Belgian Biodiversity Platform

Proceedings of the 5th meeting of the

European Platform for Biodiversity Research Strategy

2-4 December 2001 – Brussels

SCIENTIFIC TOOLS FOR BIODIVERSITY CONSERVATION: MONITORING, MODELLING AND EXPERIMENTS

WEB VERSION – PART 1

Federal science policy

Meeting under the Belgian EU Presidency

Edited by

H. Segers, E. Branquart, A. Caudron & J. Tack

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Proceedings

INTRODUCTION

These proceedings were prepared in partial fulfilment of the reporting obligations under the EU project 'European Platform for Biodiversity' (BIOPLATFORM - Project n° EVK2-2001-00043). This document exists in a printed, and an extended digital version.

'Scientific tools for biodiversity conservation:
MONITORING, MODELLING AND EXPERIMENTS'

PROCEEDINGS

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H. Segers, E. Branquart, A. Caudron & J. Tack
Belgian Biodiversity Platform
http://www.biodiversity.be/bbpf

Content

1 General Introduction

1.1 Biodiversity conservation in practice

Geert Raeymaekers
ECOSYSTMES Ltd

ECOSYSTEMS Ltd is a Brussels-based conservation consultancy under contract of DG Environment to monitor projects funded under LIFE-nature in the ten Northern Member States. This doucmuent was prepared in collaboration with MECOMAT Ltd and the Belgian Biodiversity Platform

Introduction

This contribution introduces the European Nature conservation policy, focusing mainly on the implementation of the Natura 2000 network and the LIFE-nature programme. Scientific issues related to LIFE-nature projects are stressed while more than 30 cases studies for such projects are briefly commented.

European Nature Conservation Policy

To meet its international obligations and encourage better management of Europe's natural heritage, the European Union has been progressively developing and implementing a nature conservation policy on its territory since 1973. At the heart of this policy are two pieces of Community legislation: the 'Birds Directive' and the 'Habitats Directive'. Together, they establish a legislative framework for protecting and conserving Europe's wildlife and habitats.

At the centre of this policy is the creation of a coherent ecological network of protected areas across the EU - known as **NATURA 2000**. This will be made up of:

- **Special Protection Areas (SPAs)** to conserve the 182 bird species and sub-species listed in Annex I of the Birds Directive as well as migratory birds,
- **Special Areas of Conservation (SACs)** to conserve the 253 habitat types, 200 animal and 434 plant species listed under the Habitats Directive.
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Its purpose is to maintain or restore the habitats and species at a favourable conservation status in their natural range.
To date the Member States have proposed over 15,000 sites to be included under the Natura 2000 network. Altogether these cover around 13% of the EU territory - an area equivalent to the size of Germany.

Find more information about the Natura 2000 network on the website of the EU DG Environment: Special Protection Areas under the Bird directive, Reference list of habitat types and species, NATURA 2000 - the European Commission nature newsletter, NATURA 2000 barometer, etc.

[NATURA 2000 on the website of the EU Commission]

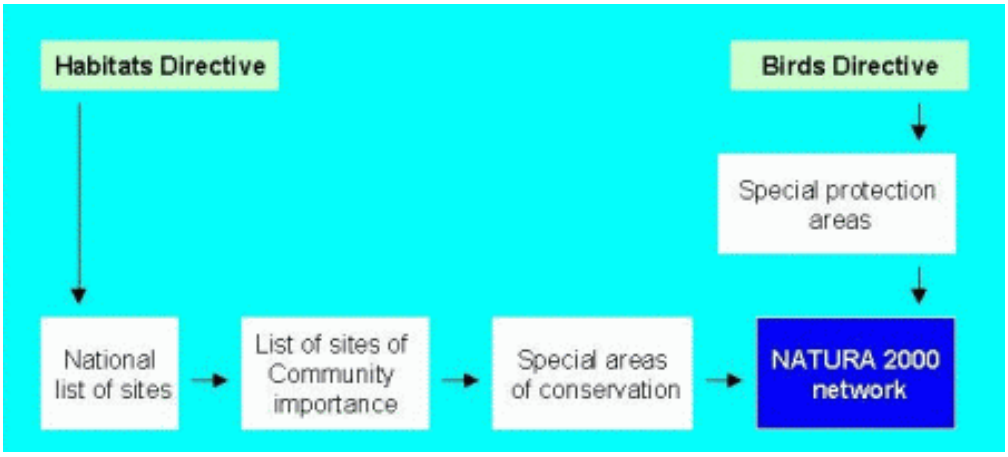

Figure 1 - Legislative framework of nature conservation within the European Union

LIFE-nature: the European financial instrument for Nature

When the Habitats Directive was adopted and the concept of Natura 2000 launched, Member States recognised the need for a more substantial budget to assist in the establishment of this ecological network. This was not intended to pay for its implementation wholesale but rather to promote practical examples and demonstration models of how Natura 2000 could work in practice.

Scope

As a result, nature conservation became a major component of LIFE, the EU's financial instrument for the environment. Since 1992, some 50-70 million euro has been made available on an annual basis to co-finance actions targeting the conservation of:

- Sites proposed under the Habitats Directive (pSCIs)
- Sites classified under the Birds Directive (SPAs)
- Species in the annexes of the Directive, whose survival is dependent on more than just protecting and conserving their existing habitats.

Since that time over 500 projects have received co-financing through LIFE-Nature to carry out work in these areas.

Overall objective

The overall objective of LIFE-Nature is to fund projects that will make a significant contribution to the conservation of Natura 2000 sites either by

- **Pump priming** initial heavy investment costs that make the long term conservation more affordable,
- **Promoting dialogue** with the other land users of a site to find ways to conserve an area to the mutual benefit of all or at least not to the detriment of one or the other,
- Providing high profile **demonstration models** of how conservation objectives for particular habitats and species of Community interest can be achieved in practice
- Developing **best practice** methods that can in turn initiate larger scale and longer term programmes for the management of the area.

Type of actions funded

On the whole, LIFE projects follow the logical framework approach whereby successful applicants identified and quantified the problems affecting their site before proposing a suite of actions to address these under LIFE-Nature. The type of actions funded can be broadly grouped into five main categories.

- **Preparatory measures**: Actions preparing the ground for on-site conservation work, e.g. administrative preparation (permit procedures, meetings between project partners), negotiations with stakeholders, preparation of management plans, site surveys, technical blueprints etc.
- **Land lease or acquisition**: Long-term conservation can often only be achieved if an effective long-term control over the land use is assured. Acquisition or long-term lease is not always an end in itself, but can also act as a first step in paving the way for restoration or biotope management work, which always affects other land uses. Compensations for restricting existing rights, or ending them altogether, also come under this heading, as do land swaps, whereby land is bought outside the project area and exchanged for a section of valuable land within the site.
- **Non-recurring actions**: (one-off restoration actions): This often means investment works to kick-start the restoration or improvement of degraded habitats back to its former and more favourable conservation status. Typical targets are e.g. overgrown grasslands or mires with a damaged hydrology, and actions often include closing of ditches, tree felling or removing scrub vegetation, fencing to allow grazing, etc.
- **Recurring actions**: (biotope management): This involves actions that have to be undertaken on a regular basis to maintain or improve the habitat conditions For instance, the nature conservation values linked many grassland and wetland habitats are dependant on traditional land-use, such as grazing and hay-making, and they rely on these low-intensity farming practices for their long-term maintenance. Recurring actions can also include the development of special mowing equipment to be used, contracts and management agreements with third parties to mow or graze conservation land, etc.
- **Raising public awareness**: aimed either at visitors, the local community or relevant stakeholders, this includes quite a heterogeneous range of measures from the installation of footpaths and bird observation towers to the preparation and publication of brochures, the organisation of workshops and public hearings, media work, and so on.

Case studies - I. Species management

PLANTS

- The conservation and development of *Jurinea cyanoides* near Volkach (Germany, 96/488)

Jurinea cyanoides is a composite of poor sandy soils and is restricted to a few sites in continental Europe. Nearly the entire population of Germany is restricted to some sandy terraces of the Main valley and is a disjunct population of those present in the Czech Republic and Russia. The beneficiary kicked off the LIFE-nature project with a

comprehensive inventory of this species in Europe and found some elements to separate the German population from the remaining populations in Europe. In order to safeguard this highly endangered species, the beneficiary developed different techniques to reduce the nutrient content of former arable fields to allow immigration of *J. cyanoides* seeds from nearby sources. At the local level, this has been a successful conservation project.

Key-words: *Jurinea cyanoides*, taxonomy, chorology, habitat restoration, ecological modelling, population monitoring.

- Conservation of the calcareous fens of Benninger Ried (Germany, 96/490)

The project focuses upon the conservation of the initial succession phases of fen habitats and in particular on the conservation of the point endemic of this habitat, *Armeria purpurea*. During the first year, it became clear that the fen ecosystem was not sufficiently understood to start restoration measures and therefore, LIFE-Nature co-financed a detailed study of the hydrology of the fen, including the assessment of seepage pressure, hydrological dynamics, etc., and later another study on seed distribution ecology of *Armeria purpurea*. The measures based on these studies are now being implemented and a comprehensive monitoring programme has been set up to examine whether the measures indeed have the effects (ecological and hydrological) predicted by the studies, or whether adjustments are needed.

Key-words: *Armeria purpurea*, autecology, fen, seed production, germination, hydrology, habitat restoration, population monitoring.

- The restoration of the Lake Constance forget-me-not and stoneworts (Germany, 99/5940)

Due to expanding urbanisation, the Lake Constance forget-me-not (*Myositis rehsteineri*) has disappeared from the pebble beaches and due to water pollution the underwater flora of stoneworts (*Chara* spp., *Nitella* spp.) declined significantly over the last century. Whereas water treatment plants improved the state of conservation of the stoneworts, reversing the situation of *Myosotis rehsteineri* was more difficult. LIFE-Nature will co-finance a detailed inventory to monitor the recovery of the stoneworts within the project sites. To prepare concrete measures to restore the *Myosotis* population, the beneficiary is making a detailed study of the pebble beach habitat (slope, wave dynamics, pebble size, mud content, …) to define the right ecological conditions to allow this species to expand its range.

Key-words: *Myosotis rehsteineri*, stoneworts (*Chara* spp., *Nitella* spp.), habitat preferences, habitat restoration, pebble beach, hydrology, population monitoring.

- Micro-reserves for flora in Valencia (Spain, 92/11-07)

The aim of this project was to set up a network of micro-reserves to protect the threatened flora of this Region. With over 3000 plant species and over 60 endemic species, Valencia is also one of the richest botanical regions of Europe. In order to select the micro-reserves, a good understanding of the plant geography and plant taxonomy was needed. Additionally, in order to save threatened species, micro-propagation techniques were tested and improved. Finally, identification keys for notoriously difficult genera such as *Limonium* were prepared.

Key-words: *Limonium*, taxonomy, chorology, phyto-geography, micro-propagation, re-establishment.

- Habitats and flora in Corsica (France, LIFE 94) - Priority species and meadows of the Lower Seine (France, LIFE 99) - Conservation of priority plant species in Aeolian Islands (Italy, 99/6217)

Ces projets concernent la conservation ex-situ des espèces végétales menacées, avec la maîtrise de la germination des graines, et de la culture pour les opérations de renforcement ou de réintroduction. Ces projets ont permis de développer une collaboration entre scientifiques et gestionnaires au service de la conservation. Parmi ces recherches, citons l'étude de la banque de semences dans le sol. En conditions défavorables, une station de plantes peut comporter un très faible nombre de pieds ou même avoir disparu, alors que peut subsister un important gisement de semences en latence. La présence de ce potentiel n'est donc pas sans conséquence sur la gestion et les actions de restauration.

Key-words: ex-situ conservation, culture, seed bank, dormancy, population viability, re-establishment.

- Conservation of priority and rare plant species of Madeira (Portugal, 99/6431)

The broad objective of this project is to avoid the extinction of eight extremely endangered endemic plants in the Madeira Island. It aims at updating the distribution range of each species, collecting seed and vegetative material and conserving the genetic variability through the creation of a germ-plasma bank. Biology and ecology studies will be carried out in order to allow the development of adequate ex-situ and in-situ propagation techniques and population reinforcement and reintroduction. The Botanical Garden of Madeira, a well-known scientific institution, is implementing actions. The project also includes measures aimed at the local community and municipalities. It is planned to achieve a better level of awareness towards the need to conserve endemic plants and to persuade the municipalities to implement a network of reserves at the local level.

Key-words: auto-ecology, bio-geography, ex-situ conservation, re-establishment, population monitoring

INVERTEBRATES

- Preservation of the beetle, *Osmoderma eremita*, in Sweden (Sweden 97/288)

The restoration and protection of 45 sites in South Sweden for this wood-dwelling beetle (and priority species under the Habitats Directive) is the main target of this project. Considering the large number of sites involved, the project also has strategic importance for the long-term survival of the species in Europe. Project actions were based on previous research in habitat requirements of the species, i.e. large and old hollow deciduous trees (mainly oak) in wooded meadows. One of the first outputs of the project was a general programme for the conservation of the species in Sweden; this was accompanied by a general management plan for the species. Both underpinned and helped to prioritise the on-site restoration work financed through the project. Challenges for the long-term survival of the species concern *inter alia* recruitment of large and hollow oak trees, which involves a time perspective of some hundreds of years if to take this issue properly into consideration.

Key-words: *Osmoderma eremita*, Hermit Beetle, wood-living beetles, wooded meadows, deciduous brood-leaved forests, rot-holes, habitat preferences, habitat restoration, population monitoring.

- Protection Programme for threatened dragonflies in SW-Germany (Germany, 96/492)

This project concerns two dragonflies *Leucorrhinia pectoralis* and *Coenagrion mercuriale*. The first species is found in second stagnant water bodies, associated with mires and the second species occurs in groundwater-influenced ditches. However, both species disperse their eggs in very specific vegetation structures, which are not always present and which depend upon the succession stages of the respective ecosystems. Therefore, successful conservation management can only be conceived if the "meta-population" is taken into account or when immigration and emigration of both species is understood. The research co-financed by LIFE-Nature as part of this project focuses on the identification of the habitat characteristics or the ecological niches of the different phases of the dragonflies and on experimental evaluation of the distribution of individuals within the meta-populations.

Key-words: *Leucorrhinia pectoralis*, *Coenagrion mercuriale*, Dragonflies, ecological succession, meta-population, dispersion, habitat preference, population monitoring.

- Pearl Mussel (Finland, 97/293)

The Pearl Mussel (*Margaritifera margaritifera*) is one of the most threatened fresh-water bivalves in Europe. The objective of this LIFE-Nature project is to stop the decline of this species and to restore its habitat in 3 river sites in Finland and prepare a technical report on how to restore Pearl Mussel rivers. LIFE-Nature only co-finances the preparation of the restoration plans, the restoration and monitoring aspects of this project. Nevertheless, this project was based upon an in-depth analysis of the three major water courses where this species occurs. Attention was given to water quality, inventory of Pearl Mussels, micro and macro habitats of pearl mussel within the river etc. But the importance of interactions with habitats around the stream (grasslands or intact forest systems) was not fully developed in this project, although it has been recognised as an important factor for the conservation of this species in other parts of Europe.

Key-words: *Margaritifera margaritifera*, Pearl Mussel, river ecology, habitat preferences, habitat restoration, population monitoring.

FISHES

- River restoration for the Danube Salmon (*Hucho hucho*) (Austria, 99/6054)

The Huchen or Danube Salmon is the largest central European salmonid. Its natural habitat is restricted to the Danube river system. Once widespread, this species is now in danger, primarily due to barriers and dams, which often prevent insurmountable obstacles for spawning fish and which present exchange between sub-populations. The concept of the meta-populations is a basic scientific element to restore the river and its tributaries and to allow the sub-populations to exchange.

Key-words: *Hucho hucho*, Danube Salmon, running waters, meta-population, habitat restoration, population monitoring.

- Atlantic Sturgeon (France, LIFE 94)

L'Esturgeon européen (*Acipenser sturio*) est l'une des 5 espèces de poissons prioritaires de la directive 92/43/CEE. Autrefois répandue dans toutes les mers et tous les grands fleuves d'Europe, cette espèce migratrice est aujourd'hui au bord de l'extinction, en raison de la dégradation des cours d'eau et de la pêche intensive. Le bassin Gironde Dordogne Garonne héberge la dernière zone mondiale de reproduction connue de cette espèce. Un projet LIFE, sur cette espèce, a permis d'identifier les différents sites clés pour l'espèce dans ce secteur, comme les zones de frayères et les zones d'alimentation des juvéniles ainsi que l'impact des pêcheries dans l'estuaire. La première reproduction en captivité a également été

réussie en 1995 dans le cadre de ce projet. Une partie des alevins obtenus a été relâchée dans le milieu naturel.

Key-words: *Acipenser sturio*, Atlantic Sturgeon, captive breeding, re-establishment, population dynamics, population monitoring, fisheries impact.

- *Ladigesocypris ghigii*, an endemic fish from Rhodes (Greece, LIFE 98)

Le projet a structuré les premières actions de conservation de l'espèce avec au préalable une première étude sur la distribution de cette espèce inféodée aux cours d'eau de l'île. Il a aussi développé une analyse génétique qui a démontré que la population de chaque ruisseau est complètement isolée des autres et que la diversité génétique au sein de chaque population est faible. Ces résultats ont des implications directes sur la conservation de l'espèce puisque chaque population doit être traitée comme une unité de conservation.

Key-words: *Ladigesocypris ghigii*, endemism, meta-population, dispersion, conservation genetics, population monitoring.

- A conservation strategy for *Anaecypris hispanica* (Portugal, 97/280)

The project aimed at preparing a management and conservation strategy for this endemic endangered species, selecting areas to propose for the Natura 2000 network and creating refuge areas for the species. A lot of scientific research was necessary due to the lack of knowledge on the biology and ecology of the species. Studies on species distribution and ecological limiting factors, genetic characterization of the populations and models of habitat use were carried out. An in-vitro breeding system was also set up. The University of Lisbon managed the project. It also contributed to reinforce communication and collaboration between different institutions and competent authorities involved in the management of river ecosystems. The results of the studies and the management measures defined in this project are very important taking into account the construction of Alqueva dam, which affects the area where this endangered species is found.

Key-words: *Anaecypris hispanica*, autecology, conservation genetics, captive breeding, population monitoring and modelling, protected areas.

AMPHIBIANS & REPTILES

- Consolidation of *Bombina bombina* in Denmark (Denmark 99/6454)

The project involves seven of the total of eight sites where this amphibian still exists in Denmark. Actions include restoration of sites, as well as captive breeding and re-location in order to reinforce existing populations and to re-introduce the species to sites where it has become extinct. In parallel, the beneficiary will create some free-living "reserve populations" in order to make the species less vulnerable to unpredictable "catastrophic" events that may destroy sites. The project objectives, in terms of numbers of individuals at various sites, are based on modern theory about metapopulation dynamics and minimum viable population sizes in order to reduce the risk of future declines. Practical difficulties in captive rearing are also being addressed as the project evolves.

Key-words: *Bombina bombina*, Fire-bellied Toad, amphibians, coastal meadows, metapopulations, population viability, captive breeding, population monitoring and modelling.

- Actions for the conservation of the *Pelobates fuscus insubricus* (Italy, 00/7233)

Pelobates fuscus insubricus is an endemic subspecies of amphibian found only in a few localities of the Po Basin in northern Italy. It is included in Annex II of the Habitats Directive as a priority subspecies. However some Italian scientists have raised a question on the validity of the subspecies. The project foresees the genetic analysis to establish whether the Western spadefoot in Italy is different from the *Pelobates fuscus fuscus* present in other parts of northern Europe. Moreover, monitoring of water quality of the *Pelobates* reproductive sites and studies on the health status of its larvae will be carried out in order to restock the population in suitable areas.

Key-words: *Pelobates fuscus insubricus*, Western spadefoot, conservation genetics, re-establishment, health status, population dynamics, population monitoring.

- Conservation of turtles (*Caretta caretta*) and dolphins (*Tursiops truncatus*) in the Canary Islands (Spain, 97/247)

The principal aim of the project was to define and implement management plans and protective measures in the marine areas frequented by cetaceans and turtles, for which basic scientific research was necessary. Turtles were marked and their movements monitored because the knowledge about their behaviour and their use of the habitat was scarce. Dolphin's population surveys and behaviour studies were carried out, which allowed preparing regulations for activities in the areas used by the species. A scientific study was made about the impact of whale watching and shipping on the cetaceans. Monitoring methods were also developed to improve knowledge for their conservation.

Key-words: *Caretta caretta, Tursiops truncatus,* monitoring, behavioural ecology, habitat preference, population monitoring.

BIRDS

- Determination of the population size and conservation of the Bittern in Schorfheide-Chorin (Germany, 99/5943)

The Bittern (*Botaurus stellaris*) is one of the most threatened wetland birds in Europe. In the large area of Schorfheide Chorin (>40.000 ha) the question of how to evaluate the number of bittern in this pond-rich environment was addressed. Voice pattern recognition research, co-financed by LIFE-Nature, allowed the beneficiary to identify the call of each individual booming male bird. As a result, it seemed that the bird population had been over-estimated in earlier inventories as males booming at different locations were counted as separate individuals.

Key-words: *Botaurus stellaris*, Bittern, voice recognition, population monitoring.

- Urgent actions for the Bittern (*Botaurus stellaris*) in the UK (UK, 95/551)

This was a strategic project aimed at improving the conservation status of the Bittern in ca 13 sites in East-Anglia. The bulk of the work focussed on the restoration and recreation of reed beds. This required some trial and error in order to find the ideal conditions for each of the different sites. Two important approaches were used for this: first the establishment of a technical task force involving leading UK technical experts in reedbed management and recreation. Their task was to visit all project sites before the practical work began to review the proposals, the site details and the feasibility studies. The range of experts involved meant that habitat restoration could be tackled in a holistic way and that new experts could be brought in as the work evolved. The findings of the project were used to produce a set of European reedbed management guidelines. How to tackle as water quality and nutrient enrichment remain key issues though.

Key-words: *Botaurus stellaris*, Bittern, reedbeds, habitat preference, habitat restoration, hydrology, nutrient balance, eutrophication.

- The conservation of the Lesser White-fronted Goose (*Anser erythropus*) in Finland and Sweden (Finland, 97/296)

This Goose is one of the most threatened bird species. Circa half of the global population breeding between Fennoscandia and the Taimyr Peninsula (ca 15.000 breeding pairs) uses the western flyway to overwinter in the Caspian and Black Sea. A significant part of the Fennoscandian population however, overwinters in Greece. The major threat is illegal or legal hunting. LIFE-Nature support co-financed the monitoring of the "Eurasian" population (radio-tracking) in order to have a better understanding of the decline of this species and to set-

up a European conservation strategy for this species. Also, earlier known breeding areas, and potential ones, in Finnish Lapland were surveyed.

Key-words: *Anser erythropus,* Lesser White-fronted Goose, migration, radio telemetry, population monitoring.

- Conservation of the Lesser Kestrel (*Falco naumannii*) in Southern France (France, LIFE 97)

C'est une espèce menacée à l'échelle mondiale. Son déclin en Europe est particulièrement sensible depuis les années soixante. La diminution importante des effectifs est liée principalement à la disparition des zones d'alimentation, en raison de l'intensification de l'agriculture. En France, l'aire de répartition s'étendait autrefois sur la façade méditerranéenne mais actuellement cette espèce ne niche plus que dans la Crau, avec 60 couples. Un suivi des oiseaux par télémétrie a permis d'identifier les secteurs clés pour l'alimentation de l'espèce durant sa présence en Crau (de son retour de migration à la fin de l'élevage des jeunes). La distance par rapport à la colonie, la période et la fréquence d'utilisation des milieux naturels et agricoles ont pu être déterminées. Sur la base de ces résultats, des orientations de gestion par type d'habitat ont été proposées.

Key-words: *Falco naumanni*, Lesser Kestrel, habitat preference, radio telemetry, population monitoring.

- Conservation of four threatened species on private protected land (Spain, 99/72408)

This project tests a series of management measures in privately owned and in intensively managed forest areas. The objective is to protect and to recover four priority species in Central Spain: the Imperial Eagle (*Aquila adalberti*), the Black Vulture (*Aegyppius monachus*), the Black Stork (*Ciconia nigra*) and the Iberian Lynx (*Lyns pardinus*).

Key-words: *Aquila adalberti, Aegyppius monachus, Ciconia nigra*, *Lyns pardinus*, population monitoring.

- Black Vulture (*Aegyppius monachos*) conservation in forest areas in Madrid (Spain, 98/467)

The project's main objective was to preserve and increase the black vulture population in the Madrid region, where it is currently classified in the category 'in danger of extinction'. Information was collected and analysed about the species biology, ecology and status in the region to diagnose its conservation status, the main problems it faces and their possible solutions. A very interesting scientific research is being carried out on the forestry practices that are considered necessary in a quite productive pine forest where one of the main black vulture

colonies is living and breeding. All these studies will permit the elaboration of a Management Plan for the species in the region.

Key-words: *Aegyppius monachos*, feeding ecology, habitat preferences, bio-geography, population monitoring.

The conservation of grouse species in the Black Forest (Germany, 98/439)

The project aims at preserving and increasing the value of forest habitats for the grouse species (*Tetrao urogallus* and *Bonasa bonasia*) in the Feldberg region by using silvicultural measures and by improving the visitor guidance system, as disturbance by tourists is one of the main negative factors. The LIFE-Nature project is part of a bigger, on-going programme for Tetraonidae across the entire Black Forest. Through the LIFE-Nature project, a model will be tested and developed which can be used for the programme as a whole. In this applied forestry research project, the range of habitats for these bird species will be better defined and forest management prescriptions will be adopted to take these habitat requirements into account.

Key-words: *Tetrao urogallus*, Capercaillie, *Bonasa bonasia*, Hazel Grouse, habitat preferences, forests, predator control, population modelling and monitoring.

- Conservation of meadow birds in Elzwiesen (Germany, 96/493) -

The Western Curlew (*Numenius arquata*) is the target species for this project on the conservation of breeding meadow birds in the lower Rhine area. The decline in breeding birds is attributed to foxes and carrion crows. Here, the beneficiary learned from his failures when he tested a number of experimental approaches to optimise the breeding success by counteracting predators. Research is now focused upon gaining a better understanding of the curlew population, the presence of foxes and crows and hunting in the region. Thus, this project has a dissemination potential, as predation by foxes and crows has repeatedly been identified as a problem that may hamper the positive outcome of meadow and wetland restoration projects aimed to the benefit for wader birds.

Key-words: *Numenius arquata*, Western Curlew, habitat restoration, wetland, predator control, population viability, population monitoring.

- Conservation of the Little Bustard (*Tetrax tetrax*) (France, LIFE 96)

Dans ce cadre du projet LIFE sur la préservation des populations d'outardes dans les plaines céréalières, une étude a cherché à mettre en évidence les liens entre la disponibilité en insectes et la réussite de la reproduction chez les outardes. Les résultats obtenus permettent de tirer des enseignements sur le type et la répartition des cultures à

favoriser pour améliorer les ressources en insectes pour les outardes durant l'élevage des jeunes.

Key-words: *Tetrax tetrax*, Little Bustard, cereal fields, feeding ecology, breeding success, population dynamics, population monitoring.

- Increase in the size of *Columba bollii* and *Columba junoniae* populations (Spain, 96/504)

The scientific work made for the evaluation of the distribution and status of both endemic species in the Canary Islands was an important part of the project. The results achieved improved very much the knowledge about these species. The new data gathered on abundance, distribution and habitat use by both pigeon species are very useful to draw up management measures. Genetic analyses led to very interesting results, which are important to define conservation measures and eventual reintroduction plans. This project also contributed with experiments for the eradication of rats in some areas, a major conservation concern in islands.

Key-words: *Columba bollii, Columba junoniae*, auto-ecology, habitat preferences, conservation genetics, predator control, re-establishment, population monitoring.

MAMMALS

- The conservation of the Wild Forest Reindeer (*Rangifer tarandus fennicus*) in Finland (Finland, 98/510)

The wild forest reindeer is a threatened subspecies, primarily because of hybridisation with the Domestic Reindeer (*Rangifer tarandus tarandus*). The LIFE-Nature project addressed one crucial research issue: it made a population genetics study of the Fennoscandian wild forest reindeer using DNA characters to assess racial purity. According to this study the wild forest reindeer in Kainuu, Finland and Karelia, Russia form a coherent group from a genetic point of view. It differs clearly from Finnish domestic reindeer as well as wild forest reindeer from Arkhangelsk along the White Sea. There is no significant "contamination" by Domestic Reindeer within the Finnish Wild Forest Reindeer population even though hybridisation has happened after the species started to come back to Finland in 1950s. The conclusion was that Wild Forest Reindeer in Finland is still genetically pure and thus can be used for reintroduction within Finland in the future. The results of this study were also in line with the results of earlier craniological studies.

Key-words: *Rangifer tarandus fennicus*, Wild Forest Reindeer, subspecies, hybridisation, conservation genetics, re-establishment, population monitoring.

- Conservation and development of *Rupicapra pyrenaica ornata* in the Gran Sasso (Italy, 97-268)

The Abruzzo chamois (*Rupicapra pyrenaica ornata*), a priority species according to the Habitats Directive, has 25-30 individuals in the Gran Sasso National Park. Through a monitoring programme and a series of thorough veterinary studies the park was able to obtain an up-to-dated picture of the chamois' demographic and health status.

Key-words: *Rupicapra pyrenaica ornata*, chamois, health, population dynamics, population monitoring.

- Bats in the Brussels region (Belgium, 98/432)

A substantial amount of the LIFE-nature support for this project is being used to monitor the distribution and abundance of bat species in the Brussels region (use of "bat boxes"). Additionally, assuming that the bat species rely on macro-benthos, emerging from the underwater substrates, the beneficiary's partner identified the larvae-fauna in a number of ponds in the Brussels region and plans to integrate these previously collected water and sediment data. The results of these studies should be used in the preparation of the management plans for the bat habitats.

Key-words: Bats, ponds, feeding ecology, population monitoring.

- Recovery of *Mustela lutreola* in Estonia: captive and island populations (Estonia 00/7081)

The distribution and population size of European Mink (*Mustela lutreola*) has decreased drastically in Western and Central Europe during the last 50 years; habitat decline and competition with the American Mink (*Mustela vison*) being the most important reasons. For the captive breeding program at Tallinn Zoo, the beneficiary has used population models in order to assess the most work- and cost-effective population number (=145 individuals) and sex composition in order secure a satisfactory genetic constitution over a 25-years period. The re-introduction of the species will be tested at two sites through the project.

Key-words: *Mustela lutreola*, European Mink, coastal meadows, captive breeding, population monitoring.

- Preservation of the Arctic Fox (*Alopex lagopus*) in Sweden and Finland (Sweden 98/515)

The main project objective is to double the population of this priority species in Finland and Sweden (and thus within the whole EU) over a 4-years period, from the precariously low level of less than 100 animals; using supplementary feeding and predator (red fox) control

as the main actions. Although the project was based on the best scientific advice available at the time the proposal was submitted (early 1998), it is now obvious that the objective will not be achieved. This failure throws the problem back to scientists, in order to identify the reasons and to propose other actions. To initiate a captive breeding and re-location program has been proposed, but still no consensus between experts whether this is the right option for the future. An action plan for the long-term management is planned as one of the final outputs from the project (by December 2002); the preparation of this document may be an interesting challenge in view of the failure to achieve the project objectives.

Key-words: *Alopex lagopus*, Artic Fox, population viability, predator control, population monitoring.

- Brown Bear conservation in Central Apennines (Italy, 99/6244)

The only certain fact is that the *Ursus arctos marsicanus* lives only in the central Apennines. The population is small but still capable of reproducing. Otherwise, there is no up-to-date information on this sub-species: the exact size of the population, demographic details (age, distribution of sexes, etc.) and state of health, all of which affect reproduction potential. This project covers a significant proportion of the brown bear's distribution area, which is being surveyed using radio-telemetry and DNA-fingerprinting to obtain bio-ecological data on the species and its habitat. Proposals for regulations will then be produced to allow co-ordination of management systems in order to minimize conflict with human activities and ensure the maintenance of a self-sustaining population of bears in the area over the long term.

Key-words: *Ursus arctos marsicanus*, Brown Bear, habitat preference, population viability, DNA fingerprinting, radio telemetry, population monitoring.

- Threatened vertebrates in the Pyrénées (France, LIFE 93 et LIFE 96) - Wolf in the French Alps (France, LIFE 96)

La recherche génétique est intervenue pour le typage génétique et le sexage des ours des Pyrénées (autochtones et réintroduits) ainsi que pour l'identification de l'origine des loups en France et la séparation loup/chien pour l'expertise des dégâts. A travers ces projets LIFE, cette nouvelle forme d'investigation (la génétique de la conservation) a pu émerger en France. Elle complète très utilement les recherches de terrain pour guider la gestion conservatoire des populations animales fragmentées et menacées. Ces techniques, issues des années 90, se répandront largement en biologie de la conservation lors de la prochaine décennie.

Key-words: *Canis lupus*, Wolf, *Ursus arctos*, Brown Bear, conservation genetics.

- Wolf conservation in Greece (Greece, LIFE 97)

Avant le début du projet, il était estimé que l'hybridation du loup avec les chiens errants était une menace sérieuse. L'analyse ADN de spécimens morts a révélé en fait un très faible taux d'hybridation avec le chien. Ces résultats ont permis au projet de réorienter ces actions vers des menaces plus importantes.

Key-words: *Canis lupus*, Wolf, hybridisation, conservation genetics.

- Actions for the conservation of the wolf in the Alto Appennino Reggiano Regional Park (Italy, 96/525)

The project involves studies to increase specific knowledge of the wolves present in the park (estimates of numbers, the animals' actual hunting range, maps of breeding sites, diet in relation to available prey) and, in parallel, on the populations of wild ungulates (roe deer, red deer and wild boar) which represent the principal food source for the wolf, in order to elaborate a correct management practice.

Key-words: *Canis lupus*, wolf, ungulates, feeding ecology, population monitoring.

Case studies. II - Management and restoration of ecosystems

MARINE AND COASTAL HABITATS

- Integrated Coastal Conservation Initiative (Belgium, 96/483)

LIFE-Nature co-financed the investigation of the effect of using domestic breeds of herbivores (horses, cattle, donkeys) in extensive grazing management of dune grasslands. Research focused on the effect of each of the grazers on the structure of the vegetation, on the food preferences and on the contribution of these grazers to the distribution of seeds within the grazed areas.

Key-words: dunes, marine environment, grazing management, feeding ecology, monitoring.

- Friesland Buitendijks (The Netherlands, 93/754)

Friesland Buitendijks is a circa 4000 ha large coastal area in the North of the Netherlands. A part of the LIFE-Nature support was used to co-finance a pilot programme to reconvert summer polders to salt marshes and this included the set-up of a detailed vegetation monitoring and erosion/sedimentation programme. Question asked: how will the vegetation react to the change from fresh water to salt

water and to the regular tidal flooding of the salt marsh? What will be the effect on the sedimentation?

Key-words: salt marshes, polders, hydrology, habitat restoration, monitoring

- Conservation of SPAs on Islands in Valencia (Spain, 98/447)

The project's overall objective is to improve the conservation status of two SPAs Islands (Columbretes and Benidorm) in the Valencia region. Interesting research on the interactions between fisheries and marine birds has been carried out. The results have already been applied on an experimental basis involving groups of local fishermen in some of these Islands (Columbretes).

Key-words: marine ecology, population monitoring.

WETLAND HABITATS

- Fochterloërveen (Netherlands, 99/6280)/ Korenburgerveen (Netherlands, 00/7049)

Both projects focus on large degraded raised bogs in the Netherlands, where restoration techniques based upon a detailed analysis of the bog hydrology will be implemented. The questions asked were: Where and how are the bogs losing water? How should dams be built to retain the water inside the bogs longer and to restart natural peat formation (growth of *Sphagnum*)? As soon as the restoration measures are completed, LIFE-Nature support will be used to set up the monitoring system.

Key- words: bogs, peat, hydrology, habitat restoration, monitoring.

- Aapa and raised bog protection (Finland, 96/542)

In order to restore one of the core areas of this project in the Seitseminen National Park, LIFE-Nature co-financed a detailed analysis of the hydrology of a raised bog. Not only did the beneficiary investigate the in- and output of water, but he also looked at the overall nutrient balances. This detailed analysis proved to be important to prepare the restoration techniques.

Key-words: bogs, hydrology, nutrient balance, habitat restoration, monitoring.

- Wieden-Weerribben (The Netherlands, 99/6282)

This project concerns one of the largest fens (minerotrophic mires) in north-western Europe and focuses on the re-creation or maintenance of the initial succession phases of the fens, such as the "quaking

mires". LIFE-Nature does not co-finance research aspects, but the restoration measures rely to a very large extent on the recently-acquired understanding of the mire hydrology and the movement of nutrients through these ecosystems (which are also called rheotrophic mires). This detailed preliminary hydrological assessment is sometimes lacking in several other fen-related LIFE-Nature projects (networking is important here).

Key-words: fens, hydrology, nutrient balance, habitat restoration, monitoring.

- The restoration of the fens of the Rhine Delta (Austria, 98/508) -

This project demonstrates that a good hydrological know-how is needed before habitat restoration can start. During the first year of the project implementation, vegetation analysis and experimental rehumidification indicated that the original minerotrophic vegetation of the fens could only be restored if water from Lake Constance, which has the right alkalinity and chemical composition, is fed into the site. The measures originally proposed, and approved for LIFE-Nature co-finance, would not be effective, the research showed. The scientifically ideal measures however, proved to be a major problem technically and financially, so that the project had to be cut short.

Key-words: fens, hydrology, nutrient balance, habitat restoration, monitoring, field experimentation.

- Border Mires - Blanket bogs (UK, 98/517) -

As with many other projects involving mire conservation in the UK hydrological issues have played a crucial role in the conservation of fens and bogs here as well. Therefore much research has focused on the hydrology of these ecosystems, which has then been put to practice in the development of the on-site restoration works. New in this project is that testate amoebas are being explored to test the wetness and mire quality (biomonitoring of the hydrology).

Key-words: fens, hydrology, nutrient balance, habitat restoration, monitoring.

- Restoration of Lake Östen (Sweden 99/6355)

This is a large-scale restoration of a shallow and eutrophic lake (and SPA) in Västra Götaland County, SW Sweden. The main actions are to adjust the water-level regulation of the lake and restore shore meadows to their former condition; to benefit breeding and migrating waterfowl and wader species. The restoration proposal (now under assessment by The National Environmental Court) was based on thorough analyses of five different alternatives, which reflected a lack of consensus between scientists as well as between site managers and land-owners about the future management of the lake. The

Environmental Court may also decide about a monitoring program as a reference for any future claims of compensation by stake-holders, as well as to follow up the results of the project actions. For this monitoring, results from surveys of bird fauna, vegetation, sediments and lake fauna (invertebrates, fish, sediments) since the 1970s and onwards exist as references.

Key-words: freshwater lakes, wetlands, grasslands, hydrology, habitat restoration, monitoring.

- Restoration of Lake Grand-Lieu (France, LIFE 94)

Avec une superficie de 6 000 ha, le lac de Grand-Lieu est un des plus grands lacs naturels de France. Cette zone humide peu profonde héberge de très nombreuses espèces d'oiseaux nicheurs et hivernants La modification de la gestion hydraulique dans les années cinquante et les pollutions agricoles du bassin versant sont à l'origine d'une dramatique eutrophisation. Elle compromet, la survie du lac, puisque le rythme de l'envasement s'est accéléré ces dernières années. L'intervention des scientifiques qui ont évalué les apports en nutriments et la capacité épuratrice du lac, a permis de proposer 3 mesures de sauvetage du lac : revenir à un régime hydraulique naturel, diminuer la pollution du bassin versant et favoriser l'évacuation des vases grâce à une technique par dilution dans l'exutoire.

Key-words: freshwater lake, hydrology, nutrient balance, eutrophication, monitoring.

MEADOW ECOSYSTEMS

- Restoration and management of meadow in Finland, Sweden and Estonia (Finland 01/7067)

This project focuses on the conservation of ca 20 coastal meadows, bordering the Baltic Sea. Butterflies are used as indicator species for habitat quality, and the monitoring constitutes a part of the Finnish Biodiversity Research Programme.

Key-words: butterflies, coastal meadows, habitat restoration, monitoring.

FOREST ECOSYSTEMS

- The protection of the primeval forests of Dürrenstein (Austria, 97/290)

The objective of this LIFE-Nature project, to safeguard the pristine forests of Dürrenstein, was primarily achieved by a one-off payment,

which stopped all land-uses. Since this is probably the last remaining untouched large forest area in central Europe, LIFE-Nature co-financed a detailed status-quo description as the basis for future monitoring and a comprehensive monitoring system to appreciate, on the basis of indicator groups, the species-richness of the area.

Key-words: alpine pristine forests, biodiversity indicators, monitoring.

- Restoring the Atlantic Oakwoods (UK, 97/234)

The aim of this project is to restore a significant proportion of the Atlantic Oakwood habitat in the UK to favourable condition. One of the main problems facing these sites apart from *Rhododendron* invasion is the serious effect of over-grazing by deer. Scientific research will be done to underpin the development of strategies for the management of grazing in the oakwood sites. This will include:

- Identifying factors effecting growth of oak, hazel, birch and rowan samplings
- Relating browsing of saplings to use of the sites by ungulates
- Predict levels of ungulate use that will allow the regeneration of the woods

Deer populations in Scotland have almost doubled in the last 40 years from 180.000 to 300.000 with an average density of 20 animals/km². But reducing this level has very serious socio-economic implications for the private sporting estates. To be able to find a way forward it is essential to be able to demonstrate the damage caused by the deer and determine optimum grazing levels. The scientific work undertaken in this project is therefore crucial.

Key-words: oak forests, invasive species, grazing, population dynamics

- Recovery of riverine ecosystems in Los Galachos SPA (Spain, 96/508)

The main objective of this project was the restoration of the riparian ecosystem within a river meander (Galachos SPA) and its management in favour of nature conservation and bird populations. The restoration of the riverine forests was based on scientific studies carried out at the beginning of the project by a sound scientific institution. At a national scale, the restoration of such a big area following scientific models is innovative. The experience of this restoration has been compiled in a publication, showing failures and successes, aimed at having a demonstration value for other restoration initiatives in riverine ecosystems in the Ebro valley and others. A monitoring plan of the restoration carried out was also contracted, although not included in the Life project.

Key-words: ecosystem functioning, riverine forests, habitat restoration, monitoring.

Case studies. III - Methodology and management planning

- Monitoring SACs in Wales (UK, 95/856)

The objective of this project was to develop an integrated monitoring and management plan methodology for Habitats Directive habitat types found in 19 SCIs in Wales, which would be both cost effective, and user friendly. The project addressed thorny issues such as how to monitor only parts of the habitats but draw conclusions about the whole. It also highlights the difficulties of monitoring without having a comprehensive knowledge of the sites and without having the necessary skills to monitor (can it be done by a layman?). The results are compiled in monitoring handbooks, including case studies, field methods and a technical guide

Key-words: biodiversity indicators, monitoring, management planning

- Management schemes of marine SACs (UK, 96/550)

The UK Marine SACs Project was set up to establish management schemes on selected marine Special Areas of Conservation (SACs). Specifically the project set out to establish operational management schemes on a selection of 12 marine SACs around the UK, working with relevant authorities and other local partners and then to share best practice on developing appropriate management schemes. The other key component was to gather existing knowledge and improve our understanding on:

- The dynamics and sensitivity of marine features
- Impact of human activities on marine features
- Practical techniques for monitoring and accessing the condition of features

This was a mammoth task! Whilst a lot of information existed, little had been done to pool the elements together into a system of easily accessible documents. That is why the project developed a dedicated website to act as a vehicle for communicating and distributing the learning, knowledge and outputs from the UK Marine SACs Project to its wider audience. All documents produced during the project can be downloaded from this site. More information:

http://www.ukmarinesac.org.uk

A similar project using the same approach has now started for UK River SACs.

Key-words: coastal habitats, management planning, monitoring

- Living with the sea (UK, 99/6081)

This project has two specific aims. The first is to develop a framework for maintaining features of European importance on dynamic coastlines. This framework will produce an agreed methodology for resolving issues and implementing best practice in member states that have dynamic coastal habitats to manage. It will review existing European interpretation of ecological integrity and European frameworks for the protection and management of coastal habitats. This will be achieved through information gathering, interpretation and European consensus building to develop support for a practical approach to solving coastal management challenges. The second element will be the development of a best practice guide to provide an information resource for authorities and other practitioners and guide them as to how they can deliver habitat restoration and re-creation works. It will refer to existing works and demonstration sites that address individual coastal habitats such as sand dune, shingle ridge, saline lagoon, salt marsh, mudflats, reed beds and grazing marsh; and identify best practice in the re-creation and restoration of these habitats.

Key-words: coastal habitats, salt marshes, climate change, habitat restoration, habitat modelling, management planning.

- Habitat Italia (Italy, 92/14686)

The project aimed at the identification of pSCIs and of the habitats/species of EU interest in Italy, included scientific research that lead to acquisition of new scientific data. Genetic analysis has been carried out, for instance, on wolves and the outcome has been integrated in the EU Action plan on this species.

Key-words: biodiversity survey, management planning, conservation actions plans, monitoring.

- Inventory of habitat types and species in Spain according to Directive 92/43/EEC (Spain, 92/11-05)

An important scientific work was undertaken through this project for the inventory of habitat types and species distribution in Spain, which was considered necessary for the preparation of the national list of sites proposed for Natura 2000 Network. This involved the participation of specialized researchers from all over the country. The information compiled on habitat types and species, also through fieldwork, was analysed and integrated into a Geographical Information System (GIS) that allowed a comparative analysis for the selection of sites to be proposed for the network of Special Areas of Conservation.

Key-words: baseline data collection, habitat typology, survey, geographical information system, protected areas

1.2 Biodiversity conservation in theory

SCIENTIFIC TOOLS FOR CONSERVATION BIOLOGY

Etienne Branquart & Jurgen Tack
Belgian Biodiversity Platform

> Conservation biology does not have the luxury of time to slowly and timidly reveal its scientific contributions to the world. We must act quickly if we are to influence species extinction rates, habitat loss and the human condition. We have no choice but to succeed, and to succeed quickly!
> Gary K. Meffe, 2001

Conservation biology, a crisis discipline

A recent study of the European Environmental Agency (1999) teaches us that our wildlife is drastically threatened as many semi-natural habitats are degraded or lost in Europe. 38 % of birds and 45 % of butterfly species are under the threat of extinction; more than 60 % of wetlands have been lost while two-thirds of trees growing in European forests are under stress induced by air pollution, climatic factors and/or inadequate forest management practices. Fish stocks are under risk of collapse while some marine life other than commercial fish have been decimated.

Facing the dramatic problems of species erosion and habitat degradation, conservation biology and restoration ecology have been undergoing rapid growth as academic disciplines, while conservation programmes were developed in the field. Since the eighties, scientific institutions have produced numerous dynamic structures such as thematic workgroups, conferences and workshops, scientific journals or international research programmes. Conservation biology is born as a crisis discipline!

Conservationists advocate that management and restoration practices need to place their reliance on **sound scientific bases** to be efficient. To their opinion, new theories and paradigms as well as the use of adequate scientific tools - controlled and replicated field experiment, careful monitoring and modelling approaches - are absolutely essential to improve the success of conservation programmes and manage ecosystems in a sustainable way.

Theoretical approaches to biodiversity conservation

The lack of conservation theory may hinder the development of guiding principles for managing ecosystems and the transfer of state-of-art research into practical management tools.

Kimberly With (1997) recently surveyed 304 papers in Biological Conservation (British Ecological Society) and 267 papers in Conservation Biology (American Society for Conservation Biology) to know what kind of approaches are used in conservation research and how large is the theoretical ground of this discipline. Her study shows that conservation biology is dominated by **descriptive** and **empirical** research, focusing on **monitoring** approaches to assess threats to biodiversity (overharvesting, habitat degradation and fragmentation) or species status (definition of biodiversity surrogates and delimitation of biodiversity 'hotspots'). Basic ecological studies related to species interactions and habitat use are also developed by many scientists (see Figure 1).

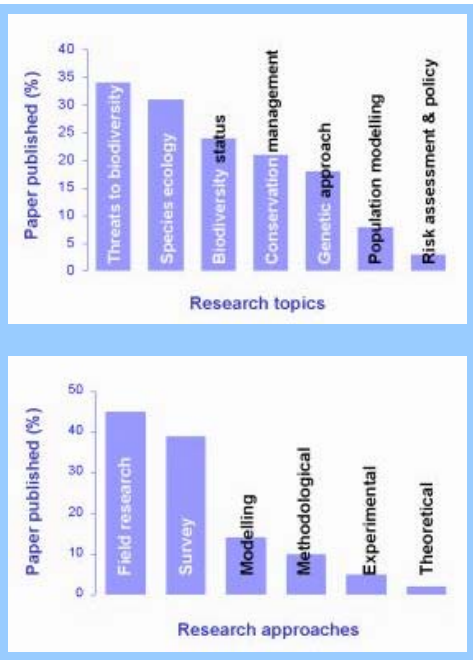

Figure 1 - Percentage of papers published in Biological Conservation and Conservation Biology according to approaches or topics of research. Categories do not tally to 100% because more than one approach may have been employed in individual papers (after With, 1997)

On the other hand, the majority of papers published in these two leading conservation journals are not grounded in any apparent **theoretical** framework and it seems that theories for management applications are virtually absent from the literature.

Moreover, basic scientific tools **such as** modelling **and** experimentation **are only small components of published research. As an emerging discipline, conservation biology needs important theoretical developments to become a reliable and predictive tool for management!**

2 Programme

Field excursion - Sunday December 2

08.30 Departure by bus from the Bedford Hotel
10.00 Coffee break and visit of the fish pass at Lixhe
Scientific presentation : Jean-Claude Philippart (ULg), Claire Prignon (FUNDP), Alain Gillet (MET), Vincent Frank & Pierre Gérard (DGRNE)
12.30 Lunch at the Nature Centre 'De Wissen'
13.30 Film projection and presentation of restoration actions undertaken along the Lower Meuse - Scientific presentation : Patrick Meire (UIA) & Bas Pedroli (Alterra)
14.30 Field visit in Kerkeweerd (B) and Meers (NL)
Field guides : Herman Gielen (AWZ), Martine Lejeune (ARK), Kris Van Looy (IN)
17.00 Departure by bus and return to Brussels
19.00 Dinner

Scientific plenary meeting - Monday December 3

08.30 Registration
09.00 Introduction/Welcome
Welcome 1 - Yvan Ylieff , Government Commissioner attached to the Minister for Scientific Research
09.10 Welcome 2 - Christian Patermann, EU Research DG
09.30 Introduction to the meeting -Abigail Caudron, Belgian Biodiversity Platform

09.40 Coffee break

Report from the e-conference –
Moderator : Allan Watt (CEH, UK)

10.10 General objectives - Etienne Branquart, Belgian Biodiversity Platform
10.20 Biodiversity conservation in practice - Mats Eriksson, Ecosystems Ltd
10.40 Biodiverstiy conservation in theory - Jurgen Tack, Belgian Biodiversity Platform
11.00 Discussion

12.00 Lunch

Management of marine ecoystems –
Moderator : Isabel Sousa Pinto (CIMAR, PT)

13.00 *Biodiversity in natural marine ecosystems : patterns, functioning and conservation – Magda Vincx*
13.20 *Scientific tools to assess, understand, monitor and sustainably manage marine biodiversity exploited by humans – Michel J. Kaiser*
13.40 Discussion

Management of forest ecosystems –
Moderator : Thomas Nilsson(Environmental Protection Agency, SE)

14.20 *Biodiversity of natural and managed forests – from genes to ecosystems – Ladislav Paule*
14.40 *Conserving forest biodiversity: how to facilitate survival of species in managed and natural boreal forests? – Jari Kouki*

15.00 Discussion

15.30 Coffee break

Management of agricultural ecosystems –
Moderator : Esteban Manrique Reol (Ministerio de Ciencia y Technologia, ES)

16.10 *Promoting and monitoring biodiversity in agricultural landscapes: the dilemna of conflicting value systems and indicators – Peter Duelli*
16.30 *Biodiversity interactions within agricultural landscapes*
16.50 Discussion –Davy Mc Cracken

17.30 Poster session : Belgian research on biodiversity conservation

19.00 Dinner *(delegates only)*

Policy-oriented discussion - Tuesday December 4

08.45 Meeting agreement (1) - Presentation of a draft document - Belgian Biodiversity Platform (Facilitator)
09.10 DIVERSITAS: presentation of the programme and new prespectives - Anne Larigauderie, DIVERSITAS, International Council for Science (ICSU, F)
09.30 Results of the e-conference on Marine Biodiversity in Europe (M@RBLE) - Carlo Heip, Project Coordinator (NL)

10.30 Coffee break

11.00 Scientific tools to conserve, manage or restore Natura 2000 habitats :
a delegates contribution - Moderator : Simone Matouch, Österreichisches Netzwerk Umweltforschung, Netzknoten Biodiversität (AT)

12.00 Meeting agreement (2) - Round table discussion **-** Belgian Biodiversity Platform (Facilitator)

13.00 Lunch

14.00 Meeting agreement (3) - Finalisation
Martin Sharman, EU Commission
14.30 The next steps for the EPBRS (relationships with the EC CHM, Diversitas and Bioplatform)
Martin Sharman, EU Commission

15.30 Coffee break

16.00 Prioritising discussion paper on next Framework Porgramme
Martin Sharman, EU Commission

16.45 Invitation to the next EPBRS meeting
Francisco Pugnaire (ES)

17.00 Farewell and closure of the meeting

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