999),



Photo: K. Raptopoulos

Stunning Vai palm grove and neighbouring beach in eastern Crete.

it only covered an area of 15.6 ha. Until a few years ago the forest was hemmed in on all sides by agricultural activities, which limited its natural regeneration. Furthermore, the forest was threatened by pressure from poorly planned tourist infrastructure development, which threatened not only its ecological value but also its aesthetic value.

This situation prompted the Greek Biotope-Wetland Centre (EKBY by its Greek initials), the local Toplou Monastery and the Forestry Directorate of Lasithi to combine forces to persuade local stakeholders to swap their land

bordering the forest for agricultural plots further away and to channel visitor use more sensitively around the forest. The monastery’s involvement was crucial because it donated land next to the forest for replanting and land-exchange so that over time, the forest could be expanded.

What did LIFE do?

To achieve the forest expansion and restoration, farmers were voluntarily relocated from 9.2 ha of sensitive areas around the forest grove to alternative land donated by the monastery. An additional 26 ha of land was fenced

and planted with the Phoenix palms. Other restoration actions included the introduction of silvicultural treatments for the existing plants and the installation of an irrigation system and underground water-level monitoring system for the planted areas. Tourist facilities, such as a main visitor car park, were also relocated to ease pressure from tourists, and vehicle access to the beach was limited. These actions were supported by an active public awareness campaign to raise the profile of this rare habitat locally.

What was the outcome?

By restoring the palm trees over an area of approximately 13.4 ha, and by securing their natural regeneration over another 2.7 ha, the project managed to double the surface of the habitat type from 15.6 to 31.7 ha. The restoration actions (fencing, planting, setting up of irrigation system, watering etc.) proved very efficient as the rate of planting success was around 95%.

A major factor in the project's success was the involvement of all the main local stakeholders in the decision-making process concerning key issues related to the forest's management. In particular, the project team accumulated significant knowledge of the ecology of the palm trees and of their management and conservation needs. The project successfully managed to transfer this knowledge to the Forestry Directorate, the authority responsible for the protection of the forest, which, prior to the LIFE project, lacked a clear strategy for the forest and lacked specific tools, such as the water-monitoring system.

Given the importance of the site as a tourist destination, the project promoted the concept of sustainable tourism, a notion that had not previously

been promoted through a LIFE-Nature project in Greece. This was done on a national level through the project's concluding conference, as well as on a local level, through the continuous discussions with local stakeholders about the development of activities compatible with the natural character of the northeast side of Crete.

On the downside, at the end of the LIFE project, the amount of land exchanged was only 2.7 ha, instead of an envisaged 9.2 ha. However, this initiative is still continuing. Similarly, due to a delay in the completion of all the project actions, the team was unable to test the effectiveness of the infrastructure and the visitors' response during the last tourist season of the project period (summer 2002).

Life after LIFE

To follow-up these actions and to assess the long-term sustainability of the results, an ex-post report was carried out in March 2006 by the LIFE external monitoring team. It concluded that the project's positive impacts, during and after-LIFE, have been that further uncontrolled tourist developments have ceased and that local stakeholders and visitors are now aware of the ecological and aesthetic value of the forest and are therefore more likely than in the past to conserve it and develop activities that respect it.

The young palm trees, which have a very slow growth rate (the trunk only becomes visible above the ground after 3-4 years), are now easily seen. They are scattered arbitrarily to achieve a natural look. Their ages range from 4-7 years as young saplings were planted over the three-year period of the project for better adaptation. Watering of the palm saplings continued regularly during



Photo: K. Raptopoulou



Photo: K. Raptopoulou

Above: LIFE viewpoint.
Below: Bus stop with LIFE logo.

the summers of 2003 and 2004. In the summer of 2005 the plants were only watered twice. From now on, no more watering will take place in order to ensure that, rather than spreading superficially, the roots will develop to the necessary depth in order to reach the underground water source.

Land exchange with another two landowners has also taken place and a further three are underway. The total area exchanged has thus increased to 3.2 ha – almost 35% of the target.



Photo: K. Raftopoulos



Project partner, the Monastery of Toplou donated land next to the forest for re-planting and land-exchange.

Photo: K. Raftopoulos



LIFE managed to double the surface of the rare palm groves.

These land exchanges are expected to continue in subsequent years. Locally based beneficiary representative, Nikos Kifonidis, handles this activity. Associated legal costs are charged to the landowners, whereas during LIFE these were financed by the project.

In order to improve the structure and vigour of the existing and extended forest, the Forestry Directorate removes competitive species (especially *Nerium oleander*) and dead biomass. This activity is repeated annually by seasonal workers employed over the summer months. Two permanent guards, employed by the forest service, are on the look-out for threats to the palm groves, especially from forest fires. In summer this activity is supplemented with wardering provided by voluntary organisations and other services. Specifically, the Municipality of Itanos (stakeholder) brings all parties involved together and an action plan is drawn up for effective fire protection. The forest is also protected by the fence that was placed during the project. This effectively safeguards the forest from visitors, illegal hunting (of hares) and grazing.

Finally, according to the beneficiary, the project achieved a change in attitude of local stakeholders regarding the tourist development of the area. Whereas prior to the project the forest area and beach were open to uncontrolled tourist development, local communities are now aware of the importance of conserving the forest and of developing sustainable tourist activities. Project Manager, Vasso Tsiaoussi, says: "We succeeded in conveying the message to everyone that the Vai palm forest is a protected area and not a means for exploitation. This integrated project addressed several key aspects: the expansion,

restoration and enhancement of the forest; as well as dissemination, environmental education and tourism."

Conclusions

A major factor contributing to this project's success was the excellent collaboration achieved between the project beneficiary, partners, local authorities and stakeholders that set a good precedent for nature conservation in protected areas in Greece. More recently the beneficiary reports that landowners are continuing to exchange their plots thus helping to further the project's sustainable results.

Project number: LIFE98 NAT/GR/005264

Title: Conservation measures for the Palm Forest of Vai, Greece

Key habitat: *Palm groves of Phoenix (9370)

Beneficiary: The Goulandris Natural History Museum/Greek Biotope-Wetland Centre (EKBY).

Contact: Ms Vasso Tsiaoussi, Project Manager.

Tel: +30 2310 473 320;

Email: vasso@ekby.gr

Period: 01-Jan-1999 to 31-Dec-2002

Total budget: € 1,068,000

LIFE contribution: € 769,000

** denotes priority habitat*



case 3

Sweden: Forging links with landowners to protect western taiga forests

Western taiga is a priority habitat that exists in just a few northern European countries. In Sweden, it is estimated that only approximately three percent remains of the original western taiga. These areas are under constant threat from commercial forestry. SEPA, the Swedish Environmental Protection Agency, believes purchase of land or compensation to landowners is the only truly effective means of securing the long-term preservation of western taiga. For this reason, it has initiated a nationwide programme for its conservation. This LIFE project aided the preservation of one of the best-remaining western taiga forest areas in central Sweden.

Grossjöberget in the municipality of Bollnäs is one of the largest and best-documented old growth forests of its kind in the county of Gävleborg in central Sweden. It consists of 338 hectares of continuous pine forest, without roads or paths, growing on a small moraine-covered mountain. Interwoven in the forest, containing 90% of western taiga are a few small but intact aapa mires, another priority habitat type under the Habitats Directive. Very little forestry has taken place in this area over the last decades and so the forest cover is virtually unbroken by clear-cuts. Consequently, the dominant generation of pine is around 185 years old, although many of the trees are closer to 300-400 years of age. Added to this pine growth is a high proportion of deciduous



The overriding aim was to set the land aside to allow natural rejuvenation.

ous trees and dead or dying stumps lying on the ground, which provide valuable habitat for a wide variety of other animals and plants. Such old growth virgin forests have all but disappeared from the Swedish boreal lowlands.

The nature conservation value of the site was identified back in the 1960s, and in 1984 a voluntary deal was set up between the local nature conservation NGO and the landowners to voluntarily refrain from harvesting the trees until such a time that sufficient

Winter: at the entrance to Grossjöberget site.



Western taiga

Western taiga is a complex forest habitat type, ranging from dry pine *Pinus sylvestris* to damp spruce forest *Picea abies*. Much of its composition is dependent upon its history, some stands may be quite young, having regenerated after a forest fire, which occurred more than a hundred years ago, while others will be significantly more mature. In all cases, natural undisturbed western taiga – that is those not subjected to commercial forestry – are extremely rich, providing habitats for many threatened species of lichens, bryophytes, insects and birds among others. The dead wood, in particular, plays a central role in maintaining this high conservation value, and its scarcity is one of the most serious threats to biodiversity in Swedish forests.



funds could be found to purchase the land from them and turn it into a pSCI (proposed Site of Community Interest) and national nature reserve. In 1997, such a move became possible thanks to the co-financing from the LIFE-Nature programme, as well as contributions from Bollnäs municipality, the project beneficiary, and project partner SEPA.

What did LIFE do?

The main objective was to acquire and legally protect the Grossjöberget site. A variety of measures were used to reach agreement with the landowners: three private owners (78 ha) and one forestry company, Korsnäs AB, (originally 302 ha, later adjusted to 368 ha). Some landowners chose to be financially compensated for their loss of income, while others opted to swap their land for suitable forestry land outside the area. Once the land was secured, a management plan was drawn up to secure the site's long-term conservation. During the implementation of the project, local nature conservation NGO, *Bollnäs Naturskyddsförening* (Bollnäs Society for Nature Conservation) played a key role in helping to increase knowledge and understanding of the priority habitats among the local community by establishing an informal network with the beneficiary and other project participants.

What was the outcome?

This objective was successfully met. The size and demarcation of the site was slightly expanded during the course of the project. As a result, the final volume of land acquired and protected was 432 ha. The management plan was completed in spring 1998 and was included in the formal application for the nature reserve (which was officially inaugurated in June 1999). After the end of the project, the site was left to passive management.

Life after LIFE

A follow-up ex-post study of the project was carried out in March 2006. It showed that the local NGO has continued to be very active, helping to coordinate inventories carried out in the area by other NGOs in cooperation with the municipality. According to the beneficiary, this close cooperation, which has been extended to other nature areas, is highly appreciated by the municipality.

In the years immediately following the establishment of the nature reserve, the beneficiary did not actively promote the area for recreational use. (The overriding aim was to set the land aside to allow natural rejuvenation.) However, the success of the LIFE project signalled the start of the establishment of other nature reserves in the municipality. Today, the municipality counts four more nature reserves with two more underway. The LIFE project beneficiary is the driving force behind these measures. After project closure (1998) the beneficiary created a Nature Fund to continue its work with nature reserves. Every year 20% [SEK 50,000-100,000 (€ 5,000-€ 10,000)] of the surplus from forestry activities goes into the fund. At the moment the fund has around SEK 1.3 million (approximately € 111,000).

For 2006, a decision has been made to use some of the money to open up more of the Grossjöberget reserve to the public. Measures already underway include:

- > dissemination of a brochure on the conservation value of the area;
- > erection of information signs along the main roads in the area;
- > construction of paths in the area,
- > preparation of maps showing the paths and the most valuable areas;
- > erection of picnic tables and benches;
- > erection of signs in the field highlighting the valuable biotopes; and
- > construction of a new website (see below).

Conclusions

This project, along with two other successful Swedish projects undertaken in the following year for western taiga conservation carried out in Bergslagen in central Sweden (LIFE98 NAT/S/005366) and in Svealand and Götaland in southern Sweden (LIFE98 NAT/S/005369), has helped to make a significant contribution to the long-term conservation of this priority habitat type in the EU.

Project number: LIFE97 NAT/S/004200

Title: Protection of western taiga, Grossjöberget in Bollnäs

Target habitats: *Western taiga (9010), Transition mires and quaking bogs (7140), Natural dystrophic lakes and ponds (3160)

Beneficiary: Bollnäs Kommun (Bollnäs Municipality)

Contact: Göran Göransson,

Tel: + 46 278 251 18

Email: goran.goransson@bollnas.se

Period: 01-Feb-1997 to 31-Dec-1998

Website: www.bollnas.se

Total budget: € 1,181,000

LIFE contribution: € 590,000

* denotes priority habitat

List of available LIFE publications

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

Best LIFE-Environment Projects 2004-2005 (2005, 44 pp. – ISBN 92-79-00889-7)

<http://ec.europa.eu/environment/life/infoproducts/bestlifeenv/bestenv.pdf>

Exchanging good practices on managing Natura 2000 sites (2006, 2 pp.)

http://ec.europa.eu/environment/life/infoproducts/natbest_leaflet.pdf

Integrated management of Natura 2000 sites (2005, 48 pp. – ISBN 92-79-00388-7)

http://ec.europa.eu/environment/life/infoproducts/managingnatura_highres.pdf

LIFE-Environment Projects 2005 compilation (2005, 97 pp. – ISBN 92-79-00104-3)

http://ec.europa.eu/environment/life/infoproducts/lifeenvcompilation_05_lowres.pdf

LIFE-Nature Projects 2005 compilation (2005, 55 pp. – ISBN 92-79-00102-7)

http://ec.europa.eu/environment/life/infoproducts/lifenatcompilation_05_lowres.pdf

LIFE-Third Countries Projects 2005 compilation (2005, 19 pp. – ISBN 92-79-00103-5)

http://ec.europa.eu/environment/life/infoproducts/lifetcycompilation_05_lowres.pdf

LIFE-Environment 1992 – 2004 “Demonstrating excellence in environmental innovation” (2005, 124 pp. – ISBN 92-894-7699-3 – ISSN 1725-5619)

http://ec.europa.eu/environment/life/infoproducts/bilanlife/lifeenv1992_2004_en.pdf

LIFE, Natura 2000 and the military (2005 – 86 pp. – ISBN 92-894-9213-9 – ISSN 1725-5619)

http://ec.europa.eu/environment/life/infoproducts/lifeandmilitary_en.pdf

LIFE for birds – 25 years of the Birds Directive: the contribution of LIFE-Nature projects (2004 – 48 pp. – ISBN 92-894-7452-1 – ISSN 1725-5619)

http://ec.europa.eu/environment/life/infoproducts/lifeforbirds_en.pdf

The air we breathe – LIFE and the European Union clean air policy (2004 – 32 pp. – ISBN 92-894-7899-3 – ISSN 1725-5619)

http://ec.europa.eu/environment/life/infoproducts/focusair/lifeair_hr_en.pdf

LIFE-Nature: communicating with stakeholders and the general public – Best practice examples for Natura 2000 (2004 – 72 pp. – ISBN 92-894-7898-5 – ISSN 1725-5619)

http://ec.europa.eu/environment/life/infoproducts/naturecommunicating_lowres_en.pdf

A cleaner, greener Europe – LIFE and the European Union waste policy (2004 – 28 pp. – ISBN 92-894-6018-0 – ISSN 1725-5619)

http://ec.europa.eu/environment/life/infoproducts/lifewaste_en.pdf

Alien species and nature conservation in the EU – The role of the LIFE program (2004 – 56 pp. – ISBN 92-894-6022-9 – ISSN 1725-5619)

http://ec.europa.eu/environment/life/infoproducts/alienspecies_en.pdf

Industrial pollution, European solutions: clean technologies – LIFE and the Directive on integrated pollution prevention and control (IPPC Directive) (2003 – 32 pp. – ISBN 92-894-6020-2 – ISSN 1725-5619)

http://ec.europa.eu/environment/life/infoproducts/cleantechnologies_en.pdf

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The financial instrument for the Environment (2002, 6 pp)

http://ec.europa.eu/environment/life/life/life_en.pdf

LIFE Environment in Action. 56 new success stories for Europe's environment (2001 – 131 pp. – ISBN 92-894-0272-5)

http://ec.europa.eu/environment/life/infoproducts/successstories2001_en.pdf

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

Type of intervention co-financing of actions in favour of the environment in the twenty-five Member States of the European Union, in the candidate countries who are associated to LIFE and in certain third countries bordering the Mediterranean and the Baltic Sea.

LIFE is made up of three thematic components: "LIFE-Nature", "LIFE-Environment" and "LIFE-Third Countries".

Objectives

- > with a view to sustainable development in the European Union, contribute to the drawing up, implementation and updating of Community policy and legislation in the area of the environment;
- > explore new solutions to environmental problems on a Community scale.

Beneficiaries any natural or legal person, provided that the projects financed meet the following general criteria:

- > they are of Community interest and make a significant contribution to the general objectives;
- > they are carried out by technically and financially sound participants;
- > they are feasible in terms of technical proposals, timetable, budget and value for money.

Types of project

- > Eligible for LIFE-Environment are innovative pilot and demonstration projects which bring environment-related and sustainable development considerations together in land management, which promote sustainable water and waste management or which minimise the environmental impact of economic activities, products and services. LIFE-Environment also finances preparatory projects aiming at the development or updating of Community environmental actions, instruments, legislation or policies.
- > Eligible for LIFE-Nature are nature conservation projects which contribute to maintaining or restoring natural habitats and/or populations of species in a favourable state of conservation within the meaning of the "Birds" (79/409/EEC) and "Habitats" (92/43/EEC) Community Directives and which contribute to the establishment of the European network of protected areas – NATURA 2000. LIFE-Nature also finances "co-op" projects aiming to develop the exchange of experiences between projects.
- > Eligible for LIFE-Third countries are projects which contribute to the establishment of capacities and administrative structures needed in the environmental sector and in the development of environmental policy and action programmes in some countries bordering the Mediterranean and the Baltic Sea.

Implementation National authorities in the Member States or third countries send the Commission the proposals of projects to be co-financed (for LIFE-Environment preparatory projects, the applicants send their proposals directly to the Commission). The Commission sets the date for sending the proposals annually. It monitors the projects financed and supports the dissemination of their results. Accompanying measures enable the projects to be monitored on the ground.

Period covered (LIFE III) 2000-2006.

Funds from the Community approximately EUR 638 million for 2000-2004 and EUR 317 million for 2005-2006.

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