



LIFE III

focus



LIFE and the marine environment

Promoting sustainable management of Europe's seas



European Commission



European Commission Environment Directorate-General

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Foreword



Peter Gammeltoft

The world's oceans and seas cover 71% of the Earth's surface and contain more biological diversity than terrestrial and freshwater ecosystems. The marine environment is a precious asset and a great contributor to economic prosperity, social well-being and quality of life. However, the marine environment is under pressure. Waste dumping, dredging and extraction of sand and gravel, water borne and atmospheric deposition of dangerous substances and nutrients, oil and gas exploration and shipping are just some of the activities examples causing the degradation of our seas. Other activities such as bottom trawling and over-fishing are also contributing to the destruction of marine habitats and species.

The European Union, aware of the increasing concern about the state of Europe's oceans and seas, included in the Sixth Environment Action Programme a commitment to develop a strategy for the protection and conservation of the marine environment with the overall aim being "to promote sustainable use of the seas and conserve marine ecosystems".

The Marine Strategy focuses on the protection of the regional seas surrounding the EU, taking into account international commitments and the importance of reducing the EU's impact on the marine environment in a global context. The Marine Strategy must also be seen within the broader context of the development of the new EU Maritime Policy.

The European Commission's LIFE (Financial Instrument for the Environment) programme has contributed to the conservation of highly endangered marine species and habitats. It has also gathered information and experience for the establishment and implementation of the Natura 2000 Network in the marine environment, and has promoted the implementation of the Habitat and Birds Directives on the European seas and oceans.

This LIFE Focus brochure details the accomplishments of various projects that with their actions contributed to the knowledge, protection, prudent use, and understanding of the marine environment.

Peter Gammeltoft

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The marine environment status



Europe borders four major seas and two oceans: the Mediterranean, Black Sea, Baltic Sea, North Sea, and the North Atlantic and Arctic Oceans.

Almost every EU-25 country¹ has coastal areas, and the maritime surface area under their jurisdiction is larger than the total land area of the European Union. Europe's identity, quality of life and economic development are directly related to the health and diversity of its seas and oceans. However, the marine environment is under significant pressure.

¹ Excluding Austria, Luxembourg, Slovakia, Czech Republic and Hungary



Main threats to the marine environment

Current pressures on Europe's marine environment that are putting the sustainability of our oceans and seas at risk include:

> Overfishing

This is a common problem in all European seas, although management systems for the exploitation of these resources have been introduced within the Common Fisheries Policy. A number of important commercial fish stocks have reached historically low levels. In addition, intensive fishing activities may have also significantly damaged non-target fish species and other marine life (cetaceans, seals, seabirds and turtles) and may damage important marine habitats such as maerl beds, *Posidonia* seagrass beds and deep-sea reefs.

> Alien species

The introduction (unintentional or deliberate) of non-indigenous species, genetically modified or disease-bearing organisms to the marine environment can have a catastrophic effect on natural ecosystems, thus threatening marine biodiversity.

> Habitat modifications and disturbance

Human activity along coasts and offshore (such as the development of ports and harbours, coastal protection, land reclamation, tourism, sand and gravel extraction, offshore oil, gas and wind power installations) has a significant impact on the marine habitats. This is the result of direct destruction, excessive

demands for marine services and goods, increasing traffic, acoustic disturbance (underwater and on the surface), exploration and installation of offshore platforms.

> Pollution (hazardous substances)

Industrial and urban discharges and emissions that reach the marine environment may contain various hazardous substances¹ have been shown to be able to disrupt the biological processes of marine species and to interfere with the ecological food chain.

> Eutrophication

This is a condition caused by the excessive influx of nutrients (nitrogen and phosphorous). Although this is predominantly from agricultural and urban sources, the atmospheric deposition of airborne nitrogen compounds (for instance from seagoing ships) may also be a relevant factor. The abundance of nutrients can promote spectacular growths of macroscopic algae – *algal bloom*.

> Oil pollution

The majority of oil pollution at sea is not the result of spectacular oil slicks but comes from routine operations,

such as leaks from coastal installations, harbour tanker terminals and coastal transport pipelines to refineries, and widespread operational discharges from tankers and other vessels on the ocean. The damage caused to coastlines from oil pollution is costly and takes a long time to recover. As a result, the marine ecosystems and centres of human activity (for example, aquaculture sites and tourist centres) may be affected.

> Climate change

The possible consequences of climate change on the marine environment are far from being fully understood, but some of the results are already noticeable. The consequences may include changes to the strength and transport capacity of ocean currents, the speed of formation of water masses, sea-level height variation, the intensity and frequency of climatic phenomena, rainfall and the flow of waterways, with downstream effects on ecosystems and fisheries. One of the most visible effects of rising sea levels is coastal erosion. One fifth of the EU's coastline is already affected, and some places are losing between 0.5 to 2 metres a year and even up to 15 metres in a few alarming cases. A particular worrying effect is the increase in the acidity of marine waters, resulting from increased rates of dissolved CO₂.

¹ These include, *inter alia*, tributyltin (TBT), PCBs (Polychlorinated Biphenyls), organochlorine pesticides, PAHs (Polycyclic Aromatic Hydrocarbons) and heavy metals

This publication shows, through LIFE case studies, how the conservation of marine ecosystems and marine biodiversity can be incorporated into policies and management plans to preserve the EU's seas. The LIFE examples featured in this brochure enhance the knowledge of our marine environments (thus promoting the implementation of the Natura 2000 Network), promote the protection of endangered species and habitats, ensure the prudent use of marine goods and services, build partnerships between stakeholders, and improve the environmental quality of our seas.

EU marine policy in an international context

One of the particular features of the marine environment is the number of organisations, regional conventions and international bodies that are concerned with its protection. In addition, the EU itself has an extensive body of legislation, policies and programmes that directly or indirectly impact upon the quality of our oceans and seas.

A review of current EU policies and legislation¹ shows the existence of a wide variety of EU measures that contribute to the protection of the marine environment. However, as most of this is sectoral and as the geographic scope varies, there is no integrated EU policy focused on the marine protection. The institutional and legal complexity of marine protection is indeed one of the main challenges to be confronted.

EU marine environment policy has evolved in a broader context of treaty obligations at global and regional levels. There are a large number of different organisations contributing to the protection of the marine environment. There is an important overlap in the geographical area covered by these organisations and in terms of membership.

At a global level, the United Nations Convention on the Law of the Sea

¹ See, for instance, annexes to COM(2002)539: "Towards a Strategy to protect and conserve the marine environment."

(UNCLOS) and the Convention on Biological Diversity (CBD) are among the most relevant bodies under which the EU has committed itself to protect the marine environment. Further agreements and commitments at a regional level, under the OSPAR Convention for the North-East Atlantic, the Helsinki Convention (HELCOM) for the Baltic Sea and the Barcelona Convention for the Mediterranean Sea, should also be highlighted.

Two recent environmental initiatives of the European Commission should be underlined:

1. The European Marine Strategy, which is intended to provide an integrated framework for action to deal with the impact of human activities on the marine environment;
2. The full implementation of the Birds and Habitats Directives in all waters under the jurisdiction of EU Member States. Once completed, the Natura 2000 Network in offshore waters will constitute a very important tool to ensure the proper protection of marine wildlife.

The Law of the Sea

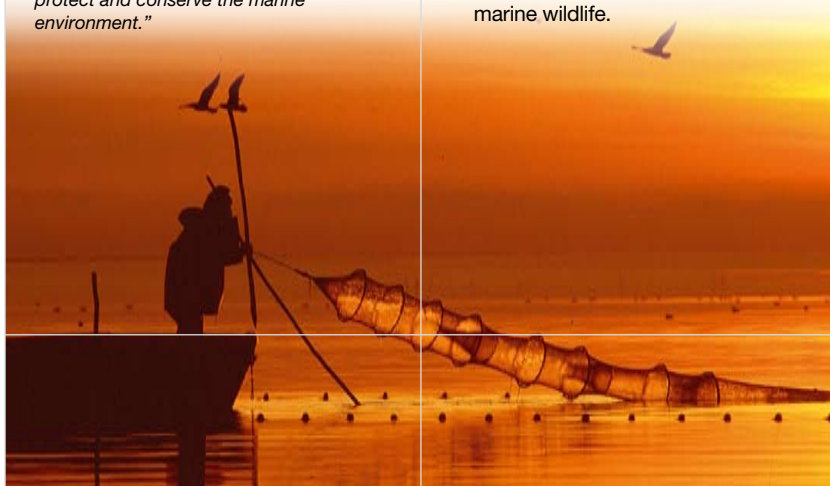
The UNCLOS – United Nations Convention on the Law of the Sea was signed by participating countries under the auspices of the United Nations (UN) at Montego Bay (Jamaica) on 10 December 1982, and has gained virtual universal acceptance. One hundred and forty-nine nations have ratified the convention since its entry into force on 16 November 1994. The convention establishes general obligations for safeguarding the marine environment and protecting freedom of scientific research on the high seas. It also creates an innovative legal regime for controlling mineral resource exploitation in deep seabed areas beyond national jurisdiction, through an International Seabed Authority*.

* More information on: <http://www.un.org/Depts/los/index.htm>

International Council for the Exploration of the Sea

The International Council for the Exploration of the Sea (ICES) is an intergovernmental organisation that coordinates and promotes marine research in the North East Atlantic, the Baltic Sea and North Sea. More than 1,600 marine scientists from 19 countries around the North Atlantic gather information about the marine ecosystem. As well as filling gaps in existing knowledge, this information forms the basis for unbiased, non-political advice on fish and shellfish stocks, the marine environment including contaminants, and the status and outlook for marine ecosystems including the effects of human exploitation. The ICES plans and coordinates marine research, and prepares technical advice on catches of fishing stocks, as well as strategies and measures to mitigate the impact of human activities on the marine ecosystem, to its including the European Commission and other international regulatory bodies such as OSPAR and HELCOM*.

* More information can be found on <http://www.ices.dk/>





The European Marine Strategy

The “Thematic Strategy on the Protection and Conservation of the Marine Environment” aims to ensure that all European seawaters are in good environmental status by 2021. This ambitious Marine Strategy, launched by the Commission on 24 October 2005, targets the protection of the marine environment and is also the key component of the future Maritime Policy, which has been proposed by the Commission.

Coastal and marine ecosystems are among the world’s most productive ecosystems and provide a wide range of services to society. However, the marine environment is under significant pressure. The UN Millennium Ecosystems Assessment¹ points out that human activity is the main cause of degradation and loss of marine species and habitats, and forecasts “a great risk of collapse of all major fish stocks and climate change-induced sea-level rise (with mean value of 0.5 – 0.7 m)”.

Although some significant improvements in the quality status of seas surrounding Europe have been achieved and some of the worsening pollution trends have been halted or reversed, a large number

¹ UNEP (2006) *Marine and coastal ecosystems and human well-being. A synthesis report based on the findings of the Millennium Ecosystems Assessment.*



European Marine Strategy logo

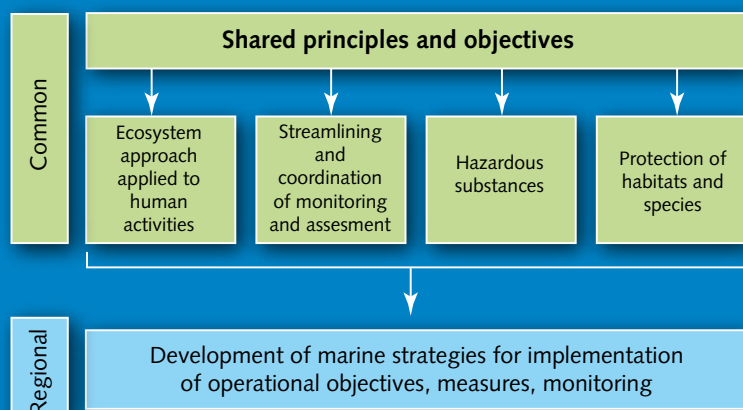
of problems have yet to be fully addressed and major threats still persist. The reasons for this include:

- A complex and inadequate legal framework for the management of the seas within and outside the EU, and the number of actors concerned;
- Gaps in basic knowledge, due to a lack of alignment between research priorities and needs;
- A lack of an integrated marine protection policy.

Taking into account the underlying problems that affect the marine environment, the Sixth Environment Action Programme (6th EAP) considered the conservation and the protection of the marine environment as a key environmental priority. In 2002 the European Commission adopted the Communication “Towards a strategy to protect and conserve the marine environment”. After three years, this communication was followed by a “Thematic Strategy on the Protection and Conservation of the Marine Environment.” The Commission proposed a “Marine Strategy Directive”, requiring Member States to take measures to achieve good environmental status for all the EU’s marine waters by 2021. To this end, they have to prepare and implement programmes of measures in close cooperation with other Member States and third countries that share the same waters, through the development of marine strategies for its marine waters. Cooperation between EU Member States and with countries outside the EU would be encouraged within the framework of existing Marine Regional Conventions (OSPAR, HELCOM, Barcelona Convention and the Bucharest Convention).

Regional marine strategies will contain a detailed assessment of the state of the environment, a definition of “good environmental status” at regional level and the establishment of clear environmental targets and monitoring programmes. To take account of regional differences, the Commission’s proposal puts forward a “two level” approach that sets out common objectives and

Figure 1: Two-level approach of the Marine Strategy



principles to be implemented at regional level. As a result, Member States sharing a marine area will be responsible for working in close cooperation to ensure the good environmental status of their common waters (see Figure I).

The Ecosystem² approach

The Convention on Biological Diversity (CBD)³ defines the ecosystem approach as “a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way”. The CBD also recognises that “humans, with their cultural diversity, are an integral component of ecosystems”. The proposal for the Marine Strategy is based on the ecosystem approach and focuses on the integrated management of human activities.

Extensive work on application of the ecosystem approach to the marine environment was carried out during a stakeholder consultation process before the adoption of the Strategy⁴. This approach is instrumental to the sustainable development of Europe's oceans and seas and to the effective protection of the marine environment. It builds upon concepts such as “favourable status of conservation” and “good ecological status”. It should apply to all areas, including coastal seas, territorial waters, exclusive economic zones or equivalent ones as well as all activities taking

² Ecosystem definition – “a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit” (Article 2 of the CBD)

³ <http://www.biodiv.org/programmes/cross-cutting/ecosystem/default.shtml>

⁴ A working group led by the International Council for the Exploration of the Sea, ICES produced the ICES cooperative research report No 273 (<http://www.ices.dk/pubs/crr/crr273/crr273.pdf>)

place in these areas that affect the marine environment

The endorsement of this approach results in a well-defined way of working that starts with the consideration of the objectives stemming from the Vision or desired state adopted for the marine environment in general and the existing principles and obligations that apply. These objectives have to be put into action. The effectiveness of the actions has to be monitored by using indicators and targets that will allow further adjustments of the actions to ensure that the objectives are eventually achieved. A summary of the process is shown in Figure II.

The Marine Strategy and the new EU Maritime Policy

In addition, the European Commission is launching a wide debate on an EU Maritime Policy that coordinates the current sectoral policy approach. On 7 June 2006 the European Commission published a Green Paper titled “Towards a future Maritime Policy for the Union: A European vision for the oceans and seas”. It aims to accomplish the objectives of the Lisbon Strategy and integrate many related maritime policy areas such as transport, renewable energies, trade, tourism, fisheries, aquaculture, marine research, coastal and harbour industries. The Marine Strategy will constitute the “main environmental pillar of the EU Maritime Policy”⁵ and be seen as the environmental component of the overall policy. A period of consultation with citizens and stakeholders has followed, starting 7 June 2006 and ending 30 June 2007. All documents, including the Green Paper and information of

⁵ Speech by Dr. Joe Borg Member of the European Commission responsible for Fisheries and Maritime Affairs at the European Maritime Policy and the Regions conference, Azores, 26 June 2006

events, can be found on the Commission's maritime website⁶.

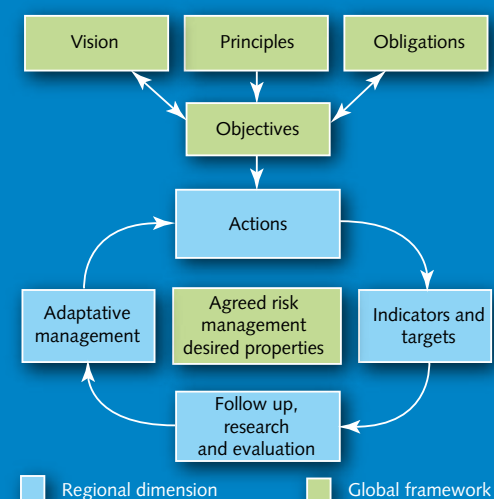
Natura 2000 and the Marine Strategy

Rather than creating new legal provisions or requirements for designating Marine Protected Areas (MPAs), the proposed Directive supports the full implementation of the Natura 2000 ecological network in the marine environment under the Habitats and Birds Directives, as an important contribution to achieving good environmental status of marine waters.

The proposed marine strategy requires the Member States to identify measures that need to be implemented in order to achieve good environmental status, taking into consideration the measures relevant for MPAs in general. Measures aimed at achieving the conservation objectives set for Natura 2000 sites included in a marine region should then be inserted in the plan of measures for the region as a whole.

⁶ http://ec.europa.eu/maritimeaffairs/policy_en.html

Figure II: Implementing the 'Ecosystem Approach'



Source: Dan Laffoley, English Nature



The marine component of the Natura 2000 Network

The Natura 2000 Network is an ecological network of natural areas designated to conserve Europe's rich but vulnerable habitats and species. The network includes more than 20,000 sites from all 25 Member States of the EU. Collectively, they cover almost a fifth of Europe's land and continental waters.



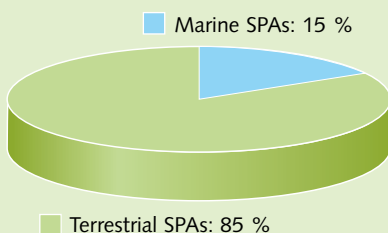
Ponta do Castelo marine site in the Azores

The Natura 2000 ecological network, set up by the EU Habitats and Birds Directives, is the cornerstone of the EU's nature conservation policy. The

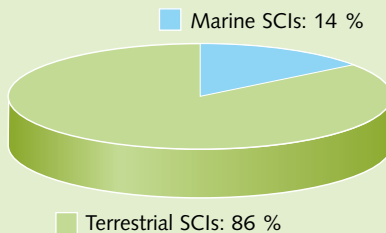
marine component of the Natura 2000 Network will be an integral component of the overall Natura 2000 Network.

Together with the Special Protection Areas (SPAs) designated under the Birds Directive, the areas designated under the Habitats Directive as Special Areas of Conservation (SACs) shelter species and habitats that are rare or endangered at European level. This network is one of the principal means of implementing the commitment made by the Union's Heads of State and Government at the Gothenburg summit in June 2001 to "halt the loss of biodiversity by the year 2010". It will also contribute to fulfilling obligations stemming from

Marine Special Protection Areas (SPAs) in Europe



Marine Sites of Community Interest (SCIs) in Europe



international conventions such as the CBD Convention. For the first time, all Member States are working together towards the same conservation goal and within the same legislative framework (the two directives) to protect and manage vulnerable species and habitats across their natural range, irrespective of political boundaries. Designation of SPAs and proposals for SACs (the so-called Sites of Community Importance, SCIs) is now almost complete in the old EU15, and the process is well under way in the new Member States. The total EU25 marine and terrestrial SCIs' area covers 559,082 km² and the SPAs' area covers 444,368 km².

The Natura 2000 Network introduced a series of key elements in nature conservation related to the marine environment:

- The inclusion of open sea as a breeding, feeding or resting zone for the targeted species in a network of protected areas, the protection of valuable habitat types, as well as the specific protection of habitats such as cold water reefs



Photo: ImagOP@Svizzho

Release of Madeiran Storm-Petrel, an endangered seabird that spends most of its life at sea

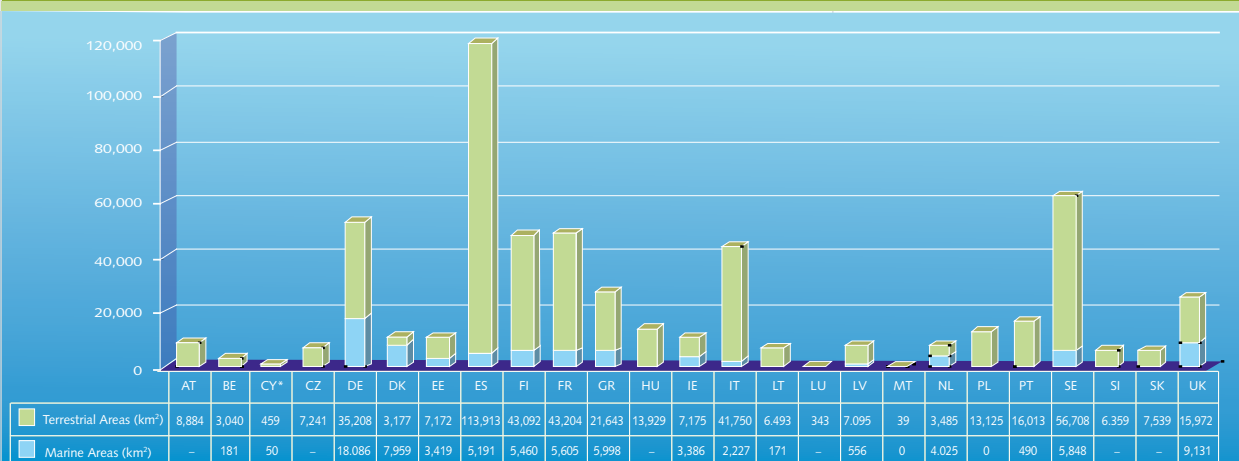
and *Posidonia* beds (underwater sea-grass prairies).

- The protection of each area as part of a coherent network, rather than as isolated sites.
- The freedom of choice for Member States to guarantee the conservation of sites either with specific management plans or through conservation measures included in broader devel-

opment plans, rather than the establishment of one set of strict rules and regulations for general application.

Many conservation actions funded by LIFE focus on building a sound knowledge base on marine species and habitats in order to be able to develop appropriate conservation measures to protect them.

Figure III: Marine and terrestrial areas of the SCIs by Member State



* denotes the area where the community acquires currently applies according to protocol 10 of the Accession Treaty.

Source: Natura 2000 Barometer - June 2006. (http://ec.europa.eu/environment/nature/nature_conservation/useful_info/barometer/barometer.htm)



LIFE on the sea



Although a relatively small fund in EU terms, LIFE's contribution has helped establish and manage the Natura 2000 Network on open water, promoting innovative techniques for the protection of the marine environment and capacity-building around the Mediterranean and Baltic Seas.

Establishing and managing Natura 2000 sites costs money. The Habitats Directive acknowledges this, and in its Article 8 foresees a contribution from the Community towards these costs. Launched in 1992 – at the same time as the Habitats Directive came into force – the nature strand of LIFE III is the only EU programme primarily dedicated to nature conservation and to the creation of the Natura 2000 ecological network. LIFE-Nature is assigned 47% of the total LIFE III programme budget for actions that contribute to the protection of species and maintaining or restoring of natural habitats under the Birds and Habitats Directives. It has so far contributed more than € 700 million to more than 800 nature projects with a total budget of € 1.3 billion across the EU and Romania. It was not intended to financially cover the implementation of the Natura 2000 Network wholesale (that would require much more money) but to help establish the network and demonstrate how it can work in practice. Some 2,000 sites, representing over 10% of the total network, have been targeted by LIFE-Nature projects so far.

Another LIFE III programme strand, LIFE-Environment, aims to implement Community policy and legislation on the environment in the EU and Romania. This approach enables the demonstration and development of new methods and innovative techniques for the protection and the enhancement of the environment. Nearly half – 47% – of the LIFE III programme budget goes to LIFE-



Photo: ©FAW

Striped dolphin (Stenella coeruleoalba) an Annex IV Habitats Directive species

Environment. Five areas, all with a potential impact on the marine environment, are tackled by LIFE-Environment projects:

- Land-use development and planning.
- Water management.
- Environmental impact of economic activities.
- Waste management.
- Environmental impact of products through an integrated product policy.

LIFE-Third Countries, which specifically aims to provide capacity building in countries outside the EU around the Mediterranean and Baltic Seas, is the third LIFE III programme strand, taking around six percent of the LIFE budget. LIFE-Third Countries projects in the marine environment cover issues like the development of national and international

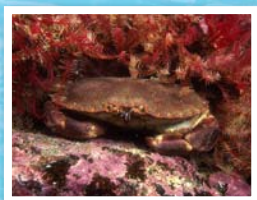
systems for responding to accidental marine pollution, establishing effluent limits based on best available technology, reducing heavy metal pollution and establishing marine environmental action plans.

The LIFE programme, as a whole, has demonstrated its effectiveness as a key financial and technical tool helping Member States to fulfil their obligations as regards the protection of the marine environment. Some of the most common actions funded are:

- Information gathering about the status and requirements of marine species and habitats, including monitoring sea mammal, bird and fish populations.
- Identification and designation of Natura 2000 sites in open waters.
- Elaboration and implementation of management actions (including management plans) for marine sites, with the aim of avoiding the depletion of endangered species and of maintaining and restoring valuable habitats.
- Demonstration and testing of innovative methods and technologies for preventing pollution and mitigating the effects of environmental accidents.
- Consultation with the public on plans and projects for the elaboration and adoption of integrated management plans for marine areas.
- Promoting capacity building in the private and public sectors in countries bordering the Mediterranean and Baltic seas.



Enhancing our knowledge of the marine environment



Implementing the Habitats and Birds Directives in the marine environment presents some substantial challenges, especially as regards the offshore environment, due to the difficulties in

obtaining scientific knowledge on the distribution and abundance of species and habitats. So while the designation of Natura 2000 sites in coastal and inshore waters is considered to be fairly advanced, there are still important gaps in the offshore marine environment network.

The LIFE programme has helped to enhance the knowledge of the marine environment needed to designate Natura 2000 sites in the open sea.





Implementation of the marine component of the Natura 2000 Network



Knowledge and designation of Natura 2000

Implementing the Habitats Directive, which includes some marine species and habitats, presents substantial challenges, especially for the offshore marine environment due to existing knowledge gaps about the distribution and abundance of species and habitats and the cost of carrying out oceanographic research. In addition, the need for a more precise definition of marine habitat types in Annex I of the Habitats Directive is widely acknowledged. Many of these species and habitats are also listed in regional conventions such as the OSPAR, Helsinki or Barcelona Conventions. On the other hand, all marine bird species are covered by the Birds Directive, which makes its implementation more straightforward.

The full establishment of the marine component of the Natura 2000 Network will be a significant step towards the protection of the marine environment in EU waters.

Part of the problem in implementing Natura 2000 in the sea is that there is insufficient data when compared with terrestrial environments. Offshore marine surveys are difficult to do and also tend to be very costly. As a result, the amount of data on the distribution of species and habitats tends to decrease the further one goes from the shore. Nevertheless, a basic level of knowledge is essential if suitable marine sites are to be selected for the Natura 2000 Network.

Member State Nature Directors agreed that further work was needed to develop a common understanding of the provisions of the Birds and

the Habitats Directives to designate and manage marine Natura 2000 sites. The European Commission was asked to establish an ad hoc working group under the Habitats Committee, with a view to providing guidance on this subject.

Since March 2003, a Marine Expert Group has been working on the development of a common understanding of the provisions of Natura 2000 relating to the marine environment in order to facilitate the designation and future management of these areas. This should help Member States achieve this important task and will provide useful reference material for other stakeholders.

Legal aspects of applying the Birds and Habitats Directives to the marine environment

The opinion of the Commission is that the claim by a Member State of rights on the maritime zone should include obligations as well as those rights: "The provisions of the Habitats Directive automatically apply to the marine habitats and marine species located in territorial waters (maximum 12 miles). However, if a Member State exerts its sovereign rights in an exclusive economic zone of 200 nautical miles (for example, the granting of an operating licence for a drilling platform), it thereby considers itself competent to enforce national laws in that area, and consequently the Commission considers in this case that the Habitats Directive also applies, in that Community legislation is an integral part of national legislation**".

This opinion was confirmed by the Position of the European Court Justice delivered in the case C-6/04 on 20 October 2005.

Thus the exclusive right of exploiting natural resources implies also the conservation of the marine ecosystems and applies to all the maritime areas claimed by the Members states, including:

- The internal waters and the Territorial Sea;
- The Exclusive Economic Zone (EEZ) and/or to other areas where MS are exercising equivalent sovereign rights (fishing protection zones, environmental protection zones...);
- The Continental Shelf.

* COM (1999) 363



Marine site selection

After the clarification of where the Habitats and Birds Directives apply, the question is: how to select marine sites for Natura 2000?

There are nine marine habitat types, 18 species listed in the Habitats Directive and numerous seabirds (under the Birds Directive), for which Member States are required to propose sites for the Natura 2000 Network. The procedures for the delineation of sites are the same as on land. The assessments must take into account the size, the distribution and conservation status of the target habitats and species and their overall contribution to the Natura 2000 Network.

The first step is to distinguish between coastal and inshore water species and habitats, and the true pelagic species (species that live in the open sea). Fish species such as those belonging to the genera *Valencia* or *Aphanius*, terns (genus *Sterna*), and habitats such as coastal lagoons (Habitats Directive Annex I code - 1150* - priority) or estuaries (1130) are related to coastal areas. For these cases the site designation procedure is similar to land sites and the surveying and delineation of areas is relatively easy to accomplish. These sites also provide for the conservation of land areas where marine species spend a part of their lifecycle, such as islands for seabirds, sandbanks for seals, and nesting beaches for loggerhead sea turtles.

Thus, the requirement for the identification and proposal of offshore sites is linked to a shorter list of habitats and species. For these cases the answer is to carry out surveys focusing on habitats and species. The surveys have to be appropriate (for example not all would depend



Photo: ImagOP@JFontes

Dusky grouper (Epinephelus marginatus) in the Azores

on sea floor information) and sometimes would be linked with oceanographic information (geology, bathymetry-sea depth, currents sea temperature, salinity levels, nutrients and plankton patterns). For a wide range of species (sea mammals and seabirds) the surveys must include onboard surveys and satellite/radio tracking to build up a picture of the species' distribution patterns and behaviour.

LIFE-Nature has been contributing to projects that aim to carry out preliminary studies and surveys of

the marine environment. This could be considered as something of an exception to its normal rule of not funding scientific studies and surveys. This approach allowed the funding of more than 50 projects that had an important information gathering and survey component, and thus provided important data that is used for the identification of sites and their inclusion in the Natura 2000 Network. Some of the projects contributed for the first time to the production of real large-scale results that covered wide areas of the European seas.



SCANS: Abundance of small cetaceans in the North Sea and adjacent waters

The SCANS LIFE project increased knowledge of the abundance and distribution of North Sea cetaceans. Its survey produced reliable information which formed the basis for establishing threshold levels for the sustainability of cetacean populations and for implementing conservation measures.

Across the world, sea mammals are under threat. Accidental entanglement (the by-catch) in fishing nets, pollution, overfishing of their food supplies and hunting are contributing to the problem. The threats faced by cetaceans in EU waters are recognised in the Habitats Directive, which lists those that require strict protection (Annex IV). Furthermore, Annex II of the directive lists the harbour porpoise (*Phocoena phocoena*) and the bottlenose dolphin (*Tursiops truncatus*) as species that Member States should protect under Special Areas of Conservation (SACs).

The International Whaling Commission (IWC) has stated that the level of by-catch for cetacean populations should be less than 1%. Also, the Agreement on the Conservation of Small Cetaceans in the Baltic and North Seas (ASCOBANS) advised that the maximum annual by-catch for harbour porpoises should not exceed 1.7% of the population. Nonetheless, the by-catch of harbour porpoise in fish nets has reached high levels and has given rise to calls for the introduction of management measures. In this respect, the adoption of a Common

Common dolphin (Delphinus delphis) spotted during the SCANS project surveys

Photo: Ana Calafadas





Onboard survey of the sea for cetaceans

Fisheries Policy Regulation¹ setting measures aimed at reducing cetacean by-catch should be seen as a breakthrough. In any event, assessing the impact of by-catch and implementing concrete conservation measures requires good estimates of the population of cetaceans in European waters. Quantitative information on the distribution and abundance of cetaceans

¹ Council Regulation (EC) No 812/2004 of 26.4.2004

Habitats Directive Annex II cetaceans' species

The harbour porpoise (*Phocoena phocoena*) is a small cetacean on average 1.8 m long, weighing between 50-70 kg. It has a circumpolar distribution in the Northern Hemisphere, and occurs, as its name indicates, mainly in coastal waters or river estuaries. Though it is the most abundant cetacean species in the North Sea, it is considered endangered by the IUCN*. The bottlenose dolphin (*Tursiops truncatus*) is the most common and well-known dolphin species. It ranges from 2 to 4 m in length and weighs between 150 and 650 kg. In north European waters it is found in coastal waters and further offshore. Its diet consists of fish, squid and shrimp.

* Red List of Threatened Species IUCN (International Union for Conservation of Nature), 2006

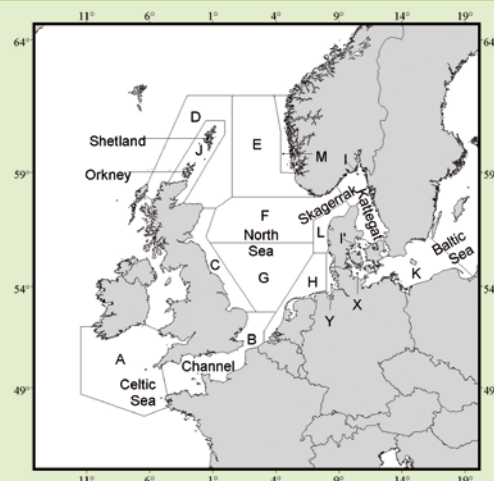
is essential for the conservation and management of these species and serves as a baseline for their future monitoring.

The LIFE-Nature SCANS project, coordinated by the Sea Mammal Research Unit (SMRU) and involving extensive international partnerships, proposed to collect information on the distribution and abundance of cetaceans in the North Sea.

What did LIFE do?

The SCANS project estimated the absolute abundance and distribution of the harbour porpoise and other small cetaceans in the North Sea and adjacent areas. The survey was carried out by international teams of observers onboard research ships and small aircraft during July 1994. The estimated population of harbour porpoise was 341,000. Most of the countries with a North Sea coast were included in the survey to map the distribution and to estimate the abundance of the harbour porpoise and other species. The project also included the revision of the methodology for collecting and analysing survey data. The intention of the project was to use these distribution and abundance estimates to set the limits of by-catch and assess the impacts on the target species.

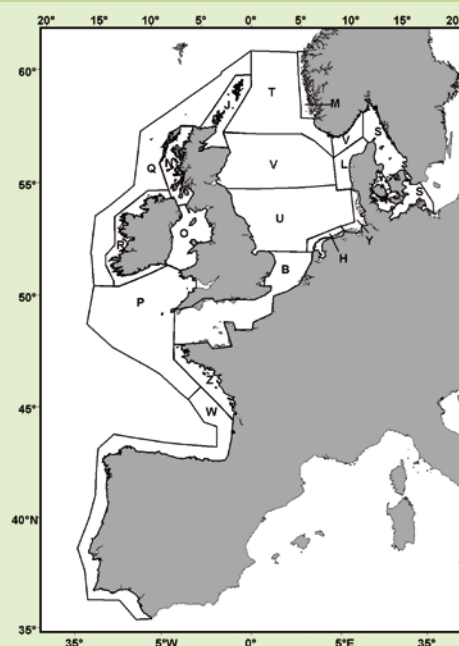
Figure IV: SCANS-1 project survey areas



What was the outcome?

The LIFE SCANS project produced the first large-scale estimates of the abundance of harbour porpoise, white-beaked dolphin and minke whale in the North Sea. The extensive survey coverage and the

Figure V: SCANS-II project survey areas covering 1,011,000 Km² of sea





Cetacean observation box installed at the bow of the survey boat

methodological developments resulted in precise, scientific estimates.

The SCANS results are now widely used by a range of international organisations (IWC, International Council for the Exploration of the Sea, ASCOBANS and the European Commission) to assess the impact of by-catch and to implement conservation measures on small cetaceans. The by-catch of harbour porpoises in these areas has decreased due to a combination of reduced fishing and the use of acoustic "pingers" (acoustic devices which emit ultrasonic signals to warn cetaceans of the proximity of nets). Furthermore, the project contributed to the devel-

opment of new survey and analysis methods that are now widely accepted by the world's scientific community.

The project results provided important data essential for the conservation and management of cetaceans in the North Sea.

Life after LIFE

The SCANS project provided the first reliable information on the abundance and distribution of small cetaceans in the North Sea. Nevertheless such estimates are only useful if repeated at ten-year intervals to monitor changes in populations and distribution. The

SMRU, now based at the University of St Andrews in Scotland, proposed a follow-up LIFE-Nature SCANS II survey that started during the second half of 2004 and aimed to update the estimates. In addition to the area surveyed during SCANS, this project will also cover continental shelf waters to the west of Britain, Ireland, France, Spain and Portugal.

The first survey was carried out in 2005 and covered more than 30,000 km of sea survey transects and 200 hours of flying time. Another part of the project aimed to refine methods to determine cetacean abundance via shipboard and aerial surveys. The information on abundance and monitoring from this project can be used to assess by-catch and provide scientific information to managers so that they can ensure conservation objectives are met. This project will aid Member States and the Commission in the definition and assessment of favourable conservation status for cetaceans as required under the Habitats Directive.

Conclusions

This project and the follow-up SCANS II project were very successful. The data acquired and the current update has been adopted as a standard for the implementation of the Natura 2000 Network in European waters.

SCANS-I project survey ship Dana.



Project number: LIFE92 ENV/UK/000065

Title: Distribution and abundance of the harbour porpoise and other small cetaceous in the North Sea

Key species: *Phocoena phocoena*, *Tursiops truncatus*

Beneficiary: Sea Mammals Research Unit, NERC c/o British Antarctic Survey

Contact: Kelly MacLeod

Email: scans2@st-andrews.ac.uk

Website: <http://biology.st-andrews.ac.uk/scans2/>

Period: 01-Jan-1993 to 31-Mar-1995

Total budget: € 1,408,900

LIFE contribution: € 704,500



LIFE in action

Portugal and Spain: Marine IBAs

LIFE-Nature co-funded projects in Portugal and Spain are providing guidelines for the implementation of the Birds Directive in the marine environment. These projects involve extensive survey work covering vast offshore and costal areas of the Atlantic and Mediterranean seas. Among the expected results from these pioneering projects is the publication of an inventory of marine IBAs that will subsequently be considered as a proposal for the identification of future Marine SPAs under the European Birds Directive.

Marine birds spend most of their life at sea. They use the marine environment to roost, feed or migrate. Indeed, some species only visit the coast during the breeding season. Seabirds, in their offshore marine habitat, are under threat as a result of increasing pollution, fishing activities, marine transport and depletion of food sources.

Thus, the implementation of the Birds Directive in the marine environment is crucial for the conservation of all seabirds and has to include more than just the simple delimitation of Special Protection Areas (SPAs) on some coastal breeding sites. These sites must be sufficient in number and size for the conservation of birds listed in Annex I of the Birds Directive as well as migratory species, taking into account their protection requirements. The difficulties for implementing Natura 2000 offshore are related



Cory's Shearwater (Calonectris diomedea) seabird surveyed by the project

to a lack of scientific knowledge and the high costs of offshore research and surveying.

Two LIFE-Nature projects run by SEO and SPEA (BirdLife partners in Spain and Portugal) aim to identify Important Bird Areas (IBAs) in Spanish and the Portuguese Economic Exclusive

Zone (EEZ), including those of the Canaries, Madeira and the Azores archipelagos.

What is LIFE doing?

These two projects are contributing to the implementation of the Birds Directive in the marine environment and will identify the most suitable areas for Annex I marine birds, that can later be proposed as SPAs in coastal and pelagic areas within Portugal and Spain.

Madeiran Storm-Petrel (Oceanodroma castro)

Projects' Target Species (Annex I Birds Directive)

Fea's Petrel: *Pterodroma fea**
 Bulwer's Petrel: *Bulweria bulwerii*
 Little Shearwater: *Puffinus assimilis*
 Madeiran Storm-petrel: *Oceanodroma castro*
 Roseate Tern: *Sterna dougallii**
 Cory's Shearwater: *Calonectris diomedea*
 White-faced storm petrel: *Pelagodroma marina*
 Freira Petrel: *Pterodroma madeira**
 Shag (Mediterranean subspecies): *Phalacrocorax aristotelis* subsp. *desmerestii**
 Audouin's Gull: *Larus audionii**
 Balearic shearwater: *Puffinus mauretanicus*

* Considered as "priority for funding under LIFE"





Survey boat Noruega used for the detection of seabirds

In 2005, the projects organised two international seminars in Lisbon and Vilanova (Barcelona) that addressed the definition of practical and methodological parameters for marine IBAs' determination and the subsequent implementation of Natura 2000 in the marine environment. The debate focused on the application of terrestrial bird IBA criteria to the marine environment. Normally this simple approach results in enormous sites. Among the conclusions of these two workshops was a new definition of the four types of marine IBAs:

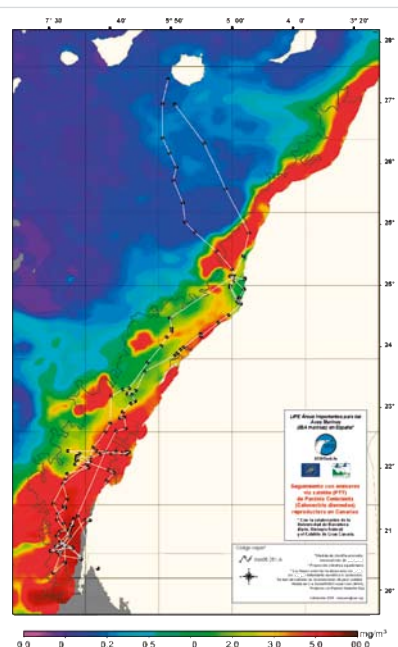
- Important feeding areas at sea;
- Areas with important regular concentrations of seabirds;
- Seaward extension of breeding colonies;
- Migration hotspots where due to the geographical position, seabirds fly in large concentrations during the migrating season.

These two projects target all the seabirds included in Annex I of the Birds Directive and are currently implementing the following actions:

- Aerial and marine census of seabirds (some of the marine censuses were done together with the LIFE-Nature project SCANS II);
- Satellite and data-logger tracking of individual birds;
- Radio-tracking of the smaller seabird species;

- Oceanographic characterisation of the marine environment (salinity, chlorophyll, temperatures, currents etc);
- Analysis of fishing activity and the presence of marine mammals.

All the data will be analyzed and correlated in order to sketch out the potential distribution for both coastal and offshore distribution patterns of seabirds. Maps are being produced showing areas of interaction with human activities and correlations with ecological and oceanographical data. From this it should be possible to identify the most appropriate areas that could qualify as IBAs. Such pre-selected areas will then be described in detail, threats to them identified and recommendations made for their conservation.



Satellite tracking movements of the Cory's Shearwater in the Canary Islands

Project number: LIFE04 NAT/ES/000049

Title: Important Bird Areas for seabirds (marine IBAs) in Spain

Key species: *Calonectris diomedea*, *Larus audouinii*, *Bulweria bulwerii*, *Puffinus assimilis*, *Oceanodroma castro* and *Phalacrocorax aristotelis* subsp. *desmarestii*

Beneficiary: Sociedad Española de Ornitología, SEO/BirdLife

Contact: Alejandro Sánchez Pérez

Email: lifemarinas@seo.org

Website: http://www.seo.org/programa_intro.cfm?idPrograma=32

Period: 01-Oct-2004 to 01-Oct-2008

Total budget: € 1,092,000

LIFE contribution: € 780,000

Project number: LIFE04 NAT/P/000213

Title: Important bird areas for seabirds in Portugal

Key species: *Pterodroma feae*, *Pterodroma madeira*, *Bulweria bulwerii*, *Calonectris diomedea*, *Puffinus mauretanicus*, *Puffinus assimilis*, *Oceanodroma castro*, *Sterna hirundo*, *Sterna dougallii*, *Sterna sandvicensis*, *Larus melanocephalus*, *Larus audouinii* and *Uria aalge (ibericus)*

Beneficiary: Sociedade Portuguesa para o Estudo das Aves - SPEA

Contact: Ivan Ramírez, IBA and Marine Programmes Coordinator

Email: ivan.ramirez@spea.pt

Website: <http://www.spea.pt/MIBA/>

Period: 01-Oct-2004 to 01-Oct-2008

Total budget: € 1,515,000

LIFE contribution: € 1,136,000



LIFE in action

UK: Establishing management schemes on Marine Special Areas of Conservation (SACs)

The UK's marine habitats are highly diverse and support a range of human activities, with intensive fishing, recreational and industrial uses. A LIFE-Nature project aimed to improve knowledge of the marine habitats around the UK by studying their ecology and developing management schemes for 12 marine sites within a framework that would be transferable to other marine SACs in the EU in order to fulfil the requirements of the Habitats and Birds Directives.

Successful conservation of the marine environment and effective implementation of management measures in protected areas must be based on comprehensive understanding of marine species and their habitats. An important aspect of this is understanding the sensitivity of different areas to human activity.

The UK's marine habitats range from coastal lagoons and estuaries, to sea caves and reefs. The UK's coastal waters are heavily used for fishing, recreation, and industry. All of these uses pose potential threats to marine species and habitats. The UK government has adopted legislation (UK Habitats Regulations) providing for management schemes to be established for marine SACs. These are designed to ensure that use of the sites is compatible with the conservation needs of the habitats and species of European interest.

The project defined and established management schemes for 12 sites around the UK, based on nine marine habitat reviews reports, guidelines, and seven studies on the impact of human activities on marine sites. The nature conservation interest of each site was defined, along with guidelines designed to ensure that the key features – such as bottlenose dolphins

in Cardigan Bay or *Zostera* eel-grass habitats along the north Norfolk coast – are maintained. The guidelines also address how to monitor sites for change, and how to respond if detrimental changes are detected.

What did LIFE do?

The project was carried out by a consortium of UK nature conservation agencies. Its key innovation was a partnership approach involving the main marine user, interest, and specialist groups, including port authorities, fisheries authorities, local and regional councils, scientific research institutes and recreational interest groups.

The four year project sought to develop approaches to and techniques for the management and monitoring of twelve marine Natura 2000 special conservation areas, thus fulfilling the EC Habitats Directive objective of setting up protected marine areas. The success of the project was based on gathering existing knowledge on the dynamics and sensitivity of marine features and on the impact of human activities, and from this developing practical techniques for monitoring and assessing the state of marine species and habitats. The project also anticipated the sharing of good practice on

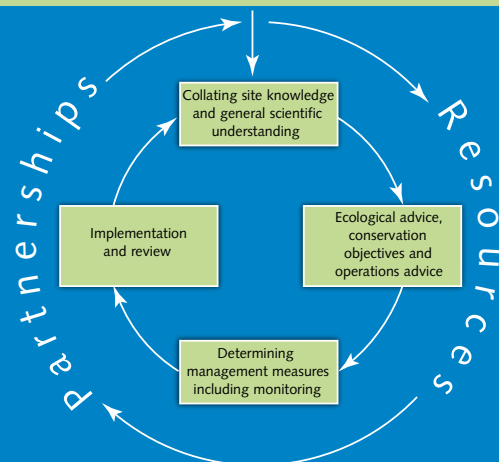
developing appropriate management schemes and raising awareness in the UK and continental Europe.

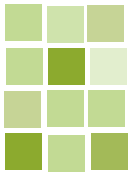
What was the outcome?

The project encouraged the development of management schemes at other UK marine sites by providing a national centre of expertise, by developing the skills base amongst consultants and others, and by disseminating information to a wide audience.

For each management plan a management group was established, which coordinated the gathering of survey data, the filling of knowledge

Process approach to management of marine SACs





The 12 marine project sites covered by management schemes

gaps, data mapping, the defining of conservation objectives, evaluation of current and potential operations, identification of monitoring programmes, and the drafting and finalising of management schemes.

The project involved the relevant authorities that have a special role in the management of a Natura 2000 marine site (local authorities, sea fisheries committees, port, harbour and navigation authorities, etc.). The project also focused on a democratic participatory approach and gave stakeholders the opportunity to voice their opinions.

The project produced surveys and marine habitat maps cartography, and compiled essential information with the help of various UK experts. This information was used to produce nine detailed review reports for habitats and communities common to many of the 12 sites covering: *Zostera* beds, inter-

tidal reef biotopes, intertidal sand and mudflats and subtidal mobile sandbanks, infralittoral reef biotopes with kelp species, sea pens and burrowing megafauna, circalittoral faunal turfs, subtidal brittlestar beds, biogenic reefs, and maerl beds. The review reports underpinned the development of the marine site management plans and provided definitive reference sources that could be used in all EU marine sites.

The project published 12 guidelines for developing conservation objectives for marine SACs that give the framework for a management and monitoring plan. The guidelines cover the legal background, practical development, supporting information, and presentation of conservation objectives.

In addition, within the scope of the project, seven series of studies were produced focusing on the impacts of human activities on marine species and habitats. These covered recreational activity, ports and harbours, water quality, collecting bait, fisheries practice, water quality in saline lagoons, and aggregate extraction. The studies have helped to establish common ground across conflicting interest groups, and their use may reduce the time needed for consultation when developing future management schemes.

In addition the project implemented a wide range of activities to raise awareness about the project sites, targeted at the general public but also local stakeholders and the European scientific community.

Life after LIFE

Conservation objectives and operations advice was provided for each of the 12 sites. In addition the guidelines for developing conservation objectives for marine SACs are not a statement of nature conservation agency policy but an opportunity to transfer the learning from the project to conservation agency staff and practitioners in the UK and other Member States. The monitoring handbook, meanwhile, fulfils the monitoring requirements under the Habitats Directive and the Water Framework Directive and gives a thorough background to the legislation and links to existing monitoring programmes.

Conclusions

The project made a major contribution on compiling and filling gaps in information regarding the implementation of management plans in marine Natura 2000 sites. Overall, it was a major breakthrough in the monitoring and management of marine sites, species and habitats.

Project number: LIFE96 NAT/UK/003055

Title: To develop and promote the necessary conservation measures for UK marine SACs

Key species: *Phocoena phocoena*

Key habitats: Submerged or partially submerged sea caves, Estuaries, Mudflats and sandflats not covered by water

Beneficiary: English Nature

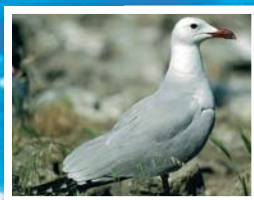
Contact: Jon Terless

Website: www.ukmarinesac.org.uk

Period: 01-May-1996 to 31-Oct-2001

Total budget: € 4,914,000

LIFE contribution: € 2,457,000



Preserving and protecting marine species and habitats of Community interest

Over the last 10 years, LIFE-Nature has contributed some € 40 million to around 50 marine projects across the EU's Natura 2000 marine sites. Many have focused on the conservation of highly endangered marine species such as the loggerhead sea turtle (*Caretta caretta*), sea mammals like the harbour porpoise (*Phocoena phocoena*), and rare seabirds such as Audouin's gull (*Larus audouini*). Projects have also focused on the conservation and improvement of marine habitats such as *Posidonia* beds, reefs and sea caves.



The European Seas

GENERAL VIEW

North Sea

The shallow areas of the sea are among the most productive marine areas in the world. This high productivity supports a wide range of species and habitats and one of the world's most important fishing grounds. The seabed is also rich in oil and gas.

Species

Harbour Porpoise (*Phocoena phocoena*)

Habitats

Mud flats (1140)

Threats

Anthropogenic impacts have been significant for many years. Pollution is still the main issue for the North Sea. Over the last decade, awareness of and concern about the precarious status of North Sea fish stocks and the impact of fisheries on other parts of the ecosystem has increased.

North-East Atlantic Ocean

The North-east Atlantic Ocean along the Western coastline of Europe is dominated by deep ocean basins. The overall biodiversity is high and the ocean hosts unique habitats, such as high diverse cold-water coral reefs, hydrothermal vents, and rare species including seabirds, several seals and whales.

Species

Zino's Petrel (*Pterodroma madeira*)

Habitats

Reefs (1170)

Threats

Around the North-east Atlantic Ocean the human population is concentrated in the coastal area. Increased human activity around the coasts has led to an increase in sewage discharge, in maritime transport, use of the sea for tourism and recreation, and exploration of the sea's natural resources. Over-fishing, eutrophication, dumping, direct discharges and spills of contaminants are all threats to biodiversity in this ocean.

Mediterranean Sea

The Mediterranean Sea is almost completely enclosed by land. This results in high water temperatures, low nutrients, high salinity (it is the most saline of Europe's seas), and reduced tidal range variation. The Mediterranean Sea is one of the world's highest biodiversity areas, particularly in the coastal zone where this is high occurrence of endemic species.

Species

Monk seal (*Monachus monachus*)

Habitats

Posidonia oceanica beds (1120)

Threats

The Mediterranean coast hosts many human activities that degrade the marine ecosystem. The main threats are: urban, industrial and oil effluents, coastal eutrophication, coastal urbanisation and biological invasions (mainly via the Suez Canal).

Baltic Sea

The Baltic Sea region is one of the largest brackish water areas in the world and in many aspects is similar to an estuary or inland lake. Only the shallow waters between Denmark and Sweden connect the Baltic to the open sea. These unique features contribute to highly diverse communities ranging from fresh to salty water habitats. The surrounding land is heavily industrialised and populated.

Species

Ringed seal (*Phoca hispida* subsp. *bottnica*)

Habitats

Large shallow bays (1160)

Threats

The Baltic sea is a semi-enclosed area that is very sensitive to anthropogenic pressures. Eutrophication remains the most pressing problem in the region. Nitrogen and phosphorus inputs are still too high, despite considerable efforts to reduce discharges. Overexploitation of fish is also considered a severe problem, mainly due to fishing quotas being exceeded and excessive fleet capacity.

Black Sea

The Black Sea is a deep water depression. Due to the relatively high salinity and density of the water, the ocean bed to surface currents are highly reduced and result in a naturally anoxic (without oxygen) environment, which also has high levels of hydrogen sulphide. Its almost landlocked position, the major influx of fresh waters from its tributary rivers, such as the Danube and Dniéper, and hydrological factors make this sea a very unique environment and highly sensitive to anthropogenic impacts.

Species

Dolphin (*Tursiops truncatus*)

Habitats

Estuaries (1130)

Threats

The Black Sea is probably one of the most environmentally degraded seas on our planet. Pollution and eutrophication by land-based sources (agriculture, industrial activity and inputs of insufficiently treated sewage), overexploitation and no overall management of fish stocks are the main threats that the Black sea faces.

The annexes to the Habitats and Birds Directives list nine habitat types, 29 seabirds and 16 other marine animals in need of protection in view of their precarious conservation state. These include such well known species as the Mediterranean monk seal, the loggerhead sea turtle, and the bottlenose dolphin, as well as rare habitats such as cold water reefs and *Posidonia* beds (underwater prairies).

Marine environment natural habitat types in Annex I of the Habitats Directive (92/43/EEC)

- Sandbanks which are slightly covered by sea water all the time - 1110
- *Posidonia* beds (*Posidonia oceanica*) - 1120*
- Estuaries - 1130
- Mudflats and sandflats not covered by seawater at low tide - 1140
- Coastal lagoons - 1150*
- Large shallow inlets and bays - 1160
- Reefs - 1170
- Submarine structures made by leaking gases - 1180
- Submerged or partially submerged sea caves - 8330

Marine environment species in Annex II of the Habitats Directive (92/43/EEC)

> Sea Mammals

- *Tursiops truncatus*
- *Phocoena phocoena*
- *Halichoerus grypus*
- *Phoca vitulina*
- *Monachus monachus**
- *Phoca hispida* subsp. *bottnica*
- *Phoca hispida* subsp. *saimensis**

> Sea turtles

- *Caretta caretta**
- *Chelonia mydas**

> Fish

- *Lampetra fluviatilis*^a
- *Petromyzon marinus*^a
- *Acipenser naccarii*^{a*}
- *Acipenser sturio*^{a*}
- *Alosa alosa*^a
- *Alosa fallax*^a
- *Salmo macrostigma*^a

Sea Birds included in Annex I of the Birds Directive (79/406/EEC)

- *Gavia stellata*
- *Gavia immer*
- *Pterodroma madeira*
- *Pterodroma feae*
- *Bulweria bulwerii*
- *Calonectris diomedea*
- *Puffinus puffinus* subsp. *mauretanicus*
- *Puffinus yelkouan*
- *Puffinus assimilis*
- *Pelagodroma marina*
- *Hydrobates pelagicus*
- *Oceanodroma leucorhoa*
- *Oceanodroma castro*
- *Charadrius alexandrinus*
- *Calidris alpina schinzii*
- *Larus melanocephalus*
- *Larus genei*
- *Larus audouinii*
- *Larus minutus*
- *Sterna caspia*
- *Sterna sandvicensis*
- *Sterna dougallii*
- *Sterna hirundo*
- *Sterna paradisaea*
- *Sterna albifrons*
- *Uria aalge ibericus* (U. aalge in Baltic Sea and North Sea)
- *Phalacrocorax aristotelis* subsp. *desmarestii*
- *Phalacrocorax pygmeus*

* priority for conservation

^a anadromous: Fish that live most of their adult life in marine environment but spawn in fresh-water



France: Rescuing Mediterranean *Posidonia* beds from invasive algae *Caulerpa taxifolia*

A growing menace to some of Europe's unique marine habitats lies under the blue waters of the Mediterranean. *Caulerpa taxifolia*, an invasive green algae, is quickly destroying high bio-diversity *Posidonia* beds. In 20 years, the ecological integrity of more than 15,000 hectares of seabed has been compromised. The LIFE programme funded two projects to monitor the spread of the invasive species in the Mediterranean, and to establish guidelines and approaches to help manage it.



Despite its beauty *Caulerpa taxifolia* is an invasive species

Posidonia seagrass beds¹ are an important part of the Mediterranean sea's marine ecosystem. The beds are mainly comprised of the seagrass *Posidonia oceanica*. Human pressure on this habitat has increased significantly in the last few years, resulting in a reduction of the surface area of the seagrass beds. The principal cause of

¹ A priority conservation habitat classified under Annex I of the Habitats Directive.

this decline is a Caribbean green algae that competes with the seagrass. This non-native species, *Caulerpa taxifolia*, was introduced in 1984. As well as its impact on biodiversity, it also threatens food resources, and can pose a risk to human health because of transmission of the algae's toxins along the food-chain. As a consequence of this coastal fishing for fish, molluscs and crustaceans, has become impossible in some areas.

What did LIFE do?

Between 1992 and 1999, the LIFE programme funded two projects (LIFE92 ENV/F/000066 and LIFE95 ENV/F/000782), led by Marseilles University and with the involvement of Spanish and Italian partners (universities, local authorities and scientific centres). These projects aimed to build knowledge about the ecology of *C. taxifolia* in

order to predict its possible spread in the Mediterranean, and to establish a scientific and technological basis for its management and thus the conservation of the *Posidonia* beds.

The projects developed a strategy and tools for surveying *C. taxifolia* and monitoring its expansion into new locations. In order to conduct the survey, the beneficiary distributed 60,000 pamphlets in six languages to fishermen, divers and yachtsmen, asking them to report the presence of the plant and, when found in nets and on anchors, not to throw it back into the sea. With this information it was possible to build a predictive model of the algae's expansion, and thus identify 'at-risk' areas and habitats. The projects also worked to improve eradication techniques using copper, as an alternative to manual eradication.

The beneficiary produced identification and eradication guidelines in English, French, Catalan and Spanish, and conducted a public awareness campaign that was also extended to southern Mediterranean countries (Malta, Tunisia and Algeria), which are also affected by the spread of *C. taxifolia*.

What was the outcome?

As a result of the LIFE projects, *Caulerpa taxifolia* is a very well known, introduced species. Unfortunately, the project has also confirmed that once the algae is introduced, it cannot be completely eradicated. Nevertheless, a Mediterranean detection and survey network has been developed, and strategic guidelines for the control of the invasive algae have been implemented. The projects have also carried out stakeholder and public awareness campaigns.



Photo: LIFE00 NAT/EE/007303

Posidonia oceanica beds an endangered Mediterranean habitat

Life after LIFE

Following the formal closure of the projects, the regional governments of the Balearics, Catalonia and Valencia drew up anti-*Caulerpa* regulations. In France, the Parliament is examining an anti-*Caulerpa taxifolia* law. Also, on the Côte d'Azur, diving enthusiasts, both amateur and professional, perform annual systematic underwater searches, and manually clear *Caulerpa taxifolia*.

Posidonia oceanica

Posidonia oceanica, named after Poseidon, the god of the sea, and commonly called Neptune grass, is a seagrass that plays an important role in the ecosystem of the Mediterranean sea by providing a vital habitat for a wide variety of marine species. It lives in a narrow coastal strip, normally on beds of soft sediment, at depths of between five and 50 metres, depending on water clarity. It is a true plant, in that it can bear flowers and disperse seeds.

The *Posidonia* habitats are increasingly being destroyed by human activities (trawler-fishing, the development of new marinas and offshore constructions, and boat anchoring). However, one of the greatest threats comes from competition with the invasive *Caulerpa taxifolia*.

The European Environment Agency's 2006 report "Priority Issues in the Mediterranean Environment", considered the *Posidonia oceanica* "a key species for the Mediterranean region".

* http://reports.eea.europa.eu/eea_report_2006_4/en/medsea_4_2006.pdf

Spread of *Caulerpa taxifolia* in the Mediterranean



Project number: LIFE95 ENV/F/000782

Title: Control of the *Caulerpa taxifolia* extension in the Mediterranean Sea

Beneficiary: GIS Posidonie

Contact: Claude Boudouresque

Tel: +33 4 91269130

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Period: 01-Jan-1996 to 08-Mar-1999

Total budget: € 290,300



LIFE in action

Greece: Recovery of the loggerhead sea turtle population on Crete

The loggerhead turtle (*Caretta caretta*) is an endangered species in Europe. It is threatened on land, where it comes to nest, and at sea, as a result of the activities of fishermen. One of several LIFE-funded projects to protect the loggerhead turtle focused on increasing, in the long term, the numbers that nest on the island of Crete. Volunteer monitoring patrols were established, and public-awareness campaigns were introduced to encourage local involvement in the protection of the sites used as nesting areas. In addition, a management plan was drawn up to ensure the long term viability of these sites. Crete can play a crucial role in the survival of the loggerhead turtle. One in four of the total population of Greece nests on the island, and the turtle returns to the same nesting sites year after year.

The use of the same nesting sites means that the survival of sea turtles is dependent on the viability of the beaches for nesting. If a nesting site is destroyed, the female may not find an alternative and eventually the local population could be wiped out through lack of recruitment. However, the sandy beaches of Greece have attracted tourists, which have caused severe degradation of the sites. Beaches have natural protection against erosion in the form of sand replenishing dunes, but constructions on the dunes can affect this process and leave beaches vulnerable. Umbrellas and sunbeds, pathways and light pollution pose an increasing threat to the nesting sites of the turtles. They impede access to the back of the beach where nests are constructed, while artificial light disorients newly hatched turtles that use reflected moon or starlight to navigate their way to the sea.

As a result, a strategy for sustainable development of tourism and other forms of land use is vital for the protection of the beaches.

The LIFE programme in Crete aimed to tackle these problems through the protection of nesting sites, pub-



Caretta caretta a priority species listed in Annex II of the Habitats Directive

lic-awareness campaigns and the implementation of a management plan for sustainability. The beneficiary was the Sea Turtle Protection Society (STPS), which was set up in 1983 to lobby for the protection of sea turtles initially on the island of Zakynthos, as well as raising awareness among the public about the threats they face. Six years after its formation, as a result of a nationwide beach survey of Greece, the STPS identified important nesting

sites for loggerhead sea turtles on the island of Crete and began small-scale initiatives in these areas.

Unlike Zakynthos, the density of turtle nests on Crete is relatively low and the population could only be sustainable provided certain conditions are respected. Islanders, however, were largely ignorant of the sea turtles existence, so raising awareness was a key first step. Public funding for the

necessary protection of the three principal beaches was insufficient. Therefore in 1995, STPS applied to LIFE-Nature for funds.

What did LIFE do?

LIFE funding supported the daily patrol of the beaches to assess the number of nests dug and, later in the season, the number of hatchlings. The patrol also included protection measures such as placing metal cages in situ to avoid human disturbances, and shading to prevent hatchling disorientation through light pollution. The beaches of Crete are prone to high seas due to strong northerly winds. As there is a danger of nests being destroyed by flooding, vulnerable nests were relocated higher up the beach, or at one of the natural hatcheries away from the danger. A major campaign

was launched to persuade hotel and sunbed operators to stack their chairs each night at the back of the beach. Similar campaigns were run to reduce light pollution, and curb the use of vehicles on the beaches.

An awareness campaign was launched that targeted local authorities, businesses, hotels, tourists, and schools. It consisted of the distribution of printed material, presentations at hotels, meetings with local businesses, talks and projects with schoolchildren and the setting up of information kiosks. The public was also informed of the beach work. Finally, a management plan for the long-term conservation of the sea turtle in Crete was agreed and circulated widely for consultation. The final version was presented to the local authorities for adoption at the end of the project.

What was the outcome?

Over the three years of the project, STPS attracted a large number of volunteers to monitor the three beaches and protect nests. At the end of the third year, hatchling rate had already increased.

Attempts to persuade hoteliers to voluntarily stack sunbeds were only partly successful, and focus has now

Municipality of Platanias information board



Marking and protection of turtles' nests





Painting the street lights facing the sea

shifted towards achieving stacking of sunbeds through regulations determined by the relevant authorities. Similar regulations would also be helpful in reducing the effects of artificial light. However, 25 operators were persuaded to make changes to their lightings for the benefit of the nesting sites, and project members painted the sides of lights facing the sea to reduce artificial light on the beach.

The project was also successful in persuading those responsible for municipal beach-cleaning activities to take into account the needs of the turtles, that is, not compacting the sand with heavy machinery. Its awareness initiatives included

around 300 hotel presentations per year, reaching an estimated quarter of a million visitors over the three years. Press releases also generated wide media coverage.

Life after LIFE

The end of the project has by no means signalled an end to the volunteer work. In fact, volunteer numbers have almost doubled. With a sufficient workforce, STPS has been able to continue its monitoring and protection work on the three beaches.

Under the LIFE project vulnerable nests were commonly transferred to hatcheries, but following international consultation, nests are now transferred as close as possible to the original location of the nest. However, STPS realised that too little was known about the potentially damaging effects of these transfers, and noted that 35-40% of the nests laid on the monitored sites need to be transferred or they would otherwise be destroyed through inundation.

The STPS has also been the beneficiary of two subsequent LIFE programmes: the implementation of a management plan for the sea turtles in Southern Kyparissia Bay (LIFE98NAT/GR/5262) and a project to reduce turtle mortality at sea (LIFE02NAT/GR/8500).



Coast guards take an injured turtle to ARCHELON's centre

Conclusions

The LIFE project has played a vital role in the survival of the loggerhead turtle on Crete. It has helped establish the beneficiary as a powerful advocate for the species on the island and has enabled it to protect nest sites. The profile of the species has also risen locally and internationally, and a strong emphasis on cooperation has shown that sea turtles and tourism can exist side by side.

A strategic long-term approach to conservation is still required, however, and it is important that national and local authorities are engaged. Legal obligations to protect beaches point the way forward, and STPS can be an effective lobbying agency in bringing these about.

Project number: LIFE 95 NAT/GR/001115

Title: Recovery of the Loggerhead Sea Turtle (*Caretta caretta*) Population Nesting on Crete

Key species: *Caretta caretta*

Beneficiary: Sea Turtle Protection Society of Greece (STPS) - ARCHELON

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

Period: 01-Apr-1995 to 31-Mar-1998

Total budget: € 536,000

LIFE contribution: € 402,000



LIFE in action

Conserving marine life in Spanish waters

Spanish waters off the coast of Andalusia and Murcia are home to many protected habitats that contain endangered marine life including turtles and cetaceans. A 2002 LIFE project aimed to draw up management plans for habitats in the area in collaboration with local stakeholders.

A recent LIFE project in the marine areas around the southern coast of Spain concentrated on developing marine management plans in collaboration with local stakeholders. The range of stakeholders with an interest in marine environments tends to be both diverse and uncoordinated. Moreover, few interest groups have previous experience of marine conservation issues. As a result, any attempt to change existing practices or attitudes is best accompanied by a targeted campaign to inform stakeholders of the issues and the potential impacts for them.

Such an approach was very successful for the southern coast of Spain. Previously the beneficiary, the Spanish Cetacean Society, had identified several potential marine Natura 2000 sites along the narrow sea that links the Mediterranean to the Atlantic. The project organisers recognised that attempts to protect these sites would be met with great resistance from local interest groups that would feel their livelihoods unjustly threatened. The project therefore launched a major awareness-raising campaign targeted at potential stakeholder groups along the coast. The aim was to explain why the rich seas around Andalusia and Murcia needed protection and to engage the different interest groups in discussions about the best ways to conserve this natural resource, while respecting the needs of local communities.



Atlantic spotted dolphins (Stenella frontalis) surface breathing

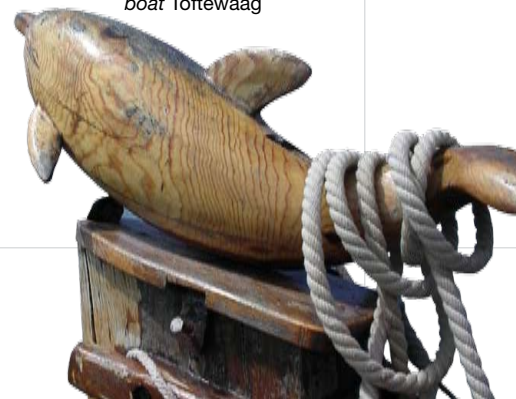
In 2002, three boats travelled to 19 ports on the coast to deliver talks and hold events, excursions and other awareness-raising activities aimed at local stakeholders. A follow-up trip, a year later, took the process one step further and engaged local stakeholders in discussing the protection of these valuable resources, especially in areas where there are potential conflicts with existing human activities.

The final trip aimed to reach a consensus on draft management plans for the areas that were prepared on the basis of the extensive consultation process. In addition to the general information campaign activities, formal meetings were held with stakeholder groups at

strategic locations along the coast to take the process forward.

So far signs are encouraging. The discussions are being held in a spirit of cooperation and constructive dialogue. Stakeholders are now aware of the important issues, meaning they can concentrate on finding practical solutions in specific areas of conflict

Figurehead of the project boat Toftewaag





Project boat, Toftewaag, in Almería harbour

without questioning the whole concept of marine protection.

Although objections to the designations cannot be ruled out, the inclusive nature of the preparatory work should facilitate local acceptance of potential restrictions to activities. Threats addressed include poor fishing practices (especially harmful to turtles), illegal fishing, noise and marine pollution. Where restrictions are likely, the project will encourage new economic ventures such as whale watching.

Reducing by-catch and pollution

To help the management planning process further, the project is also undertaking a number of practical actions relating to fisheries by-catch

and marine pollution. Through its partners, the Ministry of Fisheries and the Spanish Oceanographic Institute, satellite tracking is being used to determine the movements of turtles through this narrow sea passage and to correlate this with information on water temperature and long-line fishing operations. The results are expected to highlight the areas of greatest conflict in order that they may be specifically addressed. Already it is clear that swordfish and red tuna long lines are the most problematic.

The project is also tackling the problem of marine rubbish. Not only is this unsightly, but it also causes problems for many marine animals. For example, turtles sometimes ingest plastic bags and bottles thinking it is food and birds can get caught up in plastic material and drown. Working with local fishermen and port authorities, the project installed dustbins on all main fishing harbours and on 25 fishing vessels. This was accompanied by an awareness-raising campaign. Numerous spent lightbulbs, used during night fishing and then simply discarded overboard, have already been safely disposed of.

Building on experience

Several LIFE-Nature projects have already been coordinated by the

Spanish Cetacean Society, and the regional government of the Canaries. The first conservation project for the protection of turtles and dolphins in the Canary Islands began in 1997. In cooperation with the regional government and the Society for the Study of Cetaceans in the Canary Archipelago, it identified the key marine sites and regulated activities adversely affecting them.

Surveys showed that waters surrounding the Canaries contain some of the most densely populated areas for bottlenose dolphins in the EU. Several new sites were identified to be of key importance to the species. As a result, boundaries of existing Natura 2000 marine sites were adjusted and the standard datasheets updated to reflect the presence of dolphins in the existing marine sites.

The project also addressed the issue of whale watching which is becoming a major industry in the Canaries bringing in over € 30 million a year. After studying the biological and socioeconomic aspects of the industry, the project developed a series of measures to regulate whale watching activities in order to ensure they do not unduly disturb the mammals. By the end of the project a new law had been passed which tightened up the regulations for operating a whale watching business.



Project number: LIFE02 NAT/E/008610

Title: Conservation of cetaceans and turtles in Andalusia and Murcia

Key species: *Tursiops truncatus*, *Phocoena phocoena*, *Caretta caretta*

Beneficiary: Spanish Cetacean Society

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Website: <http://www.cetaceos.com/life/index.htm>

Period: 01-Jul-2002 to 30-Jun -2006

Total budget: € 3,474,000

LIFE contribution: € 1,737,000



LIFE in action

Spain: Recovery plan for the Balearic shearwater *Puffinus mauretanicus*

The LIFE-Nature “Puffinus” project carried out detailed monitoring of Balearic shearwater (*Puffinus mauretanicus*) colonies – providing valuable information on numbers, biology and behaviour of this critically endangered seabird species. The project also successfully drew up and implemented a plan to control predation and combat theft from nests, and carried out substantial awareness-raising activities to increase support for conservation actions among local residents.

The Balearic shearwater (*Puffinus mauretanicus*) is a critically endangered species endemic to the Balearic Islands. After spending autumn along the French Atlantic, the shearwater returns to the Mediterranean in November to mate and nest. The seabird nests in burrows or caves in the cliffs along the northern coasts of the archipelago. The main threats affecting the species on the islands are predation by rats and introduced mammals, and competition for burrows with rabbits. Even in recent times, locals have made use of the bird as a food source. As a consequence, a decline of its population has been observed since the mid-20th century and some nesting colonies have even disappeared altogether from the Balearic Islands. At present, 70% of the total breeding population is found on the island of Formentera.

What did LIFE do?

The project was implemented by the regional governing body for the Balearic Islands (Conselleria de Medio Ambiente). Its aim was to implement the Balearic shearwater (*Puffinus p. mauretanicus*) Action Plan within the Special Protection Areas designated in the Balearic Islands. Its overall objective was to ensure the viability of existing colonies, as well as to increase the numbers of their colonies and the subspecies' distribution

range. The project also carried out various awareness-raising activities aimed at making local residents aware of the importance of the subspecies and of the value of its conservation. In particular, the awareness campaign aimed to put an end to the traditional practice of catching the birds for food.

In order to meet these objectives, Can Marroig, a 130-hectare estate located in the northern coast of Formentera, was purchased. This area, classified as a Strict Protection Area has been incorporated in the Natural Park of Ses Salines of Ibiza and Formentera.

Life after LIFE

The main legacy of the project is the monitoring of shearwater numbers. This work has included population counts, which will be continued on a regular basis. It is difficult to determine whether the population in the islands has increased or decreased



Puffinus mauretanicus: a critically endangered seabird

since the beginning of the project. However, it is clear that the situation remains critical, and the biggest colonies have already been lost in Formentera. The monitoring work will be supported by surveys of other species in the area. Measures to control cats and rats are also planned. The LIFE project has played a vital role in increasing the knowledge of the ecology and distribution of the species.

Project number: LIFE97 NAT/E/004147

Title: Recovery Plan of *Puffinus p. mauretanicus* in SPA (Balearic Islands)

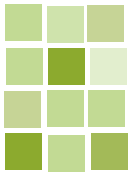
Key species: *Puffinus puffinus* subsp. *mauretanicus*

Beneficiary: Conselleria de Medi Ambient, Govern Balear

Period: 01-Mar-1997 to 31-Dec-2000

Total budget: € 2,973,000

LIFE contribution: € 1,486,000



Restoring terns and petrels colonies on the islands of Brittany

Populations of terns in Brittany are declining and endangered. As a result of changes to their habitats, successful breeding has become more difficult and the threat of predators greater. A LIFE project aimed to improve breeding conditions for the threatened bird species.

The huge number of islets off the coast of Brittany are rich in rare wild-life. Many of the coast's marine habitats are listed for special protection under the Habitats Directive and are home to the nesting sites of several species of tern, including the rare Roseate tern (*Sterna dougalli*), and petrels (*Hydrobates pelagicus*). Despite enjoying legal protection, however, the island habitats are threatened by environmental changes, mounting human pressures and introduced species such as rats and rabbits. The biodiversity of the region is further affected by the increasing presence of herring gulls (*Larus argentatus*) and people.



Young Roseate tern (above)
Project awareness campaign leaflet (left)

Photo: Arnaud Le Nevé, Bretagne Vivante - SEPNEB

The LIFE project aimed to promote the preservation of Brittany's marine areas through pilot conservation measures on five groups of islets. The first and largest group, Trégor-Goëlo, contains 80 islets ranging in size from

0.1 to 18.8 hectares. The Natura 2000 management plan had already been adopted in this group, and the project aimed to assess its success, in addition to a series of activities including securing management contracts, cleaning up and regulating access to the inter-tidal zone, and the restoration of a lagoon.

visited islets, people's movements were analysed as a basis for possible future management. Increasing public awareness and safeguarding nesting sites would lead to an improved chance of successful breeding.

Schoolchildren learn about the Brittany marine environment



Photo: Arnaud Le Nevé, Bretagne Vivante - SEPNEB

The second group was made up of privately owned islets. For this group, the project aimed to draw up conservation contracts with landowners. On Béniguet Island, the third area, the focus was on habitat restoration, while the fourth and fifth groups targeted specific measures for terns and petrels. On three of the groups, the most

Common tern (Sterna hirundo) in flight



Photo: Fanch Laduré, Bretagne Vivante - SEPNEB

Photo: Olivier Garne, Bretagne Vivante - SEPNE



Clearing vegetation at Île-aux-Dames



SEPNE and construction of nest shelters for terns

Photo: Pierre Yésou, ONCFS

Surveying and preserving

On Trégor-Goëlo, the project raised awareness of the importance of preserving the biodiversity of the tidal zone, particularly through good fishing practices. To support this goal, an educational kit containing different tools, including an aquarium, a CD-ROM, a video and models was created. The awareness-raising campaign was continued after the end of the LIFE project. However, only one agreement with an island owner for the management of land was signed. (The other owners were unwilling to accept the terms of the proposed conservation contracts.) Nevertheless, natural heritage inventories of 10 private islands were drawn up. These reports, called *bilan patrimonial*, were often the first surveys to have been made of the small islands and contain vital information for their ecological management.

New equipment including a boat helped improve the quality of the surveillance of the four species of tern that breed on the Brittany islands. In order to make their breeding sites more secure, it was necessary to control the populations of gulls and invasive species such as American mink (*Mustela vison*) and rats. Vegetation was also cut back

before the breeding season to maintain favourable conditions for the terns. For three species – the sandwich tern, the common tern and the little tern – results were positive: the project achieved an overall increase in their populations. The threatened population of the fourth species, the Roseate tern, remains stable. The colony in Brittany is the only one in France and is still endangered due its small size (about 70-80 pairs on a small island).

Restoring habitats

Artificial nest burrows for the storm petrel were tested in the Sept-Iles and Molène archipelagos. The results were encouraging in the Molène natural reserve at the start of the bird

colonisation. Agricultural activity on Béniguet Island has been largely abandoned leading to an expansion of wasteland to the detriment of natural habitats. Thanks to the tractor bought by the project, it was possible to restore dune grassland by mowing bracken (*Pteridium aquilinum*). Poor diet has resulted in the low breeding success of terns on the island in the past.

Finally, the project organised a three-day workshop on Island Management in Ouessant and Molène in February 2001. More than a hundred participants attended this symposium, which brought together scientists, stakeholders, managers, NGOs, and Balearic and Scottish experts.

Project number: LIFE98 NAT/F/005250

Title: Maritime archipelagos and islets of Brittany

Key species: *Hydrobates pelagicus*, *Sterna sandvicensis*, *Sterna hirundo*, *Sterna dougallii*, *Sterna albifrons*

Beneficiary: Société pour l'Etude et la Protection de la Nature en Bretagne - Bretagne vivante, France

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Period: 01-Oct-1998 to 28-Feb-2003

Total budget: € 1,113,000

LIFE contribution: € 557,000



Recovering the Audouin's Gull population in Spain

While numbers of Audouin's Gull have increased slightly in recent years, this native Mediterranean bird is threatened by rival species and the scarcity of nesting sites. A LIFE project was set up on a Spanish island to monitor populations of the gull and draw up a recovery plan.

The project took place on Isla Grosa, a Natura 2000 site off the southeast coast of Spain that hosts a colony of 900 pairs of Audouin's Gull (*Larus audouinii*). Ninety percent of the world's population of the species can be found in the EU, though they migrate south in the winter, particular to the Atlantic coast of Africa.

The fish-eating birds feed on waste from fishing boats and compete with the yellow-legged gull (*Larus cachinnans*) for that. The species is also threatened as a result of the lack of suitable nesting sites and its concentration in just a few locations.

To combat these threats, a LIFE project was set up with the Ministry of Environment, Water and Agriculture of the region of Murcia, in particular, the Directorate General for Nature Conservation, which is responsible for species and habitats conservation at the regional level. The project's activities were coordinated with the regional administrations of Catalonia and Valencia, which are also conducting LIFE projects on the species.

The Murcia project restored an abandoned military installation to use as a surveillance and research centre. It also sought to control competitor species, in particular the yellow-legged gull (*Larus cachinnans*). Restoration of the Audouin's Gull population was also attempted by encouraging



Audouin's Gull (*Larus audouinii*): 90% of the world's population can be found in the EU

the species to breed. This was done by creating artificial nests and using artificial calls. The same methods were used to enhance the breeding of the European storm petrel (*Hydrobates pelagicus*).

This ongoing project features a widespread public information campaign, and the recovery plan for the species on the island, based on the results of the monitoring programme, will be approved during the project.

Project number: LIFE03 NAT/E/000061

Title: Conservation of *Larus audouinii* in Spain. Grosa Island SPA (Murcia)

Beneficiary: Consejería de Medio Ambiente y Ordenación del Territorio

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Website: <http://www.carm.es/cma/dgmn/europa/life0361/indice.htm>

Period: 01-Jan-2004 to 31-Dec-2007

Total budget: € 943,000

LIFE contribution: € 707,000

Ensuring prudent utilisation of marine goods and services

Many Natura 2000 marine sites are also economically important. Activities such as transport, tourism and temporarily fishing, or constantly impact on the marine environment. Many LIFE-Nature projects have established management plans and national action plans for marine species and sites. The development of these plans is complex and delicate, involving a wide range of interests. Moreover, many stakeholders had limited previous management experience and incomplete base-line information on the marine environment. The projects helped to change practices and attitudes through awareness-raising campaigns and demonstration activities that fulfil both Natura 2000 conservation requirements and socio-economic objectives. These goals included the regulatory control of financial activities, incentive schemes for implementing appropriate management practices, limiting of activities to defined zones, and establishing sustainability objectives.





Threatened Cetaceans: Aiding the recovery of Black Sea dolphins

The overwhelming majority of stranded dolphins on the Romanian Black Sea coast were found to have been caught up in gillnets, and either drowned or died from their injuries after escaping. A LIFE-Nature project reduced the number of dolphin fatalities and addressed the problems of habitat loss and degradation, and the depletion of food resources. The success of this project was mostly due to intensive awareness-raising campaigns that targeted local fishermen, tourists and schoolchildren. Some of the project's actions have served as a model for other dolphin programmes in the Black Sea.

Three dolphin species live in the Romanian Black Sea waters: the harbour porpoise (*Phocoena phocoena*, between 400-600 individuals), the bottle-nosed dolphin (*Tursiops truncatus*, 500-1,000 individuals) and the common dolphin (*Delphinus delphis*, 600-800 individuals). Today's population in the Black Sea is estimated to be a mere 4% of what it once was. After a period of killing for soap production between the 1930s and the early 1980s, a hunting ban was declared (in 1966 in the former USSR, Bulgaria and Romania; and in 1983 in Turkey). In spite of the ban, stocks continued to decline, primarily due to dolphins getting caught in large fishing nets.

Urban development and industrialisation along the coast have also taken a toll. Pollution and over-fishing have resulted in the destruction of fish nurseries and the accumulation of toxic compounds in the cetaceans. Habitat degradation and maritime traffic is also affecting the dolphins. These threats have raised the level of stress and incidence of disease among Black Sea dolphins.

Romania has signed up to several international agreements to undertake measures for improving the conservation status of cetaceans in the Romanian Black Sea. The



A group of Black Sea bottlenose dolphins (*Tursiops truncatus*)

LIFE-Nature project, however, proposed a national action plan for dolphin conservation. The project was implemented by the National Institute for Marine Research and Development in collaboration with the NGO, Mare Nostrum, and Dolphinarium Constanta.

LIFE funding made possible the implementation of an ambitious conservation project that also led to the creation of the first protected marine site on the Romanian coast. (The site now extends across the border to Bulgaria.)

What did LIFE do?

The main goal of the project was to develop the technical and legal bases for conservation of the three endangered dolphin species in the Romanian Black Sea. It aimed to find out more about the accidental catching of dolphins and to impose restrictions on fishing methods known to have adverse impacts on them. The project also prepared and adopted a national action plan, proposing measures for the conservation of the habitat, including the designation of new marine reserves.

What was the outcome?

Knowledge about the Black Sea dolphin populations has greatly increased as a result of the project. Years after the project, dolphin sightings, strandings and unintended captures continue to be systematically recorded. Furthermore, the project cooperated with a leading oil company to obtain data on population distributions and conducted a survey on the adverse impact of marine and land-based economic activities. A marine database was created that allows dolphin scientists to monitor the effects of management plans. Initial results show that the decline of the dolphin populations has stopped.

Cooperation was found to be important. The support of ACCOBAMS (Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic Area) and international experts¹ as well as the cooperation of the main stakeholders and authorities involved in dolphin conservation, made possible the adoption of a national action plan for dolphin conservation. The action plan has served as a valuable model for Bulgarian waters and the Mediterranean. Moreover, a suitable monitoring system has been designed and implemented to assess the change in cetacean populations and their habitats in this marine area.

Little was known about the Black Sea's fish stocks, and it was important to make an assessment of the main fish species that make up the dolphins' diet. Data collected can also be used to mitigate the effects of possible over-fishing in the Black Sea. Romanian fishermen do not see dolphins as serious competitors in their

fishing areas. Dolphin by-catch happens mostly incidentally and creates financial losses, and fishermen are legally obliged to notify the authorities of each caught dolphin. The same authorities are responsible for issuing fishing licences and fishing associations receive a small grant for valuable information about stranded dolphins.

Surveys conducted as part of the project have identified the best areas for dolphin protection in the Romanian littoral zone. These have helped flesh out a management plan for one of the priority areas, the Danube Delta Biosphere Reserve. Together with the Ministry of Environment, the beneficiary is implementing measures for considerably reducing fishing pressure in this reserve. Two key measures were the suspension of fishing licences for the 1,200 km² Danube Delta marine area; and the reduction of the diameter of existing gillnets to reduce the risk of dolphins being caught in the nets.

The second priority area is the marine reserve of Vama Veche - 2 Mai, which the LIFE beneficiary was authorised to manage. Actions included the removal of fishing gear in the reserve area and the cross-border matching extension of the reserve into Bulgarian waters.

Key to the success of the project is the support of the public, and numerous awareness-raising activities were held with the participation of local institutions (the dolphinarium, schools, children's clubs, etc.). During the project, a dolphin week was organised every year featuring exhibitions, theatre performances, and drawing contests, among other activities. Moreover, the project widely publicised its activities through the mass media, including TV broadcasts on several channels, and the production of eye-catching communications.



Dead dolphins as a result of illegal fishing

The project also presented its results at scientific meetings in the Black Sea region and in scientific publications. In addition, scientists from the neighbouring countries Bulgaria, Turkey and Ukraine, in cooperation with the ACCOBAMS secretariat, were trained in dolphin protection.

Around 50 people cooperated with the project on a voluntary basis: students, border police and even the Romanian navy were trained by the NGO, Mare Nostrum, in monitoring stranded dolphins on beaches. Fishermen, meanwhile, are registering the dolphin by-catches. Young people have been especially positive towards dolphin protection, and local stakeholders (fishermen, sailors, frontier policemen) have changed their attitudes towards environmental protection.

Dolphin awareness-raising campaign logo



¹ ACCOBAMS website:
<http://www.accobams.mc/>



Stranded dolphins on a Black Sea beach

Analysing the impact of fishing gear on dolphins and stock assessments of the main migrating fish species are now common exercises, which the project plans to intensify in the future. In cooperation with Turkey, several marine resource management and conservation measures have been implemented on the south coast of the Black Sea. International cooperation on projects has the added benefit of prompting local authorities in Romania to intensify their nature protection efforts.

A model project

One of the main achievements of the project has been to include relevant national and international stakeholders in drawing up and implementing a national action plan for dolphins. The project has promoted a consensus about the protection and suitable management of these species in the Romanian Black Sea among scientists, nature conservationists, authorities, fishermen and international organisations. Such a consensus is quite an achievement for Romania, which had little experience of the management of marine species and areas before the LIFE project.

Life after LIFE

LIFE has given an enormous boost to dolphin protection in Romanian waters, but they are still far from being entirely dolphin-friendly. The beneficiary was aware that the work of the three-year EU-funded project needed to continue. Along with the project partners, it has managed to maintain the high profile of dolphin protection along the Black Sea coast.

Monitoring the incidental catches of dolphins and strandings continues, along with the surveys and behaviour observations at sea. The school projects in Constanta are also ongoing, as is the yearly dolphin week. Sci-

entific studies are still urgently needed in several areas, including fishing gear management and acoustic deterrents (which are believed to disturb dolphins' orientation).

Furthermore, both marine areas, as well as almost 50% of the Romanian Black Sea coastline, have been included in the Natura 2000 site nomination process. It is also proposed that the marine reserve, Vama-Veche - 2 Mai, should be included in this list along with the other priority area for dolphin protection, the Danube Delta biosphere reserve (marine zone). Such measures ensure that Romania meets the EU's target for designating Special Conservation Areas that assure the protection and conservation of the three dolphin species included in the Habitats Directive.

The future

Future measures include the creation of a tissue bank for aiding research into the causes of diseases affecting the dolphin population and closer monitoring of Black Sea pollution. In addition, the introduction of a dolphin-safe label should popularise dolphin-friendly fishing products. Surveys on pollutant sources from the Romanian coast that have harmful effects on dolphins and studies on the incidence of diseases will also be carried out.

Project number: LIFE00 NAT/RO/007194

Title: Conservation of the Dolphins from the Romanian Black Sea waters

Key species: *Delphinus delphis*, *Phocoena phocoena*, *Tursiops truncatus*

Beneficiary: National Institute for Marine Research and Development

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Website: <http://www.delfini.ro/>

Tel: 40 41 540870

Period: 01-Jul-2001 to 30-Jun-2004

Total budget: € 417,000

LIFE contribution: € 208,000



LIFE in action

Greece: Protecting the endangered monk seal in fishing areas

The Mediterranean monk seal (*Monachus monachus*) is one of the most endangered marine mammals in the world. The main threats come from accidental or deliberate killing by fishermen, reduction in food sources (mainly because of over-fishing), human disturbance, and the deterioration and destruction of their habitats. Greece has a special responsibility for this species, as its waters host the largest European populations (200-250 individuals). One of three LIFE projects to protect the monk seal focused on the study and protection of the species at two Natura 2000 sites. Surveillance with regular boat patrols was central to the success of the project. It highlighted the effect of tourist boats and amateur fishing boats in one area. Surveillance findings helped secure funding for a follow-up LIFE project that aims to mitigate the conflicts between protecting the seals and the fisheries sector.

What did LIFE do?

Over the past nine years, the project beneficiary, the Hellenic Society for the study and protection of the monk seal (MOM) in Greece, has run three consecutive LIFE-Nature projects concerned with the monk seal. The first project in 1996 (LIFE96 NAT/GR/003225) set out to discover more about the species' distribution.

Having helped to establish a network of protected sites for the seals in Greece under Natura 2000, the second project sought to implement some of the main actions proposed in the management plans on the islands of the Polyagos-Kimolos and the Karpathos-Saria complex, which host around 40 and 20 seals respectively.

To achieve this objective, the beneficiary first established regular surveillance activities of the monk seal sites and caves; and secondly implemented a major awareness-raising programme aimed at fishermen, local inhabitants and tourists.

The project targeted in particular the problem of deliberate killings of seals by fishermen and illegal fishing. For



Awareness-raising campaign



The monk seal - one of the most endangered marine animals in the world

decades, monk seals have been persecuted by local fishermen for stealing fish and damaging nets.

A dedicated team of local wardens was recruited at both of the Natura 2000 sites and provided training in

surveillance techniques at the National Marine Park of Alonissos-Northern Sporades. The teams were responsible for implementing a protection scheme in cooperation with the port authorities. This involved collecting information on various aspects of the species' behaviour and monitoring illegal activities.



The teams talked to local people about the plight of the monk seal and built up support and acceptance for conservation. The awareness-raising campaign was supported by dissemination tools, such as a website and information leaflets, posters, stickers and newsletters. These were aimed at tourists, local authorities and, in particular, fishermen. Schoolchildren were



The impact of human activities was studied by the project



Preparing to monitor the monk seal populations



Dimitris an orphaned monk seal found in December 2003

targeted via a programme of environmental education, and the general public via information centres. The project team also worked closely with local, regional and national authorities in order to promote the two management plans.

What was the outcome?

The project made significant progress in implementing conservation measures at the two sites. By the end of the project, 32 seal pups had been born in the Kimolos-Polyaigos area – a breed-

Awareness-raising campaign for schoolchildren



ing rate of eight pups per year had been achieved in the Natura 2000 site. According to the beneficiary, "It is the second highest number of pups ever recorded – in such a period – in a single area within the Mediterranean." Based on available data, the beneficiary estimated that the area contained at least 43 seals (not including the pups). The project also highlighted the potential threat to the marine environment posed by tourist boats and amateur fishing boats in the area of Kimolos.

For the Karpathos area, over the same four-year period, 19 newborn pups were recorded – an average birth rate of just under five pups per year. The beneficiary estimated that a minimum of 23 adult and juvenile seals inhabit the area.

The local element of the project was fundamental to its success. As well as aiding conservation, teams located on the ground helped to change local atti-

tudes. Rather than viewing the monk seal as a threat, local people are now realising the potential of eco-tourism for the islands.

Conclusions

A third LIFE project (LIFE05 NAT/GR/000083) is building on the experience of the project by aiming to mitigate the conflicts between monk seals and fishermen in Greece. Seven hotspots will be selected in which the scale of the problem will be assessed and measures to combat it will be proposed. A monk seal fisheries action plan is expected to be adopted by 2009 that will cover the monk seal's range in Greece¹.

¹ Source DG Environment website: "Marine: Good management practices of Natura 2000" http://ec.europa.eu/environment/nature/nature_conservation/natura_2000_network/managing_natura_2000/exchange_of_good_practice/marine/04case_seals.html



Project number: LIFE00 NAT/GR/007248

Title: The Monk Seal: conservation actions in two Greek Natura 2000 sites

Key species: *Monachus monachus*

Key habitats: *Posidonia* beds (*Posidonion oceanicae*)

Beneficiary: MOM/Hellenic Society for the Study and Protection of the Monk Seal

Contact: Spyros Kotomatas

Website: www.mom.gr/life

Period: 01-Jan-2001 to 31-Jan-2005

Total budget: € 1,498,000

LIFE contribution: € 899,000



Building partnerships for the seas

Another key issue addressed by many LIFE-Nature projects concerns the interactions between fisheries and threatened marine habitats and species. Numerous surveys have shown the extent of the problem and the types of fishing practices that are most damaging in specific marine areas. This knowledge has been used to open a dialogue with the fishermen and authorities concerned.





Portugal: Sustaining coastal and marine zones in the Azores

The coastal and maritime environments of the Azores archipelago boast a natural heritage of national and Community-wide importance. The Portuguese islands contain a range of important marine species and habitats. With the active support and participation of regional environment and fisheries' authorities, tourism operators and the local population – the MARÉ project was able to complete management plans for 12 Natura 2000 sites and to introduce key measures for the conservation of four marine species – including the priority loggerhead sea turtle (*Caretta caretta*), the bottlenose dolphin (*Tursiops truncatus*), the Madeiran storm-petrel (*Oceanodroma castro*) and the Roseate tern (*Sterna dougallii*) seabirds.



Photo: IFAW

Sperm whales (*Physeter macrocephalus*) in the Atlantic

Over the past 20 years, an increase in human activities (fishing, tourism, scuba-diving etc.) has started to damage the marine species and habitats of the region's coastal and marine environments. Several measures to reduce this environmental damage were introduced during this period, including the legal protection of loggerhead seas turtles and

bottle-nosed dolphins. But these measures did not address broader issues such as the management of activities already going on in nature reserves or the surveillance of these areas. The application of the Birds and Habitats Directives to the Azores had resulted in the designation of 31 proposed Natura 2000 sites.

What did LIFE do?

The four-year project sought to draw up a range of integrated measures for 12 of the 31 proposed sites, targeting the sustainability of fishing and tourism activities, including whale watching. The project was implemented by the project beneficiary, the University of the Azores, through its Department

Photos: ImagDOP@JFontes



Common dolphin (Delphinus delphis).

of Oceanography and Fisheries (*Universidade dos Açores - Dep. de Oceanografia e Pescas*).

When the project began there was little data on the impact of socio-economic activities on the targeted marine species notably on loggerhead sea turtles and bottlenose dolphins in the region. The first phase of the project was therefore dedicated to the collection of such data and included a marine species census. On the basis of this information management plans were drawn up and implemented in conjunction with local environment and fisheries authorities. They were adopted following public consultation.

Management actions were also developed for whale watching. These resulted in the adoption of a new regional regulation. Measures to be adopted by fishermen to reduce the amount of by-catch of sea turtles were also defined.

What was the outcome?

Management plans for 12 Natura 2000 sites were completed. An important achievement was the establishment of good cooperation between the scientific community and the tourism and fisheries' sectors. Awareness-raising activities were also successful both in the Azores and on mainland Portugal, as

shown by the continuing high demand for the project's awareness-raising educational kit. This project involved the whole Azores community (fishermen, students, scientific community and local population) together with the economic agents (tourism operators) and the regional authorities responsible for the Natura 2000 coastal and marine sites management.

Life after LIFE

A post-project follow-up study of the project was carried out in March 2006 by the LIFE external monitoring team. It showed that a permanent warden post had been created. Moreover, four other people hired under the LIFE project are continuing to work on some of the actions initiated by LIFE but now funded by Interreg, the European Regional Development Fund, and the Portuguese Science and Technology Foundation.

Management plans are being drawn up for a further 18 Azores Natura 2000 sites. This task is now overseen by the regional authorities and financed through structural funds for the Azores region and also with an Interreg project with Spanish partners. Two other projects have been launched to continue research into biological and ecological aspects of cetaceans of the



Diver with pilot whales (Globicephala melaena)

Azores. These should prove useful in monitoring the effectiveness of the proposed actions and possibly in improving existing management measures. A test on turtle by-catch in long line fishing activities is still ongoing. So are the majority of the awareness-raising measures through schoolteachers and NGOs that were involved with the project, and also through a visitors' centre established during the LIFE phase and now managed by an NGO.

Conclusions

The project made a major contribution to the establishment of the Natura 2000 Network; its management plan preparation and implementation strategies can be used as a model for other important marine sites both in mainland Portugal and elsewhere in the EU.

Project number: LIFE98 NAT/P/005275

Title: MARÉ - Integrated management of coastal and marine zones in the Azores

Key species: **Caretta caretta*, *Oceanodroma castro*, *Sterna dougallii*, **Tursiops truncatus*

Beneficiary: Universidade dos Açores- Dep. de Oceanografia e Pescas, Portugal

Contact: Ricardo Serrão Santos

Email: ricardo@dop.horta.uac.pt

Website: www.horta.uac.pt/projectos/macmar/ogamp/index.html

Period: 01-Oct-1998 to 31-Mar-2003

Total budget: € 1,366,000

LIFE contribution: € 819,000

* Denotes priority species



LIFE in action

Bothnian Bay: Conserving through partnership

Human activities pose a threat to the marine environment of Bothnian Bay in the Baltic Sea. To meet this challenge, a LIFE project brought together various governmental bodies to develop a joint database for the exchange of information about the bay's water quality and to introduce a plan for the sustainable management of the area.

Located between Finland and Sweden, Bothnian Bay is the most northern basin of the Baltic Sea. The bay, which freezes over for several months of the year, is particularly vulnerable due to the scarcity of the species living in it, its arctic conditions and the shallowness of its waters (average depth 40 metres). Moreover, the bay is exposed to pollution from the local steel, pulp and paper industries as well as from sewage treatment plants. Perhaps even more importantly, the bay is affected by agricultural and forestry practices, peat mining, and to some extent construction work related to sea transport.

Tools for managing the sea area

Many different national and regional bodies monitor environmental conditions in the bay, and the beneficiary identified the need to pool various information sources. To achieve this, the project built up an extensive online database under the guidance of the beneficiary, the North Ostrobothnia Regional Environment Centre (NOREC) in Finland. The database features various indicators of water quality in the bay:

- Physical and chemical data from 62 observation points.
- Results of automatic water quality monitoring and samples collected by the system.
- Data on the material transport and water discharges of 31 rivers, and

use of the land in their catchment area.

- Information about the 52 industrial plants and wastewater treatment plants, including annual loading data.
- Top ten lists for rivers, industries and wastewater treatment plants.

In addition to the database, the project also developed a web-based BAT (Best Available Technology) information exchange system for the metal industry and produced a versatile exhibition for dissemination purposes.

The project, which began at the end of 2001, also developed a model for estimating the impact of human actions in the coastal areas. The Bothnian Bay Water Quality and Ecosystem Model allows experts working in the area to assess the impact of loading on water quality. Assessments are made by calculating likely changes to the concentration of soluble nutrients and algae. Human activity has caused eutrophication (the addition of nutri-



Photo: Anne Laine

Bothnian Bay: the most northern basin of the Baltic Sea

ents that promote the growth of algae) that disrupts the coastal ecosystems.

The project canvassed the views of a wide range of experts and stakeholders to produce an action plan for Bothnian Bay. The plan outlines targets and priorities for sustainable development and sets guidelines for monitoring and for status assessments. It also aims to meet EU and national environmental requirements and to improve information exchange and cooperation in the Bothnian Bay area. NOREC continues to cooperate with the project partners to implement the action plan and maintain databases.

Project number: LIFE00 ENV/FIN/000646

Title: Integrated Management System for the Bothnian Bay

Beneficiary: North Ostrobothnia Regional Environment Centre, Finland

Contact: Anne Laine

Email: anne.laine@ymparisto.fi

Website: www.ymparisto.fi/perameri

Period: 01-Aug-2001 to 31-Jan-2005

Total budget: € 1,049,000

LIFE contribution: € 520,000



Improving environmental quality of our seas



Despite the many conventions and measures taken at national and international levels, the environmental status of our seas is still not satisfactory and in some areas can be considered critical. However, there are also positive signs. The reinforcement of effluent limits, waste recycling, and alternative solutions for treating dangerous substances are on their way. Some legislation sets best practice standards, and LIFE can contribute substantially to the improvement of best available techniques and methods.



Treating TBT-rich sediment from the Port of Antwerp

As one of the largest ports in the world, the Port of Antwerp is particularly affected by TBT-contamination from ship paints. A LIFE project attempted to remove affected sediments from Antwerp's harbours and to treat the material for eventual reuse.

The use of tributyltin (TBT) in ship paints has been banned in the EU since the beginning of 2003. TBT is a toxic biocide that was used since the 1970s to prevent the growth of algae, barnacles and other organisms on ships' hulls. The toxic substance, however, leaches from the paint into marine waters and eventually accumulates in sediments on the beds of harbours and ports. The removal of these sediments is vital to prevent TBT being reabsorbed into the water.

The project, which was carried out by the Antwerp Port Authority (Gemeentelijk Havenbedrijf Antwerpen), aimed to demonstrate an integrated approach to the elimination of TBT from the marine environment: prevention, removal, treatment and finally reuse. Specific objectives included the following:

- Assess the environmental impact of available alternatives for TBT.
- Evaluate the release of TBT from sediments into the aquatic environment during dredging operations.
- Test on a pilot-scale several treatment technologies for TBT contaminated sediments.
- Identify possibilities for the reuse of treated sediments.

The port teamed up with the Environmental Research Centre (ERC) in Hofstade, (Aalst) to carry out the chemical analyses and perform lab-scale feasibility experiments for the different sediment and water remediation techniques.



Dredging craft in the port of Antwerp

Five-point plan

The project was expected to produce a list of environmentally friendly alternatives to TBT in anti-fouling (that is, the prevention of growth of organisms) systems. It was also expected to determine limits and best practice

Removal of TBT contaminated sediments



for dredging operations in order to minimise the release of TBT from sediments. To achieve its aims, the project focused on five main action areas:

- 1) The drawing up of a questionnaire on alternatives for TBT to be sent to interested parties in the EU including coating producers, ship-repair yards, ship-owners etc. From the answers received, the project would be able to assess the impact of the alternatives based on their characteristics, active compounds, methods of application, energy use, waste generation and ease of maintenance.
- 2) Simulation of dredging operations on a pilot-scale and analysis of TBT concentrations in the aqueous phase. TBT concentrations would be correlated with turbidity measurements taken simultaneously.

3) The dredging of about 2000 m³ of TBT contaminated sediments from the Port of Antwerp and elsewhere in Flanders and its treatment in pilot-scale installations, on-site or off-site, using thermal treatment, bioremediation, washing and separation, phyto-remediation and electrochemical treatment. An evaluation of TBT removal rates for each technique was to be performed.

4) The construction of a pilot-scale treatment plant for the purification of TBT contaminated waters created during dredging or treatment operations. An evaluation of the removal efficiency of this plant for TBT was planned.

5) The reuse of cleaned sediments in landscaping, dike reinforcement and construction.

Results

While a standard practice for the reuse or application of sediment on land has yet to be reached, geotechnical and chemical requirements were developed. Chemical criteria were developed by the Flemish Institute for Technological Research (VITO) in accordance with Flemish legislation on reuse of soil and treated mineral waste for construction purposes.

The project provided a general framework for quantifying the effects of toxic materials that can be used in discussions with the Flemish authorities and for the development of European quality controls on the reuse of sediments.

Deposition of extracted sediments following TBT removal



Disseminating the project results and experiences

Some results of the project could also be used to formulate recommendations and restrictions on dredging activities. The project demonstrated that the amount of TBT released during dredging activities is mainly determined by conditions in the harbour (for example acidity, salinity and temperature). These environmental conditions are more important than the dredging technique.

The project also determined that dredging of highly contaminated sediments in the Port of Antwerp is best performed during the winter when the pH of the water is below 8.0. A new time schedule for dredging operations now dramatically reduces the release of TBT in the port. Such a recommendation could also apply to other ports.

Another important aspect of the project was the construction of a mechanical water extraction installation. The installation should be operational by the end of 2008 and will cost an estimated € 65 million.

The project worked in consultation with the Flemish government to carry out the mechanical extraction of water from dredged material and to develop acceptable TBT-concentrations in dewatered sludge and discharge limits for effluent water. Dumping sites in Antwerp are expensive and limited in number and size. However, prospects for the port are very encouraging. Once recycled, for example, sediments can now be reused for creating dikes and other constructions.

Project number: LIFE02 ENV/B/000341

Title: Development of an integrated approach for the removal of tributyltin (TBT) from waterways and harbours: prevention, treatment and reuse of TBT contaminated sediments

Beneficiary: Gemeentelijk Havenbedrijf Antwerpen, Belgium

Contact: Eddy Bruyninckx

Website: www.portofantwerp.be/tbtclean

Email: eddy.bruyninckx@haven.antwerpen.be

Period: 01-Oct-2002 to 01-Jan-2005

Total budget: € 3,222,000

LIFE contribution: € 1,335,000



OSIS: Improving oil-spill detection in the North Sea

Ships and offshore installations are the most common sources of more than 500,000 tonnes of oil that is spilt in the marine environment every year. The OSIS (Oil Spill Identification System), developed and tested with LIFE-Environment co-funding, is aiding identification of oil discharges from offshore installations in the North Sea. This permanently-mounted 'real-time' sensor – together with a new mobile sensor being adapted for ships in a follow-up LIFE project – will allow decision-makers to take corrective action rapidly.



New OSIS sensor on board Gunnar Seidenfaden

Every day large amounts of oil are deliberately pumped into the sea by ships along the coastline of Europe. Together with large oil spills, such pollution constitutes a major threat to the environment and places enormous demands on national authorities responsible for rapid response and clean-up operations. The 1992

OSPAR Convention¹ for the protection of the marine environment of the

¹ The OSPAR Convention <http://www.ospar.org/eng/html/welcome.html>, which entered into force in March 1998 and includes the participation of the EU, develops new programmes and measures required to identify, prioritise and monitor the emissions, discharges and losses of substances to the marine environment.

northeast Atlantic tackles this environmental threat.

Effectively controlling oil pollution has, however, proved difficult. Airborne surveillance systems currently used to control oil outlets are too expensive to be utilised efficiently against the large number of offshore



'Real-time' OSIS sensor at the front of an oil rig

installations. Along with ships, such installations are the most common sources for the more than 500,000 tons of oil spilt annually into the marine environment². The lack of monitoring systems means that offshore installations have not yet been included in the strict OSPAR rules

² Source: Global Marine Oil Pollution Information Gateway <http://oils.gpa.unep.org/facts/sources.htm>

Close-up of the permanently-mounted OSIS sensor



potential solution to this widespread problem of international concern by developing online remote monitoring of offshore installations in any location based on new sensor technology. The system would use a new generation of communication satellites and the internet.

The project has fully achieved its objective, posting impressive results from tests for the detection of spills surrounding oil rigs in the North Sea. Data gathered by OSIS is also transferred via satellite to onshore decision-makers and can be used in conjunction with a Geographical Information System (GIS). This provides further information about leaks and helps the planning of corrective actions. "This will enhance the information for decision-making concerning corrective action and also provide opportunities for efficient clean-up operations," says Mr Moeller-Jensen.

governing oil pollution in 'special areas' designated by the International Maritime Organisation (IMO).

OSPAR call for technologies

Peter Moeller-Jensen, project manager at OSIS International, a privately owned Danish SME says: "In the late 1990s, OSPAR called for technologies, such as OSIS to be developed so that they could enforce a new type of regulation in those special areas." The OSIS team thus sought to demonstrate a

Conclusions

The OSIS technology, designed for fixed offshore structures such as oil platforms, is also proving attractive for maritime transport. A second LIFE project (LIFE04 ENV/DK/00076) launched in 2004 by the same beneficiary is currently adapting the fixed OSIS sensor and transmission system for ships.

Project number: LIFE02 ENV/DK/000151

Title: Sensor for identification of oil spills from offshore installations

Beneficiary: OSIS International, Denmark

Contact: Peter Moeller-Jensen

Website: www.osis.biz

Email: pmj@osis.biz

Period: 01-Jan-2002 to 30-Apr-2005

Total budget: € 3,359,000

LIFE contribution: € 867,000



Further successful and promising projects

The table below presents some of the numerous past and current LIFE projects focusing on the marine environment. For further information on individual projects, visit the online LIFE database at: <http://ec.europa.eu/environment/life/home.htm>.

Start	Country	Number	Title
Enhancing our knowledge of the marine environment			
1992	United Kingdom	LIFE92 ENV/UK/000065	Small Cetacean Abundance in the North Sea and adjacent waters (SCANS) with follow-up project
2004	Portugal	LIFE04 NAT/P/000213	Important bird areas for seabirds in Portugal
2004	Spain	LIFE04 NAT/ES/000049	Important Bird Areas For Seabirds (Marine IBAs) in Spain
2004	United Kingdom	LIFE04 NAT/UK/000245	Small Cetaceans in the European Atlantic and North Sea (SCANS II)
Preserving and protecting marine species and habitats of Community interest			
1995	Greece	LIFE95 NAT/GR/001115	Recovery of the Loggerhead Sea Turtle (<i>Caretta caretta</i>) population nesting on Crete
1996	Greece	LIFE96 NAT/GR/003221	Conservation actions for <i>Larus audouinii</i> in Greece
1996	Portugal	LIFE96 NAT/P/003019	Conservation support project for North Atlantic <i>Caretta caretta</i> sea turtles
1996	Spain	LIFE96 NAT/E/003144	Actions for the recovery of the Atlantic Monk Seal (<i>Monachus monachus</i>) population
1996	United Kingdom	LIFE96 NAT/UK/003055	To develop and promote the necessary conservation measures for UK marine SACs
1997	Italy	LIFE97 NAT/IT/004153	Capraia and other small islands of the Tuscan Archipelago : biological diversity conservation
1997	Spain	LIFE97 NAT/E/004146	Recovery plan of <i>Puffinus p.mauretanicus</i> in SPA's
1997	Spain	LIFE97 NAT/E/004151	Project to support the conservation of <i>Caretta caretta</i> and <i>Tursiops truncatus</i> in the Canary Islands
1998	France	LIFE98 NAT/F/005250	Maritime archipelagos and islets of Brittany
1998	Spain	LIFE98 NAT/E/005300	Conservation of island SPAs in the Valencian region
2000	Spain	LIFE00 NAT/E/007303	Protection of <i>Posidonia</i> grasses in SCIs of Balears
2002	Spain	LIFE02 NAT/E/008610	Conservation of cetaceans and turtles in Andalusia and Murcia
2002	Third Countries	LIFE02 TCY/TR/061	Preserving the Marine Environment of Oludeniz Lagoon
2003	France	LIFE03 NAT/F/000105	Conservation of Cory's shearwater on the Hyères islands
2003	Italy	LIFE03 NAT/IT/000163	Reduction of the impact of human activity on <i>Caretta</i> and <i>Tursiops</i> and their conservation in Sicily
2003	Spain	LIFE03 NAT/E/000061	Conservation of <i>Larus audouinii</i> in Spain. Grosa Island SPA (Murcia)
2003	Spain	LIFE03 NAT/E/000062	Conservation of <i>Tursiops</i> and <i>Caretta</i> on the Gomera Island

Start	Country	Number	Title
2004	Italy	LIFE04 NAT/IT/000172	Tuscan Islands: new actions towards sea birds and habitat
2004	Italy	LIFE04 NAT/IT/000187	Tartanet, a network for the conservation of sea turtles in Italy
2005	France	LIFE05 NAT/F/000137	Conservation of the Roseate Tern in Brittany
2005	United Kingdom	LIFE05 NAT/UK/000141	Canna seabird recovery project
2006	Denmark	LIFE06 NAT/DK/000159	Rebuilding of Marine Cavernous Boulder Reefs in Kattegat
Ensuring prudent utilisation of marine goods and services			
1997	Finland	LIFE97 NAT/FIN/004102	Conservation and Management of the Porvoonjoki Estuary - Stenbôle Natura 2000 Area
1998	Greece	LIFE98 NAT/GR/005262	Application of Management Plan for <i>Caretta caretta</i> in southern Kyparissia Bay
1999	Italy	LIFE99 NAT/IT/006271	Urgent conservation measures of <i>Caretta caretta</i> in the Pelagian Islands
1999	Italy	LIFE99 NAT/IT/006275	Protection of sea and coastline habitats in SCIs along the Southern Tyrrhenian Sea in Italy
1999	Portugal	LIFE99 NAT/P/006432	Project for the conservation of cetaceans in Madeira Archipelago
2000	Greece	LIFE00 NAT/GR/007248	The Monk Seal : conservation actions in two Greek NATURA 2000 sites
2000	Romania	LIFE00 NAT/RO/007194	Conservation of the dolphins from the Romanian Black Sea waters
2002	Greece	LIFE02 NAT/GR/008500	Reduction of mortality of <i>Caretta caretta</i> in the Greek seas
2003	France	LIFE03 NAT/F/000104	Limitation to the negative interactions between dolphins and human activities
2005	Greece	LIFE05 NAT/GR/000083	Monk seal & fisheries: Mitigating the conflict in Greek seas
2005	Spain	LIFE05 ENV/E/000267	Benign and environmentally friendly fish processing practices to provide added value and innovative solutions for a responsible and sustainable management of fisheries.
2006	Italy	LIFE06 NAT/IT/000050	Urgent conservation measures for biodiversity of Central Mediterranean Sea
2006	Portugal	LIFE06 NAT/P/000192	Restoration and Management of Biodiversity in the Marine Park Site Arrábida-Espichel
Building partnerships for the seas			
1996	Denmark	LIFE96 ENV/DK/000012	Integrated Cooperation on Sustainable Tourism Development and Recreational Use in the Wadden Sea Area
1998	Portugal	LIFE98 NAT/P/005275	Integrated management of coastal and marine zones in the Azores
2000	Finland	LIFE00 ENV/FIN/000646	Integrated Management System for the Bothnian Bay
2005	Latvia	LIFE05 NAT/LV/000100	Marine protected areas in the Eastern Baltic Sea



Start	Country	Number	Title
Improving environmental quality for our seas			
1995	France	LIFE95 ENV/F/000782	Control of the <i>Caulerpa taxifolia</i> extension in the Mediterranean Sea
1996	Third Countries	LIFE96 TCY/INT/08	Development of oil spill response capabilities of Cyprus, Egypt and Israel
1998	Greece	LIFE99 ENV/GR/000567	Demonstration and large scale application of the new magnetic method 'cleanmag' for the clean-up of waterborne oil spills
1998	Italy	LIFE98 ENV/IT/000079	BO.FO.PO.LI Port of Leghorn's seabed reclamation
1998	Netherlands	LIFE98 ENV/NL/000199	Action to demonstrate the harmful impact of TBT. Effective communication strategies between scientists and policy makers to assist in policy development
1999	Third Countries	LIFE99 TCY/INT/017	Development of the national system for preparedness and response to accidental marine pollution in Syria
2000	Spain	LIFE00 ENV/E/000560	Integral management of fishing waste in a coastal area : Pilot scheme
2002	Belgium	LIFE02 ENV/B/000341	Development of an integrated approach for the removal of tributyltin (TBT) from waterways and harbours
2002	Denmark	LIFE02 ENV/DK/000151	Sensor for identification of oil spills from offshore installations
2003	Netherlands	LIFE03 ENV/NL/000474	LNG Tanker, Demonstrating the effective and safe use of liquid natural gas as fuel for ship engines for short-sea shipping and inland waterway transport.
2004	Denmark	LIFE04 ENV/DK/000076	Oil Spill Identification System for Marine Transport
2006	Belgium	LIFE06 ENV/B/000362	Demonstration of a 100% non-toxic hull protection and anti-fouling system contribution to zero emissions to the aquatic environment and saving 3-8 % heavy fuels
2006	Finland	LIFE06 ENV/FIN/000195	Controlled Treatment of TBT-Contaminated Dredged Sediments for the Beneficial Use in Infrastructure Applications Case: Aurajoki - Turku
2006	Germany	LIFE06 ENV/D/000479	Demonstration of an innovative wind propulsion technology for cargo vessels

<http://ec.europa.eu/life>

The LIFE programme's online database features all LIFE projects since 1992, including LIFE-Nature projects specifically addressing marine environment issues. Many of the LIFE-Environment and LIFE-Third Country projects registered are also relevant to the marine environment.

Search the database by year, country or keyword, to find information and contact details of successful projects and good practices relevant to your work.

Available LIFE publications

LIFE-Focus brochures

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

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

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

Integrated management of Natura 2000 sites (2005 - 48 pp. - ISBN 92-79-00388-7) http://ec.europa.eu/environment/life/infoproducts/managingnatura_highres.pdf

LIFE, Natura 2000 and the military (2005 - 86 pp. - ISBN 92-894-9213-9 - ISSN 1725-5619)
http://ec.europa.eu/environment/life/infoproducts/lifeandmilitary_en.pdf

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

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A sustainable approach for the environment - LIFE and the Community Eco-Management and Audit Scheme (EMAS) (2003 - 32 pp. - ISBN 92-894-0543-0)
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Water, an essential resource - LIFE and the new European water policy (2002 - 28 pp. - ISBN 92-894-0538-4)
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A number of printed copies of certain LIFE publications are available and can be ordered free-of-charge at: <http://ec.europa.eu/environment/env-informal>

Other publications

Best LIFE-Environment Projects 2005-2006 (2006, 40 pp. - ISBN 92-79-02123-0) http://ec.europa.eu/environment/life/infoproducts/bestlifeenv/bestenv_0506_lr.pdf

Best LIFE-Environment Projects 2004-2005 (2005, 44 pp. - ISBN 92-79-00889-7) <http://ec.europa.eu/environment/life/infoproducts/bestlifeenv/bestenv.pdf>

LIFE-Environment 1992 - 2004 "Demonstrating excellence in environmental innovation" (2005, 124 pp. - ISBN 92-894-7699-3 - ISSN 1725-5619)
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LIFE-Environment in Action. 56 new success stories for Europe's environment (2001 -131 pp. - ISBN 92-894-0272-5)
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LIFE-Third Countries Projects 2006 compilation (2006, 20 pp. - ISBN 92-79-02787-5) http://ec.europa.eu/environment/life/infoproducts/lifetcycompilation_06.pdf

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

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

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

Objectives

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

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

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

Types of project

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

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

Period covered (LIFE III) 2000-2006.

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

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