European Commission

LIFE and new partnerships for nature conservation

LIFE *Nature*

Environment

EUROPEAN COMMISSION
ENVIRONMENT DIRECTORATE-GENERAL

LIFE (*"The Financial Instrument for the Environment and Climate Action"*) is a programme launched by the European Commission and coordinated by the Environment and Climate Action Directorates-General. The Commission has delegated the implementation of many components of the LIFE programme to the Executive Agency for Small and Medium-sized Enterprises (EASME).

The contents of the publication "LIFE and new partnerships for nature conservation" do not necessarily reflect the opinions of the institutions of the European Union.

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Luxembourg: Publications Office of the European Union, 2015

ISBN 978-92-79-54059-2
ISSN 2314-9329
doi:10.2779/193419

Foreword

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Partnership work is key to the successful implementation of EU nature and biodiversity policy, in particular the management of the Natura 2000 network. The ability of LIFE Nature and Biodiversity project beneficiaries to mobilise the support and goodwill of different stakeholder groups has enabled LIFE to achieve outstanding results over the past 23 years.

Without strong partnerships the Natura 2000 network of terrestrial and marine sites across the EU would be noticeably weaker. Such partnerships also strengthen the ability of EU Member States to achieve a favourable conservation status for the habitats and species listed in the annexes of the Birds and Habitats directives.

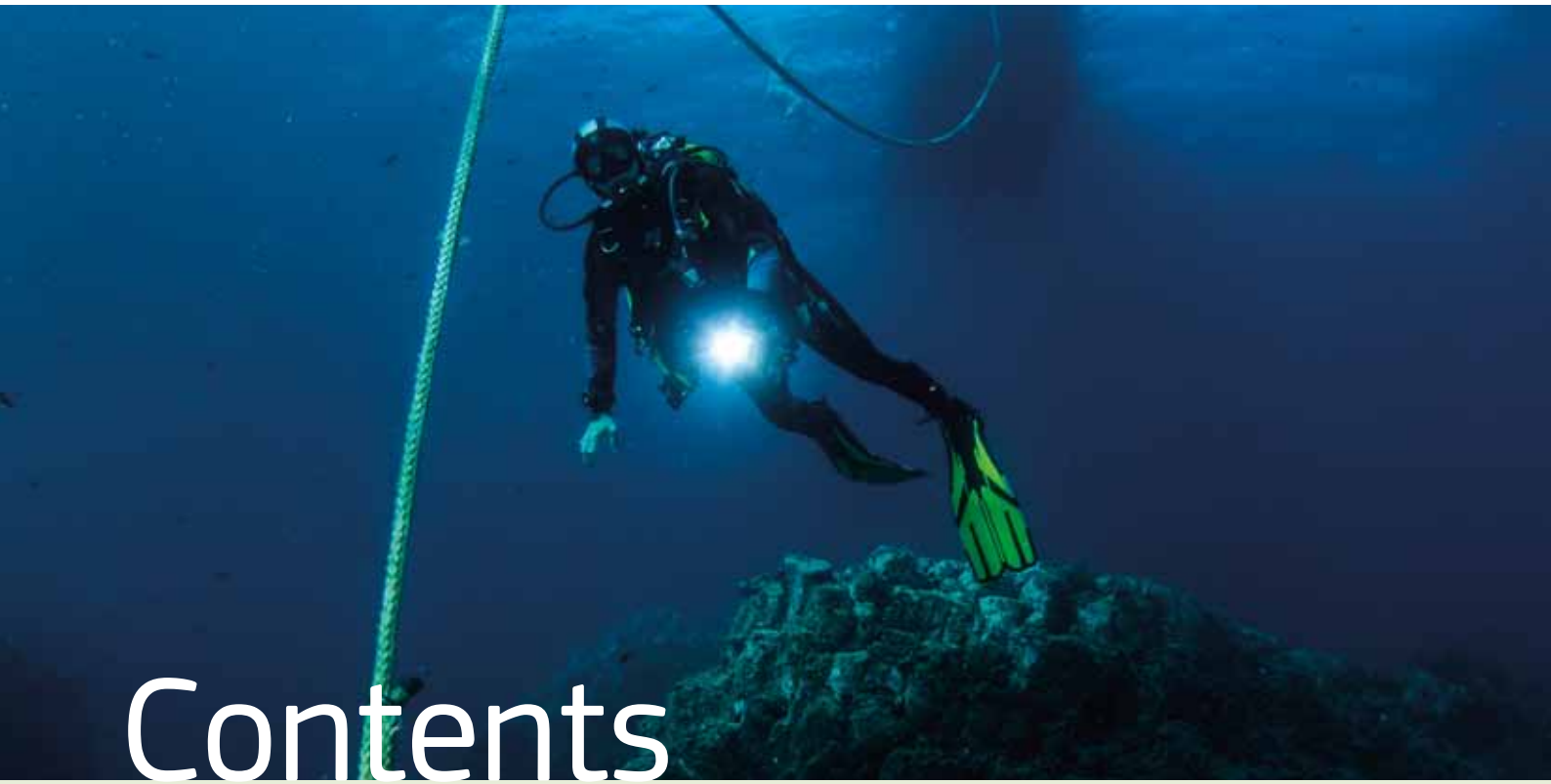
Effective conservation today means working with a variety of different stakeholder groups. It means going beyond traditional partnerships with those who make a living from the land or sea – farmers, fishermen, foresters etc. – and working with society as a whole.

This new LIFE Focus brochure gives a taste of the breadth of stakeholder groups atypical to nature conservation that LIFE projects have worked with up till now - partnerships with the military, with religious and cultural institutions, volunteer networks, research institutes, law enforcement officials, and enterprises of all types and sizes. It reveals the secrets of successful projects and highlights important lessons for building strong and durable stakeholder partnerships for managing EU biodiversity.

It also offers suggestions for innovative ways of collaborating with traditional LIFE project stakeholders; ways that demonstrate how new private initiatives can complement existing public funding mechanisms, be economically sustainable and create jobs. Land stewardship is one way of working with landowners and users to extend conservation practices beyond the boundaries of the Natura 2000 network. The pioneering LIFE project LANDLIFE has built a land stewardship network in order to stimulate the growth of a European movement for private land conservation.

LIFE can also draw on lessons from other parts of the world, especially the USA, to act as a pilot for new ways of incentivising private landowners to meet (and exceed) minimum conservation standards. As this brochure shows, the existing involvement in LIFE projects of private sector stakeholders – salt producers, mines and quarries, electricity companies, tour operators, railways and so on – is a clear indication that the programme can generate mutual benefits for business, biodiversity and local economies.

With additional mechanisms such as the Natural Capital Financing Facility (NCFF) now in place, the LIFE programme is uniquely positioned to build public-private partnerships that have a large impact on Europe's nature and biodiversity from a relatively small initial investment.



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INTRODUCTION

New partnerships for managing the Natura 2000 network

The Natura 2000 network is the centrepiece of EU nature and biodiversity policy. The involvement of all relevant stakeholders in its management is crucial to achieving a favourable conservation status for Europe's most precious habitats and species.

Photo: LIFE05 NAT/FIN/000104

Finnish soldiers erecting signs to limit access to the EU's largest area of boreal dunes as part of a LIFE Nature project

The aim of the Natura 2000 network is to protect vulnerable habitats and species across their natural range in Europe. EU Member States also have to ensure that they are restored to or maintained at a favourable conservation status. The Natura 2000 network covers almost one-fifth of the EU's land area as well as a significant part of its marine waters. Thus, the effective management and restoration of sites in the network is central to achieving the overall objectives of the Habitats and Birds directives. Member States are obliged to adopt conservation measures that correspond to the ecological requirements of the natural habitat types and species included in annexes of these directives. This may involve the introduction of appropriate management plans, amongst other measures.

Despite the existence of EU legislation on nature conservation, just 16% of Habitats Directive-listed habitats, 23% of listed species and 52% of bird species have a favourable conservation status, according to the latest report on the State of Nature in the EU .[1]

The European Commission is keen to stimulate innovative ways to conserve nature to further protect biodiversity and to help reach the objectives of the EU Biodiversity Strategy to 2020. These may involve working with different types of stakeholders from those typically involved in LIFE projects in the past, including from the private sector. New private initiatives are particularly important as a complement to existing public funding mechanisms in light of limited budgets in the wake of the financial and economic crisis (see pp. 8-10).

1 State of Nature in the EU (http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2015:219:FIN)

The EU Business and Biodiversity Platform

The European Commission launched the EU Business and Biodiversity (B@B) Platform to provide a mechanism for direct interaction between the Commission and private enterprises, from large multinationals to SMEs, to enable the delivery of objectives under the EU Biodiversity Strategy to 2020.

Phase 1 of the B@B Platform

The B@B Platform was launched in 2008 with the aim of facilitating and promoting actions by the business community in favour of biodiversity. The platform lasted for three years and covered six sectors: Agriculture, Forestry, Finance, Food Supply, the Non-energy Extractive Industry and Tourism. In this first phase, private sector participants gave input and feedback through workshops and questionnaires on several aspects of business and biodiversity.

Phase 1 of the platform was effective in reaching target audiences from the six sectors and in increasing awareness of the ways that business can support biodiversity. The B@B Platform also invested significantly in the benchmarking of best practice where the main challenge was the development of methodologies that accommodate the needs of all sectors. Some useful good practice examples concerning, in particular, the monitoring of biodiversity were also developed. Importantly, the first phase of the platform also encouraged the creation of national business and biodiversity platforms in several Member States.

Phase 2 of the EU B@B Platform

The second phase of the platform launched in 2014 takes a different approach to deliver sustained and strategic dialogue on the links between business and biodiversity. Phase 2 is open to all sectors and aims to engage businesses more actively in the three 'workstreams': 1) Accounting for Natural Capital; 2) Innovation for Biodiversity and Business; and 3) Access to Finance and Innovative Financing Mechanisms. The platform aims to deliver tangible results by working with businesses to develop tools and approaches that integrate biodiversity considerations into business practice. The B@B Platform is also helping to coordinate and raise awareness of innovative national and international initiatives, as well as showcasing business best practices at EU level.

It is important to remember that the Natura 2000 network is not a system of strict nature protected areas that systematically excludes all human activities. It adopts a different approach – the European Commission fully recognises that humankind is an integral part of nature and the two work best in partnership with one another. Indeed, many sites in the Natura 2000 network are valuable precisely because of the way they have been managed up to now – the machair habitat in Scotland and Slovenia's salt pans being two examples. Thus, rather than nature conservation being incompatible with human activities, in many areas protected habitats and species are dependent for their management and survival upon people making a living from the land.

The management of Natura 2000 sites is therefore best done by working closely with the landowners and stakeholder groups in or around individual Natura 2000 sites in order to agree on the most appropriate ways to conserve their species and habitats whilst respecting the local socio-economic and cultural context. Through the LIFE programme, the Commission actively encourages the exchange of experiences and good practices in the management of different types of Natura 2000 sites. This publication highlights innovative approaches to working with stakeholder groups, both typical and atypical.

Different types of stakeholder

Typical or 'classical' Natura 2000 stakeholders are drawn from professions directly involved in managing Natura 2000 network sites and whose activities influence the conservation status of habitats and species – the likes of farmers, fishermen and foresters. However, management of the network sometimes involves other, atypical stakeholders, whose activities either take place within the Natura 2000 network or on its borders. Many of these stakeholders are private enterprises.

Natura 2000 is at the core of Europe's Green Infrastructure, which aims to promote dynamic solutions to tackle diverse and often competing land management issues, keeping in mind the numerous services provided by healthy ecosystems. As such, there is a greater need for strengthened cooperation and engagement with the business sector, which ultimately depends on healthy ecosystems and environmental sustainability. In financial terms, the ecosystem services and benefits provided by the Natura 2000 network have been estimated at €200 billion-€300 billion per year.

The European Commission seeks to enhance co-operation between business and nature conservation sectors to develop win-win solutions benefiting biodiversity, and at the same time meeting economic needs. To this end, it has launched The European Business and Biodiversity (B@B) Platform, which provides an EU-level forum for sustained and strategic dialogue on the links between business and biodiversity (see box).[2]

The partnership forged by BirdLife International with cement company CEMEX and the Renewable Grids Initiative, representing energy grid operators, in which industry is committed to helping meet Europe's objectives to protect nature, are excellent examples of how business and biodiversity can benefit from each other. LIFE projects provide many good examples, showing how salt producers, power companies, tour operators and others can run profitable enterprises that positively contribute to meeting the EU's biodiversity goals (see pp. 51-73).

Photo: LIFE12 NAT/BG/000572

LIFE projects increasingly involve atypical partners, such as electricity companies

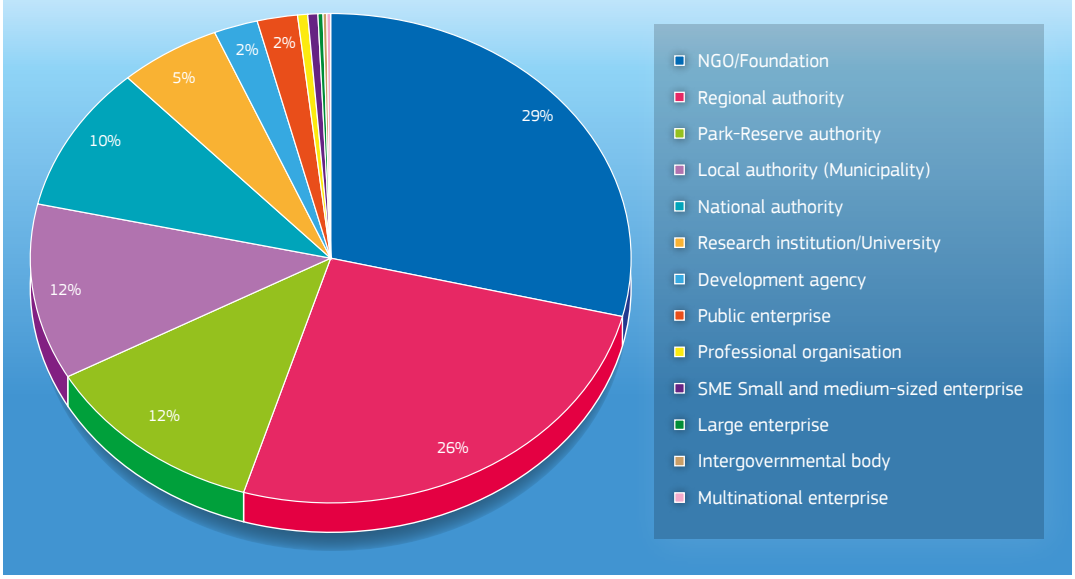
LIFE's diverse stakeholders

The LIFE programme is the EU's funding instrument for the environment and climate action. The general objective of LIFE is to contribute to the implementation, updating and development of EU environmental and climate policy and legislation by co-financing projects with European added value. Since 1992, LIFE has co-financed some 4 171 projects, contributing around €3.4 billion to the protection of the environment and climate. More particularly, the LIFE Nature and Biodiversity strand has co-financed more than 1 500 projects, mobilising €1.6 billion in favour of Europe's natural capital.

The LIFE programme helps translate EU Nature and Biodiversity policy into practice at the local level. For more than two decades it has been finding best practices and practical - sometimes innovative - solutions to local conservation problems, in particular in the Natura 2000 network.

2 http://ec.europa.eu/environment/biodiversity/business/index_en.htm

Figure 1: **Types of beneficiary of LIFE Nature and Biodiversity projects (1992-2013)**



Normally, the progress of these best practices is supported by establishing partnerships between the different groups of people concerned with and directly affected by Natura 2000 network sites, and by the particular project's target species and/or habitats.

More than half of all LIFE Nature and Biodiversity projects have been led by NGOs or regional authorities (see Figure 1).

These beneficiaries quite often establish partnerships with different stakeholders in order to fulfil the objectives of their projects. This has generated a wealth of practical experience and know-how regarding the most effective ways to work with stakeholders – both classical and atypical – in order to successfully manage Natura 2000 network sites and ensure a favourable conservation status for protected species and habitats.

The aim of this publication is to focus on LIFE projects that have developed partnerships with those atypical stakeholders (see Table 1), or that have pioneered innovative ways of working with the classical stakeholder groups.

The value of volunteering

The European Commission recognises the role that volunteers play in improving social cohesion and generating citizenship. In 2011, it produced a Communication on 'EU Policies and Volunteering: Recognising and Promoting Cross-border Voluntary Activities in the EU'. The Communication describes volunteering as, "a journey of solidarity and a way for individuals and associations to identify and address human, social or environmental needs and concerns."

In particular, the Communication emphasised that, "environmental volunteering plays a major role in protecting and improving the environment for present and future generations while at the same time increasing awareness of environmental issues and the likelihood of carrying out environmentally friendly practices."

Table 1 – Atypical LIFE stakeholder groups

Category	Stakeholders	Examples of LIFE project actions
Military	• Managers of military areas in Natura 2000 sites	• Restoration and recurrent activities of habitat and species conservation in Natura 2000 sites • Coordination of military activities and nature conservation requirements and restrictions
Civil society	• Religious and cultural heritage organisations as Natura 2000 landowners • Volunteers • Social innovation in the Natura 2000 network • Research (SMEs, research institutes and universities)	• Restoration and recurrent activities of habitat and species conservation in Natura 2000 sites • Raising Natura 2000 awareness • Working with socially-disadvantaged groups (prisoners, long-term unemployed, people with mental health conditions) • Applied research in conservation science • New technologies and citizen science for monitoring habitats and species
Law enforcement and governance	• Police departments responsible for environmental crimes • Judges and lawyers • Fire departments	• Enforcement, protection and raising awareness at Member State level of the Habitats and Birds directives • Support on prevention and enforcement of illegal persecution of species (Illegal hunting, poisoning, trafficking)
Business and private initiatives	• Tour operators • Energy utility companies • Extractive industries • Zoos and museums • Transport	• Development of business activities that rely on the Natura 2000 network – ecotourism (e.g. whale watching) • Renovation and management of the energy transport network (e.g. preventing bird deaths caused by collisions with power lines) • Restoration and recovery of habitats in extractive areas (quarries and mines) • Ex-situ conservation and raising awareness of Natura 2000 species • Reduction of impacts of transport activities and infrastructure on Natura 2000 sites

Nature conservation NGOs often mobilise their volunteer networks to give practical support (fieldwork) that contributes to the implementation of concrete conservation actions in the Natura 2000 network. Some LIFE project beneficiaries, such as the BirdLife partners (e.g. RSPB in the UK), are particularly dependent upon the work of volunteers in order to implement specific actions and pursue LIFE project objectives. Pressures on budgets and technological advances (e.g. smartphones) mean that the involvement of volunteers increasingly goes beyond traditional manual site clearance and restoration (e.g. eradicating invasive alien plant species; erecting fences) to encompass advocacy, education, corporate social responsibility and high-tech monitoring (citizen science – see pp. 24-30 and 41-44).

The Environmental Governance and Information (LIFE GIE) priority area defined in the Multiannual Work Programme[3] of the new LIFE Environment sub-programme 2014-2020 provides co-funding for sharing of best practice through projects aimed at developing and supporting the role of networks of volunteers with the aim of ensuring their long-term contribution to the active management of the Natura 2000 network.

Land management opportunities

The European Commission is keen to stimulate private land conservation to help protect biodiversity

3 LIFE multiannual work programme for 2014-2017 -(OJ L 116, 17/04/2014) http://ec.europa.eu/environment/life/about/index.htm#mawp

LIFE enables applied conservation science research

Many LIFE Nature and Biodiversity projects have established partnerships or ad hoc collaborations with research institutions. This has enabled applied research in nature conservation science in Natura 2000 network sites and/or on species listed in the annexes of the Birds and Habitats directives.

The requirement that LIFE projects monitor the impact of their actions, and the obligation for EU Member States to report on the conservation status of species and habitats, have generated a wealth of useful information. Scientists investigating this material have made important findings, ranging from better knowledge of species ecology, to the definition of new monitoring techniques to new methods and technologies for captive breeding and habitat restoration. Even though LIFE is not a research programme, and the LIFE regulation does not consider pure research eligible for funding, a number of LIFE Nature projects have generated data that have later been used in research work.

According to the LIFE project publications database[1] LIFE Nature and Biodiversity projects have resulted in more than 130 publications (theses, scientific papers in peer-reviewed publications, conference proceedings and scientific books).

1 http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=home.getDocs

Photo: LIFE09 NAT/SI/000378

further and reach the objectives of the EU Biodiversity Strategy to 2020. New private initiatives are particularly important as a complement to existing public funding mechanisms in light of limited budgets in the wake of the financial and economic crisis.

In October 2015, the LIFE external monitoring team (NEEMO) published a thematic report entitled *LIFE and Land Stewardship: Current status, challenges and opportunities*. In this report to the European Commission, the authors assess the contribution made by the LIFE programme in engaging private stakeholders in nature conservation. The comprehensive report also explores how LIFE projects could further contribute to land stewardship agreements throughout the EU.

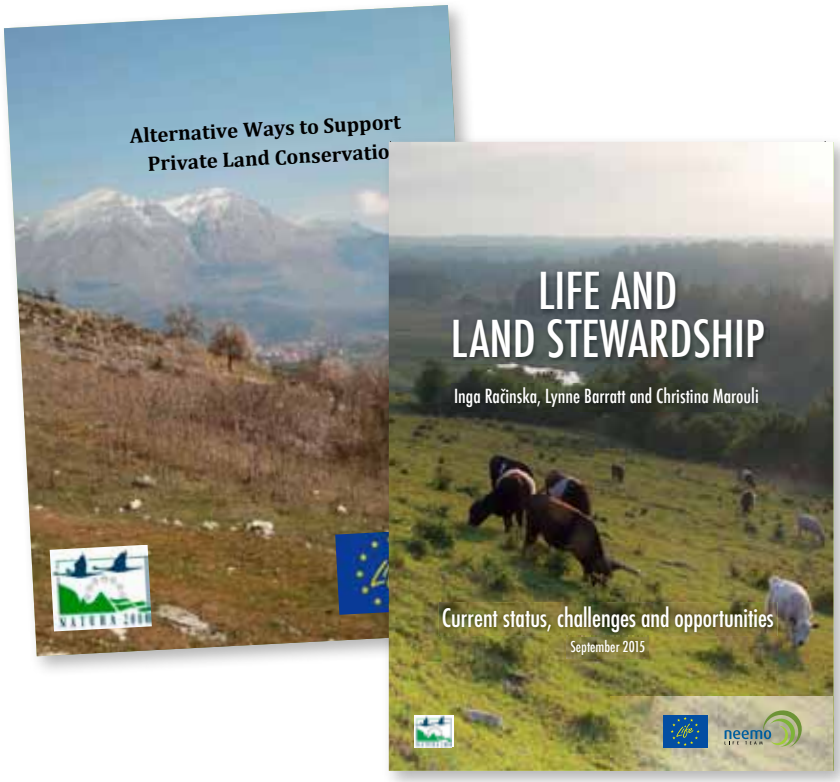
Land stewardship is defined as a strategy to involve landowners and land users (such as farmers, foresters, hunters, fishers and recreationalists) in the conservation of nature and landscape, with the support of a range of civil society groups. The implementation of voluntary agreements between these groups offers an important means of extending conservation practices beyond the boundaries of the Natura 2000 network and other conventionally-protected areas.

According to the report, land stewardship has great potential to be more widely used as a practical tool to implement policies and legal instruments for biodiversity conservation. The authors identify eight different land stewardship mechanisms that have been implemented in the EU. Management transfer and property transfer mechanisms have been used in 23 Member States. Management support mechanisms are also popular, with 20 Member States using them. By contrast, only seven EU countries have tested the use of tax incentives and tax benefits for engaging in voluntary land stewardship mechanisms, and these are not widely applied, indicating that there is scope for greater uptake.

The report notes that "land stewardship methods are being used by most of the LIFE Nature projects that deal with nature restoration and management." Some 63% of the LIFE projects featured in the thematic report have used management support agreements; 27% have used management transfer agreements. Areas where there is scope for further development include working closely with business entities (used by only 8% of the featured projects) and payments for ecosystem services (tested by just 2% of the projects).

Three projects have taken a strategic approach to land stewardship, including LANDLIFE (**LIFE10 INF/ES/000540**), which created a Land Stewardship Network and led to 133 new land stewardship agreements being signed in France and Italy, covering an area of more than 8 300 ha. "The European Commission can help these networks grow further and coalesce into a European movement for private land conservation by providing logistic, financial and technical support for their respective meetings and it could initiate the formation of a 'network of networks' for private land conservation," the report states.

The land stewardship report should be considered alongside another report commissioned by the LIFE programme, *Alternative Ways to Support Private Land Conservation* [4], written by Tilmann Disselhoff, which looks at various methods of private land conservation and incentives that can prompt landowners to surpass minimum conservation standards (see pp. 9-11).



4 http://ec.europa.eu/environment/life/publications/lifepublications/generalpublications/documents/support_land_conservation.pdf

INTRODUCTION

Boosting nature conservation by private landowners

A report commissioned by the LIFE programme highlights alternative ways to support private land conservation. These can complement the existing legal obligations of public authorities.

Private land conservation is voluntary activity carried out by individuals, communities, corporations or NGOs in order to protect a piece of land – its habitats and species – or to restore it to its former condition. It is thus the opposite of mandatory land conservation by public authorities.

At EU Green Week in June 2015, the LIFE programme launched a new report, *Alternative Ways to Support Private Land Conservation*, written by Tilmann Disselhoff, a LIFE Nature project evaluator who specialises in conservation financing and private land conservation.

His study argues that private land conservation approaches have several advantages over regulatory approaches: "They are better suited to solve questions pertaining to property and use rights. They are more cooperative in nature and can solve, if not avoid, conflicts of interests. They can tap into the huge but hitherto largely ignored pool of private landowners who are willing to conserve their land beyond what they are legally obliged to do. They can offer solutions to landowners who have refrained from proactive conservation measures on their land because they fear the regulatory consequences that an improved conservation status of habitats and species on their land may trigger."

Additionally, private land conservation approaches provide incentives to go beyond minimum conservation standards. The study addressed these incentives – financial, social and ethical – before assessing some case studies and drawing comparisons between the EU and the US.

Innovative private land conservation measures can support existing agri-environmental funding for nature conservation

Photo: LIFE12 NAT/BG/000572/Yavor Iliev

Private land conservation instruments in the EU, however, vary greatly. The most advanced tools are agri-environmental funding programmes under the Rural Development Policy and the use of certification and labelling schemes. But in many Member States, land conservation has been considered a "public duty rather than an opportunity for private initiatives", the report finds, and alternative private initiatives are still in their infancy.

Nevertheless, studies have shown that the private sector is willing to pay for biodiversity conservation and that this 'resource' cannot be fully tapped into through regulation. The report, however, emphasises that private investment is often driven by local interests, creating a risk that the outcomes are haphazard. It concludes therefore that private conservation should be considered as complementary to the regulatory approach and not a replacement.

Policy support

Notwithstanding these limitations, evidence shows that private land conservation schemes may have a significant impact, at a lesser financial cost and with an increased acceptance from the private owners/managers involved in these mechanisms. The easement contract mechanism largely used in countries such as the USA and Canada clearly shows these vehicles may have a great potential to help reach ambitious goals such as that of protecting EU biodiversity.

The tools for supporting private land conservation, such as tax and property legislation, mostly operate on a national level. Whilst Member States' reforms can be supported by the EU, each country has its "unique history of land conservation", the report finds. "As a result, local conditions vary in terms of the social, cultural and political environment for private land conservation."

Such differences cannot be resolved at an EU level, but knowledge sharing and capacity building can level out discrepancies. The report argues that private land conservation can be supported by ensuring that regional stakeholders learn from examples of good practice in other areas. It also suggests developing common definitions of terms and guidelines on reconciling private approaches with the requirements of the Habitats Directive.

Another area where the EU can provide assistance is in the creation of a culture of private land conservation. The report argues that individual private actors must consider themselves "part of a movement" and that they need to have an understanding of "common goals and the awareness that others fight for the same ideals and experience the same challenges."

The US land trust movement is particularly instructive. It started with the formation of the Land Trust Alliance, a national umbrella organisation connecting local/regional initiatives and giving them a voice in the political arena. A uniting target was permanent tax exemptions for donations for conservation. The report recommends that Europe learn from the success of its "non-confrontational, bipartisan, solution-oriented" approach.

Similar networking initiatives are also being developed in the EU at a regional, national and Community level – for example the Land Stewardship Network that came out of the LIFE project 'LANDLIFE' (**LIFE10 INF/ES/000540**). The development of enabling legislation for private land conservation is a competence of the Member States. However, as the report notes, "a more in-depth legal comparison of the national laws relevant for private land conservation would be necessary as a basis for any meaningful proposal for legal reform." Thus, as well as supporting the development of new networks, the EU could also help private land conservation groups lobby on a national level by "showcasing successful examples of conservation law and legal guidelines"..

The idea of using property legislation to further conservation is gaining traction in the EU. Indeed, the report concludes: "The legal initiatives for conservation

The EU can help create a culture of private land conservation

Illustration: LIFE10 INF/ES/000540/Elisenda Adell

easements in England and France, which both refer to the US as role model, show that there is rising pressure to reform property law for private land conservation."

Finally, the report addresses the issue of economic incentives. Whilst landowners might not be financially motivated, it acknowledges that the costs for them should not be prohibitive. "Public policy thus needs to create an environment in which private landowners feel that they benefit from land conservation or at least do not suffer a disproportionate burden."

Tax is one way to offset financial cost – though tax incentives do not have to completely compensate the economic loss associated with conservation. In this way, the report argues, "governments can thus 'buy' land conservation for below-market costs by making use of the mixed motivations of private landowners." The challenge for policy-makers is therefore to create the right level of incentives.

Public debate

The report was launched with a debate at Green Week, moderated by Angelo Salsi, Head of the LIFE and CIP Eco-innovation Unit in the Executive Agency for Small and Medium-sized Enterprises (EASME). Mr Salsi noted that around 50% of the Natura 2000 network is in the hands of private landowners and that some 30% of the LIFE budget since 1992 has been invested in buying land for conservation purposes, a level of public spending that may not be sustainable in the long term, making it necessary to find ways to engage private landowners more in conservation efforts.

Vesna Valant, Adviser in DG Environment's Directorate for Natural Capital, noted the importance of tax relief to ensure the correct working of the mechanisms covered in Mr Disselhoff's report - privately protected areas (PPAs), safe harbour agreements (SHAs), the right of first refusal, conservation easements and conservation leases.

Conservation easements are the most common tool in the USA, due to enabling legislation and a favourable fiscal framework (including tax relief). By contrast, in the EU instruments such as those listed above are still in their infancy. "They are limited to just a few Member States or a few pilot projects," according to Ms Valant. Whilst tax and property law comes within the competence of national governments rather than the EU, she said the latter could provide support to create "a culture of private land conservation within Member States." Ms Valant recommended looking at key ingredients of successful models from around the world and trying to replicate some of these.

Photo: EU/Patrick Mascart

LIFE held a debate on Alternative Ways to Support Private Land Conservation at Green Week in June 2015

The view from the USA

James Levitt of the Lincoln Institute of Land Policy and Harvard University gave an overview of private land protection in the USA, which now accounts for more than 20 million ha. He believes that one of the keys to the movement's success is that "it's viral, it's contagious; it spreads the will to be a conservationist." Another is the fact that it is voluntary and economically efficient. "It's much less expensive for a government or a land trust to buy an easement on a property than it is to buy the title to the property," he says.

Private land conservation is a growing phenomenon. Mr Levitt estimates it is present in over 100 nations, in a variety of forms. "This is truly a global movement," he said, emerging around the world "at a similar time when we're faced with similar global challenges." Mr Levitt concluded that whilst this innovative approach may not be for everyone, "for those people who want to act as conservationists, it's a very attractive option."

The landowners' view

Thierry de l'Escaille, CEO of the European Landowners Organisation (ELO) found the US example of conservation easements to be very interesting "because it shows that cooperation between different sectors is possible." The ELO chief concluded, "We strongly believe this instrument of private conservation is a way to do better [...] and do it cheaper."

MILITARY STAKEHOLDERS

Military cooperation vital for nature conservation efforts

More than 40 LIFE projects have worked with armed forces across the EU to achieve nature conservation goals. These collaborative efforts have benefits for both sides.

Photo: LIFE05 NAT/B/000088

The Belgian military's involvement in the NATURA2MIL project even extended to pedagogical activities

Military-owned land is hugely important for conservation of the Natura 2000 network, not least owing to the sheer scale of the areas used for training manoeuvres or for shooting practice. The ministry of defence, for example, is one of the largest landowners in France controlling more than 250 000 ha, whilst the Italian army controls an area four times the size of the Abruzzo National Park. For species with a large range, such tranches of almost undisturbed land can be vital for their survival.

Though not all military-owned land is of interest for nature conservation, many military areas consist of natural and semi-natural habitats listed in the Annexes of the Habitats Directive that are essential for conserving Europe's biodiversity. Around airfields and munitions depots, biodiversity-rich areas can often be found. The question is thus posed: how can they be best conserved? LIFE projects have been particularly successful in developing partnerships with a range of landowners, including the military. In fact, more than 40 LIFE projects to date have forged close links with military personnel in order to advance nature conservation objectives.

A recent study by the CEN Aquitaine et Provence-Alpes-Côte-d'Azur emphasised the importance of military areas in France for the conservation of biodiversity. Though around 20% of military land is part of the Natura 2000 network of protected sites, bringing together the military and conservationists remains the focus. The two groups come from

"different worlds", says Perrine Paris-Sidibe, project manager of Life Défense Nature 2 MIL (**LIFE11 NAT/FR/000734**). "Our first and main challenge was to make people know each other and to build mutual trust. From the beginning we tried to find common interests and develop winner-winner actions to make sure our partnership was beneficial for both of us."

The project was launched to build the capacity of the armed forces to carry out long-term nature conservation – habitat restoration for bat, gull and raptor species – in the south-east of the country. Training military personnel in this task is key. This includes onsite training and official training for ministry of defence civil servants. "To ensure a continuation of the project, we are also working to secure funding after the end of the LIFE project," she adds.

The project team is also working closely with the National Federation of Natural Areas Conservatory and the defence and environment ministries to modify biodiversity legislation. It is confident that the management of unused military areas will be transferred to specialist NGOs. In fact, the project beneficiary would like to see the ownership of such land also transferred. "Efforts are actually being made to study the legislative implications of such a transfer. What happened in Germany is very interesting for us. In 2014, an NGO succeeded in getting the transfer of 150 000 ha of ministry of defence property," says Ms Paris-Sidibe.

But for many military areas, sustainable management simply entails striking the right balance between the needs of the military and conservation requirements. Such a scenario was true for the Salisbury Plain LIFE project (**LIFE00 NAT/UK/007071**), which helped restore chalk grassland habitats across the plain, a renowned training ground for British soldiers for more than a hundred years. This large expanse of land – increased in area to 39 000 ha during World War II – is rare in the UK as the majority of similar areas are now intensively farmed.

Military exercises, however, have required in the past the planting of trees that are not compatible with conservation goals. But modern warfare has changed training demands, and it was possible to remove these trees – though the long-term outlook is uncertain as demands could change again. Nevertheless, the project actions have been maintained and even extended following the end of the project. Relationships with stakeholders including the military are ongoing and demonstrate the commitment to the grassland conservation forged during the project. This informal stakeholder network helps to provide management guidance and technical advice as well as the monitoring vital for carrying out a coherent approach to landscape management.

Towards common goals

For one Polish LIFE project – LIFE MILITARY HABITATS PL (**LIFE12 NAT/PL/000031**) – securing the involvement of the armed forces was not an issue. This nature conservation project, which is targeting sandy habitats in the Pustynia Błędówska Natura 2000 site (a former military area of the Błędów Desert) in southern Poland, was implemented by the regional authority managing the land on behalf of the Polish ministry of defence.

Cooperation with the military is working "very smoothly", says Edyta Mazur, project manager. "Together we take care of the proper implementation of the project, and after its completion, together with the units which train in this area, we will maintain the environmental impact of the project," she adds.

The project is planning to produce guidelines on nature conservation in military areas, including examples of best practices and analysis of ways to minimise the impact of military activities on natural areas.

Noticeboard erected by Life Défense Nature 2 MIL. The project is building the capacity of the French armed forces to carry out long-term nature conservation

Photo: LIFE11 NAT/FR/000134

But such cooperation between conservationists and the military is not always easy to achieve, explains Katarina Klimová, the project manager of the Zahorie Sands project in Slovakia (**LIFE06 NAT/SK/000115**). Although the project coordinator, the Military Technical and Testing Institute (VTSU) Zahorie, already had some experience of working with the national nature conservation agency, which became a project partner, conservation of military training areas was still quite new to Slovakia. To address this issue, the project organised "several study tours and many meetings, and gave project presentations to explain its importance and secure cooperation," emphasises Ms Klimová.

The Zahorie Sands project focused specifically on restoring the most valuable remaining Pannonic inland sand dunes and dry heaths in the Zahorie military site. "All practical management activities were conducted in close cooperation with employees of VTSU Zahorie, and cooperation in the region still continues on some level. We are also hoping to continue the aims of the project and are currently preparing a new project proposal," she adds.

Moving artillery practice and military exercises away from the most sensitive areas is a common conservation goal and one of the main successes of the project, Vattajan dyyni LIFE (**LIFE05 NAT/FIN/000104**). The Vattajan Natura 2000 site in Finland is home to over one-third of Europe's grey dunes and is the largest boreal dune area in the EU. The project, which was set up to restore these habitats, worked closely with the military to raise awareness of conservation needs among personnel. In fact, military personnel reported that combining training activities with nature conservation was more that just a case of deciding 'where to park the tank'. The military erected signs and poles to limit access to the dunes and to standardise military actions.

Furthermore, new guidelines were incorporated into the code of conduct of the defence forces and a general management plan was officially approved. This plan will govern future use of the area. Moreover, defence forces, the local community and the natural heritage agency Metsähallitus, the project beneficiary, are continuing to work together after the project to ensure that its outcomes are maintained.

Benefits for habitats

In some cases, military activities actually support the conservation of certain habitats, for example those found in the Adazi Natura 2000 site in Latvia. Use of the land by the military since the 1930s has shaped its characteristics, but with a decline in its use, open habitats, most notably dry sand heaths with heather (*Calluna*) and crowberry (*Empetrum nigrum*), have become overgrown. This has had a detrimental impact on the black grouse (*Tetrao tetrix*), European nightjar (*Caprimulgus europaeus*), European roller

Projects such as Vattajan dyyni LIFE have directly involved soldiers in habitat restoration

Photo: LIFE05 NAT/FIN/000104

Photo: LIFE09 NAT/PT/000041

Two soldiers were deployed to the LIFE Ilhéus do Porto Sant project to help remove invasive alien plants from the Madeira archipelago

(*Coracias garrulus*), woodlark (*Lullula arborea*), tawny pipit (*Anthus campestris*) and other bird species that forage, mate and nest there. The formation of scrubland and tree cover on these habitats has little conservation value.

In response to this problem, two LIFE projects have been launched on the site: ADAZI (**LIFE06 NAT/LV/000110**) and the ongoing LIFE Birds in Adazi (**LIFE12 NAT/LV/000509**). The Adazi military training area extends over more than 7 700 ha making it the largest training area in Latvia and in the Baltic states as a whole. Most of this area is a Natura 2000 site (6 126 ha).

The first project drew up a management plan for the site that takes account of nature conservation and military priorities. The plan is now being used to establish zones for different land uses and is being implemented in part by the military. The capacity of military personnel to carry out this task is being increased by training sessions and events – the training programme created by the project is being used in infantry schools and at the National Defence Academy – as well as by the presence of onsite signage to educate soldiers in the field.

Cooperation with the military was also essential for the clearing of unexploded ammunition from the site. Five years after the first project's completion (2014) around 1 600 ha had been cleared. Furthermore, in order to prevent further degradation of the lakes on the site, it was necessary to agree on restrictions of military use.

LIFE Birds in Adazi is building on the cooperation established in the first project and promoting cooperation and international networking with managers of other military Natura 2000 sites and institutions that are focusing on similar species and habitats. Furthermore, military personnel are being encouraged to take part in visitor days that are being organised as part of the project.

Military "combatting" IAS

In the Madeira archipelago, a LIFE project has enlisted the support of the Portuguese army to help control and eradicate invasive alien species (IAS) on islets near Porto Santo island. The LIFE Ilhéus do Porto Sant project (**LIFE09 NAT/PT/000041**) led by the Serviço do Parque Natural da Madeira, the body responsible for managing Madeira's national parks,

made use of a protocol established by the regional environment ministry and the Portuguese army. "The collaboration between the Secretaria Regional do Ambiente e Recursos Naturais and the Portuguese Army in Madeira dates back to the 1990s and was formalised in 2004," explains project manager, Filipe Alves. Under its terms, each month eight military personnel are deployed to the regional environment ministry to assist it in its work. Two soldiers were deployed to the LIFE project team to help mechanically-remove seed-producing invasive alien plants - mostly specimens of American aloe (*Agave Americana*) and tree tobacco (*Nicotiana glauca*) - on Ilhéu de Cima islet.

"These actions are outside the scope of the LIFE project, but support our goals," says Mr Alves. "They are also in line with the Portuguese army's objective during peace time of providing free services to improve quality of life," he adds.

The beneficiary is now monitoring the area cleared by the army to be able to rapidly remove any re-sprouting plants upon detection.

Working with the military in Belgium

Two Belgian projects have required the cooperation of the military to meet their objectives: MILITAIRE GEBIEDEN (**LIFE03 NAT/B/000024**) and NATURA2MIL (**LIFE05 NAT/B/000088**).

The former targeted 12 military bases in Flanders, covering some 4 000 ha in total. The project built on existing co-operation between the military and conservation managers in order to ensure the long-term continuation of the project aims. A major challenge for the team initially was to find a "common language and understanding of each other's objectives and priorities," says Els Martens, the project manager.

To this end, the project ran training sessions on the EU nature directives, Natura 2000 site management measures and environmental actions for new recruits. "Training and awareness actions certainly had their impact and materials [information stands, slides and films] are still being used," says Ms Martens. Although personnel and budget cuts in recent years have made these training actions less intensive, "the awareness of the importance of natural values and the Natura 2000 regulation is still on the agenda of the overall policy of the ministry of defence," she says.

Photo: LIFE05 NAT/B/000088

The NATURA2MIL project targeted Nardus grassland and heath habitats in three large military training grounds in Wallonia: Marche en Famenne, Lagland and Elsenborn. This work was facilitated by the establishment in 1999 of a management body that brings together the managers of military camps and those from the department of nature and forests. "At most camps, there was already a good collaboration among the military, local naturalists and the department," explains Grégory Motte of the project beneficiary, Departement de l'Etude du Milieu Naturel et Agricole.

The LIFE restoration measures took into account the needs of the armed forces, with a military representative even acting as deputy coordinator of the project. The challenge for this project, however, was to convince the military that its restoration techniques were effective – namely, controlled burning of the grasslands and the installation of fences to allow grazing by sheep.

As part of the project, studies were carried out to assess the feasibility of resuming the hunting of wild boar at the military bases. Hunting is tightly managed and each year a quota is set according to the number of animals recorded at the bases – the military is involved in this process. Hunters can be fined for exceeding the quota.

MILITARY STAKEHOLDERS

Developing management plans for Hungarian military land

A series of LIFE projects from Hungary provides a strong example of the mutual benefits of partnership working between conservationists and the military.

Some 70% of the land managed by the Hungarian Ministry of Defence (MoD) is within areas designated as part of the Natura 2000 network. The LIFE programme has helped establish partnerships that allow the military to go about its business whilst meeting legal obligations to protect habitats and species on its land.

"We started our involvement with the LIFE programme in 2004," explains Rita Gyovai-Balogh of the MoD, a former officer in the Hungarian army who was assigned to manage the MoD's involvement in the HUNVIPURS project (**LIFE04 NAT/HU/000116**). Led by the NGO MME BirdLife Hungary, in partnership with the national parks, DINPI and KNPI, the aim of HUNVIPURS was to create the conditions to save Europe's most endangered snake, the Hungarian meadow viper (*Vipera ursinii rakosiensis*), from extinction. In Hungary, the species is confined to two small and isolated populations: at Hanság in northwest Hungary and Kiskunság in the plains between the Danube and Tisza rivers.

As part of the project, the MoD asked MME and other project partners to help develop and oversee a management plan for its main training area, a 42 km^2 site that is part of the Natura 2000 network.

A second management plan

With the experience gained from its involvement in this first LIFE project, the Hungarian MoD took on the role of project beneficiary for a second project, working in partnership with a number of nature conservation organisations. The Eastern Bakony project (**LIFE07 NAT/H/000321**) targeted the restoration of EU priority habitats (Sub-Pannonic steppic grasslands, Pannonian woods, Medio-European calcareous screes) and priority species (*Serratula lycopifolia* and *Falco cherrug*) in the Eastern Bakony military area.

Photo: Bálint Halpern

Thanks to LIFE, military exercises in Hungary are carried out in accordance with nature conservation objectives

Working with environmental and forestry experts, military personnel developed a management plan for the area to control the threats to its biodiversity posed by natural processes and military activities.

Though the site is not accessible to the public and, like much military land, relatively undisturbed, the harmful effects of past and ongoing military activities meant that habitat restoration work was necessary, explains Ms Gyovai-Balogh, who was Eastern Bakony project manager. The work was mostly undertaken to combat "biological succession and the natural degradation of priority habitats and to preserve priority species of the area," she explains.

These conservation actions were carried out by forest managers under the supervision of the national park directorate, but the technical planning and inspections, and the preparation of the after-LIFE conservation plan was the responsibility of the military. The partners met frequently "to discuss all the issues before or during the implementation of certain tasks," says Ms Gyovai-Balogh. "In order to sustain

the results of the conservation actions the military personnel of the two project sites were given training focusing on nature protection issues. Field guides and field cards (both in Hungarian and English) also support the military troops."

A particular challenge to the project actions was posed by the coordination of shooting practice; it was not possible to carry out conservation work around the firing range during such training. However, thanks to the good cooperation fostered by the project team, forestry workers and park personnel were made aware of the dates of target practice well in advance.

Awareness in the field

According to Ms Gyovai-Balogh, "the attitude of military personnel to nature and nature protection/conservation has positively changed. As the result of the training, soldiers and officers gained a deeper knowledge of protected and priority species and habitats and their importance, and they have thus strived to reduce the size of their carbon and ecological footprints. As a result, natural values are protected by the military and populations of protected species (both animals and plants) are increasing."

Ms Gyovai-Balogh is now leading another project that is engaging Hungary's armed forces in nature conservation. The aim of the Hungarian Little Plain project (**LIFE08 NAT/H/000289**) has been to restore and conserve priority-listed Pannonic sand habitats and populations of valuable species at the military practice ranges at Gönyü, a Natura 2000 network site. As well as safeguarding the area's biodiversity, the project has sought to find a balance between ongoing military activities and nature conservation needs. To do this it has taken a similar approach to the Eastern Bakony project, including encouraging cooperation amongst the National Park directors, environmental experts and military personnel.

"The added value of the MoD being a project beneficiary is that LIFE enormously boosts the budget we have allocated for managing the Natura 2000 sites we own," says Ms Gyovai-Balogh.

The 2007 and 2008 LIFE projects also produced field cards for military personnel, "including a detailed map of the project area showing military training locations and the protected areas together with the protected species and habitats. The cards were designed to fit the military uniform," Ms Gyovai-Balogh explains.

Both these projects helped define a methodology for manoeuvres in the armed forces' Natura 2000 sites that includes defined "no fire protection zones". This approach has since been applied in other MoD military training areas as well.

A particular obstacle for the Hungarian Little Plain project was the discovery of 18 illegal waste dumps and underground bunkers in the project area. The waste, which may have originated from the Soviet army's use of the area, had a significant width of plant cover (trees and herbaceous species) making it difficult to detect. Before any conservation actions could take place, it was necessary to treat and safely dispose of the waste material and demolish the bunkers. These unusual challenges, particular to conservation work on military land, underline the importance of good cooperation between the armed forces and conservation organisations.

Nature meets NATO

In September 2015, a NATO military exercise dubbed 'Brave Warrior' involving 1 800 troops from six countries took place in the areas targeted by the HUNVI-PURS and Eastern Bakony projects. The exercise was planned in accordance with the restrictions and management plans implemented during the LIFE projects. NATO has an internal regulation on environmental protection that takes into account legal requirements around management of Natura 2000 network sites. Prior to the exercise all participating military personnel were briefed on the work of the project and areas to avoid. They were also equipped with the field cards developed by the LIFE projects, demonstrating the "wide visibility of the project" amongst this key stakeholder group, says Ms Gyovai-Balogh.

Two Hungarian LIFE projects produced field cards to help military personnel avoid sensitive habitats and species during manoeuvres in the Natura 2000 network site

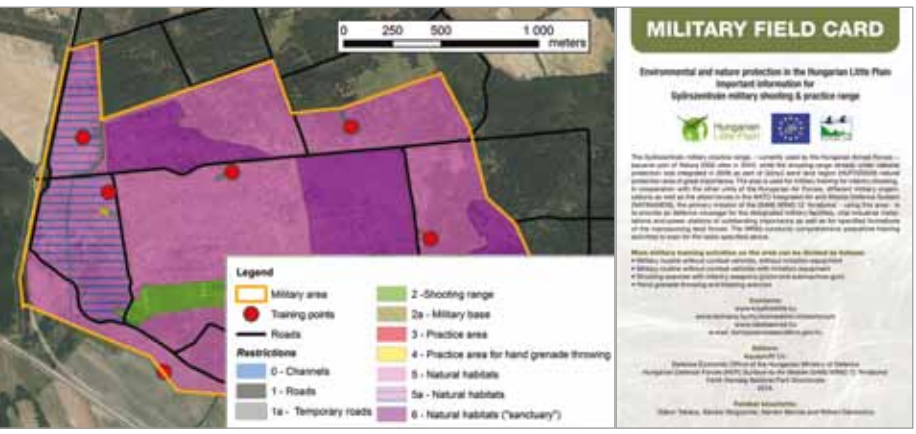


Photo: LIFE08 NAT/H/000289

RELIGIOUS AND CULTURAL HERITAGE

Conservation on hallowed ground

Churches, monasteries and religious communities are responsible for significant amounts of property and land within Natura 2000 network sites. The support of these stakeholders has been essential to the success of a number of LIFE projects.

The Quirópteros Extremadura project (**LIFE04 NAT/ES/000043**) was led by the regional authority for nature conservation, which successfully implemented a number of measures to improve the conservation status of priority bat populations in 23 Natura 2000 sites across Extremadura.

Many project activities centred on the Monastery of Yuste, which was originally founded by the Hieronymite Order of monks in 1402. The monastery is in a Natura 2000 network site and houses "a number of important bat colonies," says Maria Jesus Palacios Gonzales from the regional authority. At the start of the project the monastery was inhabited by six Franciscan monks who carried out no renovation work on the buildings, enabling the bats to live there in peace.

However, when the monastery was awarded the European Heritage label in 2006, the Patrimonio Nacional, which manages cultural heritage sites in Spain, decided to invest in the infrastructure of the building to make it more attractive to tourists.

"This led to a delicate situation," Ms Palacios explains. "The renovation work planned by the organisation did not include any conservation actions for the bat. A lack of understanding between the two institutions would have effectively damaged the colonies," she continues.

Help, however, came in a surprising form: Queen Sofía of Spain was told about the LIFE project and bat colonies whilst visiting the monastery and

The Monastery of Yuste, an important part of Spain's cultural heritage and home to protected bat colonies

Photo: albTotxo/CC BY-NC-SA 2.0

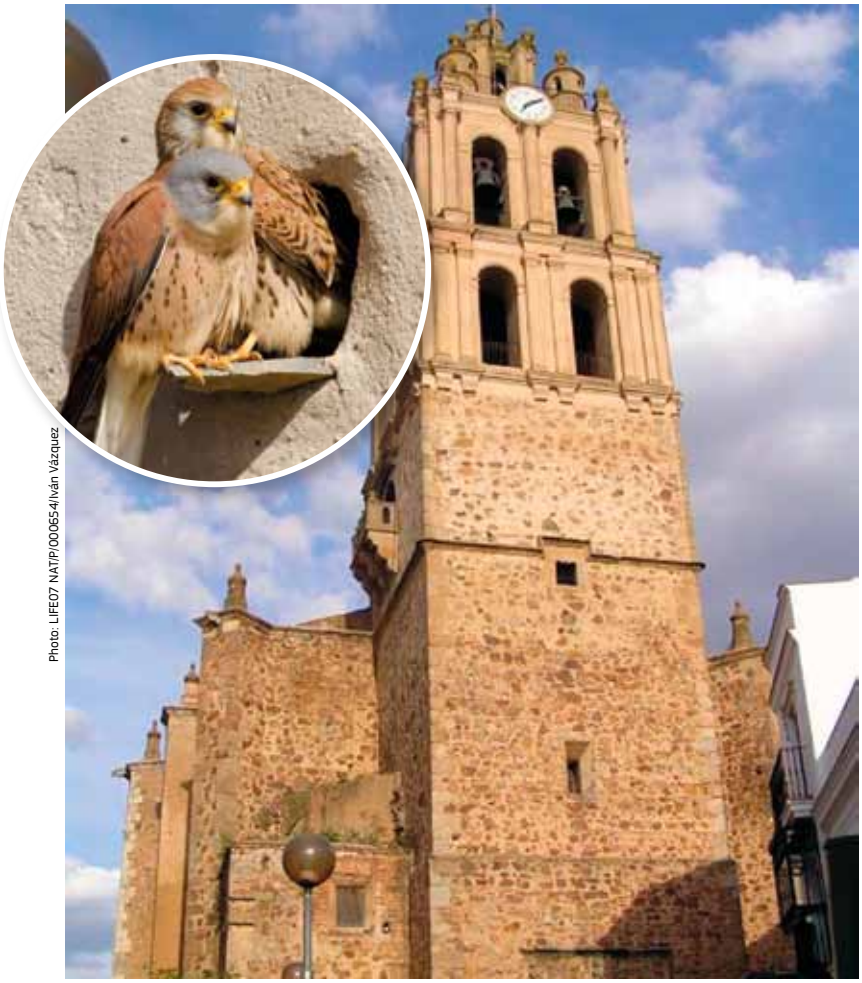


Photo: LIFE07 NAT/P/000654/Iván Vázquez

Photo: Roberto Sueiras Revuelta/CC BY-SA 3.0

A partnership between a conservation NGO and the Church Ntra Sra. de la Purificación in Almendralejo has significantly increased the size of its lesser kestrel colony, the world's largest

instantly showed an interest in the matter. According to Ms Palacios, the Queen requested that the restoration work should respect the colonies at all times and that the Patrimonio Nacional should support the project implementation as much as possible.

The first comprehensive survey of Extremaduran bats was carried out during the project as well as a variety of conservation activities to protect the mammals and a comprehensive awareness-raising campaign. The project made significant progress in the conservation of and knowledge about the species observed. Major outcomes from the project were the approval of a nationwide conservation plan for endangered bat species and the development of excellent partnerships with the Patrimonio Nacional and the Spanish Royal Family.

The Queen's support gave the impetus for the allocation of certain buildings to the project and its bats, the construction of alternative refuges and a great cooperation and understanding between the regional authority and the heritage organisation. "As a result of the project, the two bodies have developed an excellent relationship," says Ms Palacios, who adds that the stakeholder approach applied is a great example for other projects seeking to balance the needs of species conservation with human settlements.

Finally, the project also helped the authority to build up a good rapport with the royal family. "Since collaboration on this project Queen Sofia has supported other environmental initiatives that we have worked on, such as attending the birth of three baby lynx as part of the LIFE Iberlince project (**LIFE10 NAT/ES/000570**)," says Ms Palacios.

Protecting lesser kestrels in churches

Also in Extremadura, a longstanding partnership between a nature conservation NGO and a church has been highly successful in conserving cultural and natural heritage in order to protect the lesser kestrel.

In 1995, representatives of the Spanish nature conservation NGO Defensa y Estudio del Medio Ambiente (DEMA) met with Rafael Corraliza, priest of the Church Ntra Sra. de la Purificación in Almendralejo. The aim of the meeting was to discuss ways to conserve the lesser kestrel (*Falco naumanni*), a protected bird of prey which likes to nest in the roofs of churches. The meeting also addressed the issue of holes in the roof of the church caused by nesting kestrels.

"Both parties wanted to demonstrate how nature conservation and cultural preservation can be compatible," notes Pepe Antolín, DEMA's Conservation Project Manager. The church agreed to the installation of artificial nests, which by 1997, had resulted in an increase in the size of the lesser kestrel colony from 20 to 85 pairs. The project also took action to inform and educate various stakeholders living

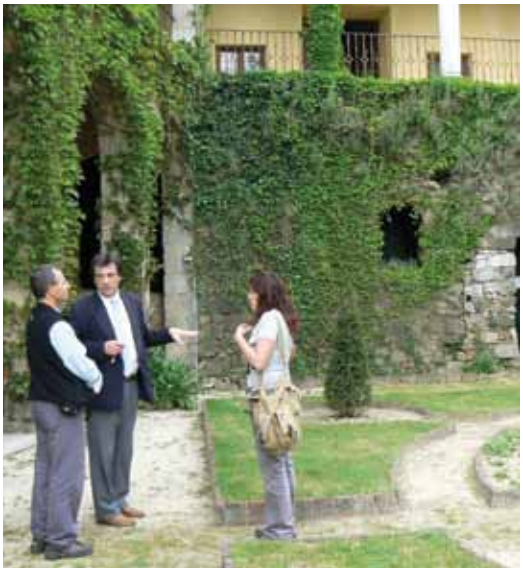


Photo: LIFE04 NAT/ES/000043/NEEMO EEIG/Alva Sopeña

in the town and to obtain their support for the kestrel. DEMA and Mr Corraliza later worked together to draw up a proposal to make the church the first urban Special Protection Area for birds, which was approved in 2003.

With the church now part of the Natura 2000 network, DEMA became a partner of the French-led LIFE project TRANSFERT (**LIFE05 NAT/F/000134**). This enabled it to install around 100 artificial nests under the roof of the church in Almendralejo, contributing to efforts to improve the conservation status of the lesser kestrel in Spain.

"We have now been working with the Church Ntra Sra. de la Purificación on the same topic for more than 20 years," recalls Mr Antolín. "After the LIFE project our relationship got better and better and the activities we carry out together have also continued to grow," he says. In 2014, the regional government of Extremadura granted funds of €26 000 for the creation of a kestrel observatory, special guided tours and to fix part of the church roof. In recognition of its work with the church's kestrels DEMA was a finalist in the 2014 Natura 2000 awards under the title "A divine `Special Protection Area´ for the lesser kestrel".

> *"With patience, perseverance, will and continuous courage, with or without money, you can accomplish anything"*
>
> *Pepe Antolín, DEMA*

Conservation on Mount Athos

The Holy Mount Athos, a self-governed part of the Greek state (its official name is Autonomous Monastic State of the Holy Mountain), is situated on the Athos peninsula. It is home not only to spectacular, continuous forests of oak trees but also to 20 Eastern Orthodox monasteries. "The monks living here have a very special relationship to their natural surroundings. The spiritual value of nature, which they believe is a direct expression of God, is entrenched in their monastic rules that were established as far back as the year 963 AD," notes Angelo Salsi, Head of the LIFE and CIP Eco-innovation Unit in the Executive Agency for Small and Medium-sized Enterprises (EASME), who visited Mount Athos in 2015 on an ex-post evaluation visit, following up a LIFE project that ran from 2003-2006.

"These principles are enshrined as an integral part of our lives and all of the Mount Athos monasteries operate in the same way. We believe that the 'greater good' is more important than us as individuals and these spiritual beliefs are very much aligned with the way that the EU's environmental policy works," says Father Gregorios Gregoriatis of the Holy Community of Mount Athos.

When the Holy Community began the LIFE project FRAINETTO WOODS Mnt.ATHOS (**LIFE03 NAT/GR/000093**), it embarked on a journey to learn how to manage 500 ha of Hungarian oak (*Quercus frainetto*) and holm oak (*Quercus ilex*) woodland in a more sustainable manner. Despite restricted access to visitors and limited land use options these forests are threatened because they have been coppiced for fuel for centuries, which is having a negative effect on the area's trees and biodiversity.

The project transformed the forest from coppiced woodland to high forest through selective thinning activities on 45 pilot plots. Monks and local foresters took part in training to be able to continue this work. The restoration improved the structure of the forest, enhanced biodiversity, reduced the risk of fire and rehabilitated the landscape. It also helped to restore the image of the peninsula's once flourishing virgin forests, creating a landscape worthy of the spiritual and cultural importance of Mount Athos and its monasteries.

The project succeeded in uniting the 20 independent monasteries, who agreed to expand the area of forest within the Natura 2000 site and to implement a single Natura 2000 management body for the protected area (a decision that awaits ratification by the Greek state). If the monks were able to create a site management board, as foreseen in the project's After LIFE plan, "it would be a powerful example for many other religious groups managing Natura 2000 sites in the EU," says Mr Salsi.

Father Gregorios Gregoriatis of the Holy Community of Mount Athos

Photo: LIFE03 NAT/GR/000093/NEEMO EEIG/Tim Hudson

RELIGIOUS AND CULTURAL HERITAGE

Conserving moorland and preserving Bronze Age relics

Excellent cooperation between archaeologists and nature conservationists during LIFE's ReHa Federseemoor project led to exciting archaeological discoveries and the renaturalisation of 450 ha of moorland.

Photo: LIFE07 NAT/D/000233/Jost Einstein

The Federseemoor is the largest bog in south-west Germany. Home to rare animal and plant species - including more than 10 species of orchid - the Natura 2000 network site contains all fen ecosystem stages - and a host of archaeological treasures

The Federseemoor covers an area of 3 300 ha in southern Germany. It is a nature reserve and also home to an incredible array of archaeological gems. "The finds are sensational," explains Helmut Schlichtherle, an archaeologist from the office in charge of the preservation of historical monuments in Baden-Württemberg. "They encompass a large number of Stone and Bronze Age wetland settlements from between 4 200 and 600 BC. Some parts are still in pristine condition," he continues. In 2011 the settlements were declared a UNESCO World Heritage Site together with a number of other areas in Europe boasting similar treasures.

"The collaboration between archaeologists and nature conservationists began informally in the 1980s when we realised that we all wanted to protect the moor," reveals Mr Schlichtherle. Both groups were alarmed to discover that drainage and intensive agricultural use were causing 1-2 cm of peat to disappear per year. "This was endangering the area's biodiversity and its settlements, which only remain intact when submerged in the moor's low-oxygen water," explains Stefan Schwab from the nature conservation authority in Tübingen.

As a consequence, the historical monument office, NABU moor information centre and Tübingen's nature conservation authority together drew up a moor conservation agreement. The LIFE projects Federseelandschaft (**LIFE96 NAT/D/003047**) and ReHa Federseemoor (**LIFE07 NAT/D/000233**) were a culmination of this long-term partnership.

Digging for moor

Both LIFE projects worked towards renaturalising the Federseemoor and securing the area's underwater heritage. ReHa Federseemoor (2009-2014) mainly involved direct interventions in the northern part of the landscape to re-flood the moor. These measures included filling in drainage channels, dismantling an airfield for gliders and returning the course of the main river to a more natural meandering state. At the end of the project over 200 ha of moorland was covered by water again.

The nature conservation agency and NGO NABU were responsible for managing the project but close work with a team from the historical monument office was necessary at all times. "As part of the in-situ conservation we drilled and dug over 2 000 holes to gain an insight into the current state of the archaeological sites," says Mr Schlichtherle. This work uncovered some extraordinary new finds. "One day we accidentally stumbled across some very well-preserved Neolithic wheels," he recalls. Mr Schwab, who was project manager of ReHa Federseemoor, was thrilled to be present when a dugout canoe with shunting pole was unearthed right next to a piece of old birch tree. "You could really imagine someone returning from fishing thousands of years ago and tying their boat to a tree," he enthuses.

The drilling, however, also caused a number of challenges, as Mr Schwab explains: "It took us a whole year of planning before we were finally able to start with the field work because of all the specific site-related requirements from the archaeologists. We often had to rethink the digging in particularly-sensitive areas." In the end, however, working this way also brought positive results and meant that none of the archaeological sites were damaged during the project. Digger drivers from the Netherlands with experience in similar terrain, light diggers, digger mattresses, and woodchip roads also made work in the area easier.

Good planning and mutual trust

Despite the challenges Mr Schwab describes working with the team of architects as "complementary and trusting". Mr Schlichtherle confirms this and says that he didn't think the cooperation could have been any better. The keys to this successful cooperation were strategically agreeing the main parts of the project from the very beginning, planning for challenges and mutual trust. "We always knew exactly who was responsible for which task and we worked very closely together to find solutions for each phase of the project. We also always asked ourselves where the technical challenges would be and were able to plan accordingly," Mr Schwab recounts. Regular meetings between both teams were organised on and off-site and they always appeared together in tandem at stakeholder information events with presentations from both parties.

Collaboration with local municipalities and landowners was also important in both projects. It took a lot of work to persuade them that re-flooding the area was the best way forward. "Creating transparency through regular meetings and publicity work and taking the time to talk to people was crucial," says Mr Schwab. "Buying land and showing people the richness of the archaeological finds also helped," Mr Schlichtherle reflects.

Both men believe that the strong foundation laid by the original agreement is one of the reasons why stakeholder cooperation worked well in both projects. This will also help in the future because, as Mr Schlichtherle points out, "collaboration between all parties will need to continue for years to come if the moor is to be safeguarded for future generations."

LIFE has helped build strong partnerships between conservationists and archaeologists

Photo: LIFE07 NAT/D/000233/Kerstin Wernicke

VOLUNTEERS

Volunteers vital to success of LIFE Nature and Biodiversity

Volunteers play a crucial role in the success of many LIFE Nature projects, supporting activities for the conservation of endangered habitats and species and raising awareness of the importance of conservation and the Natura 2000 network.

Within the LIFE programme, LIFE Nature and Biodiversity projects in particular, have benefited from the ability of many nature conservation NGOs to leverage their networks of volunteers to minimise the costs of conservation works, involve local society, and to help ensure projects' longer-term sustainability.

For instance, for the Lorraine Belge project (**LIFE99 NAT/B/006285**), the project beneficiary, Natagora - an NGO active in nature conservation in the French- and German-speaking parts of Belgium - mobilised large numbers of supporters to restore and subsequently manage very rare alkaline fens at four sites in Belgian Lorraine.

Traditionally, these wet areas were often used as hay meadows in Belgium. However, in recent decades the Lorraine fens, abandoned by farmers, have been spontaneously afforested by bush and scrub, or have been drained and turned into plantations or nurseries. During the LIFE project, volunteers helped remove bush and scrub overgrowth from abandoned hay meadows to enable their function to be restored. After LIFE, Natagora's Lorraine district team of volunteers has continued to manage the restored sites. The work involves regular cutting of willow and cyclic mowing of the wetland.

A main conclusion of a 2015 follow up visit carried out by the LIFE programme external monitoring team (NEEMO EEIG) was that the habitats are "well developed due to the implementation of the LIFE measures, but also to the recurrent management carried out by the NGO (including volunteer work)."

The local volunteers have also continued communicating the value of this work to the public, through guided tours, nature management open days, an educational programme for schools and other activities.

La Mancha wetlands

In Spain, the ongoing project HUMEDALES DE LA MANCHA (**LIFE10 NAT/ES/000563**) is another example of the deployment of significant numbers of volunteers to carry out labour intensive and otherwise costly works. The 2011-2016 project is being coordinated by Fundación Global Nature, a private, non-profit educational organisation established in 1993. As a foundation, a large proportion of its projects enlist volunteer workers, especially students. The foundation undertakes activities all over Spain, including the location of this project, the Humedales de la Mancha wetlands in Castilla-la Mancha. The wetlands are surrounded by Mediterranean forest, grasslands and agricultural lands with the latter (lands for cereals, vineyards and olive trees) posing the greatest negative impacts on the groundwater/wetland conservation.

Much of the project work is focused on recovery and extension of 'buffer zones' between the especially sensitive wet areas and the agricultural lands. Volunteers are mainly needed during the summertime, when the land is dry – with students and other amateur conservationists able to assist with tasks such as dismantling of drainage ditches and debris clearance for recovery of landscape and water levels, as well as (with guidance from experts) sowing seeds by hand within the target wetland habitats.

Volunteers make a crucial contribution to the success of many LIFE projects

Photo: LIFE11 NAT/SI/000882/Vesna Pimat

VOLUNTEERS

A volunteer LIFE force

Forward-thinking LIFE projects are pioneering new ways of involving volunteer stakeholders to further their conservation aims. As well as carrying out traditional tasks, this unpaid workforce is helping to foster long-term support for nature and biodiversity.

Photo: LIFE11 NAT/BG/000362/Dian Tomov

Volunteers helping a LIFE project to repair dikes in Bulgaria

There's nothing new about using volunteers for nature conservation. Groups or individual amateur conservationists are the life force of many conservation NGOs across Europe. One example is a regular LIFE project beneficiary, BirdLife International, whose UK membership alone – via the RSPB charity – counts over 18 000 volunteers. Many LIFE projects have harnessed the support of numerous volunteer stakeholders in order to carry out diverse tasks, such as monitoring, tracking, wardening, ground clearance, planting and so on..

In recent years, LIFE projects also have begun to mobilise their stakeholder networks in innovative ways, such as advocacy work, building expert and community networks and high-tech monitoring of project results (see pp. 41-44).

Volunteer advocacy

A series of projects led by the local government on the Balearic island of Menorca demonstrate the role that volunteers can play as advocates for LIFE conservation actions. Beginning with Flora Menorca (**LIFE00 NAT/E/007355**), followed by the BASSES project (**LIFE05 NAT/ES/000058**), and finally, Reneix (**LIFE07 NAT/E/000756**), the coordinating beneficiary, the Conseil Insular de Menorca, went to great lengths to involve local people in helping to spread knowledge and awareness about the work being done to improve the conservation status of priority habitats and plant species.

During the first project, for instance, work to combat the highly invasive alien plant, 'carpobrotus' (*Car-*

Photo: LIFE00 NAT/E/007355

A trio of projects on Menorca has built a volunteer network to tackle the threat of the invasive plant species, Carpobrotus edulis (pictured)

pobrotus edulis) was significantly enhanced once islanders themselves accepted and realised the damage the highly aggressive plant was doing to native species and coastal habitats. After some initial reluctance, notably on the part of some private gardeners and growers, local communities, ecological volunteers and unemployed groups joined the LIFE workforce in promoting the project's aims and dissuading gardeners and stores from stocking and growing the plant.

Under the most recent of the three projects, this "participatory approach" has evolved into the active involvement of hundreds of individuals and numerous stakeholder groups, says Reneix project manager, Joan Joaneda. For example, workshops run by volunteers illustrate how communities by pulling together can contribute to the project's conservation goals.

Photo: LIFE09 NAT/ES/000513

Building new networks

The value of building volunteer networks is also seen in the impact achieved by two French projects, CHIROFRSUD (**LIFE04 NAT/FR/000080**) and COREXERUN (**LIFE07 NAT/F/000188**). The former targeted the conservation of three cave-dwelling bat species in southern France whose populations were in spectacular freefall – attributed to deterioration of their natural habitats and particularly disturbance of roosts by human activities such as caving. An important aspect of the project was its creation of a network of (volunteer) bat specialists from across the south of France to heighten awareness amongst local people and cavers about the need and means to conserve bat habitats. They in turn worked with almost 200 non-specialist volunteers in carrying out numerous studies to better understand the species.

COREXERUN took place from 2009-2014 in the French overseas department of Réunion. The island's national park authority used LIFE co-funding to target the conservation and restoration of relict areas of semi-dry forest habitats, which are today only found in degraded form and in inaccessible areas of gullies and cliffs. The project manager,

Pascal Truong, explains that in order to preserve these very rare habitats and to get the local community on board, the project formed more than 30 partnerships. These involved islanders, local authorities, schools, companies, the army and other associations. The goal was to fully integrate the project into the community to ensure its longevity, says Mr Truong. More than 1 700 volunteers took part (see box).

Corporate volunteering initiatives

COREXRUN's experience with volunteers from businesses is illustrative of a growing trend for corporate volunteering, a trend that LIFE Nature and Biodiversity projects have been able to tap into.

For instance, the ongoing project LIFE BEAR DEFRAGMENTATION (**LIFE12 NAT/ES/000192**) is mobilising employees of Gas Natural Fenosa who have signed up to a volunteer scheme established under the Spanish gas and electricity company's Corporate Social Responsibility (CSR) programme. To aid the project's objective of creating a corridor of suitable habitat between two sub-populations of brown bear in Spain's Cantabrian Mountains, around 20 volunteers from Fenosa are helping to plant cherry, rowan and silver birch trees in areas within the Hoces de Vegacervera Natura 2000 site near the town of Cármenes (Leon province).

In Portugal, the BRIGHT project (**LIFE10 NAT/PT/000075)** has been working with volunteers from several enterprises, including insurance companies, law firms and small local businesses.

Since its launch in 2012, the project has involved 31 companies and more than 1 500 private sector volunteers, as well as a further 3 500 volunteers from NGO networks and social care institutions. "The volunteers have carried out 105 actions," says project manager Nelson Matos. These include removing invasive alien plant species (river spiderwort - *Tradescantia fluminensis* – and several types of acacia) and planting hundreds of specimens of Portuguese laurel (*Prunus lusitanica*).

When the project area was hit by a powerful storm in 2013, several of the companies supplying volunteers mobilised their networks to help remove fallen wood and clear trails and access points. Other enterprises are supporting the project by making donations of materials. For instance, the company ERSUC donated 45 tonnes of vegetable compound, whilst SIPCAM Portugal gave 400 kg of fertiliser. Both gifts "are very important for the project's plant nursery," says Mr Matos.

To date, volunteers working on the project have planted 3 100 trees and bushes, cleared 4 km of pathways and removed invasive species from 17.68 ha.

COREXERUN's integrated volunteer network

Pascal Truong says the LIFE team was "very pleasantly surprised" by the level of support volunteers gave the COREXERUN project. "We thought that on an island where the unemployment rate is around 40%, there would be no place for volunteering. We were wrong," he says.

Groups of islanders helped in reforestation work. The army and students removed invasive plant species and weeded around seedlings planted in previous years. Volunteer students from the island's agricultural college helped with ex-situ production of nearly 1 000 native and endemic plants that were subsequently planted in the project areas.

The private sector also contributed, especially after forest fires in 2010 and 2011 destroyed almost 2 800 ha of forest in Maïdo national park. Following the Maïdo fires, "many business leaders contacted us to mobilise their employees for reforestation actions," says Mr Truong.

One of the motivations for some volunteers was to increase their awareness of the culture and traditions of their island. "Many Réunion volunteer groups especially want to know about the plant species that are part of the natural heritage of their island and were used by their ancestors for healing. This also encourages them to plant these species in their garden instead of exotic species," explains Mr Truong.

A follow-up LIFE Biodiversity project is aiming to build on COREXRUN's achievements. In particular, LIFE+ Forêt Sèche (LIFE13 BIO/FR/000259) aims to reach even more islanders so that it "can mobilise a volunteer network that will endure," says Mr. Truong.

Photo: LIFE07 NAT/F/000188

VOLUNTEERS

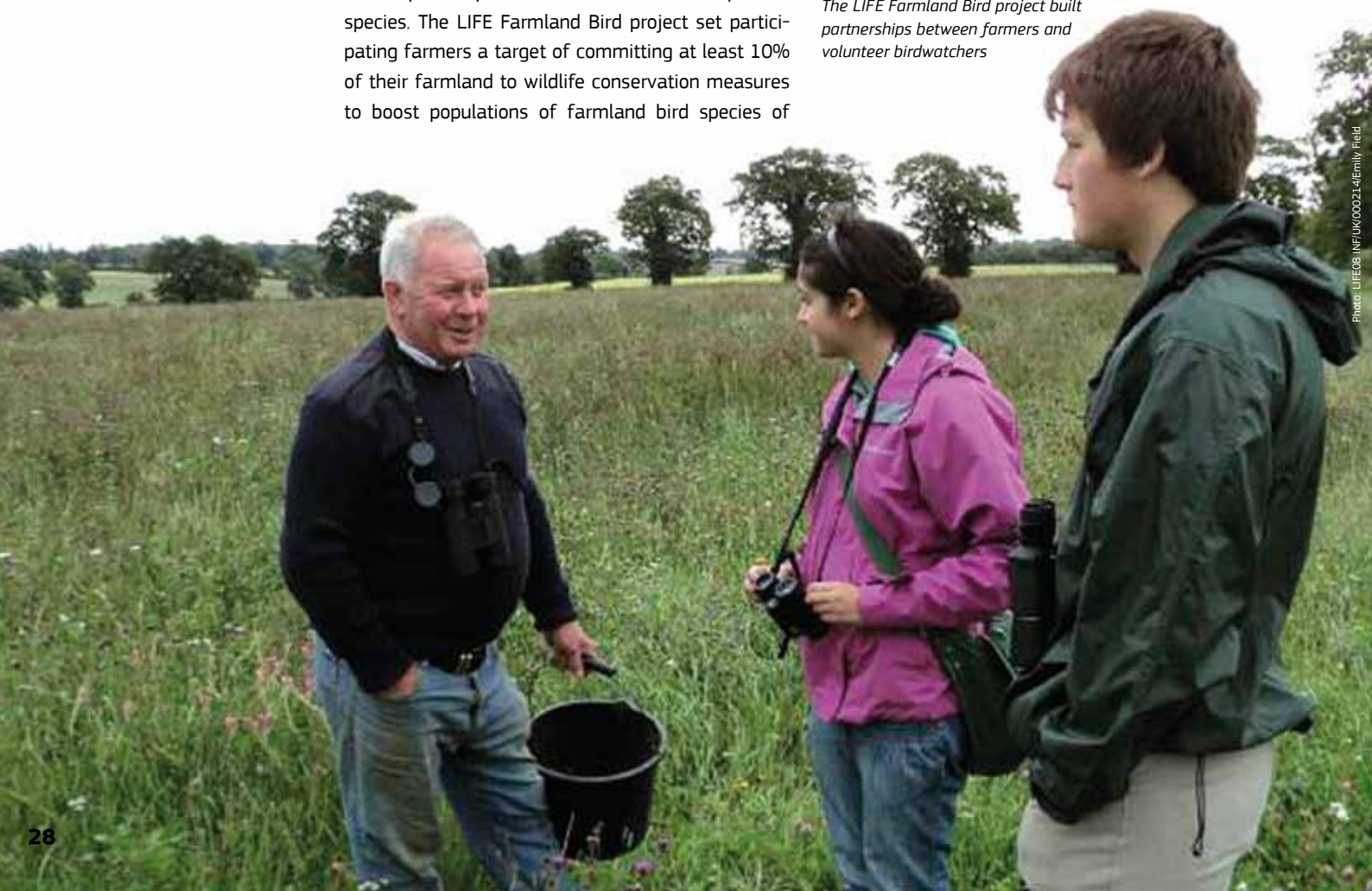
A conservation alliance of farmers and birdwatchers

The RSPB-led LIFE Farmland Bird project saw volunteer birdwatchers conduct surveys on UK farms, giving the NGO information it could use to advise farmers on practical measures they can take to protect these species. Participating farmers and volunteers highlight the value of this partnership

Richard and Inger Mee own an organic farm and café just outside the market town of Loughborough in England's East Midlands. The farm was first surveyed by the RSPB's Volunteer & Farmer Alliance (V&FA) in 2003, and re-surveyed during the UK LIFE Farmland Bird project (**LIFE08 INF/UK/000214**) in 2012 – see the boxes for interviews with two V&FA volunteers.

The RSPB's regional farmland bird adviser was then able to provide practical advice on how to help these species. The LIFE Farmland Bird project set participating farmers a target of committing at least 10% of their farmland to wildlife conservation measures to boost populations of farmland bird species of conservation concern. Oakley Grange Farm is one of many contributing significantly more than the 10% target.

Mr and Mrs Mee also entered the 'Nature of Farming' biodiversity awards established as part of the project in 2013, winning the regional competition and finishing third in the national public vote.



The LIFE Farmland Bird project built partnerships between farmers and volunteer birdwatchers

Photo: LIFE08 INF/UK/000214/Emily Field

One of the project's general, longer term goals was that farmers themselves would become advocates of wildlife-friendly farming. The Mees are in their own modest way strong proponents of this. Both have agricultural links – Richard's family have farmed the area for over 80 years; whilst his Danish wife Inger is also from a farming background. "I didn't intend to farm. I was running away from it!" she jokes.

Going organic

When the couple took over Oakley Grange in the 1990s, they decided to make a break with (recent) tradition and switch from mainly arable to mixed farming and to go down the organic route. Today, their 660-acre (c. 260 ha) organic farm, with its land surrounding the village of Hathern, is renowned for its premium quality beef, pork and lamb, its café-shop – open year-round, seven days a week and employing eight people full-time – craft fairs and other events.

One such event is the annual Open Farm day, the most recent of which was held in June 2015 and attracted over 1 000 visitors. RSPB volunteers who had carried out bird surveys at Oakley Grange led 'farm and birdlife' walks on which the eagle-eyed could spot, amongst other species, the buzzard (*Buteo buteo*), kestrel (*Falco tinnunculus*) red kite (*Milvus milvus*), lapwing (*Vanellus vanellus*) dunnock (*Prunella modularis*), skylark (*Alauda arvensis*), yellowhammer (*Emberiza citrinella*), meadow pipit (*Anthus pratensis*) and swift (*Apus apus*).

Photo: David Iliff/CC-BY-SA 3.0

Skylark (Alauda arvensis)

This rich birdlife is a direct result of Mr and Mrs Mee's decision to go down the organic farming route: "I've always been interested in animal welfare. Right from college I thought it was daft putting fertiliser on

Keith Freeman, birdwatcher, 77

I am 77 years old, married with two children, five grandchildren and one great grandchild. I retired 12 years ago. But I do one day a week volunteer driving. My wife Anne and I live in a suburban area of Loughborough, with not much birdlife. I've lived in Loughborough all my life: it's a medium-sized market town in the centre of Leicestershire. Since my childhood the birdlife has definitely decreased...

I've been involved with the RSPB for a long time - 40 years - and in the V&FA for nine years. Each springtime four of us carried out three visits to the farms selected by the RSPB, noted the bird species on a map provided – which farms they were on, what they were doing and so on. Then we sent the information to the RSPB farmland bird adviser, in our case Anna Broszkiewicz. The advisers suggest practical ways in which farms can help the birds on their land.

The farmers were pleased to see us as the completed surveys helped them with their grant applications. We also helped the farmers with some of their stewardship. Mr Mee's farm is unusual in that it's an organic farm. Also the land is split across two areas – one on one side and the other on the other side of the village. It was very interesting to survey, as there's a lot of fallow land and with it being organic you do notice the difference between it and some of the other farms, where everything has been sprayed out. We were surprised to find lots of skylarks, linnets and yellowhammers.

The V&FA is very important as it makes it possible to see the effect of changes to farmland policy on bird populations.

Photo: LIFE08 INF/UK/000214

Geoff Roberts, birdwatcher, 85

I first became interested in bird watching as a result of country walks with my father around Chepstow, Monmouthshire (Wales) in the 1930s and 1940s. There were more birds and bird species then (or example, hawfinch) and not as many people, dog walkers, cyclists, runners and so on.

I live in suburban Loughborough, on the western outskirts. We have a small garden with an area of wildflower meadow. I have been doing the BTO [British Trust for Ornithology] garden surveys for around 20 years. There are normally 8-10 species of common birds in the garden. Sadly, house sparrows have disappeared.

My 'local patch' is a walk from the house across fields and through woods and back - around 3.5 miles. I've also been sending records to the BTO Birdtrack for around 20 years [a UK project tracking migration movements and distributions of birds throughout Britain and Ireland]. My count is usually 20-25 species.

I enjoy seeing birds and observing bird behaviour, walking and visiting reserves and of course the company and companionship. The downside is rather poor eyesight which makes spotting and recognising birds difficult. But, I can recognise a lot of bird calls and songs. My most exciting discoveries in birdwatching are mainly local and of unexpected birds such as the wood warbler, nightingale and lesser spotted woodpecker – and also the thrill of hearing or seeing returning migrants.

I have been part of the RSPB survey group for 12 years. On all 13 farms we surveyed the farmers were interested in the birdlife on their farm and in conservation. On each of the farms the numbers of species seen was much the same – from 31 to 52 on average.

It is interesting that the same Red List birds were recorded on all the farms including: skylark, linnet, house sparrow, grey partridge, starling, yellowhammer and song thrush.

Geoff Roberts (front) with Keith Freeman

Photo: LIFE08 INFIUK/000214

grassland when you've got clovers etc., to fix nitrogen," says Mr Mee. Taking inspiration from Mrs Mee's brother, who has a herd of organic pigs in her native Denmark, the couple began offering organic pork, before adding beef and lamb as sales grew. Today the farm has eight 'Oakley Grange hybrid' sows, 90 cows and three bulls (Lincoln Red) and 100 ewes.

Inger and Richard Mee

Photo: LIFE08 INFIUK/000214/NEEMO EEIG/Wendy Jones

The decision to go 100% organic from the offset and subsequent engagement in the LIFE project was not just based on economics. "You don't just do organic farming because of the higher premiums. It's the welfare of the animals and the environment," says Mr Mee. "It's the whole approach – the lifestyle," adds his wife.

Historically, the farm had a 1:5 ratio of grassland to cropland. Under the committed organic stewardship of the Mees this ratio has been reversed – with just 100 acres 'under the combine' (harvester) and 550 acres of grassland and wildlife areas. "There are now over 80 acres (around 30 ha) solely for wildlife," says Mr Mee. "We don't organically farm and then, say cut all the hedges in September. We produce food for the birds and so on. You can see our 30 km of hedges are enormous!" he adds.

SOCIALLY-DISADVANTAGED GROUPS

LIFE supports **social innovation for nature conservation**

LIFE projects have created partnerships with prisons in Portugal, Finland and Denmark. In the Coimbra region of Portugal a project enabled prisoners to participate in project actions. This unusual stakeholder collaboration benefits nature conservation in a Natura 2000 network site and helps rehabilitate prisoners back into society.

Photo: LIFE10 NAT/PT/000075

Prisoners help clear invasive plant species that threaten the rich biodiversity of Portugal's Bussaco National Forest

Social innovation[1] means developing new ideas, services and models to better address social issues. It invites input from public and private actors, including civil society, to improve social services. Some LIFE Nature projects that have nature conservation in the Natura 2000 network as their main objective, are also addressing social issues at the same time.

The BRIGHT project (**LIFE10 NAT/PT/000075**) aimed to control the invasive alien species that threaten the rich biodiversity of the Bussaco National Forest near Coimbra, central Portugal. This forest was created in the 17th Century by the Discalced ('Barefoot') Carmelites, who fenced off an area of 90 ha and planted 'biblical' tree species such the white cedar (*Cupressus lusitanica*). In 1834, the forest came under state ownership and other trees were planted. The surviving pristine forest encompasses about 17.5 ha and is unique in Portugal and Europe. It includes indigenous Mediterranean oaks and laurel woods, and a relict green olive tree habitat dominated by *Phillyrea latifolia*. "These woods are under threat from the expansion of invasive plant species, in particular acacias and *Pittosporum undulatum*," says Nelson Matos,

1 http://ec.europa.eu/social/main.jsp?catId=1022

the LIFE project manager. The project is restoring areas by eradicating invasive species and planting native flora characteristic of the original habitats. The plants come from nurseries established by the project.

Prison partnership

An innovative partnership was established between the LIFE project and Coimbra Regional Prison, which enabled prisoners under strict evaluation to work with the project. It was the first time that Coimbra city municipality, the project beneficiary, had worked like this with prisoners. "We contacted the prison director and explained the type of actions that we were developing. [The prison] immediately showed interest and undertook all the formalities to provide a team to work for the project," explains Mr Matos.

One prisoner's plant nursery

Prisoner A. was convicted for murdering a man in a dispute. He is 62 years old and works in the BRIGHT project's plant nursery:
"Back in 2010, I was working in the prison's kitchen as a cook, when the prison director asked me, as I used to work as a farmer, if I wanted to be part of a team to work in Bussaco forest. I said no...it is hard work working in a forest. The director insisted and finally I said yes. At the time, we were a team of five prisoners and we were the first prisoner team to do this kind of work."

"In the meantime, the LIFE project started in September 2011 and I started with the nursery. Two prisoner teams were set up, one working in the forest and another in the nursery. I am in charge of the main plant nursery work: collecting seeds, preparing the seeds and pots, watering, transplanting and planting. As I worked in the woods before, I am the one that knows where the donor seed plants are and when to collect the seeds. I also improved the germination techniques for the different local species like the strawberry tree, holly and oaks. As soon I finish my sentence here, I would like to return to my little café...but I like the experience and I am outside the prison everyday in contact with nature."

Photo: LIFE10 NAT/PT/000075

"The prisoners work on almost all project actions, from the plant nursery to the eradication of invasive plants, to planting trees and scrubs. The work they do is similar to what an external outsource company would do, if contracted by the project," he adds.

The prisoners arrive on site every day at 8:30 am in a prison van with two guards, and they leave at 5pm. Two teams work on different project actions. "At the beginning, we had some of the local population against the prisoners working in the forest. But now we have no problems. They are integrated with the rest of the project personnel and they have specific training. That helped to overcome the initial stigma of having prisoners working in the forest," says Mr Matos. "Nowadays, it is easier for locals to accept the prisoners' presence than to understand why we are eliminating invasive species by cutting trees down," he notes.

The work done by the prisoners is paid for by the project as a normal external contract, including insurance and transport. So far, around 15 prisoners have worked on the project, in various stages of serving their sentence. Upon release, the project beneficiary helps them reintegrate into society by offering them a job. Two former inmates have taken advantage of this opportunity to work for the project team.

A study done by the project's associated beneficiary, the University of Aveiro, based on interviews with 92 prisoners, found that "the ones that work outside the prison, and especially the ones that are in contact with nature, have more success in social reinsertion in active life," says Milene Matos, the researcher in charge of the university's study.

The involvement of convicts raised the visibility of the project. The Portuguese media (TV and newspapers) showed interest in this type of activity, and at the same time the project linked this social aspect with raising awareness about the control of invasive species. "We sometimes have volunteers, corporate volunteers (see p. 27) and prisoners working on invasive alien species eradication and control together in the same area and, because of their experience, the prisoners explain the elimination techniques to the volunteers," reinforces Mr Matos.

The project won a 2013 Manuel António da Mota Citizenship Award (http://premiomam.mota-engil.pt) in recognition of its commitment to social inclusion. This innovative approach to working with prisoners is now being implemented by the LifeBiodiscoveries

project (**LIFE13 BIO/PT/000386**), which is involving the external services of Montijo Prison in the Lisbon region in project actions.

The prison that manages wetlands

Satakunta State Prison in south-western Finland is an unusual LIFE project partner, in part because the open prison manages – through ecological farming with grazing cattle – the Raijalinjärvi Natura 2000 wetland site. This is one of the locations of the Kokemäenjoki-LIFE project (**LIFE06 NAT/FIN/000129**).

The prison had a specific problem, which was resolved by its involvement in this large-scale LIFE Nature restoration project. The main part of its farmland is on protected areas that are important bird habitats and thus popular with birdwatchers. However, as this is prison land, access to the general public needs to be restricted. The LIFE project, which ran from 2006 to 2012, put up information boards and built a wildlife observation tower, with new nature trails directing the general public and birdwatchers to one specific area. In addition, it dug ponds near to the tower to make the area more attractive.

During a visit by the LIFE unit's external monitoring team (NEEMO EEIG) in July 2015, the prison partner representatives – Jari Mäkinen, foreman; Elina Kamppari, estate manager; and Erkki Lahtinen, agricultural foreman – expressed their satisfaction with the new recreational facilities. Moreover, they reported that the number of people wandering freely on the site has "decreased considerably".

"Very positive experience"

The three agreed that the project was a "very positive experience", with the work carried out benefiting the prison greatly. They emphasise that they are extremely thankful for the support they received from the project manager, Tapio Aalto of the Centre of Economic Development, Transport and the Environment for South-western Finland (the coordinating beneficiary).

On the downside, they confess that the technical and financial reporting aspects were "somewhat challenging". For example, the prison encountered specific issues relating to the reporting of personnel costs (as prisoner names could not be identified). To preserve confidentiality, therefore, any work times documented for individual prisoners were coded, with supporting documents held at the prison. The reporting of the different agricultural support schemes was similarly challenging, but in the end they say the experience was worthwhile as it has proved helpful for tackling other administrative tasks.

The Kokemäenjoki-LIFE project built this tower for birdwatchers on a Natura 2000 network site managed by Satakunta State Prison in Finland

They conclude that participation in the LIFE project has made working with nature conservation clearer, both to those working at the prison and for the prisoners themselves: "Before the LIFE project the fields were just fields with birds and grazing animals, but through the project the fields became interesting and valuable in a completely new sense."

Another LIFE project that has established a partnership with a prison is LIFE WETHAB (**LIFE12 NAT/DK/000803**), in which the Kragskovhede State Prison in Denmark is an associated beneficiary. The prison manages a large land area (635 ha) within two Natura 2000 sites, but it is not foreseen that prisoners will be involved in project actions. As such, the prison is just offering the Natura 2000 land areas for habitat restoration.

APPLIED RESEARCH AND NEW TECHNOLOGY

Less light equals more Life at Night

Slovenia's Life at Night project is a shining example of cross-sectoral collaboration between a number of atypical LIFE programme partners. The project saw a private sector company partnering with academic researchers to develop nature-friendly lighting for churches.

Photo: NEEMO EEIG/Mitja Kaligarič

Life at Night installed low-impact lighting for Slovenian churches and monitored the impact on bats and moths

Light pollution is on the increase across the EU. In one country, Slovenia, the Črni Vrh Observatory calculated an average increase in light pollution of 8% per year until 2007.

Excess lighting is a huge problem for astronomers. It can also be a burden on public finances as well as having significant health impacts (see box).

Light pollution and health

"The day and night, light and dark rhythm is of great importance for the human body. It keeps us healthy and allows us to function normally," explains Dr Damjana Rozman, University of Ljubljana, Faculty of Medicine, Centre for Functional Genomics and Bio-Chips. "People with shift work, such as nurses, doctors or airplane crew are subjected to significant health risks," she adds.

Light pollution also has a negative impact on nocturnal animals, such as bats and moths, whose behavioural patterns are disrupted. "Over recent decades we have dramatically changed the night environment which of course causes problems," says Barbara Bolta Skaberne, Life at Night project manager.

Concerns about light pollution led Slovenia to become the first country in the world to enact a law on light pollution, the Decree on Limit Values due to Light Pollution, passed in 2007. Since then, installations of environmentally-friendly lighting in Slovenia have risen. "There has been a significant increase in the number of shielded lamps that do not emit light into the sky," says Andrej Mohar, technical project manager of the Life at Night project (**LIFE09 NAT/SI/000378**).

Nature-friendly illumination

In cooperation with the Slovenian National Commission for UNESCO, the Life at Night project published a set of 12 recommendations for nature-friendly lighting of churches.

1. An average façade luminance of less than 1 cd/m^2.
2. Illumination with 0% emission into the sky.
3. No more than 10% of light missing the façade.
4. Avoid placing lamps close to the wall directed upwards ('wall washing').
5. Use amber LEDs or white LEDs that filter the blue light spectrum.
6. Avoid lighting cultural heritage in Natura 2000 sites and do not light flight openings for bats in churches where they roost.
7. The areas surrounding cultural heritage buildings should be lamps that emit warm, yellowish light and are shielded to prevent upward emissions of light.
8. Lighting should be switched off after 11pm.
9. Avoid illuminating overhangs.
10. Do not use ground-recessed lamps.
11. Reduce energy consumption and install timers.
12. Consult nature and culture protection experts.

Photo: NEEMO EEIG/Justin Toland

Despite this success, issues of implementation and enforcement remain. "We have a problem with a whole array of cultural monuments that are located in rural areas. In Slovenia, every hill has a church and every church has extravagant illumination," explains Marjutka Hafner of the Slovene National Commission for UNESCO, which helped produce a set of recommendations for lighting churches (see box - nature-friendly illumination).

Slovenia's lighting Decree specifies that "the brightness of the illuminated parts of cultural monuments shall not exceed 1 cd/m^2" and that "no more than 10% of the light stream may go past the façade of the cultural monument." However, Mr Mohar says that Slovenia's hilltop churches often exceed the brightness threshold and "in most cases 80% of the light overshoots the façade and reaches towards the sky."

To address this problem, LIFE Nature funding was secured for the Life at Night project, which was established to reduce the impact of illumination of Slovenia's historic churches on protected bats and moths (and their prey).

Unusually, the project was led by a private company, Euromix, a Ljubljana-based SME which specialises in moisture and humidity sensors and analysers. Euromix was founded by Andrej Mohar, who initially became involved in the working group that proposed the Decree on lighting because of the impact excessive lighting had on his ability to practice his hobby: astronomy (Mr Mohar is also a member of Dark Skies Slovenia).

Mr Mohar's interest in light pollution led to the development by his company of a lamp designed to drastically reduce luminance levels and the amount of light passing by the façade of buildings to the sky. The Life at Night project set out to assess the impact of different types of lighting - including the new lamp - on bats and moths at 21 of Slovenia's historic churches. As well as the already installed lighting, the project tested two types of adapted lamp: the first type filtered out the ultraviolet part of the spectrum; the second type also filtered out the blue part of the spectrum.

The Euromix lamp differs from existing lighting systems in three respects: firstly, the lamps are equipped with masks with cut-out silhouettes of the façades. "This enables us to illuminate only the façades, while the surroundings are preserved in darkness," says Mr Mohar. The masks are black to avoid reflection. Secondly, the luminance of the lamps is within the limit proposed by the Decree (1cd/m^2). "On top of this we have also implemented a third improvement - we have incorporated a filter that filters out the blue light spectrum." he adds. "We use a UV and infrared filter to reduce the blue part and enhance the yellow part."

Test triplets

The project selected triplets of churches where research into the impact of lighting would take place. "Three churches within a 10 km radius to diminish the potential impact of different geographic locations. If you compare churches from different sites you are also adding some additional noise to the

Photo: NEEMO EEIG/Justin Toland

Technical project manager, Andrej Mohar

data," says Dr Maja Zagmajster from University of Ljubljana, Biotechnical Faculty, Department of Biology. Dr Zagmajster led a study of the impact various types of church illumination have on the lesser horseshoe bat (*Rhinolophus hipposideros*) at three triplets (nine churches in all). Selection was partly based on the existing monitoring data gathered under Slovenia's Article 17 reporting obligations (on the status of species and habitats) - the lesser horseshoe bat is listed in Annex IV of the Habitats Directive. "We chose churches where there were roosts and that were already illuminated," she says.

Relations with the churches were cordial. "We haven't had problems with the priests, but some local communities that financed the lighting were against reducing it," explains Barbara Bolta Skaberne.

The aim of the bat research during Life at Night was to monitor emergence times and durations and to see if different types of lighting would have any effect on the growth rate of young bats.

"The time the bats emerge is linked to the light intensity outside their roosts. If the flight openings are illuminated, they think it is still daytime and they might leave their roosts later," explains Dr Zagmajster. If the bats miss the evening peak activity of their insect prey, food may become scarce, leading to undernourished females and offspring.

One triplet of churches was shared with the team researching the impact of illumination on moths (who covered five triplets and 16 churches in all). Slovenia has more than 3 600 butterfly species, of which 95% are nocturnal moths. Moths are the second most important plant pollinators after bees. In recent decades biologists have recorded a tenfold reduction in the moth population in light-polluted area such as cities, towns and villages.

"Moths orientate themselves with the help of luminous objects. In nature the moon represents such an object. When a moth sees a stronger light source, this becomes its new orientation point," explains Dr Rudi Verovnik, an expert in Lepidoptera at the University of Ljubljana, Biotechnical Faculty, Department of Biology, who led the Life at Night moth research: "When moths settle on lamps they do not breed or feed and often become prey to various predators. Churches are especially problematic as regards light pollution as they are often situated in rural areas and the natural environment surrounding them is illuminated. More moth species gather around these lamps than lamps in urban surroundings."

Seeing the benefits

Using software called EcoCandela, the project team analysed church brightness. Prior to Life at Night, the participating churches had a façade luminance of over 7 cd/m^2. After the project, luminance at the churches with the new lamps was below 1 cd/m^2. In addition, energy consumption was cut by 65% on average and up to 90% for individual churches.

Blue light was filtered out to produce an average colour temperature of less than 2 600 K. "Yellow light is much less attractive to moths," explains Mr Mohar.

According to Dr Verovnik, the tests showed "that the new adapted church lighting would attract significantly lower moth numbers - six times fewer adults

Photo: NEEMO EEIG/Justin Toland

Photo: NEEMO EEIG/Justin Toland

Gašper Pintar: Municipalities "like to see the shape of the church"

and four times fewer moth species." Cutting the blue light spectrum was found to have particular benefits: "Statistical differences were clear, 40% fewer moths were found on façades illuminated by lamps without the blue light spectrum."

For the lesser horseshoe bat, results were less clear cut. In part, says Dr Zagmajster, this is because key factors such as bat colony sizes, the position of openings and how well illuminated they were varied significantly from one church to another. "Some comparisons were possible but we had to be careful. More comparisons were possible in the same churches between years." For instance, at the church in Špitalič, where the flight openings had been strongly illuminated (8.3 lux), a reduction under the adapted illumination to 1.16 lux had a measurable impact on emergence times (on average 20 minutes earlier) and durations (all bats emerged in less than 40 minutes with the adapted lighting, as opposed to more than two hours on occasion with the original lighting). The bats' feeding habits make it important for them to emerge early, as the insect density is at its highest during the first part of the night. In general, the project found that lesser horseshoe bats mainly roost in churches located near woods with appropriate flight openings that are not illuminated and that the bats respond positively to adapted illumination.

"Research is inevitably connected with conservation. With a good basic knowledge you can put the right measures into practice," says Dr Zagmajster. The assistance of more than 100 volunteers was crucial to the data-gathering during Life at Night. "The method was precise but still simple enough that we were able to include other people. There was a core team of six to eight people every year and volunteers who participated in one or more field works," says Dr Zagmajster.

Further bat research is ongoing. Students from the Department of Biology are writing their Master's theses on topics related to the Life at Night studies. One student is looking at the impact of microclimatic conditions on juvenile lesser horseshoe bat growth in one triplet of churches. "We could not relate juvenile growth directly to illumination; the answer is more complex," notes Dr Zagmajster. "With this work we can add these additional factors," she says. This post-LIFE work also continues the relationship between the department and Euromix, which lent hydrometers to measure humidity and temperature.

Selling nature-friendly lighting

The project beneficiary is also continuing to improve its low-impact lighting for churches. Mr Mohar explains that trials of LED lamps took place at two churches during Life at Night, but "the technology was not mature at that time. Now LED modules are much more powerful."

The availability of 'warm' yellow LED chips means his company can produce a product with similar energy efficiency to white LED lamps, but without the blue spectrum that is so disruptive to moths. Mr Mohar notes that the Decree "says nothing about colour because in 2007 the most efficient bulb was high-pressure sodium, which is yellow."

Since the LIFE project ended, Euromix has employed a full-time sales manager for its cultural heritage lighting, Gašper Pintar.

One of the 21 churches that participated in the Life at Night project

Photo: NEEMO EEIG/Justin Toland

Acoustic monitoring of biodiversity

Another LIFE project to involve stakeholder collaboration in order to produce a technological innovation with conservation potential is AMIBIO (**LIFE08 NAT/GR/000539**). This project developed an automated system for the acoustic monitoring and inventorying of biodiversity on Hymettus mountain in Athens.

The project was led by the University of Patras / Wire Communications Laboratory, which developed the Amibio Web Portal, a central interface through which multi-sensor monitoring stations and a remote central station for signal processing and analysis were controlled. A team from the Technological Educational Institute of Crete (TEIC) applied its expertise in sound pattern recognition to enable the project to automatically identify and classify insect and other animal sounds.

The sounds were then analysed by experts from the Zoologisches Forschungsmuseum Alexander Koenig (ZFMK), in Bonn, Germany, to produce a biodiversity assessment of the project site. This included being able to monitor key biodiversity trends over time, explains project leader, Nikos Fakotakis (University of Patras): "Estimation of the density of the animals through their vocal activities, estimation of the health of certain species from their vocalisation, monitoring and warning of threats to rare species or species threatened with extinction, and monitoring of migrating birds."

According to Professor Fakotakis, establishing the partnership with ZFMK was rather straightforward. "They are famous in their field. We had the idea so we got in contact with them. They liked the idea so we formed the partnership." Further collaboration is now planned: "We want to see a continuation of this project – it was really a success," he says. Through biodiversity surveys of insects, birds and bats, this pioneering project has identified nearly 50 species not previously known to be present in the Natura 2000 network site, including several included in the annexes of the EU Birds and Habitats directives. The biodiversity assessment produced by the project will serve as the baseline for the future development of an official conservation plan for the mountain, to be drafted by another project partner, SPAY, an association of 15 municipalities dedicated to the protection and development of Hymettus.

"We have had a really good reaction from scientists; a lot of references to our publications," says Professor Fakotakis. "A lot of interest in our technology also."

Photo: LIFE08 NAT/GR/000539/NEEMO EEIG/Justin Toland

Mr Pintar has sold the more nature-friendly lamps to more than 50 Slovenian churches, in addition to the 21 churches whose lighting was adapted during Life at Night. Whilst he pushes the benefits for biodiversity of the Euromix lamp, most customers are primarily interested in the efficiencies. "Savings of energy and money - this is the main thing for the municipalities," he says. The other main selling point is the outline on the mask that prevents light spilling beyond the façade. "They like to see the shape of the church," notes Mr Pintar.

Although the benefits for nocturnal animals are of less interest to the churches and municipalities, the sales manager believes it is important that the technology developed by Life at Night is being installed rather than the alternatives. "If we don't do this, somebody else will. It's better that we do it with our more environmental lighting."

Project number: LIFE09 NAT/SI/000378

Title: Life at Night - Improving the conservation status of nocturnal animals (moths and bats) by reducing the effect of artificial lighting at cultural heritage sites

Beneficiary: Euromix d.o.o.

Contact: Andrej Mohar

Email: andrej.mohar@euromix-lj.si

Website: www.lifeatnight.si/

Period: 01-Sept-2010 to 28-Feb-2014

Total budget: €596 000

LIFE contribution: €294 000

APPLIED RESEARCH AND NEW TECHNOLOGY

Researching **new ways of managing biodiversity**

Two award-winning LIFE projects steered by research institutes have explored new ways of broadening their reach via innovative stakeholder partnerships and networking.

Bulgaria's BulPlantNet (**LIFE08 NAT/BG/000279**) and Greece's JUNICOAST (**LIFE07 NAT/GR/000296**) - both LIFE Nature 'Best' projects for 2014 - also share other similarities. Run by national research institutes and using various stakeholder groups they have explored innovative ways of managing nature and biodiversity in their countries.

BulPlantNet used the 'plant micro-reserve' model, pioneered by LIFE projects in Spain in the 1990s, demonstrating the concept for the first time in Bulgaria. By the end of the 2010-2014 period, 58 small protected sites had been officially designated under Bulgarian legislation and incorporated into the Natura 2000 network, almost twice as many as initially foreseen by the project. Alongside this, the project drew up 47 action plans for the next 10 years covering all the targeted plant species. These plans have been endorsed by the Bulgarian Ministry of Environment and Water.

Aimed at safeguarding isolated populations of rare and endangered Bulgarian flora species, these achievements could not have been achieved without the remarkable commitment of the stakeholder network developed by the project beneficiary, the Institute of Biodiversity and Ecosystem Research of the Bulgarian Academy of Sciences. Bringing together biodiversity experts and enthusiasts throughout the country, the project created a network and database that is continuing after LIFE.

Dimitar Peev, the project manager, says LIFE Nature and Biodiversity funding was the "most appropriate" financial instrument to enable the BulPlantNet team to achieve its nature conservation goals. "There were several other options but they would not finance all activities that were needed in order to apply a multilevel conservation approach," he says. "LIFE makes it possible to incorporate various actions, including in-situ and ex-situ conservation, research activities, administrative actions, monitoring, dissemination and awareness raising, all of which are aimed at the sustainable long-term conservation of biodiversity."

A broad spectrum of expertise

The network of small protected sites was one of the best outputs, he continues, noting that "many people with a broad spectrum of expertise as well as local people were involved in its creation." These were researchers, experts from the ministry and its regional inspectorates, local forestry units, members of NGOs, local mayors and also other people who helped in various ways, he says.

Professor Peev believes that the support of local communities is of "crucial importance" for nature conservation. "Without their understanding and involvement our network would have been much less

BulPlantNet applied the plant micro-reserve concept in Bulgaria with great success

Photo: LIFE08 NAT/BG/000279

effective in the preservation of plant biodiversity. The good will and help of local stakeholders is also extremely important both for the establishment and the persistence of the network of small protected sites. We met unexpectedly high interest, welcome, sympathy and readiness to help from local communities. We are deeply grateful for this support."

The legal protection afforded to the micro-reserves established by the project – and the continued monitoring of the sites - should ensure their long-term future.

Spreading the word

Coastal dunes with *Juniperus* spp are important in terms of biodiversity, as they host several rare or endemic species of flora and fauna. *Juniperus* is a slow-growing species and requires time to recover from any natural or human disaster. Stakeholder consultation was an important part of the JUNICOAST project, which targeted the recovery of this protected habitat in 17 sites in Crete and the South Aegean (Greece). This partnership approach helped to spread awareness of the value of the habitat and of the human pressures on its survival, including uncontrolled tourism, fire risk and overgrazing. The project was coordinated by the Mediterranean Agronomic Institute of Chania (MAICh), a research institute that has been involved in many Mediterranean R&D projects financed by LIFE and other EU funding sources, working in close collaboration with Greek and other European academic and research institutions.

Until the LIFE project, there were no active conservation measures for the protection and restoration of coastal dunes with juniper species in Greece and, importantly, a lack of knowledge amongst local communities, the tourism sector and other businesses

Coastal dunes with juniper species on the island of Gavdos

Photo: LIFE07 NAT/GR/000296/George Kazakis

> *"Upon leaving, take with you your experiences and memories. Leave behind ONLY your footprints!"*

Excerpt from JUNICOAST 'Code of conduct' for beach users

of the habitat's value and of the threats to its continued survival. Thus, environmental education and public awareness were of "paramount importance" says George Kazakis, the project manager. The project also researched and addressed the governance structure and the legal status of the protected habitat.

With an overall budget of €1.5 million, the multi-stakeholder project involved two other independent and voluntary groups – a 'scientific committee' and a consortium of local stakeholders and community groups. The scientific committee included academics as well as hospitality/ tourism professionals from Greece, Malta and Canada. Participants met four times over the course of the project. Their advisory role was to support and evaluate the project's scientific actions and findings.

The local consortium also met regularly and feedback from these meetings enabled the JUNICOAST team to produce reports for each of the targeted Natura 2000 sites. These were instrumental in pinpointing problems that were then addressed by the project team in favour of the long-term conservation of the habitat. For example, a 'Code of conduct' was published for the public and exhibited on sites promoting the idea of collecting rubbish and placing it in bins provided outside of the habitat boundaries.

The JUNICOAST team also held on-site discussions with campers (e.g. to dissuade them from camping in sensitive areas) and environmental education workshops were organised on behalf of the project, by a local environmental education centre. Students and staff also helped by distributing information about the habitat to summer camps.

Crucially, such activities did not stop when the LIFE funding ended. A range of stakeholders, including forest directorate staff, government officers, tourism representatives and schools are continuing the awareness raising started by the project.

APPLIED RESEARCH AND NEW TECHNOLOGY

Projects apply citizen science

Many LIFE projects have benefitted from the enthusiasm, skills and commitment of volunteers willing to gather vital scientific data that underpins their work.

Public participation in science has undergone a revival in recent years. When members of the public undertake scientific work, usually in collaboration with professional scientists, it can be called 'citizen science'. The recent growth in citizen science has been facilitated by technology, for example, improved communication between scientists and the public via the Internet, and the use of GPS data input systems by volunteers in the field.

The use of volunteers in LIFE projects is nothing new, though recent projects have sought new approaches to engaging the general public in their activities (see pp. 24-30). Further to this, some LIFE projects have embraced the concept of citizen science and involved members of the public in key roles, including the monitoring of species and habitats in Natura 2000 sites.

Scuba divers

Posidonia Baleares (**LIFE00 NAT/E/007303**) was the first LIFE project to establish a volunteer network of scuba divers, to monitor underwater meadows of Neptune grass (*Posidonia oceanica*). The network encompassed 110 divers, plus the staff of diving clubs. Volunteers could choose from three levels of commitment, and they benefitted from training that taught them about the marine environment. The involvement of the divers helped the project achieve its educational and awareness-raising objectives, as well as expanding its monitoring capabilities.

Photo: LIFE09 NAT/ES/000534(Consej. Medio Amb. y Orden. del Territorio

LIFE Posidonia Andalucia (**LIFE09 NAT/ES/000534**) developed a similar volunteer diver network, to monitor a different part of the Mediterranean. In the first two years of monitoring (2012 and 2013), 150 trained volunteers were selected. The project created 16 monitoring stations that were regularly monitored by volunteer divers, who collected data on plant density and the presence of invasive species.

Diverse roles for volunteers

An existing volunteer network is being strengthened in the Bocages project (**LIFE11 NAT/BE/001059**). Volunteers are being engaged though workshops, field trips and other activities involving around 270 people, to help in the conservation of habitats and species in bocage landscapes in the Fagne and Famenne (Belgium).

Volunteers can help enforce legislation in Natura 2000 areas (see pp 45-50). In north-western Scotland, for example, volunteers with the 'Pearls in Peril' project (**LIFE11 NAT/UK/000383**) take part in river patrols to report incidents of illegal fishing of the freshwater pearl mussel (*Margaritifera margaritifera*) to the police.

The LIFE Biodiscoveries project (**LIFE13 BIO/PT/00386**) aims to control the spread of invasive species in Natura 2000 sites in Portugal, with volunteers playing a key role. The project is conducting a cost-benefit analysis on the impacts of various volunteer actions, to demonstrate how best to deploy the general public in nature reserve management.

The Italian project CSMON-LIFE (**LIFE13 ENV/IT/000842**) aims to improve the knowledge base for the country's biodiversity policies by involving citizens in data collection and validation using smartphones and tablets. The information will be integrated into the databases of the Italian biodiversity network and disseminated to policy-makers, scientific organisations and stakeholder groups, contributing to meeting the goals of the EU Biodiversity Strategy to 2020.

APPLIED RESEARCH AND NEW TECHNOLOGY

Creating **a plant monitoring network**

A LIFE project bought together members of the public, environmental rangers and scientists, in a network for monitoring plants and habitats in Natura 2000 areas.

The Habitats Directive requires EU Member States to monitor species and habitats listed in its annexes, and assess their conservation status every six years. "There are a diverse range of habitats in Aragón, from semi-desert to alpine, so a lot of work is needed to implement the Habitats Directive," says David Guzmán Otano, project manager of LIFE RESECOM (**LIFE12 NAT/ES/000180**).

Dr Guzmán works in the Agriculture, Livestock and Environment Department of the Aragón Government, the project's coordinating beneficiary, where his responsibilities include monitoring plant populations. The LIFE RESECOM project was initiated, he says, because the existing monitoring capacity was insufficient for all the listed species. The project enabled the regional government and its partner organisation, the Pyrenean Institute of Ecology (IPE-CSIC), to create a dedicated plant monitoring network, with extended roles for rangers and volunteers.

Volunteers monitoring Erodium celtibericum during the LIFE RESECOM project

Photo: Silvia Lopez

"The LIFE project undertook its first field work in 2014, monitoring plant species and habitat types of Community importance. The Habitats Directive-listed plants include endemics, those on the edge of their range, and ones that are collected, for example, for medicinal uses," he explains. "The plant monitoring network comprises about 100 people (50 rangers and 50 volunteers), plus government scientists and freelance botanists. The network means that many more species can be monitored."

Different levels of engagement

With volunteers having varying levels of experience, the project established a hierarchical approach with four levels of engagement. They are given maps showing previous plant distributions, and the first two levels involve confirming the presence or possible extinction of populations, discovering new populations, marking the extent of the current distribution and noting possible threats. Level 3 involves yearly monitoring to see if abundance is increasing or decreasing, whilst Level 4 involves the long-term monitoring of individual plants.

In the field, Dr Guzmán demonstrates how permanent plots are established, using Lady's slipper orchid (*Cypripedium calceolus*) as an example. This species has been monitored since 1997. The LIFE project coordinates with an ecotourism operator, so that visitors are shown orchids nearer the road - leaving this plot undisturbed.

Plots are marked with short stakes, around which a measuring tape is run, with flags used to avoid recounting. The orchid plot is on a steep slope and is 10 metres square. The method is adopted for each species monitored, depending on the number of plants and their distribution. "We supply volunteers with stakes, tape and flags," says Dr Guzmán, "and

we are developing an app for smartphones with GPS for them to input field data."

Some plants have been systematically monitored for up to 20 years, but many are being monitored for the first time during the LIFE project. These include some in the high mountains that require several hours walk to reach them, so rangers typically monitor those. "The advantage of involving rangers in the network is that they can spend longer in the field and monitor populations over a long period of time," explains Dr Guzmán. There are around 450 rangers working for the Aragón Government. They monitor species or habitats as an extension of their usual work. For example, Rafael Vidaller is monitoring *Galanthus nivalis* as part of the project.

Photo: NEEMO EEIG/Stephen Nottingham

Lady's slipper orchid (Cypripedium calceolus)

TRAINING VOLUNTEERS

María Begoña García of IPE-CSIC is the LIFE project's volunteer organiser. Her experience of monitoring Aragón's unique flora includes a 20-year study of the world's only population of *Borderea chouardii*, a "true cliffhanger" in that it is only found in crevices on adjacent vertical cliffs (where it relies on two ant species for pollination and dispersal).

As part of a team of three, Dr García is responsible for training rangers and volunteers. Volunteers are closely supervised in the field over several visits, as it is important to make sure standardised protocols for sampling and recording data are understood and rigorously applied. By doing this, volunteers can make a valuable contribution even though their monitoring tasks may take only one day a year per population.

"The volunteers' commit to working with one or more species for 10 years at least," explains Dr García: "The aim is to improve knowledge of the biology and distribution of species of Community interest, and to detect changes in population abundance." If changes are found, the project team want to assess them in terms of global change drivers, especially land use and climate change.

At the orchid site, Dr Guzmán points out how quickly the landscape can change, as the once open location has been covered by encroaching woodland since monitoring began, whilst Dr García shows aerial photographs of a valley in the Pyrenees in 1956 and 2006, where the forest is denser and the treeline has shifted upward. The project team are placing mini data-loggers in the monitoring plots (e.g. to record air temperatures), to assess plant population trends in terms of environmental factors.

A citizen science association

Volunteers in the IPE-CSIC network participate in other scientific projects besides LIFE RESECOM. "We organised a citizen science association, called AMBA ciencia cuidadana," says Dr García. At an AMBA meeting in 2014, volunteers were presented with certificates for 'adopting a plant' and told about the results of the year's fieldwork. "We went to a monastery, an iconic place in Aragón; one woman is the caretaker and in her spare time monitors a couple of endemic plants on its walls."

The volunteers are aged from 18-72 and range from those with little previous experience of botany to highly-skilled people. In the offices of ANSAR (Asociación Naturalista de Aragón), an environmental NGO based in Zaragoza, a group of volunteers discuss their involvement with the LIFE project.

Soledad Martín works as an administrator: "Going to the countryside is my hobby, my passion. Breathing the country air makes me feel alive. I would go anyway to look at plants; the only difference is that now I do it following a method; but it doesn't feel like work to me." She monitors *Arnica montana*, which is Habitats Directive-listed because it used to be collected for its medicinal properties.

The oldest volunteer Antonio Fuentes retired from his job as an electrical engineer 15 years ago. "Retiring changed my life: I've gone from a regular job

Photo: NEEMO EEIG/Stephen Nottingham

Ranger Raffael Vidaller with David Guzman with Jasonia glutinosa on cliff habitat

to collaborating as a volunteer in activities that I both enjoy and can see are really meaningful to society." He monitors two orchid species, but also records birds by listening to their singing as part of another project. "What I enjoy most about being a volunteer is enjoying nature alone in silence," he says. However, like the others, he also enjoys the network's social aspects, especially talking about common natural history interests.

Jesús Ruz retired from his telecoms job three years ago. For most of his life, he says, he was not particularly interested in plants. This changed when he joined ANSAR, and the LIFE project training has furthered his knowledge: "This activity is a bit different to what I did before because it´s not just about observing and putting names to plants, but applying methods to monitor them." He goes into the field with his wife Maria Fustero, who first got him interested in botany; they monitor *Euphorbia nevaedensis* and two other species.

The only non-ANSAR member at the meeting, Ana Lobera works as a nurse. She does fieldwork with up to 10 relatives, all of them learning about plants together, monitoring a club moss (*Lycopodium clavatum*) and another species. "I really enjoy working on something scientific, but outside my area of professional training," she says. "We don't just count the plants; we spend the whole day with them... I am a sexologist and what I see in plants, I relate to what I see in people: plants and people aren't so different!"

Rosa Germán, who retired from her job as an administrator in 2014, monitors an alpine clubmoss (*Diphasiastrum alpinum*) and helped make a significant discovery. "I monitor a very scarce plant. We used to have just one single population in Aragón, and now there is a new population to monitor - one that we discovered!" Ms Germán adds that the plant is difficult to spot, because it is tiny, covers only a few square metres and is mixed together with other species. "We have to do the work in a very careful way: That´s how we discovered the second population, by being thorough."

A freelance wildlife photographer, Ricardo Gracia has produced a book on orchids in Natura 2000 sites in Aragón. His role in the citizen science association is, unsurprisingly, monitoring orchids: "When I carry out this work, I end up teaching as well. People passing by are interested in what I am doing. That is what has most surprised me. I tell them what I am doing and I am helping to raise their awareness."

Benito Campo works as a construction technician, but has been involved in voluntary botanical work for many years. He monitors the endemic *Androsace cylindrica*, which occurs on cliffs. "What I find most interesting is the process of democratising science. By sharing information, both scientists and volunteers benefit," he says.

Did you know?

Nearly half of the total estimated flora for the Iberian Peninsula can be found in Aragón. More than 200 species in Aragón are listed in Habitats Directive annexes or national and regional lists that require them to be monitored.

Project number: LIFE12 NAT/ES/000180
Title: LIFE RESECOM – Monitoring network for plant species and habitats of Community interest in Aragón
Beneficiary: Government of Aragón

Contact: David Guzmán
Email: dguzman@aragon.es
Website: www.liferesecom.com
Period: 01-Jul-2013 to 31-Dec-2017
Total budget: €1 312 000
LIFE contribution: €656 000

ENFORCEMENT AND GOVERNANCE

Training and capacity building for enforcement

LIFE projects have helped enforce the Habitats and Birds directives at Member State level, by providing training and other support for enforcement officers.

The Natura 2000 network comprises over 26 000 sites protected under EU law. Threats to habitats and individual species listed in the annexes of the Birds and Habitats directives both within and outside Natura 2000 network sites can therefore be addressed through the implementation of environmental legislation. A small number of high-impact LIFE projects have provided support for the legal profession and enforcement officers to help them protect Natura 2000 network sites at risk from arson, off-road vehicles, vandalism, wildlife smuggling, illegal fishing and other activities..

The Dorset Heaths project (**LIFE00 NAT/UK/007079**) pioneered a new approach to tackling arson on heathland near urban areas in Poole, England. The project conducted an extensive awareness-raising and education campaign, particularly aimed at school children (the group most responsible for setting fires), in collaboration with the Dorset Fire and Rescue Service. As a result, a stronger working relationship was established between the police and fire services, the local council, and community groups. A voluntary warden service was established to provide firefighters with accurate information about the location of fires and the priority conservation significance of affected areas. Volunteers and firefighters learned, for example, about the most important locations for sundew and reptiles, and the main bird breeding sites.

Off-road vehicle use and motocross were threatening the creation of a network of lagoons and dunes in Natura 2000 sites on France's Mediterranean coastline. The LAG Nature project (**LIFE07 NAT/F/000193**) improved coordination between different environmental police organisations to combat these and other illegal activities in protected areas. For instance it developed training courses for municipal and regional police forces, and staff within the legal department of the Languedoc-Roussillon region.

In Romania, the Iron Gates project (**LIFE00 NAT/RO/007171**) helped enforce legislation protecting species targeted by wildlife smugglers in the Iron Gates Natural Park. The endangered venomous snake *Vipera ammodytes* is threatened, for example, as a result of its illegal removal by snake

Tim Spring from Dorset Fire and Rescue Service

Photo: LIFE00 NAT/UK/007171/NEEMO EEIG/Justin Toland

breeders. The LIFE project trained people to become rangers and taught frontier police to recognise the viper.

The ongoing project, LIFE Activa Red Natura 2000 (**LIFE11 INF/ES/000665**) has compiled a list of sentences passed by courts for all illegal activities in Natura 2000 sites in Spain, as a resource for the legal profession and to show how judges have been interpreting environmental legislation. The project also established the annual Natura 2000 Day, to raise awareness about the network. Wouter Langhout, EU Nature Policy Officer at beneficiary BirdLife Europe said: "This event is a good opportunity to recall that these sites, home to rich and unique wildlife, are still threatened by habitat deterioration and destruction as a consequence of the lack of EU law enforcement."

Improving the enforcement capacity of maritime police in Portugal

The project MarPro (**LIFE09 NAT/PT/000038**) aims to support the implementation of the marine Natura 2000 network for the target cetacean and seabird species and their habitats throughout the Economic Exclusive Zone of Continental Portugal. The main objective is to reduce conflicts between human activities (mainly fisheries) and the target species - the harbour porpoise (*Phocoena phocoena*), bottlenose dolphin (*Tursiops truncates*) and Balearic shearwater (*Puffinus mauretanicus*) - in line with the requirements of the Habitats and Birds directives.

Portugal has more than 900 km of coastline. One of the project's key objectives is to improve the response capabilities of the two networks for stranded wildlife that currently operate in Portugal. One of the networks focuses on dead stranded marine mammals, seabirds and sea turtles, the other on 'live strandings'. The maritime police are responsible for all the events that occur in the sea and coastal areas: if a dolphin becomes stranded there, the police are in charge. They report strandings and coordinate security measures during removal or rescue of the animal, with the support of the Institute for Nature Conservation and Forests (Instituto da *Conservação da Natureza e das Florestas* – ICNF), the government body responsible for marine species listed in the Habitats Directive.

José Vingada from the University of Minho, an associated beneficiary of the MarPro project, is in charge of the project's stranded wildlife rescue teams and recovery centre. He says that coordination between the maritime police and the ICNF needed to be improved. In particular, it was necessary to upgrade methodologies and equipment in order to improve detection and response to strandings along the Portuguese coast. This became a more pressing issue as, from 2002 onwards, the number of stranded animals detected increased dramatically - by around 300 animals per year.

As part of the LIFE project, the ICNF held several training sessions for the maritime police and other enforcement agencies (e.g. the National Authority for Civil Protection and SEPNA, the Nature and Environment Protection Service). These covered procedures for live and dead strandings, information about the species and the legal issues affecting marine animals in Portugal. More than 100 people took part in these training sessions.

By improving the capacity of the maritime police, improving coordination between the partners involved in the project and upgrading forensic facilities, the MarPro project has made it possible to carry out more autopsies than before. "Now in Portugal we are performing autopsies on 70% of stranded animals, compared with 30% in the UK. We are one of the most efficient stranded animal response teams in Europe," says Catarina Eira of the University of Aveiro, the LIFE project manager.

MarPro co-funded the improvement of a rehabilitation centre and purchased a rescue ambulance used to transport stranded animals. Thus, thanks to the project, the number of rehabilitated marine animals has increased. Good cooperation with the maritime police is helping raise awareness amongst another important group of stakeholders; they are supporting efforts to make fishermen aware of the problem of by-catch.

Photo: LIFE09 NAT/PT/000038

ENFORCEMENT AND GOVERNANCE

LIFE applies **the law to fight environmental crime**

The VENENO NO project in Spain worked with environmental officers from the national and regional police, and lawyers and other legal professionals, to enforce the law relating to illegal wildlife poisoning.

VENENO NO helped create this canine unit to sniff out the toxins commonly used in poisoned baits

Laying out poison baits to protect livestock or crops was once a normal countryside practice in Spain. It has been illegal since 1983, but the practice persisted and few convictions were sought. The VENENO NO project (2010-2014) raised awareness of the problems of poisoning, which indiscriminately kills wildlife and is a particular threat to endangered species. In particular, it acted to implement the 'National Strategy against the illegal use of poisoned bait in the countryside' (2004).

David de la Bodega Zugasti, the coordinator of VENENO NO, is an environmental lawyer with project beneficiary SEO/BirdLife. He previously worked for the Ministry of Agriculture, Food and Environment on the international regulation of chemicals. Therefore, he is ideally placed to interact with environmental officers and legal professionals. He is currently managing a new project, to create a European network against environmental crime.

Detective work

"The first stakeholder group we met was the environmental enforcement officials or police," recalls Mr de la Bodega. "In Spain we have two groups

of environmental police: the national Service for the Protection of Nature (Seprona) and environmental enforcement officials in the 17 autonomous regions." At the regional level, the VENENO NO project first contacted environmental enforcement officers in Catalonia. Both Catalonia and Andalusia have specialist wildlife poisoning units, so they were considered the best models for improving environmental crime enforcement capacity in other regions.

"The Catalonian unit has been a key element in the training of around 500 environment officials," says Mr de la Bodega (see box, 'Regional enforcement'). "We explain the right way to collect the sample, because if you don't collect correctly it could be rejected during the trial." This knowledge was gathered into protocols for law enforcement officials, which defined best practice for collecting samples and reporting cases.

VENENO NO created a specialist unit within the environmental police in Castilla-La Mancha called UNIVE, for officers specialising in detecting illegal poisoning. As in Catalonia and Andalusia, mobile patrols used dogs trained to sniff out the toxins commonly used in poisoned baits.

The LIFE project supplied equipment to enforcement officers in six regions, including sampling bags, night-vision binoculars and GPS camera equipment. "They need to collect as much information as possible from the crime scene," explains Mr de la Bodega. "They need to look for cigarettes and clothing, check for tyre tracks and footprints, and to clean the area of poisoned baits." Samples are put into bags and secured with tags, each with a unique identification number. These are taken to wildlife recovery centres. If preliminary analysis shows poisoning, the samples are sent to a toxicological laboratory.

"The main proof of a case is the toxicological report, to show that the animal died as a result of poison and for no other reason," emphasises Mr de la Bodega. To improve this process, VENENO NO produced two documents, in collaboration with IREC (Spanish Institute of Game and Wildlife Research). The first was a comprehensive report on the substances used in poison baits, which showed aldicarb (banned 1984) and carbofuran (banned 2008) to be the most used toxins (72% of cases), indicating the existence of illegal stockpiles. The second was a procedural protocol for wildlife rescue centres and toxicological laboratories for dealing with cases of illegal poisoning.

SEO/BirdLife also receives information on wildlife poisoning from the general public, who are encouraged to report incidents on a freephone number. This has revealed the large-scale problem of domestic animals being poisoned in urban areas, especially cats and dogs; but as the baits usually take the form of poisoned food this also poses a threat to people, especially children. SEO/BirdLife produced a model complaint form to facilitate the reporting of these cases. "We also have a network with 339 volunteer members," explains Mr de la Bodega. Courses for volunteers who patrol selected areas teach them

Regional enforcement

The Cos d'Agents Rurals (CAR), of the regional government of Catalonia, work to protect the environment. As a result of protected species being killed by poisoning and the difficultly of identifying poisoners, CAR created a mobile patrol in 2003 dedicated to the investigation of such cases. The patrol's main aim is to bring poisoners to court, by catching them in the act of setting baits.

A CAR spokesperson says the overall experience of the patrol has been extremely positive. Many poisoners have been found guilty as a consequence of direct evidence presented by CAR, when previously a lack of evidence gave them immunity. "Therefore, we thought it could be interesting to share the methodology used and the lessons learned with our colleagues throughout Spain." Part of this was to help VENENO NO develop a training course focusing on procedures for investigating illegal poison baiting. The LIFE project has, according to CAR, been a key factor in the resurgence of investigations in poisoning cases. This is because it has enabled rangers to unify and share methodology, and execute strategies in different regions to extend actions against this type of environmental crime.

Photo: ARuralès-Catalunya

Pablo Ayerza: Lawyer

"I have a law degree from the University of Navarra and have been a practicing lawyer since 1992, with my own law firm. I combine the typical work of a generalist firm with specific jobs in the defence of the environment. Since the beginning of my career, I have advised and been actively involved in environmental advocacy programmes with national and local associations. Regarding the fight against poisoning, I have been legal counsel for WWF-Spain since 1999, so my work was well known by SEO/BirdLife. They entrusted me to bring several cases to court in the framework of the LIFE project.

"VENENO NO has been a real revolution in the fight against the illegal use of poison-baits in Spain, squeezing the most from the resources available. It has been possible to act not only in the prosecution of the perpetrators of this crime in court (criminal and administrative), but also to influence and advise governments, and judicial and administrative agents, on the facts of this problem, its consequences and its origin. Furthermore, awareness has been raised in the sectors most concerned, such as hunting and farming. The project provided a framework of cohesion to the various stakeholders involved in combatting poisons, which has become a permanent forum for exchange."

about the issues and the protocols to follow: "We ask volunteers to phone the number if they find poisoned bait, and then to wait in place until an enforcement officer arrives."

Preparing for court

When the project team learned that an illegal poisoning case was going to court, they had to decide if they wanted to be involved in the legal process. If the answer was yes, they briefed their lawyers, for example, on the conservation status of the wildlife killed or with additional information to clarify the facts.

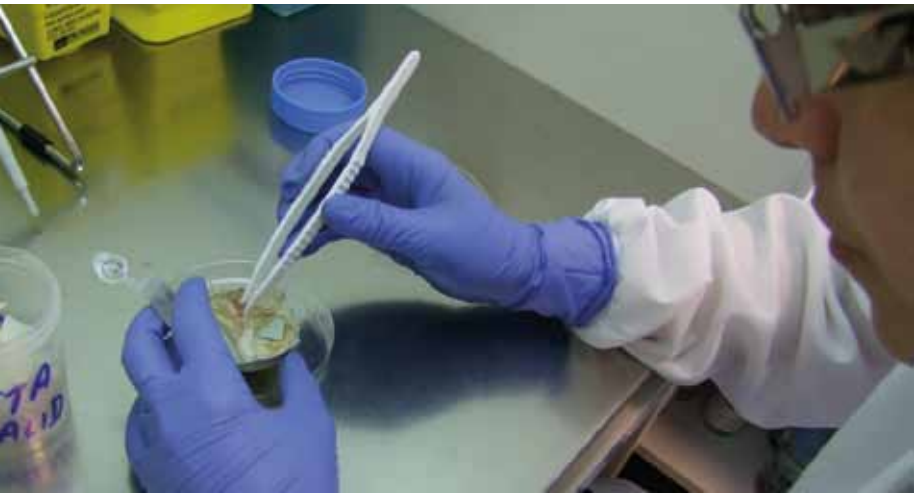
SEO/BirdLife works to obtain convictions that reflect the conservation importance of the species in Natura 2000 areas, based on the concept of civil responsibility. "In Spain, every wild animal has a value, and the owners are the regional governments," explains Mr de la Bodega. "The wildlife value is different in each region, with the highest value being for Iberian imperial eagles in Castilla-La Mancha, where each bird is valued at €60 000."

In Castilla-La Mancha, six Iberian imperial eagles (*Aquila adalberti*) were poisoned on a nature reserve in Ciudad Real in January 2012. This represented a serious setback for the species, as Castilla-La Mancha is home to almost half of its global breeding population; information which the LIFE project bought to court through its lawyers. "In cases like this, we ask for civil responsibility to apply not just for the official value of the species, but also taking into account other factors." In this case, the court, in April 2015, imposed bail of €800 000, as requested by SEO/Birdlife, with the judge taking into account each bird's wildlife value, the scarcity of the species, the danger to the overall population, and the investment efforts of organisations involved in its conservation.

"We have collaborated mainly with two lawyers," notes Mr de la Bodega: "The first, Pablo Ayerza, is the national expert for cases involving illegal poisoning (see box), but for three cases we have gone with Maria Soledad Gallego."

The Prosecution Office's role in court is to defend the interests of the state. "We try to apply the highest

Participants in VENENO NO's wildlife crime enforcement training course in Cantabria



Laboratory analysis of a sample from a poisoned bird, one of the evidence-gathering methods used by the VENENO NO project

penalties, which may be a different agenda to the prosecutors'," acknowledges Mr de la Bodega. SEO/BirdLife brings information into court, and talks to prosecutors to ensure they are aware of the issues, in a sort of lobbying role.

The project's main interaction with the Spanish Environmental Prosecution Office, however, arose from its report on poisoning substances, which revealed a black market in pesticides. SEO/BirdLife anonymously purchased banned chemicals, of the type used in poison baits, over the Internet. They presented the evidence to the prosecutor Raquel Muñoz. The project has also lodged an official complaint with the Environment Coordinator of the Ministry of Justice, urging stronger measures against the illegal trade in banned agrochemicals.

Judgements

"When we first designed the project, we thought of developing an action for raising the awareness of judges; but this is difficult because they are very proud of their independence," explains Mr de la Bodega. He notes, however, that although the project has no direct contact with judges, each trial is in itself an awareness-raising experience. "The judges involved sometimes did not know much about illegal poisoning or its consequences, so when we explained about the problem it was an occasion to inform the judges."

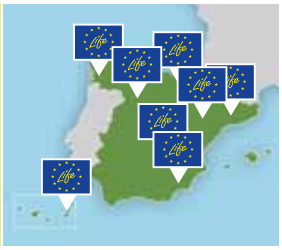
"We have brought 24 cases and obtained 11 convictions, with eight cases still ongoing," says Mr de la Bodega. The longest jail sentence was given for an incident involving a farmer, who laid poisoned baits thinking they would protect his foals and calves from wolf attack. The baits killed at least 11 red kites (*Milvus milvus*), five dogs, six foxes, a cat, a raven, a buzzard and four vultures. A court in Santander found the farmer guilty and sentenced him in June 2015 to two years in prison, two years post-release disqualification from farming or animal husbandry, four years disqualification from hunting, a civil responsibility fine of €90 270, and an additional fine of €28 500 to be used to monitor endangered red kites over the next three years.

Prior to the LIFE project, few such cases came to court. The project has therefore strengthened the enforcement of laws tackling wildlife poisoning and raised awareness amongst many different stakeholder groups. The LIFE project team believe that the cases they have helped bring to court act as a powerful deterrent against this environmental crime.

A regional enforcement officer and LIFE euipment for gathering evidence of poisoning in the field

Project number: LIFE08 NAT/E/000062
Title: VENENO NO – Action to fight illegal poison use in the natural environment in Spain
Beneficiary: SEO/BirdLife

Contact: David de la Bodega
Email: ddelabodega@seo.org
Website: www.venenono.org
Period: 01-Jan-2010 to 30-Mar-2014
Total budget: €1 672 000
LIFE contribution: €647 000



BUSINESS AND PRIVATE SECTOR STAKEHOLDERS

Promoting the nature of business

LIFE has a long tradition of working with business and private initiatives through its Environment strand. LIFE Nature and Biodiversity funding can also be mobilised to help companies make better business decisions for biodiversity.

More and more EU businesses now appreciate that nature conservation can help protect company assets, reduce threats and encourage innovation. Firms from all Member States are able to become more nature-friendly and the EU proactively encourages such corporate social responsibility.

Interactions between commerce and conservation are promoted for example through The European Business and Biodiversity (B@B) Platform (see pp.3-8). Additional EU support is available in this field through projects such as the 'BTAU' initiative. It has established Biodiversity Technical Assistance Units in Bulgaria, Hungary and Poland with aims to create "Pro-Biodiversity Businesses". On a global scale, EU companies can learn and share through the Natural Capital Coalition's[1] work.

All these business advisory services focus on the benefits that result from considering biodiversity through business decision-making. These include the fact that compliance with biodiversity regulations can improve the image of a company, increase customer loyalty, and expand the scope of its business. Nature-friendly enterprises can also create jobs. Other boardroom decisions concerning biodiversity are made to reduce threats and disruptions caused by natural hazards, climate change and raw material costs.

The LIFE programme provides many useful options for the private sector to take a leadership role in biodiversity conservation. As well as traditional grant-based funding, since 2014, LIFE also includes the Natural Capital Financing Facility (NCFF). Administered by the European Investment Bank (EIB), the NCFF has a budget of €100-125 million for 2014-2017 to make loans and investments in funds to support projects that promote the preservation of natural capital. The aim is to demonstrate to potential investors that such projects can generate revenues or save costs, whilst delivering on biodiversity and climate adaptation objectives. The four project areas that the facility covers are: payments for ecosystem services, green infrastructure, innovative pro-biodiversity and adaptation investments, and biodiversity offsets.

LIFE's flexibility means it can be used relatively easily by EU enterprises to further their own biodiversity interests associated with company growth, employment creation, and overall economic prosperity. The following pages spotlight examples of LIFE projects that demonstrate how the private sector can do this in practice.

Beetles in fashion

The founders of the Zegna textile corporation helped to establish a nature park around the area where its original woollen mills were based in Piedmont, northern Italy. The park's emblem is a well-known local beetle (Olympia's ground beetle - *Carabus olympiae*), which is listed as 'vulnerable' in the IUCN Red List. With the assistance of experts from academia and nature conservation organisations, Zegna applied for LIFE co-funding for a project to help improve the beetle's conservation status (CARABUS – **LIFE11 NAT/IT/000213**). Match funding from public authorities was also awarded to the private sector project, which is developing better beetle habitat conditions by working with farmers and foresters.

Photo: LIFE11 NAT/IT/000213

1 *http://www.naturalcapitalcoalition.org*

BUSINESS AND PRIVATE SECTOR STAKEHOLDERS

Return of the salt industry allows nature to flourish

The revival of salt production in Slovenia, in part thanks to LIFE, is generating multiple benefits for businesses, the local community and nature. Important lessons can be learned about the private governance of Natura 2000 network sites.

Sečovlje salina is a 650 ha area along the estuary of the Dragonja River on the southernmost stretch of the Slovenian coastline, bordering Croatia. Salt production has taken place in this location since Roman times.

"Salt works are extremely important habitats. Traditional salt making provides conditions for a favourable conservation status for many habitats and species," says Andrej Sovinc, Head of the Sečovlje landscape park.

"This is a very specific habitat: it was manmade, it has to be maintained by people. For biodiversity protection you have to invest something," explains Mr Sovinc.

In the 1990s, the future of the park looked bleak. "Salt production was not financially viable... cheaply produced salt from North Africa really destroyed this type of production. On the other hand the state authorities didn't have the money (perhaps also interest) to run a public institution," recalls Mr Sovinc. "It was a typical 'paper park', so no management."

Enter Mobitel

"We were very lucky at that time that the government made a contract with a mobile phone company, Mobitel. The head of the company, Anton Majzelj, really fell in love with the area, and offered to invest to protect the natural and cultural heritage. They

Slovenia's Sečovlje salina has been producing salt since Roman times

Photo: LIFE09 NAT/SI/000376/NEEMO EEIG/Justin Toland

were clever enough to realise that by doing that they would get indirect benefits in marketing," he explains.

Mobitel gave seed money to restore salt-making and biodiversity at Sečovlje in return for exclusive rights to use pictures from the park on its packaging and in its other marketing campaigns. "This proved to be very profitable," says Mr Sovinc. The mobile phone company commissioned a customer survey a couple of years ago which revealed that the second most important reason why people were its clients was because it was seen as an environmentally-responsible company. "They made money indirectly by getting new clients because they were seen as responsible towards the environment," he notes.

When Mobitel first came on board in 2000, the infrastructure of the park was in a sorry state. "Nobody had invested in maintaining it for 50 years because of the problems selling the salt. The sea defences were in ruins," says Mr Sovinc. "This was a problem for salt-making, but it was even worse for biodiversity: we had several important habitat types; several important breeding birds, fish species and the European pond turtle (*Emys orbicularis*), and every time there was a high tide it was all just flooded; we lost all the breeding birds.

"The mobile phone company said: We'll give you initial money for the first three years or so, to restore, to make it work, but then you'll have to be on your own." At that point, Mobitel set up the wholly-owned subsidiary, SOLINE, which has a concession to manage the park for 20 years (till 2023).

More help from LIFE

Early actions were co-funded by the LIFE Sečovlje project (**LIFE03 NAT/SLO/000076**), which ran from 2003 to 2006 and restored dilapidated dikes and embankments, created artificial nesting islands for terns and drafted a site management plan. In total the project was able to protect some 2 000 m^2 of the most valuable habitat area and convert 5 000 m^2 into potential new breeding areas for six bird species. In terms of value for money, it should be noted that every LIFE-supported metre of dikes supported further reconstruction of more than 4m of dikes.

"This first project was used just to put a major fire out and to prepare for a big LIFE project," says Mr Sovinc. That big project is MANSALT (**LIFE09 NAT/SI/000376**), which began in 2010 and was in the final stages of completion when the LIFE Communications Team visited in July 2015.

Photos: LIFE09 NAT/SI/000376

The LIFE project beneficiary developed local skills to restore and strengthen flood defences

MANSALT was given added urgency by a major flood in the area in December 2008. "The dikes here all collapsed. I couldn't leave the office building because it was flooded; it was really a natural disaster," recalls Mr Sovinc. "We immediately drafted the MANSALT proposal and secured co-funding from the government for a reconstruction programme."

MANSALT has ensured control over the water regime and hydraulic management in saline ecosystems

based on a system of sea-defence walls, embankments and internal channels. "Our keystone species is the little tern (*Sterna albifrons*). The LIFE project was designed to protect this species by controlling the water regime, by dredging out the channels around the breeding islands, by protecting the area against the intrusion of mammalian predation and so on," says Mr Sovinc.

In one area of the park, the project has constructed a set of 2.7 m-high gates across a 4 km-long channel. "They will be closed a couple of days a year - when high tides are forecast," explains Mr Sovinc. During the 2008 floods, the water level reached a height of 2 m.

On the other side of the park (and just outside its boundaries), hundreds of illegal piers and boats have sprung up in recent years, threatening the ecology of the park and rare species such as Spartina grass. To address this unregulated development, the MANSALT team has produced a set of guidelines for Piran municipality on how to reconstruct the area in a nature-friendly and visually-appealing way. The nature conservation authorities, mayor and municipality have approved the guidelines. "One day there will be a nice wooden boardwalk with the boats next to it," says Mr Sovinc.

A local team

According to Mr Sovinc, the success of both LIFE projects and of the landscape park in general has been down to its philosophy of community involvement: "No Natura 2000 site and no protected area could work without the support of the local community."

To gain local acceptance SOLINE chose "the most complicated way" to restore the dikes. "The easiest way would be to hire construction companies and let them do the work, but that would be expensive, you'd pay somebody else and the park and local community wouldn't get much out of it. We said we will employ our own people - people from the local community - who will be employed through the LIFE project to do the reconstruction works," says Mr Sovinc. He points to a 518-m long stretch of dike restored by the MANSALT team: "Every stone that you see here was cut by hand, prepared by local people. We are really very proud of that."

To achieve this, the project involved three or four older community members whose own parents and grandparents had worked on the salt pans and who

Photo: LIFE09 NAT/SI/000376/NEEMO EEIG/Justin Toland

Project manager Andrej Sovinc: "The ecosystem services that we have here are as important as ordinary financial parameters."

knew how to build infrastructure that would be able to cope with two high tides each day. "We listened to them and we made a team of local people who really had the knowledge how to do this and then we started," says Mr Sovinc, who explains that thanks to the recent LIFE funding, the team of construction workers is now more than 40 strong, "including 20 people new people: young people from the local community."

With tourism as the major local industry, most young people are only employed during the summer months. "We offered them a job through the LIFE project as a park or as a Natura 2000 managing authority, a private company. This is the major success, this is how it works, this is a model for others to use," believes Mr Sovinc.

"You wouldn't believe the difference from 10 or so years ago - there's been so much investment. At first it was just for fun but now it is a serious investment." says his colleague, Klavdij Godnic, Director, Piranske Soline.

The park is also looking to generate additional income with the team of construction experts it has built. "We believe we have enough experience that perhaps after the conclusion of the LIFE project we could also go outside the park: There are other natural areas that need some restoration and we believe that we have trained a successful and powerful group of workers who could do this job," explains Mr Sovinc.

Giving nature a value

The park has an annual budget of €600 000-700 000 to maintain biodiversity and manage visitors. "One

third comes from the government because the park is a state-designated nature conservation area; one third we generate by ourselves from guided tours, visits, interpretation and some other services; and one third comes from the commercial part of the company through sales of the salt and international projects," says Mr Sovinc.

The introduction of an entrance fee for visitors to the park (currently €6) serves two purposes: "[It's] an important source of income for us, but the main purpose was not to get money, it was to make people realise that nature has a value," he emphasises. The park has up to 50 000 visitors per year.

"One of the major tasks that we as managers of Natura 2000 sites have is to demonstrate to the public the benefits that ecosystem services provide here, using first of all our key products, the salt, the seawater and the sun, but also others like water retention, like microclimate. We are using this microclimate to bring people to enjoy the outdoor spa that we have constructed here (see box - Lepa Vida). It's really important to explain to people that nature is not for free, that they have to calculate the costs of maintenance," believes Mr Sovinc.

He adds that it's not only the public that needs to be persuaded that nature has a value: "If you want the model on how to run a Natura 2000 site by private governance, it's one very specific thing: when delivering your yearly report you have to persuade your bosses that two parameters are important to them - the usual one showing that the curves of your financial indicators are stable; and the second one, that the indicators on LIFE target species are stable or increasing."

Lepa Vida

Since 2013, an additional source of income for the park is its outdoor spa, Lepa Vida, and associated range of beauty products. "It's very simple: no concrete buildings, open only in summer, no overnight stays, no food," says Andrej Sovinc. "What we offer here is to enjoy nature in a natural environment with some traditional spa activities, local to the area: no Thai massage, no Finnish sauna. We have therapeutic basins with really hot hypersaline water; hot and cold plunge pools; massage with mud or salt."

The buildings have been constructed using local wood and other materials and visitors (limited to 40 at a time), arrive by electric vehicle at the solar-powered spa. "Clients get some information about the park and biodiversity; you can watch nature - it is next to the breeding areas for LIFE target bird species. This is how we think tourism can be accepted and tolerated in the protected area...we could earn more, have more visitors, but we said no, it is biodiversity first: Ecotourism as it should be," believes Mr Sovinc.

The success for the Sečovlje landscape park is in having this accepted by SOLINE and its parent company. "The guys wearing ties and suits and understanding mostly numbers are also looking at the pictures of birds and diagrams showing how many breeding pairs we have at the end of the year... They understand the ecosystem services that we have here are as important as ordinary financial parameters," says Mr Sovinc.

Salt production

At Sečovlje, up to 3 000 tonnes of salt is produced using traditional, artisanal methods each year. These traditional techniques were passed on to a new generation by three old salters (now deceased) at the start of the restoration process

Traditional and unique methods of salt production also benefit the wildlife of the Sečovlje landscape park

Photo: LIFE09 NAT/SI/000376/NEEMO EEIG/Justin Toland

Other salt extraction projects in Natura 2000

The Italian-led MC-SALT project (**LIFE10 NAT/IT/000256**) is targeting six Natura 2000 network sites in coastal salt meadows in Italy, France and Bulgaria. The project, which runs until March 2016, is reconstructing sluices and drainage channels in the salt works to optimise water flow. Control of invasive seagulls and the creation of artificial breeding islands will benefit a number of protected terns, waders, gulls and the greater flamingo (*Phoenicopterus roseus*). In June 2014, more than 80 pairs of the common tern (*Sterna hirundo*) were observed on breeding platforms and islets built by the project at Lake Pomorie in Bulgaria; in June 2015, common terns were breeding on an artificial islet at the Cervia saltwork in Italy.
A key aspect of this project revolves around developing a sustainable approach to tourism on the sites through the construction of bird-watching towers and the renovation of a heritage building at the entrance to the Comacchio salt work in Italy. The project team will also publish a management model for Mediterranean salt works in Bulgarian, English, French and Italian.

The maintenance of salt production is also a key feature of two Bulgarian projects targeting the conservation of coastal lagoon habitats along the Black Sea coast used by huge numbers of migrating waterfowl. Both LIFE FOR THE BOURGAS LAKE (**LIFE08 NAT/BG/000277**) and the ongoing Salt of Life project (**LIFE11 NAT/BG/000362**) have worked with a traditional salt producing company to help maintain the Bourgas lake wetland complex, an area that provides suitable habitat to more than 100 species listed in Annex I of the EU Birds Directive.

In Spain, the CIRCUREVIEJA project (**LIFE08 NAT/E/000077**) targeted the salt lakes of Torrevieja and La Mata, for 200 years a site of industrial salt production. This activity has helped create a wetland that is now part of the Ramsar Convention as well as being included in the Natura 2000 network. Unlike the other saltworks mentioned in this article, this is a large-scale industry facility, producing some 750 000 tonnes/yr of salt. The LIFE project set out to address inefficiencies in the production process that were causing the progressive silting of the Torrevieja lagoon.

The salt producer, NCAST, secured LIFE funding to construct a new brine decantation circuit that has led to a 66% reduction in residual volume discharged into the lake. The work has also meant that a 35 ha area that was previously flooded regularly is now dry and favourable for nesting birds. As a result, the population of Audouin's gull (*Ichthyaetus audouinii*) has steadily increased and the lakes have become the second most important nesting sites for the species in the Mediterranean.

Photo: LIFE10 NAT/IT/000256/NEEMO EEIG/Michele Lischi

some 15 years ago. This was vital because "the way salt is produced here is not used anywhere else in the world," says Mr Sovinc. "Our salters grow a live 'biosediment' which they feed every morning with fresh water that has been naturally enriched with minerals by being stored in a hypersaline environment. These microorganisms merge with the mud and create a special layer called *petola*, which cannot be grown elsewhere in the Mediterranean, it's too hot, it wouldn't survive. The *petola* forms a barrier between the salt and the mud - Piran salt is pure white and it is sweet - the salters embed the microorganisms that form the *petola* in a bubble of sugar so that they are not harmed by the hypersaline environment. These properties are the reason there were wars for this salinas in the Middle Ages." Today Piran salt is marketed as a gourmet product used by renowned chefs such as Jamie Oliver.

Mr Sonvinc adds that "it was very important when we started the park to invest quite a lot of time explaining to the salters that they are not only responsible for the salt-making, they also have to transfer waters for the wildlife. Now they understand that wildlife here also attracts people and that is why we can earn money."

BUSINESS AND PRIVATE SECTOR STAKEHOLDERS

Habitat support from Europe's extractive industries

Extraction of essential raw materials can seriously damage Natura 2000 and its habitats and species. LIFE is helping the sector address this issue.

Extractive industries such as mining and quarrying tend to affect biodiversity in both direct and indirect ways. Potential direct threats to nature come from land clearance linked to exploration, drilling, mining, stripping, by-product tailings, and construction of infrastructure. Similarly, indirect results of extraction include the discharge of waste materials into watercourses and atmospheric emissions. Such negative impacts may be greater when the industry is operating in remote, environmentally-, or socially-sensitive areas.

Despite these risks to biodiversity from extractive industries, the sector is in a position to help minimise or prevent habitat disturbance as well as enhance the conservation status of EU species and habitats. It is possible to integrate the assessment and management of biodiversity into new sites earmarked for extraction activity and into established mines and quarries. Disused facilities can often be remediated and "returned to nature".

Sustainable extraction

The International Council on Mining & Metals (www.icmm.com) encourages the planning and practice of extraction to consider the impact on nature and biodiversity from the outset. Sustainable mining and quarrying also means protecting and restoring biodiversity, through actions ranging from species monitoring to the creation of strips of native vegetation that can act as wildlife reserves and corridors.

LIFE co-finance is being used by companies in the sector to mitigate impacts on nature and biodiversity. Such restoration projects can have knock-on socio-economic benefits for mining and quarrying areas.

Restoring clay quarries in Spain

The LIFE-ECORESTCLAY project (**LIFE12 BIO/ES/000926**) is pioneering the use of geomorphological restoration of quarries and open-cast mines to boost biodiversity.

A follow-up to EcoQuarry (**LIFE04 ENV/ES/000195**), the project aims to develop a management protocol for restoring these heavily-modified ecosystems, which often require complete reconstruction. The project's private sector beneficiary, cement company CEMEX, has begun re-introducing landforms that mimic the natural conditions of the surroundings in seven clay quarries (total area: 80 ha) that neighbour a Natura 2000 network site in one of the most degraded downstream areas of the Ebro river (Tortosa, Tarragona).

The project is using a method called GeoFluv, which creates a new hydrologic network that is integrated with the existing wetlands occupying the bottom of the clay pits.

Mosaics of soil substrates and reintroduced vegetation are also key parts of the project, which has its sights set on facilitating "a paradigm shift in the way that mining reclamation is planned and executed." One of the goals of the project is to increase the number and variety of bird populations in the quarries.

By July 2015, the restoration works in the first quarry were being finalised. Re-use of soil from extraction in the restoration works is a novelty in the sector and it is proving to be effective. This much-needed collaboration between the extractive industries and research centres is demonstrating that the competitiveness and efficiency of the sector is compatible with the maintenance of ecosystem services. One of the direct benefits is expected to be a reduction in flash flooding in the sites.

Photo: LIFE12 BIO/ES/000926

BUSINESS AND PRIVATE SECTOR STAKEHOLDERS

The role of zoos in conserving Natura 2000 network species

LIFE projects that conduct ex-situ conservation actions have benefitted greatly from partnerships with zoos, botanical gardens and museums. The involvement of these stakeholders is crucial for effective Natura 2000 network management that extends beyond the boundaries of protected sites.

Zoological institutions, botanical gardens and natural history museums can provide valuable support for actions and measures that improve the conservation status of Natura 2000 network species and habitats. In particular, they can play a crucial role in ex-situ conservation actions, for example, through animal recovery centres. In this context, the Zoos Directive (Council Directive 1999/22/EC)[1] was adopted to promote wild animal species protection and conservation by strengthening the role of zoos in the conservation of biodiversity.

Budapest Zoo and Botanical Garden has supported four LIFE projects in Hungary through captive breeding and species rehabilitation actions

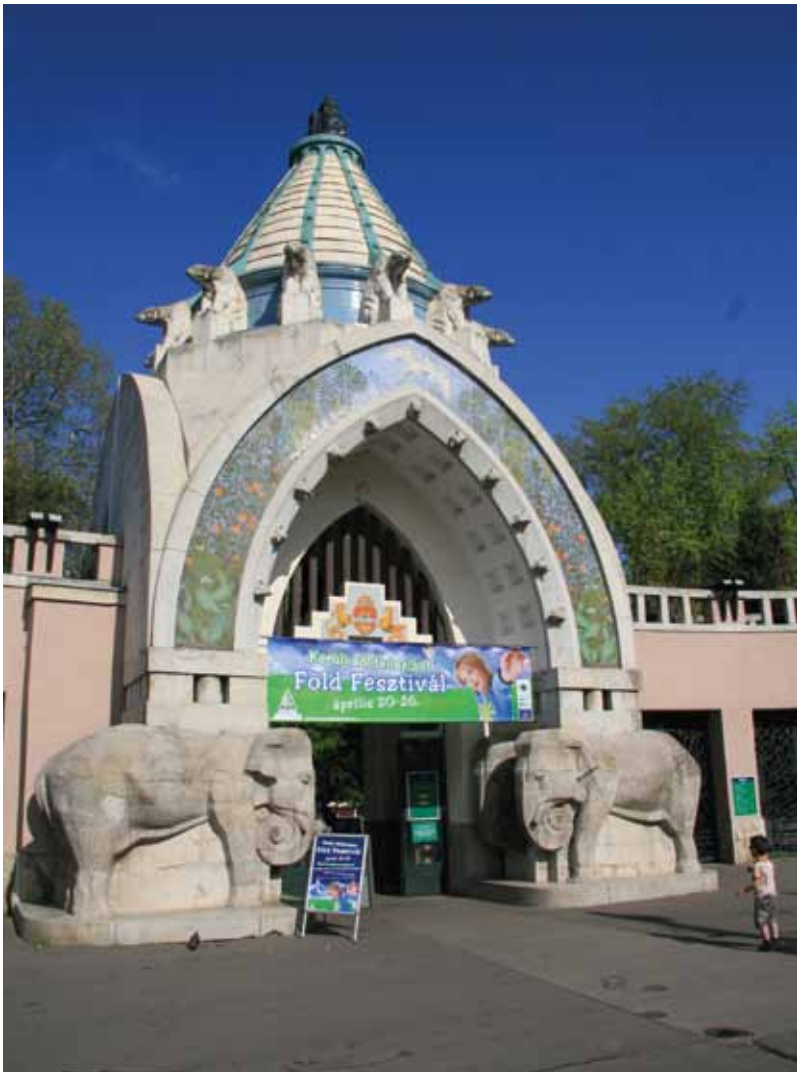


Photo: LIFE04 NAT/HU/000116

Several best practice approaches have been developed to assist zoos in their biodiversity conservation efforts, including those relating to concrete conservation and management actions within the framework of the Natura 2000 network. The LIFE programme has demonstrated and supported such best practices. This article features a selection of LIFE projects that have established partnerships with zoos.

Budapest Zoo

Budapest Zoo and Botanical Garden in Hungary is probably the zoological institution with the closest and longest association with the LIFE programme. Since 2004, the zoo has established direct partnerships with four LIFE projects managed by MME (BirdLife Hungary), as a partner or associated beneficiary, and has indirectly provided expertise and support to another four LIFE projects.

According to Endre Sós, the veterinary director of the Budapest Zoo and the person responsible for coordinating its LIFE project actions, "the collaboration with LIFE started before the first project (HUNVIPURS) the zoo was involved in. It started, back in 2001, with the workshop 'Population and Habitat Viability Assessment (PHVA) for the Hungarian Meadow Viper (*Vipera ursinii rakosiensis*)' organised at Budapest Zoo. At that

1 Council Directive 1999/22/EC of 29 March 1999 relating to the keeping of wild animals in zoos (http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:31999L0022)

Photo: LIFE04 NAT/HU/000116

The zoo implemented captive breeding and radio tracking of the Hungarian meadow viper (Vipera ursinii rakosiensis) - Dr. Sós sedating a viper

workshop it was decided that we needed ex-situ (captive breeding) actions to save the species from extinction. At the zoo, we had started to build up experience in the captive breeding of *Vipera renardi* and it was decided at the workshop that the Budapest Zoo was the best place to build up a captive breeding population of Hungarian meadow vipers."

The zoo also has a cricket-breeding centre (prey-breeding facility) that is able to produce large numbers of crickets, to serve as the main food source for the vipers. This facility was used during the first LIFE meadow viper project. "All the conditions were in place for the zoo to be a partner in the LIFE project and to support its objectives," says Dr Sós. As such, the zoo was responsible for several actions during HUNVIPURS and the follow-up project (CONVIPURSRAK). The zoo set up a Viper Captive Breeding Protocol and supported its implementation, for example, as well as developing guidelines in the Reintroduction Protocol for the release of vipers into the wild.

The zoo implanted radiotelemetry tags in some of the vipers released into the wild to enable the project team to track their movements and better understand the behaviour of the species. These intracoelomic radiotelemetry tags were inserted surgically under anaesthesia a couple of months ahead of release. On release, the project team provided the snakes with an artificial burrow to aid their transition into their new surroundings. "The tags were a first for this species," points out Dr Sós, adding that "these techniques are very important to track vipers' movements, monitor the reintroduction success, and study their ecology and behaviour in the wild." The zoo also hosts a rescue centre, created in the same building as the viper exhibition, to serve as a temporary facility for those individuals in need of veterinary care or observation. These animals mainly come from the Hungarian Meadow Viper Conservation and Exhibition Centre, but the facility accepts individuals from wild populations as well.

LIFE project partnerships with Budapest Zoo

- **LIFE04 NAT/HU/000116** - HUNVIPURS - Establishing the background of saving the Hungarian meadow viper (*Vipera ursinii rakosiensis*) from extinction;
- **LIFE07 NAT/H/000322** - CONVIPURSRAK - Conservation of Hungarian meadow viper (*Vipera ursinii rakosiensis*) in the Carpathian-basin;
- **LIFE10 NAT/HU/000019** - HELICON - Conservation of imperial eagles by managing human-eagle conflicts in Hungary; and
- **LIFE13 NAT/HU/000183** - RAPTORSPREYLIFE - Securing prey sources for endangered *Falco cherrug* and *Aquila heliaca* populations in the Carpathian basin.

Photo: LIFE04 NAT/HU/000116

Photo: LIFE10 NAT/HU/000019

The zoo is working with the HELICON project to support the rehabilitation and recovery of poisoned and injured imperial eagles (Aquila heliaca)

Reaching the public

A key aspect of the project's partnership with the zoo is to raise awareness of the Hungarian meadow viper and the objectives of the LIFE projects that have worked to conserve the species. CONVIPURSRAK co-financed an exhibition area in the zoo's reptile house ('House of Venom'), which opened in 2009. The exhibition area for the Hungarian meadow viper occupies around 20% of the building's floor space, with live specimens on display and information panels. It allows visitors to learn about this native viper species and its conservation needs, to see specimens up close, and even to touch one. "Well, not a real one, but the mounted embalmed body of one," Dr Sós adds. The zoo has more than one million visitors each year. According to Dr Sós, "they are not coming to the zoo to see the vipers, but the exhibition is now quite popular amongst visitors and it has high public acceptance."

Many events have been organised with the LIFE projects in Budapest Zoo, including an Animal Festival, Hungarian Meadow Viper Day and Earth Festival; these are attended by thousands of visitors. The zoo estimates that at least half of its annual one million visitors enter the House of Venom (which is also home to a Komodo dragon). "It's quite an efficient way of doing communication, because when people come to the zoo they are open-minded and learn about the viper," enthuses Bálint Halpern of MME Hungary and the project's coordinator.

Imperial eagle conservation

Budapest Zoo was already involved in imperial eagle (*Aquila heliaca*) conservation before it participated in the HELICON and RAPTORSPREYLIFE projects. "It started in the nineties with the Bird Rescue Centre that we have at the zoo," says Dr Sós. The zoo's main action under the HELICON project is to support the rehabilitation and recovery of poisoned and injured imperial eagles (and other species), and to perform toxicological post-mortem analysis of the birds - which have mainly been poisoned - that are dead on arrival or that subsequently die at the centre. Between January 2012 and April 2015, a total of 46 eagles were collected and given toxicological tests. Out of 13 individuals found alive, 11 (85%) were rehabilitated and released. In the zoo the LIFE project also established information points, in the publicly-accessible part of the Bird Rescue Centre, featuring large panels describing the different threats to wild birds.

The zoo has since established a partnership with another LIFE project (RAPTORSPREYLIFE) aiming to conserve both imperial eagle and saker falcon (*Falco cherrug*) populations in the Carpathian basin. To this end, the Veterinarian and Conservation Department at Budapest Zoo is gathering information about the prevalent (mainly infectious) diseases of the main potential food sources of imperial eagles and saker falcons. These prey species are the suslik or European ground squirrel (*Spermophilus citellus*), the European hamster (*Cricetus cricetus*), the blind mole rat (*Nannospalax superspecies leucodon*) and the European hare (*Lepus europeus*).

The methodology consists mainly of non-invasive techniques (e.g. regular faecal sample collections from the above-mentioned species for bacteriological and parasitological analysis). As part of this LIFE project's dissemination work, Budapest Zoo plans to establish a new grassland habitat-based exhibit where birds of prey are displayed along with their prey species. "This is a habitat that in general is only exhibited very rarely in zoos," notes Dr Sós.

Establishing partnerships with LIFE projects has been very important for the zoo. "It highlights Budapest Zoo's role in conservation," concludes Dr Sós, "and improves its international and national reputation."

Latgale Zoo in Latvia

The Latgale Zoological Garden, a small zoo managed by the Daugavpils municipality in south-east Latvia, has an active programme of nature conservation. It has been involved in two LIFE projects: PHS in NPR (**LIFE04 NAT/LV/000199**) and Life-HerpetoLatvia (**LIFE09 NAT/LV/000239**).

The zoo established its first partnership with a LIFE project in 2004, with the aim of protecting habitats and species in the Rāzna National Park. This Natura 2000 network site, encompassing species-rich lakes and wetlands, is the second largest protected area in Latvia. The project resulted in the creation of a research laboratory and breeding facilities for the fire-bellied toad (*Bombina bombina*) at the zoo. These facilities included automatically-regulated incubation areas and terrariums, which produced a constant stock of fire-bellied toads for release into the national park. The project reintroduced around 300 individuals to selected wetland and shallow pond locations, following habitat improvement actions.

In the more recent Life-HerpetoLatvia project, in which the zoo was the coordinating beneficiary, the aim was to improve the conservation status in Latvia of the European pond turtle (*Emys orbicularis*), smooth snake (*Coronella austriaca*) and fire-bellied toad, by implementing a combination of in-situ and ex-situ actions and by improving their legal protection.

The LIFE project created suitable habitats and a network of ecological corridors to sustain key populations of the target species, proposed the establishment of two further Natura 2000 sites for the main fire-bellied toad population in Latvia, and prepared and approved a species protection plan for the smooth snake. The zoo's facilities and expertise played an important role in implementing habitat management actions and, especially, in the ex-situ conservation of the fire-bellied toad and European pond turtle.

The Life-HerpetoLatvia project paved the way for the improvement and enlargement of the laboratory and breeding facilities at Latgale Zoo, which were fully renovated and re-opened as the Rare Reptile and Amphibian Breeding Centre. Today, many more fire-bellied toads can be reared and released into the wild. For instance, in 2013 some 1 000 individuals were released and in 2014 more than 3 000. Therefore, thanks to the zoo there is a guarantee that the work initiated under the LIFE projects will be continued into the future.

Latgale Zoo has also started breeding European pond turtles in the old incubators created around the time of its first LIFE project. Over 90 young turtles, bred from the captive population of 18 adult animals, were raised in the newly established Rare Reptile and Amphibian Breeding Centre, with 42 of these being released in new or restored ponds in the Nature Park "Silene" in July 2014.

Latgale Zoo developed a captive breeding programme for the European pond turtle (Emys orbicularis) in support of the Life-HerpetoLatvia project - turtles marked and ready to be released in the wild

Photo: LIFE09 NAT/LV/000239/Mihails Pupins

BUSINESS AND PRIVATE SECTOR STAKEHOLDERS

LIFE helps **the EU energy sector to support EU biodiversity**

Power infrastructure is a major cause of bird mortality. Energy distribution companies across the EU have worked with NGOs on numerous LIFE projects to remove hazards to bird species in Natura 2000 network sites.

In 2011, the Convention on Migratory Species adopted a resolution on power lines and migratory birds, which reiterated an earlier call from BirdLife International for appropriate technical measures to address the adverse effects of power lines. Electrocution and collision are main mortality factors "for numerous medium-sized and large birds, such as storks, eagles, vultures, other raptors, owls, ravens, bustards, rails and waders," explains Dr Markus Nipkow of NABU – BirdLife Germany.

The *State of Nature in the EU* report (2007-2012) indicates that 6% of mortality cases involving bird species listed in the annexes of the Habitats and Birds directives can be linked to energy production and transport infrastructure. This is a conservative estimate; experts believe that many of the victims are not found. Studies have shown how quickly predators can consume casualties and injured birds may die up to 2 km from the site of the accident. Thus, it is necessary to improve knowledge about the extent of the risk, particularly as experts believe that casualty numbers are highest in important bird areas within the Natura 2000 network.

Knowledge building

LIFE projects have made an important contribution to the existing knowledge base on the threat to birds posed by power lines. This has involved partnership working between NGOs and electricity grid operators. The Po ENEL project in northern Italy (**LIFE00 NAT/IT/007142**) was coordinated by the Po Delta Regional Park consortium with electricity company ENEL a key partner. The project applied a range of then-innovative techniques – burying lines in areas of high landscape value and insulating others

Photo: LIFE12 NAT/BG/000572

Power lines are a major cause of bird mortality

- to remove risks to birds from 110 km of power lines in northern Italy. A further 9 km of power lines was fitted with high-visibility flight diverters and perch plates for large-nest builders such as the white stork (*Ciconia ciconia*) and osprey (*Pandion haliaetus*). The beneficiary also monitored bird numbers and mortality rates in the project areas and used the results of its work to produce guidelines on the impact of power lines on birds. These were sent to the Italian Ministry of Environment for use in drawing up a new environmental protection regulation connected to the 'Framework law on protection from exposure to electrical, magnetic and electromagnetic fields'.

Safeguarding Lithuania's returning storks

Lithuania is famous for its white stork populations that migrate from Africa each year to enjoy the Baltic summer. Stork conservation specialists in Lithuania suspected that power grid growth in the countryside was jeopardising this popular bird's survival. The ongoing Electrogrid project (**LIFE13 BIO/LT/001303**) is showing how NGOs and electric companies can work together to reduce electric shock deaths suffered by storks and kestrels, by installing protective devices on high-voltage pylons and overhead electricity transmission lines.

Photo: LIFE13 BIO/LT/001303/M Karlono

The ongoing project LIFE for safe grid (**LIFE12 NAT/BG/000572**) is monitoring the effects of power infrastructure on bird mortality in Bulgaria for the first time. Led by the privately-owned utility company, EVN Bulgaria Elektrorazpredelenie, the project aims to improve understanding about best practices for conserving the country's imperial eagle (*Aquila heliaca*) population. To this end, it is using the monitoring results to develop a new GIS-based tool for mapping nesting sites and temporary settlement areas and cross-referencing them against hazardous power lines. This conservation tool will enable informed decisions about appropriate measures that can cost-effectively mitigate mortality causes.

Practical and policy measures

LIFE has prioritised funding for practical action to remove or reduce risks to birds from electrocution and/or collision. More than 60 projects have included measures such as bird-friendly power poles for mid-voltage distribution networks and insulated perch areas (to prevent electrocution) and/or measures to increase the visibility of cables (to prevent collisions), such as Electrogrid (see box).

One of the most successful projects of this kind was an Austrian-led cross-border initiative, the Grosstrappe project (**LIFE05 NAT/A/000077**). This saw energy production and network companies working with wildlife bodies to mark and bury electric power lines between Austria, Hungary, Slovakia and the Czech Republic, in order to support the great bustard (*Otis tarda*) in its West Pannonian habitat. The project replaced some 47.4 km of medium-voltage aerial power lines and pylons with underground cables, exceeding the original target of 42 km. Bird protection markings were added to a further 153 km of aerial high-voltage lines in six locations, further helping to reduce mortality risks. Monitoring indicates that the Austrian population of Europe's largest land bird increased by more than 70% during the project (up 260 individuals in 2010).

Integrated Natura 2000 site actions

LIFE projects have also worked with electricity utilities to strength the structure, functions and connectivity of habitats, such as breeding, feeding and staging areas. Habitat connectivity can be improved through the application of planning tools that assess habitat fragmentation risks associated with

Making wind farms safer

Wind power is an important source of renewable energy. However, wind turbines can also have a negative impact on biodiversity. A LIFE Biodiversity project - Windfarms & Wildlife (**LIFE12 BIO/GR/000554** - is field-testing different technologies that may help solve this problem at 10 sites around Greece.

These 'early warning systems' are designed to control wind turbine operation and/or deter birds. A dedicated mitigation laboratory will operate at a demonstration wind farm (PENA), generating data on the efficiency and effectiveness of the different measures. Results will be used to produce a good practice guide and a GIS decision-support tool. The final stage of the project will involve training for key stakeholders on the procedures and standards for the application, operation and evaluation of mitigation technologies on wind farms.

Photo: LIFE12 BIO/GR/000554

Bird radar system for wind farms

energy distribution infrastructure (e.g. the electricity grid).

For the Tendidos Electricos Murcia project (**LIFE06 NAT/E/000214**) statutory authorities and private power companies joined forces to implement a full strategy for Annex I-listed endangered bird species in five Natura 2000 sites in Murcia region. Both the corrective measures applied to more than 1 000 pylons, and the public-private cooperation, have a clear innovative, demonstrative and exportable character.

The project began by drafting a regional electric-technical bird protection law. In anticipation of this law being officially approved after the project's end, the project team also produced a handbook providing practical guidance on implementing the measures required by the draft legislation to reduce the threat to birds from overhead power cables.

Key to the project's success was the signing of agreements with the major power company Iberdrola and 17 other private landowners. These set in motion 14 separate sets of interventions, which modified a total of 724 dangerous pylons – 538 belonging to Iberdrola and 186 to private owners. Alongside and in cooperation, another 327 pylons were modified using additional private and public funding outside the scope of the LIFE project.

To ensure the work was carried out as intended, the project held awareness-raising courses for different stakeholders: electricity technicians, environmental actors and nature-protection services as well as technical workshops on the correct installation of different isolating materials.

Before-and-after monitoring data for six sub-areas - where 46% of pylons had been modified - found that residual mortality of birds after modification of the pylons fell from 1.87 to 0.56 carcasses per km per year – a 70% reduction. For raptors alone, the reduction in mortality was even higher at 87%. Encouragingly, no bird included in Annex I of the Birds Directive was killed by overhead power cables in the project area between the interventions and the end of the project.

Another Spanish project looking to have a regulatory impact was ZEPA eléct. Aragón (**LIFE04 NAT/ES/000034**) which, in addition to practical measures to reduce bird mortality, drafted a regulation on bird-friendly power lines that in 2005 became a Decree in Aragón. The project also modified 60 power lines running over 325 km in 18 of the region's Natura 2000 network sites, as well as establishing and renewing long-term collaboration agreements with the electricity companies involved. Initial monitoring showed an impressive 87.7% reduction in bird deaths.

ZEPA eléct. Aragón (LIFE04 NAT/ES/000034) drafted a regulation on bird-friendly power lines that in 2005 became a Decree in Aragón

Photo: LIFE04 NAT/ES/000034

Biodiversity corridors

Another LIFE project with high potential for replication is ELIA (**LIFE10 NAT/BE/000709**), which is testing and promoting the potential of forest clearings found underneath power lines to act as biodiversity corridors. The new ecological corridors (approximately 50 m wide) will allow local biodiversity to develop and will help facilitate the movement of species from one natural site to another, which is especially important in the context of climate change. Specifically, the project is restoring 130 km of corridors under overhead high voltage lines in Belgium and France with the aim of demonstrating that active management for biodiversity can reduce the costs of securing and maintaining corridors under overhead power lines. The project aims to become an important pilot at European level that will share its experience with other European electricity transmission system operators, representing 300 000 km of potential green corridors.

BUSINESS AND PRIVATE SECTOR STAKEHOLDERS

LIFE enables **Slovak power companies to reduce bird mortality risks**

Electricity companies provide vital services for EU citizens and LIFE funding in Slovakia has shown how these private sector stakeholders can help conserve eagles, falcons and other protected European bird species.

LIFE has funded two projects in Slovakia that developed partnerships between electricity companies and bird protection bodies. These are reducing electrocution and collision threats to the imperial eagle (*Aquila heliaca*), lesser spotted eagle (*Aquila pomarina*), saker falcon (*Falco cherrug*) and red-footed kestrel (*Falco vespertinus*) from power lines and other infrastructure. .

"Most power lines pose fatal risks for birds and significantly affect the habitats of our large birds, especially in their breeding, staging and wintering areas," explains Lucia Deutschová, executive director, Raptor Protection of Slovakia (RPS), the NGO that coordinated both the APOMARINA_SK project (**LIFE09 NAT/SK/000396**), which ran from January 2011 to June 2015, and its ongoing follow up, LIFE ENERGY (**LIFE13 NAT/SK/001272**).

Her colleague Zuzana Guziová, who was project manager of APOMARINA_SK, points out that the LIFE funding "has focused on species that act as key indicators for the state of biodiversity in Natura 2000 sites. Our partners from the electricity companies have been very proactive in their approach to limit the risk of electrocution and collision here."

For APOMARINA_SK, the NGO worked with the electricity companies Východoslovenská energetika (VSE), and Stredoslovenská energetika (SSE). Its partners in the LIFE ENERGY project are Východoslovenská distribucná (VSD) and Západoslovenská distribucná (Slovakia ZSDIS).

"We have been cooperating with conservationists for almost 20 years," says Andrea Danihelová, communication director of RWE Slovensko, which includes both VSE (electricity supply) and its sister company, VSD (electricity distribution). RWE Slovensko has been systematically addressing the issue of bird protection since 2010. "Thanks to joint efforts with conservation advisors, we managed to significantly reduce the risk of injury and death to birds by insulating 620 poles, which cover approximately 47 kilometres of power lines," says Ms Danihelová.

She adds that the company "has developed a methodology for determining the risk sections of power lines in terms of bird collisions." This can be applied to VSD's 1 657 km network of electricity infrastructure. "Our

LIFE ENERGY is working with electricity companies in Slovakia to introduce measures that will protect the common buzzard (Buteo buteo) and other raptor species

Photo: LIFE13 NAT/SK/001272/Dominik Schneider

main task during LIFE ENERGY will be the installation of so-called flight diverters on the most dangerous sections of power lines."

Michaela Dobošová, spokesperson for Slovakia ZSDIS, explains that the company has invested some €800 000 over the last decade to insulate pylons to protect birds from electrocution: "All of our new power lines that are built are now safe for birds and our repair work also involves making pylons safer for birds...The LIFE ENERGY project is a next step in our conservation efforts."

Birds use pylons and poles as vantage points to seek out prey. "Hence we had to avoid adversely affecting beneficial habitat features whilst still providing safe places for birds to perch," explains Ms Deutschová.

No bird casualties from electric shocks have been recorded around the adapted infrastructure. "Our project results are useful for electric companies, public bodies, academics, and the general public," says Ms Deutschová. Stakeholders from Austria, Czech Republic, Greece, Hungary, Italy, Romania, Spain, the UK and the USA have all expressed interest in the work being done in Slovakia. One part of LIFE ENERGY involves drafting new guidelines for bird-friendly approaches to managing electricity infrastructure in cooperation with electric companies, NGOs, the Ministry of Environment, and the State Nature Conservancy.

Celebrity support

Media coverage of the plight of birds killed by power lines encouraged the utility companies to get involved in conservation actions. Now the LIFE ENERGY partners have enlisted the help of well-known Slovak actress and singer Dorota Nvotová to promote their conservation work.

"Dorota has been really supportive of the project and she wants to take a hands-on approach", explains Ms Deutschová. "She took part in the survey work and has also helped install some of the bird protection equipment. We are filming her contributions for a series of short videos that we expect will bring a lot more helpful media attention to the project."

Photo: LIFE13 NAT/SK/001272/Tomas Hulik/Ochrana dravcov na Slovensku

The business case for conservation

Electricity companies are not only interested in reducing collision problems for nature conservation purposes. Collisions can cause power cuts as well as general safety concerns from broken power lines. Maintenance costs may also be incurred, especially from larger bird strikes. "It is more cost effective to introduce bird-friendly zones during the planning of new pylon networks than having to retrospectively fit bird-safety equipment," notes Ms Guziová.

Another business benefit from participating in the LIFE raptor protection projects is the useful data they generate about the state of electricity transmission networks. LIFE ENERGY is surveying nearly 8 000 km of the most dangerous power lines (7 177 km of 22 kV and 685 km of 110 kV). Each power pole or pylon in the survey areas is being geotagged using GPS coordinates, with a description of its condition and a photograph. This on-the-ground assessment is giving the electricity companies a more accurate picture of their networks than their existing records.

"Actions funded by LIFE will provide project partners with the first systematic survey of power line threats from collision," says Ms Deutschová. "A control survey later on in the project should give the information we all need to help us target our bird conservation measures with much more effect. This will increase cost efficiencies for the companies." She explains that "higher risk areas are not expected to exceed more than 3% of the grid network and once we know this we can make sure we concentrate conservation measures where they will help save the most birds. Another useful part of LIFE ENERGY will give power companies better understanding about collision threats along lines in forest breaks."

Ms Guziová believes that the LIFE programme offers a unique and useful means of funding project partnerships between businesses and nature conservation bodies. "Everyone is treated equally by LIFE and all partners are eligible for participation, which is widely welcomed here. We would like to see more of this inclusive approach to help protect wildlife." Government support is also acknowledged. "The Ministry of Environment has put in place a special reimbursement mechanism for LIFE project partners from electricity companies. It was introduced to encourage their participation and we hope this tool will continue in the future," she says.

BUSINESS AND PRIVATE SECTOR STAKEHOLDERS

Boosting sustainable tourism in the Natura 2000 network

The Natura 2000 network is an important motor driving local economies by attracting visitors who appreciate the wildlife, landscapes and recreational facilities it offers. The LIFE programme is helping to ensure the sustainable growth of the tourism sector in these areas.

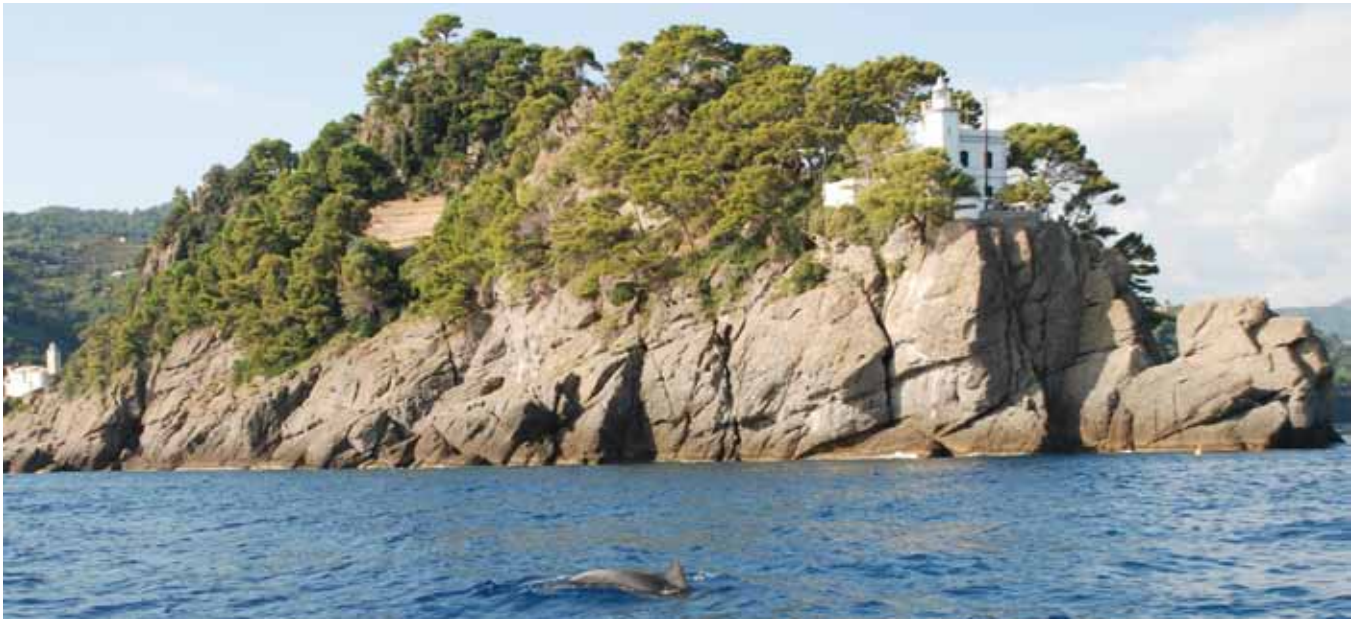


Photo: LIFE09 NAT/IT/000190

LIFE has supported measures to ensure the sustainable growth of whale watching

It was estimated that visitors to Natura 2000 network sites contributed around €50–85 billion to local economies in 2006. Tourism and recreation supports between 4.5 and 8 million full-time jobs, whilst Natura 2000 areas provide additional benefits by attracting inward investment, improving a region's image and enhancing quality of life.

The LIFE programme has helped to restore and manage numerous Natura 2000 sites, and to improve the conservation status of the habitats and species they contain. At the same time, LIFE project actions have enhanced cultural ecosystem services, such as the recreational and aesthetic value provided to visitors. Since 1992, more than 250 LIFE Nature projects have conducted direct or indirect actions relating to tourism in the Natura 2000 network. They have established partnerships with local enterprises and tourist operators, for instance, with beneficial knock-on effects for a range of other local businesses. In some cases, the revenue streams from tourism can provide funding to help guarantee the long-term sustainability of LIFE project activities and investments, including the costs of Natura 2000 network site management.

Natura 2000 for recreation in Estonia

Kõpu Peninsula, on the westernmost tip of Hiiumaa Island in Estonia, is a biodiversity hotspot. In a small area, there are no less than 23 Habitats Directive Annex I habitat types, including eight priority habitats (e.g. grey dunes, Baltic coastal meadows, bog woodlands, western taiga and wooded meadows). Because of its scenic beauty, Köpu now attracts around 60 000 visitors per year, placing the peninsula's

biodiversity under increasing pressure, particularly as, until recently, there were few facilities for visitors and nothing to channel them away from sensitive areas. Therefore, the LIFE project KopuNatura (**LIFE04 NAT/EE/000073**) prepared a draft management plan that defined ways to enable visitors to access the area without damaging its conservation value. This included a zoning scheme and specific actions, such as building stone walls to prevent motor vehicles driving on the dunes, establishing waste collection points to reduce rubbish in the forest and on the beach, and actively directing visitors away from the nesting areas of eagle owls, white-tailed eagles and cranes.

The project built five recreational sites on the Kõpu Peninsula. These all had facilities for camping and nature trails and were sited to prevent unnecessary human impact on the vulnerable dune and coastal habitats. The recreational sites are linked by a cycling network, marked out during the project, making the area more accessible to both locals and tourists. The project also enabled the renovation of the Ristna Nature School as a centre for nature studies and a source of information on nature conservation, sustainable forestry and the Natura 2000 network.

European Charter for Sustainable Tourism

In 1995, the LIFE project Nature parks in Europe (**LIFE94 ENV/F/000878**) established a sustainable tourism charter. The Charter was drafted by a Steering Committee made up of representatives from protected areas, the tourist industry and international organisations. Ten pilot nature parks in six European Union countries took part in the trial phase of the Charter over a period of three years. The text of the Charter was officially presented in April 1999 in Lille, France. The European Charter for Sustainable Tourism in Protected Areas (http://european-charter.org) is a practical management tool for ensuring that tourism contributes to a balanced economic, social and environmental development of protected areas in Europe. The Charter is a voluntary agreement that aims to encourage good practices that meet agreed requirements for the sustainable development and management of tourism.

Tourist trails created in 'the Lands of Priolo'

Photo: LIFE03 NAT/P/000013/NEEMO EEIG/João Salgado

Laurissilva habitats in 'the Lands of Priolo'

The Pico da Vara/Ribeira do Guilherme Natura 2000 site on the island of São Miguel in the Azores is a major hotspot for biodiversity within the Macaronesia biogeographical region. It is home to one of the EU's most endangered birds, the Azores bullfinch (*Pyrrhula murina*), known locally as the Priolo, which is listed as a priority species for conservation in the Birds Directive. The bullfinch lives in the Habitats Directive-listed Macaronesian laurel forests, but this and other native forest, heath and shrub habitats are severely threatened by invasive alien plant species.

Two LIFE Nature projects have helped to conserve the Azores bullfinch and its habitat: the Priolo project (**LIFE03 NAT/P/000013**) and the Life Terras do Priolo project (**LIFE12 NAT/PT/000527**). In addition, the LAURISSILVA SUSTENTAVEL project (**LIFE07 NAT/P/000630**) developed management tools and conducted conservation actions for the other laurissilva habitats in Pico da Vara/Ribeira do Guilherme. It also prepared an application to the European Charter for Sustainable Tourism (see box) covering 'the Lands of Priolo', which was officially approved in 2012.

Within this Charter, the project established the Priolo Brand, a quality seal for companies that establish partnerships with São Miguel Natural Park to promote conservation and sustainable tourism. Nineteen companies from the tourism sector became members within the first year; the aim is eventually to include all companies involved with sustainable tourism in the municipalities of Nordeste and Povoação. This will create a network of companies implementing environmentally-friendly practices. The Priolo Brand also acts as a promotional tool for these enterprises.

Birdwatching on Skyros

The southern part of the Aegean island of Skyros and most of its offshore islets are included in a Natura 2000 network site, whose steep coastal cliffs provide nesting sites for Eleonora's falcon (*Falco eleonorae*). Skyros hosts the world's largest colony of this globally-threatened migratory

falcon. The island also has several endemic plants and habitats, and other endangered seabirds, listed in the annexes of the Habitats and Birds directives.

The LIFE project SKYROSBIODIVERSITY (**LIFE09 NAT/GR/000323**) has developed a Biodiversity Action Plan for Skyros, and is raising awareness of conservation actions on the island. The project is restoring habitats, whilst simultaneously demonstrating the compatibility of tourism and conservation through the implementation of a Tourism Action Plan. This proposes types of sustainable and biodiversity-compatible tourism and specific actions, with an emphasis on birdwatching. Actions include the creation of an information centre, ecotourism and birdwatching guides, nature trails, and hiking and cycling routes, as well as activities involving diving, sailing, photography, local arts and culinary tourism. Eight hiking routes were created, for example, covering 48 km in total.

In April 2013, a Scottish tourist agency specialising in birdwatching started operating on Skyros for the first time. In addition, the LIFE project presented Skyros as a bird tourism destination in the UK and elsewhere in Europe. To boost the local economy, the project established a network for local artisans making decorative products (e.g. woodcarving, pottery and weaving) linked to the island's biodiversity, such as rare wildflowers, seabirds and the Skyrian horse, which the artisans sell to tourists.

Tourism in marine Natura 2000 sites

Several LIFE projects have targeted emblematic marine species across the EU, in particular marine mammals (dolphins, whales and seals), sea turtles and seabirds. Project actions are improving the conservation status of these species, whilst monitoring activities have been used to define and designate marine Nature 2000 network sites in offshore areas.

Arising from this, several marine-related tourist activities - whale watching, scuba diving and sports fishing - have benefited from the conservation actions of LIFE projects. For example, more than 20 LIFE projects have worked directly or indirectly with whale-watching operators to promote sustainable tourism that is less disturbing for marine mammal species. This is particularly important for species in areas that coincide with tourist hotspots, such as the Atlantic (Azores, Madeira and Canaries) and the Mediterranean islands.

Photo: LIFE09 NAT/GR/000323

A LIFE project on the Greek island of Skyros has developed a Biodiversity Action Plan that includes provision for birdwatching and other sustainable forms of ecotourism

The Pelagos Sanctuary

The Pelagos Sanctuary for Mediterranean Marine Mammals is a marine protected area that includes three Natura 2000 sites. It extends about 90 000 km^2 in the north-western Mediterranean Sea between Italy and France. The Sanctuary contains habitat suitable for the breeding and feeding needs of the entire complement of Habitats Directive-listed cetacean species regularly found in the Mediterranean Sea. Four LIFE projects since 2003 have worked to improve the conservation of these species, taking tourism into account.

The main objective of the first of these projects, LINDA (**LIFE03 NAT/F/000104**), was to protect populations of bottlenose dolphins off Corsica, whilst guaranteeing peaceful cohabitation of the animal with economic activities. The main stakeholders (environmental managers, socio-economic agencies, fishermen, local communities and tourist operations) worked together to introduce sustainable practices for fishing, boating and whale-watching activities. Acoustic pingers were introduced to reduce conflict between bottlenose dolphins and fishermen, but they failed to keep dolphins from fishing nets. The project therefore recommended that fishermen should compensate for loss of revenue by exploiting the dolphins for profit through 'whale watching' trips for tourists.

During the LINDA project, whale-watching practices in Corsica were assessed. As a result, the project

Photo: LIFE07 NAT/P/000646/Madeira Whale Museum/Cátia Nicolau

LIFE projects in Madeira have created codes of conduct for whale-watching boats

defined a code of conduct for the management of whale watching and recommendations for responsible boating activities. This code of conduct fed into cetacean management plans developed by the Pelagos Sanctuary and ACCOBAMS (the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area). In parallel, the SANTUARIO CETACEI project (**LIFE03 NAT/IT/000148**) developed 'Guidelines for commercial cetacean-watching activities in the ACCOBAMS area', for an area overlapping that of the LINDA project.

More recently, the ARION project (**LIFE09 NAT/IT/000190**) worked to improve the conservation status of bottlenose dolphins in the Natura 2000 site of Portofino (Sardinia). This project established a stakeholder network, involving fishery and business associations, local authorities and leisure boat operators. The network helped define a Protocol of Conduct for good practice when approaching dolphins during boat trips.

Cetaceans off the Atlantic islands

The waters off the Madeira archipelago are one of the most diverse cetacean areas in Europe. Since 1986, a Madeira regional law has protected these cetaceans, but the original legislation made no mention of tourist activities, such as whale watching. The cetáceos/Madeira project (**LIFE99 NAT/P/006432**) determined the conservation status of cetacean species and the potential impacts on their populations of human activities.

"We identified 17 potential human activities with an impact on cetaceans. The ones that had a serious direct impact on the species were marine litter and whale-watching activities," says Luís Freitas, the LIFE project manager. He notes that, contrary to other places in Europe, fisheries by-catch had no significant impact on Madeira's cetacean populations. Although local litter is a declining threat in Madeira, several examples occurred of cetaceans being stranded on beaches or in difficulty at sea due to interactions with ocean-borne litter, especially non-degradable plastics. "The only outstanding problem that needed to be addressed was the rapid increase in whale-watching companies and its potential impact on the cetacean species. With the first LIFE project, we started to address the issue," explains Mr Freitas.

The project helped raise awareness amongst fishermen, tourists, tourism operators, students and the local population about the importance of cetacean conservation and the appropriate behaviour when in proximity to these marine mammals. "We established the first partnerships with whale-watching companies and we set up voluntary conduct rules that the majority of the companies followed with no problems," recalls Mr Freitas. With this partnership, the project started working with boat skippers and company owners to obtain data on cetacean sightings.

This led to a second LIFE project, CETACEOSMADEIRA II (**LIFE07 NAT/P/000646**), which defined areas of operation for whale-watching boats in

Madeiran waters and established limits on the number of boats. The aim was to distribute the pressure caused by the rapidly growing whale-watching sector, by preventing large concentrations of boats in restricted areas. The project also sought to guarantee the sustainable growth of the whale-watching industry, based on sound knowledge and criteria.

The first LIFE project had worked in partnership with four companies. "By 2013, we had 13 companies just in Funchal," notes Mr Freitas. "With the first project we proposed a draft regulation for whale watching that was only approved in 2013. In the meantime, the regulation had to be updated to include other marine species and updated rules in order to cope with the demand," he explains. The project proposed a regulation based on the maximum carrying capacity per area and port. "Funchal and the east side of the island have a maximum limit of 25 registered boats. We adjusted the maximum number of boats registered according to the number of recorded sightings per area. Therefore, the area with more sightings can have more boats." This approach was accepted by whale-watching companies. However, there was a delay before the regional government approved the legislation. "I had the companies always asking: When is the legislation going to be approved?" points out Mr Freitas.

The CETACEOSMADEIRA II project proposed a marine Natura 2000 site (not yet approved) for bottlenose dolphins and other cetaceans in the inshore waters of the Madeira archipelago, which will help link other marine Natura 2000 sites in this Atlantic area. "To compensate for the areas where whale watching is allowed with rules, we proposed areas where whale watching is forbidden in the Natura 2000 site. These areas are very important as feeding and resting zones for the cetacean species," adds Mr Freitas.

Another project, Caretta/Tursiops Truncatus (**LIFE97 NAT/E/004151**), in the Canary Islands, defined management plans for three marine Natura 2000 sites frequented by cetaceans and turtles. The project conducted an innovative study on the impacts of whale-watching activities, which accounted for variables such as boat movements and environmental conditions. The existing regional regulation covering whale watching was consequently modified, by means of a new Decree in September 2000.

Whale watching - a skipper's job

The whale watching company VMT in Madeira operates three catamarans daily from Funchal harbour. "We are really pleased with the whale-watching regulation and guidelines. It gives us an opportunity to make our business sustainable and credible," says the firm's chief executive officer, Celso Brazão, who adds that the LIFE project engaged in consultations with the whale tourism companies during the development and implementation of the regulation.

Celso Franco is the skipper of one of VMT's whale-watching catamarans ("Sea Nature"): "We are really lucky to have cetacean sightings everyday and we operate almost all-year round. We are the only place in Europe that can operate almost on a daily basis, and we have a 90% chance of daily dolphin sightings and 50% for whales, just 4 to 5 miles offshore from Funchal harbour. This year, during the migration period in April, was very good for whales, we had killer whales, blue whales, humpback whales, and we have several sperm whales all-year round."

He continues: "We had training from the LIFE projects on the species identification and on approaching cetaceans. We follow the rules: eight boats maximum per group of cetaceans in a maximum of 40 minutes. Two at a time on the side of the group, maximum 10 minutes approaching from behind and then we leave the group from the side. We explain to the public that there is a maximum time to avoid stress on the animals, and the public understands."

BUSINESS AND PRIVATE SECTOR STAKEHOLDERS

Minimising transport's impact on nature

LIFE has addressed the harmful effects that road, rail and marine transportation can have on protected habitats, species, biodiversity and the Natura 2000 network. Strong and effective partnerships are a common feature of all these projects.

Protected areas are often criss-crossed by roads, improving transportation but bringing habitat fragmentation and disturbance to flora and fauna. Three LIFE projects found that joining forces to reroute these thoroughfares was the road to success, and not just for biodiversity.

The marsh fritillary butterfly (*Euphydryas aurinia*) has suffered a 20-50% decline in its distribution in Europe over the past 25 years. Cornwall Moors (**LIFE03 NAT/UK/000042**) was able to reconnect 130 ha of habitat favourable to the species by involving the UK Highways Agency as a project partner. Although this was the agency's first involvement with the LIFE programme, the project ticked a lot of boxes in its Biodiversity Action Plan, a long-term strategy for the conservation of habitats and species on road verges in England.

LIFE STRADE has created a comprehensive communications campaign to inform drivers about the problem of road kill

Photo: LIFE11 BIO/IT/000072

To support the marsh fritillary, the Highways Agency rerouted the A30, the main road through mid-Cornwall, which previously cut through a large Natura 2000 network site. It also worked with the beneficiary and other project partners to design the downgrading requirements for the part of the A30 that crossed the Natura 2000 network site. The downgraded road is now a multi-use trail for cyclists, horse riders and walkers. According to project manager Wesley Smyth rerouting the road required "vision, willing partners and the Habitats Directive behind it."

In Italy, the Cesine project (**LIFE95 NAT/IT/000807**) closed a 5 km stretch of road that led through the centre of a Ramsar wetland site. This heavily used route was having a deleterious effect on the protected area's flora and fauna. In the long-term the road removal has not only had major positive impacts on biodiversity. "People that hardly knew the protected area before are now visiting the site and using the road for leisure activities," says Angelo Salsi, Head of the EASME LIFE and CIP Eco-innovation Unit, who visited the site in 2015 as part of an ex-post evaluation of the project. This recreational use is also bringing economic benefits to the area.

Reducing road kill

Europe's ever-increasing road and rail infrastructure has created a growing problem for protected species: mortality caused by collisions with vehicles and trains. However, there is limited awareness of the problem and its impact on biodiversity. In Italy, five regions and three provinces have joined forces to address both issues by working closely with a wide range of stakeholders and testing a state-of-the-art road kill prevention system.

Good planning and consultation

As an indirect result of measures limiting dune damage from human activities in the project HABI.COAST (**LIFE05 NAT/IT/000050**), one of the main access roads to the beach at the SCI Torre Guaceto e Macchia S. Giovanni was closed, a car park opened and a road-train made available to shuttle tourists to and from the beach. This was possible thanks to a partnership between institutions, two local municipalities and the NGO WWF Italy, in the long-established Consortium for the Management of Torre Guaceto.

A consultation of tourists and the local community found widespread acceptance of the plan. "This may have been because we made a concerted effort to solve issues that might arise, such as wheelchair accessibility, over a number of years," says Francesco de Franco from the Consortium.

Photo: LIFE05 NAT/IT/000005/NEEMO EEIG/Michele Lischi

The activities of LIFE STRADE (**LIFE11 BIO/IT/000072**) involve three main stakeholder groups: local institutions responsible for monitoring and managing road kill, drivers and the general public.

The first group, which includes the police, protected area managers and local authorities, has provided important input into the development of a road-kill monitoring and management protocol. The three regional governments are now evaluating how they can improve their road kill legislation. The project is targeting drivers and the general public through an extensive communication campaign to highlight the problem of road kill. It will carry out a survey at the end of the project (2017) to assess the reaction of drivers towards the prevention system.

"Generally the stakeholders have been very helpful because they believe that the project is targeting a very urgent and severe problem," says project manager Annette Mertens. She believes that joint monitoring of the issue by project partners and continued awareness raising are the key to reducing road kill in the long term.

Another ongoing project involving anti-collision technology is LIFE IMPACTO CERO (**LIFE12 BIO/ES/000660**), which will test a new tubular anti-collision screen to reduce the number of bird-train collisions on high-speed railway lines in Spain. The project is a partnership between two of Spain's major public rail companies (ADIF and RENFE), environmental researchers from the Autónoma de Madrid University and private construction and transport infrastructure companies (FCCCO and PROINTEC).

"The main benefits for nature will be a better protection of biodiversity and an increased environmental awareness in the construction and operation of rail transport," says Javier Lozano López of lead project partner ADIF Alta Velocidad. He sees the project's public-private partnership as important to its success and as sowing the seeds of future collaborations.

Cetacean conservation

The NGO Sociedad Española de Cetáceos, lead partner of the project Cetáceos Mediterráneo (**LIFE02 NAT/E/008610**), worked closely with five different stakeholder groups to improve the conservation status of sea mammals and turtles off the southern coast of Spain. Project manager Ricardo Sagarminaga explains that "the biggest success story was our work with the marine transport sector." A quarter of the world's maritime traffic and over 30% of its dangerous cargo passes through the corridor where the project activities took place. Project partners and the local marine transport organisation realised that they both wanted the shipping routes in the area to be moved 20 nautical miles further away from the shore for human safety and conservation reasons. The local fishing industry also supported the proposal.

When the NGO approached the national government with the idea they found out that the government had been lobbying the International Marine Organisation (IMO) to make the change for years but without success. Together they worked on a proposal encompassing scientific research and the advantages the move would have for various stakeholders and the environment. "The IMO approved the proposal straight away," says Mr Sagarminaga.

Selected LIFE projects demonstrating new partnerships for nature conservation

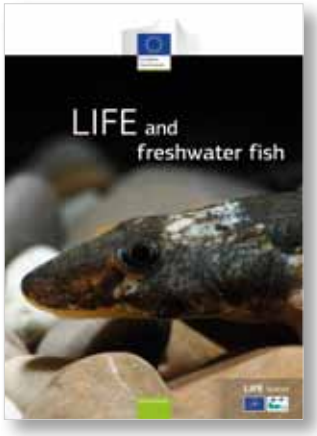
Here is a complete list of projects that are featured in *LIFE and new partnerships for nature conservation*. Arranged by theme, the list highlights more than 90 LIFE projects that have developed partnerships with atypical nature conservation stakeholders, or that have pioneered innovative ways of working with typical stakeholder groups. These projects are drawn from a total of 19 EU Member States.

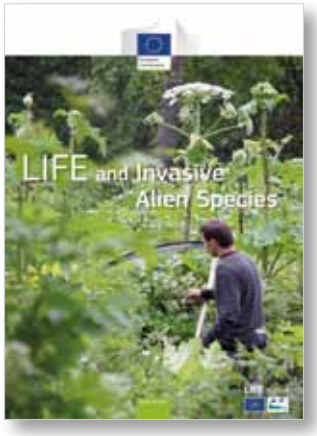
PROJECT	ACRONYM	PROJECT
Introduction		
LIFE10 INF/ES/000540	LANDLIFE	Boosting Land Stewardship as a Conservation Tool in the Western Mediterranean Arch: a Communication and Training Scheme
Military stakeholders		
LIFE00 NAT/UK/007071	Salisbury Plain	Improving the management of Salisbury Plain Natura 2000 sites
LIFE03 NAT/B/000024	MILITAIRE GEBIEDEN	Integrated restoration of natural habitats on military areas in Natura 2000
LIFE04 NAT/HU/000116	HUNVIPURS	Establishing the background of saving the Hungarian meadow viper (Vipera ursinii rakosiensis) from extinction
LIFE05 NAT/B/000088	NATURA2MIL	Rehabilitation of habitats in military camps in Wallonia
LIFE05 NAT/FIN/000104	Vattajan dyyni LIFE	Restoration of dune and coastal habitats in the Vattaja Military Area
LIFE06 NAT/LV/000110	ADAZI	Restoration of Biological Diversity in Military Training Area and Natura 2000 site “Adazi”
LIFE06 NAT/SK/000115	ZAHORIE SANDS	Restoration and Management of Sand Dunes Habitats in Zahorie Military Training Area
LIFE07 NAT/H/000321	Eastern Bakony	Restoration and conservation of priority habitats and species in the Eastern Bakony area
LIFE08 NAT/H/000289	Hungarian Little Plain	Restoration and conservation of priority-listed Pannonic sand land habitats in military owned area of the Hungarian Little Plain
LIFE09 NAT/PT/000041	Life Ilhéus do Porto Sant	Halt the loss of European Biodiversity through the recovery of habitats and species of the islets of Porto Santo and surrounding marine area.
LIFE11 NAT/FR/000734	Life Défense Nature 2 MIL	Biodiversity restoration and conservation of remarkable military lands in southeast France
LIFE12 NAT/LV/000509	LIFE Birds in Adazi	Improving of the conservation status of specially protected bird species in Natura 2000 site “Adazi”
LIFE12 NAT/PL/000031	LIFE MILITARY HABITATS PL	The integrated conservation of non-forest natural habitat on military area in Natura 2000 site.
Religious and cultural heritage		
LIFE03 NAT/GR/000093	FRAINETTO WOODS Mnt. ATHOS	Rehabilitation of Coppice Quercus frainetto woods (9280) and Quercus ilex woods (9340) to high forest
LIFE04 NAT/ES/000043	Quirópteros Extremadura	Conservation of threatened chiropters of Extremadura
LIFE05 NAT/F/000134	LIFE TRANSFERT	Reinforcement and conservation of Lesser Kestrel populations in Aude (FR) and Extrémadure (ES)
LIFE10 NAT/ES/000570	Iberlince	Recovering the historic distribution range of the Iberian lynx (Lynx pardinus) in Spain and Portugal
Volunteers		
LIFE00 NAT/E/007355	Flora Menorca	Conservation of areas with threatened species of the flora in the island Minorca
LIFE04 NAT/FR/000080	CHIROFRSUD	Conservation of 3 cave-dwelling bats in Southern France
LIFE05 NAT/E/000058	BASSES	Management and conservation of temporary ponds in Minorca
LIFE07 NAT/D/000233	ReHa Federseemoor	Restoration of habitats in the Federsee bog (ReHa Federseemoor)
LIFE07 NAT/E/000756	Reneix	Priority species’ habitats restoration in the island of Menorca
LIFE07 NAT/F/000188	COREXERUN	Conservation, restoration and reconstitution of the semi-xerophilic habitats of the “massif de la Montagne” in Reunion

PROJECT	ACRONYM	PROJECT
LIFE08 INF/UK/000214	Birds Directive	Promoting the importance of the EU Birds Directive in conservation management on farmland
LIFE10 NAT/ES/000563	HUMEDALES DE LA MANCHA	Restoration of salt flats around 27 endorheic wetland areas in La Mancha
LIFE10 NAT/PT/000075	BRIGHT	Bussaco´s Recovery from Invasions Generating Habitat Threats (BIODIV)
LIFE12 NAT/ES/000192	LIFE BEAR DEFRAGMENTATION	Habitat defragmentation for brown bear in the Cantabrian mountains
LIFE96 NAT/D/003047	Federseelandschaft	Conservation and development of nature of the Federseelandscape (SENF)
LIFE99 NAT/B/006285	Lorraine belge	Restoration of wetlands in Belgian Lorraine
Socially-disadvantaged groups		
LIFE06 NAT/FIN/000129	Kokemäenjoki-LIFE	From Ancient to the Present Estuary, Kokemäenjoki Wetland Chain
LIFE10 NAT/PT/000075	BRIGHT	Bussaco´s Recovery from Invasions Generating Habitat Threats (BIODIV)
LIFE12 NAT/DK/000803	LIFE WETHAB	Restoration of Wet Habitats in the Jerup Beach Ridge Plain
LIFE13 BIO/PT/000386	lifeBiodiscoveries	Invasive species control through public participation
Applied research and new technology		
LIFE00 NAT/E/007303	Posidonia Baleares	Protection of Posidonia grasses in SCIs of Baleares
LIFE07 NAT/GR/000296	JUNICOAST	Actions for the conservation of coastal dunes with Juniperus spp. in Crete and the South Aegean (Greece)
LIFE08 NAT/BG/000279	BulPlantNet	A Pilot Network of Small Protected Sites for Plant Species in Bulgaria Using the Plant Micro-reserve Model
LIFE08 NAT/GR/000539	AMIBIO	Automatic acoustic monitoring and inventorying of biodiversity
LIFE09 NAT/ES/000534	Life Posidonia Andalucia	Conservation of Posidonia oceanica meadows in Andalusian Mediterranean Sea
LIFE09 NAT/SI/000378	Life at Night	Improving the conservation status of nocturnal animals (moths and bats) by reducing the effect of artificial lighting at cultural heritage sites.
LIFE11 NAT/BE/001059	Bocages	Conservation of habitats and species of bocage landscapes of the Fagne and Famenne
LIFE11 NAT/UK/000383	PIP GB	Pearls in Peril - securing the future of the freshwater pearl mussel in Great Britain
LIFE12 NAT/ES/000180	LIFE RESECOM	Monitoring network for plant species and habitats of Community interest in Aragón
LIFE13 BIO/PT/000386	lifeBiodiscoveries	Invasive species control through public participation
LIFE13 ENV/IT/000842	CSMON-LIFE	Monitoring biodiversity by a Citizen Science approach for solving environmental problems
Enforcement and governance		
LIFE00 NAT/RO/007171	Iron Gates	Iron Gates Natural Park - habitat conservation and management
LIFE00 NAT/UK/007079	Dorset heaths	Combatting urban pressures degrading European heathlands in Dorset
LIFE07 NAT/F/000193	LAG Nature	Creating an experimental and demonstrative network of lagoon and dune Natura 2000 sites on the mediterranean coastline of Languedoc-Roussillon.
LIFE08 NAT/E/000062	VENENO NO	Action to fight illegal poison use in the natural environment in Spain
LIFE09 NAT/PT/000038	MarPro	Conservation of Marine Protected Species in Mainland Portugal
LIFE11 INF/ES/000665	LIFE Activa Red Natura 2000	Natura 2000: Connecting People with Biodiversity
Business and private sector stakeholders		
LIFE00 NAT/IT/007142	Po ENEL	Improvement of the habitats of CIS through restoration and/or transformation of electrical plants existing and under construction in the Po Delta Park
LIFE02 NAT/E/008610	Cetáceos Mediterráneo	Conservation of cetaceans and turtles in Andalusia and Murcia
LIFE03 NAT/F/000104	LINDA	Limitation to the negative interactions between dolphins and human activities
LIFE03 NAT/IT/000148	SANTUARIO CETACEI	Activities for the protection of cetaceans in the international sanctuary
LIFE03 NAT/P/000013	PRIOLO	Azores bullfinch habitat recovery in Pico da Vara/Ribeira do Guilherme SPA
LIFE03 NAT/SLO/000076	Secovlje	Conservation of endangered species and habitats in the Secovlje salt-pans Park
LIFE03 NAT/UK/000042	Cornwall Moors	Restoration of the mid Cornwall Moors for the Euphydryas aurinia
LIFE04 ENV/ES/000195	EcoQuarry	Ecotechnology for environmental restoration of limestone quarries
LIFE04 NAT/EE/000073	KopuNatura	Management of Natura 2000 habitats of the Kopu Peninsula

PROJECT	ACRONYM	PROJECT
LIFE04 NAT/ES/000034	ZEPA eléct. Aragón	Adaptation of the electric power lines in the SPA of Aragón
LIFE04 NAT/HU/000116	HUNVIPURS	Establishing the background of saving the Hungarian meadow viper (Vipera ursinii rakosiensis) from extinction
LIFE04 NAT/LV/000199	PHS in NPR	Protection of habitats and species in Nature Park "Razna"
LIFE05 NAT/A/000077	Grosstrappe	Cross-border Protection of the Great Bustard in Austria
LIFE05 NAT/IT/000050	HABI.COAST	Protection of coastal habitats in pSCI Torre Guaceto
LIFE06 NAT/E/000214	Tendidos Electricos Murcia	Correction of Dangerous Overhead Cables in Special Protection Areas for Birds in the Region of Murcia
LIFE07 NAT/H/000322	CONVIPURSRAK	Conservation of Hungarian meadow viper (Vipera ursinii rakosiensis) in the Carpathian-basin
LIFE07 NAT/P/000630	LAURISSILVA SUSTENTAVEL	Recovery, conservation and sustainable management of Tronqueira/Planalto dos Graminhais
LIFE07 NAT/P/000646	CETACEOSMADEIRA II	Identifying critical marine areas for bottlenose dolphin and surveillance of the cetaceans' conservation status in Madeira archipelago
LIFE08 NAT/BG/000277	LIFE FOR THE BOURGAS LAKE	Ensuring Conservation of Priority Bird Species and Coastal Habitats at the Bourgas Natura 2000 Wetland Sites
LIFE08 NAT/E/000077	CIRCUREVIEJA	Decantation circuit of residual salts and ecological recovery of the Natural Park of Las Lagunas de la Mata and Torrevieja
LIFE09 NAT/GR/000323	SKYROSBIODIVERSITY	Demonstration of the Biodiversity Action Planning approach, to benefit local biodiversity on an Aegean island, Skyros
LIFE09 NAT/IT/000190	ARION	Systems for Coastal Dolphin Conservation in the Ligurian Sea
LIFE09 NAT/LV/000239	Life-HerpetoLatvia	Conservation of rare reptiles and amphibians in Latvia
LIFE09 NAT/SI/000376	MANSALT	Man and Nature in Secovlje salt-pans
LIFE09 NAT/SK/000396	APOMARINA_SK	Conservation of Aquila pomarina in Slovakia
LIFE10 NAT/BE/000709	ELIA	Development of the beddings of the electricity transportation network as means of enhancing biodiversity
LIFE10 NAT/HU/000019	HELICON	Conservation of imperial eagles by managing human-eagle conflicts in Hungary
LIFE10 NAT/IT/000256	MC-SALT	Environmental Management and Restoration of Mediterranean Salt Works and Coastal Lagoons
LIFE11 BIO/IT/000072	LIFE STRADE	Demonstration of a system for the management and reduction of collisions between vehicles and wildlife
LIFE11 NAT/BG/000362	Salt of Life	Urgent Measures to Restore and Secure Long-term Preservation of the Atanasovsko Lake Coastal Lagoon
LIFE11 NAT/IT/000213	CARABUS	Protection and species habitat conservation for the consolidation of the Carabus olympiae population in Valsessera
LIFE12 BIO/ES/000660	LIFE IMPACTO CERO	Development and demonstration of an anti-bird strike tubular screen for High Speed Rail lines
LIFE12 BIO/ES/000926	LIFE-ECORESTCLAY	Holistic Ecological Restoration of a mining area in Tarragona (Spain) with seven clay Quarries
LIFE12 BIO/GR/000554	LIFE WINDFARMS & WILDLIFE	Demonstration of good practices to minimize impacts of wind farms on biodiversity in Greece
LIFE12 NAT/BG/000572	LIFE for safe grid	Enhance conservation of the globally threatened Imperial Eagle in Bulgaria by reducing mortality caused by power lines
LIFE12 NAT/PT/000527	Life Terras do Priolo	Active protection of the population of the Azores bullfinch (Priolo) and its habitas and sustainable management of Pico da Vara/ Ribeira do Guilherme SPA's
LIFE13 BIO/LT/001303	LIFE Birds on Electrogrid	Installation of the bird protection measures on the high voltage electricity transmission grid in Lithuania
LIFE13 NAT/HU/000183	RAPTORSPREYLIFE	Securing prey sources for endangered Falco cherrug and Aquila heliaca population in the Carpathian basin
LIFE13 NAT/SK/001272	LIFE ENERGY	Energy in the land - power lines and conservation of priority bird species in Natura 2000 sites
LIFE94 ENV/F/000878	Nature parks in Europe	Nature parks in Europe : a charter for sustainable tourism
LIFE95 NAT/IT/000807	Cesine	Conservation of Wetlands in Cesine and decrease of human impact in the area
LIFE97 NAT/E/004151	Caretta/Tursiops Truncatus	Project to support the conservation of Caretta caretta and Tursiops truncatus in the Canary Islands
LIFE99 NAT/P/006432	cetáceos/Madeira	Project for the conservation of cetaceans in Madeira Archipelago

Available LIFE Nature publications





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KH-AJ-15-002-EN-N

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

Period covered 2014-2020

EU funding available approximately €3.46 billion

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

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

> "Traditional" projects – these may be best-practice, demonstration, pilot or information, awareness and dissemination projects in any of the following priority areas: LIFE Nature & Biodiversity; LIFE Environment & Resource Efficiency; LIFE Environmental Governance & Information; LIFE Climate Change Mitigation; LIFE Climate Change Adaptation; LIFE Climate Governance and Information.

> Preparatory projects – these address specific needs for the development and implementation of Union environmental or climate policy and legislation.

> Integrated projects – these implement on a large territorial scale environmental or climate plans or strategies required by specific Union environmental or climate legislation.

> Technical assistance projects – these provide financial support to help applicants prepare integrated projects.

> Capacity building projects – these provide financial support to activities required to build the capacity of Member States, including LIFE national or regional contact points, with a view to enabling Member States to participate more effectively in the LIFE programme.

Further information More information on LIFE is available at http://ec.europa.eu/life.

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

Contact

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

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Publications Office

doi:10.2779/193419