



„Living Lakes - Sustainable Management of Wetlands and Shallow Lakes“

- EU LIFE Environment Project -
Nr. LIFE00 ENV/D/000351



Conference-Reader

Graf Zeppelin Haus, Friedrichshafen
Lake Constance, Germany
28 - 30 October 2004

Co-financed by the European Union



EU LIFE Programme - DG Environment



*International Foundation
for Environment and Nature*

Imprint

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Content

1. Welcoming Remarks and Introduction: Need and Contents of Management Plans for Wetland Areas Prof Aitken Clark	2
2. Welcoming Speech Tillmann Stöttele	4
3. Conservation and Nature Management in Friedrichshafen Bertrand Schmidt	5
4. Introduction to the EU LIFE Project Udo Gattenlöhner	7
5. Development of the Project "Sustainable Management of Wetlands and Shallow Lakes " in Spain Fernando Jubete and Antonio Guillem	9
6. Experiences in Management Planning and Wetland Restoration at the Nestos Lakes and Lagoons in the Frame of a Life Environment Project Hans Jerrentrup	13
7. The EU Water Framework Directive: More Protection for our Waters, More Participation of Citizens Dr Helmut Blöch	19
8. Participatory Approach to Managing a Wetland National Park Dr Michael Green	20
9. Ecological Quality Assessment of Lakeshores - Requirements of the EC Water Framework Directive and the Natural Habitats Directive (FFH) Dr Wolfgang Ostendorp	22
10. Constructed Wetlands Treatment Plants: Requirements, Operation Modus, Costs, Servicing Dr Andreas Bally	23
11. Programme of Action for the Restoration of Upper Swabian Lakes Albrecht Trautmann	24
12. Agri-Environmental Measures for Villacañas Wetlands Eduardo de Miguel	25
13. Sustainable Tourism: Policy Instruments and Best Practice Marion Hammerl	28
14. Elements of Management Plans for Wetlands – Action Programme Lake Constance 2004 to 2009 Dr Heinz Gerd Schroeder	30
15. Evaluation and Monitoring of Natural Resources Dr Argiris Kallianiotis	31
16. Dissemination and Transferability Udo Gattenlöhner	32

1. Welcoming Remarks and Introduction: Need and Contents of Management Plans for Wetland Areas

Prof Aitken Clark

Vice President of GNF and Advisory Board, UK

I would hereby like to welcome you to the final conference of the EU LIFE Environment Project on "Sustainable Management of Wetlands and Shallow Lakes" in Friedrichshafen. This conference is taking place at Lake Constance, junction of three countries and vital source for Millions of people who live, work and relax here. Such exposed area requires an adequate management in order to maintain its beauty and sustainable value.

Since 2001, at the steppe lakes La Nava and Boada in Spain and at the Greek Nestos Lakes and lagoons a project promoting sustainable use and development of these endangered wetland regions has been carried out. The goal of the project is to develop in cooperation with the neighbouring communities protection concepts for these valuable wetlands considering ecological aspects as well as social and economic needs. This EU subsidised project is being coordinated by GNF and realised in collaboration with seven partner organisations from Greece, Spain, England and Germany.

Looking back the EU LIFE projects origin, GNF together with the Broads and other partners, was among about one hundred applicants out of about 830 applicants to receive a grant from the European Union Life III Programme.

Starting off in the beginning of 2001, GNF the EU LIFE participants have successfully shown their ability to intertwine transboundary know-how and combine interests as well as to use its financial resources, expediently. Wetland Management is a comprehensive task incorporating a well structured concept and a continuous reconciliation with the parties involved. Thus, it is an essential component to maintain the mutual exchange of information among the parties involved about the current project status and to inform the public. The latter being accomplished by experienced PR work as well as trainings to support environmental education for a broad public.

There was a consensus in the project team, that the management plans have to be a product of an iterative process: The concept is to start with

drafts for the project areas – developed by the project partners. These drafts constituted the basis for the next step: the discussion with local and regional stakeholders. In an stepwise, sometimes repeating process the plan was adjusted to the differing interests and finally signed by all stakeholders involved.

As we have seen throughout the last three years, this project succeeded in gathering valuable hands-on experience with respect to wetland management based on the Lakes La Nava and Boada in Spain, and the Nestos Lakes in north-eastern Greece. Good news is, that this knowledge is, adopted to the prevailing in-situ conditions, transferable to other regions. The most important outcome of this project are detailed management plans for the project areas and beyond. These have been developed in a participatory approach together with all stakeholders in order to be transferred from paper to practice within the coming years.



The conducted activities merge in the enhancement of the regions nature conservation value while benefiting the social and economic needs of the local communities.

Focussing on exemplary contents of wetland management for e.g. the Nestos area the management plan included the following subjects such as Biotope and Water Management, Restoration, Agricultural Extensification and Sustainable Tourism/Visitor Management. A three-day workshop on wetland management took place in the Nestos area in October 2003. It was

organised by the Living Lakes partner EPO. In 2002 already, new plantations along four freshwater lakes in the Nestos region were realised to create a biotope connection. The workshop participants were able to visit the ongoing planting arrangements close to the Nestos lagoons. An area of 5 ha along the lagoon of Vassova has been created as buffer zone. By reducing the nutrient input into the lagoon that way, the quality of this valuable ecosystem will be maintained. Mainly the native cattail (*Typha spec.*) is being used as seed stock and planted in a density of 15,000 plants per hectare.

The project activities and outcomes are documented in a multilingual brochure (English, Greek, Spanish) summarising the focal points and most important measures. Guidelines and recommendations for the development of a management plan with numerous practical examples and experiences made within this project are published in a detailed manual that is available in four languages (English, Greek, Spanish and German). Moreover an educational video has been produced to give an overview of the implemented project activities.

I look forward to this stimulating and challenging programme which is being presented today by many of the experts who have been engaged in this project.

Zusammenfassung:

Herzlich Willkommen zu der Abschlusskonferenz des EU LIFE Projekts „Nachhaltiges Management von Feuchtgebieten und Flachwasserseen“ in Friedrichshafen. Ein solcher Ort wie der Bodensee, der sich zwischen den drei Ländern Schweiz, Deutschland und Österreich befindet, bedarf eines angemessenen Managements, um diese Schönheit und den nachhaltigen Wert zu erhalten.

Das Projekt wird seit dem Jahr 2001 in Spanien (La Nava und Boda) und Griechenland (Nestos Seen) vom Global Nature Fund in Zusammenarbeit mit sieben Partnerorganisationen durchgeführt. Ziel war es, Schutzkonzepte zu erarbeiten, die sowohl ökologische als auch soziale und wirtschaftliche Faktoren berücksichtigen.

Der Erfolg des Projekts spiegelt sich in den wertvollen Erfahrungen, die wir machen konnten und den Erkenntnissen, die wir gewonnen haben, wider. Die gute Nachricht ist, dass diese Elemente auf andere Gebiete übertragbar sind. Hierzu zählen auch die Managementpläne, die entwickelt und z.B. im Hinblick auf Biotop und Wassermanagement und nachhaltiges Tourismusmanagement eingesetzt wurden. Einige von Ihnen haben sich von der Anlage von Pufferzonen der Nestos Lagunen selber vor Ort überzeugen können.

Die Ergebnisse wurden in mehrsprachigen Broschüren bzw. Dokumentationen festgehalten und mittels Filmaufnahmen illustriert.

Ich freue mich nun auf das vielseitige Programm, das von vielen der Experten gestaltet wird.

2. Welcoming Speech

Tillmann Stottele

Director of the Office for Environment and Nature Conservation, City of Friedrichshafen, Germany

For good reasons the tri-national region of Lake Constance hosts the final Draft Conference of the EU LIFE Environment Project “Sustainable management of Wetlands and Shallow Lakes”: Ecological and environmental concern for a sustainable development of the lake and its catchment area has a tradition for decades as well as international exchange and cooperation is the imperative condition for its success.

The City of Friedrichshafen supports the Living Lakes Project of the Global Nature Fund with great sympathy. The idea of an international network carries the positive experience with cross-border cooperation at Lake Constance all over the world. This requires courage and enthusiasm, especially for such a small team as the Global Nature Fund in Radolfzell.



The City of Friedrichshafen as you will get to know it today would not exist without that kind of courage and enthusiasm. From its harbour started the first steam ferries over the lake, from its lake shore took off the first Zeppelin, whose follow-up models connected Europe with the new world by scheduled flights long time before modern airplanes were invented. The Zeppelin industry was the basis for the economic growth and wealth of our city and its surroundings. Nowadays, Friedrichshafen, with its 57.000 inhabitants and 26.000 high-tech jobs, is the second biggest town and most important industrial site at Lake Constance. The exhibition and the airport are beneath Stuttgart the second important facilities in this vein in South West

Germany. But anyway, the city is an important tourist location, thanks to its long promenade at the lake, its cultural facilities and its agricultural coined hinterland.

Many basic problems result from this coexistence of partly competing use in an ecological sensitive region:

- Persistent population growth (+1% per year)
- Continuing settlement growth
- Big traffic increase, especially freight traffic
- Intensive use and change of the affluents
- Increasing use and change of the shore line and shallow waters
- Growing use of the lake for leisure activities and shipping
- Continuing intensification of farming and forestry
- High immissions of fertilizers and of pollutants into the lake
- Remarkable climate warming since 1880: + 1,5 to + 2,0°C and another expected + 2,0 to + 2,5°C until 2100

The solution of these problems requires great efforts, endurance and persuasive power. The City of Friedrichshafen is aware of its responsibility for an ecological, economic and social sustainable development of the region. We know about the impacts city growth causes to the environment. Therefore, settlement and landscape planning as well as the environmental policy are on a high level in Friedrichshafen. The latter puts one main emphasis on lake shore restoration, water quality, protection of natural waters and wetland management. Friedrichshafen is the only community in the region with a comprehensive coverage of its ponds and creeks as Bertrand Schmidt will show. Through the actual land use planning we prepare some large landscape protection zones which include the major creeks and reeds in the city's hinterlands. Therefore this conference is of special interest also for ourselves and was looking forward to learn of all the competence and experi-

ence of each of you. Thank you for coming to Friedrichshafen, thank you for your contribution to this conference! I wish us all fruitful and stimulating days and hope, that you enjoy your stay in our town.

Zusammenfassung:

Es gibt gute Gründe, warum die Abschlusskonferenz dieses EU-Projekts ausgerechnet am Bodensee und speziell in Friedrichshafen stattfindet. Der Gedanke einer nachhaltigen Entwicklung einer Seenregion hat hier eine lange Tradition. Die Stadt Friedrichshafen ist sich ihrer Verantwortung für eine ökologische, ökonomische und soziale Entwicklung in der Region bewusst. Durch ein internationales Projekt wie dieses, werden die positiven Erfahrungen in aller Welt verbreitet. Dies erfordert Mut und Begeisterung, die der Global Nature Fund bewiesen hat.

3. Conservation and Nature Management in Friedrichshafen

Bertrand Schmidt

Vice-Director of the Office for Environment and Nature Conservation, City of Friedrichshafen, Germany

Founded in 1811, Friedrichshafen is a comparatively young and dynamically growing town at the northern shore of Lake Constance. The entire area is about 70 km². With its 57,000 inhabitants the population density is 814 people per km². Famous for the Zeppelin, big global players in the sectors automotive supply industry, engineering and aerospace with 26,600 employees are domiciled in the town. The trade fair and the airport are the second biggest facilities in South West Germany. Additionally, tourism with 640,000 over night stays per year, plays an important role, thanks to its long promenade along the lake, its cultural facilities and its attractive cultural landscape with meadows, woodlands, wetlands and old orchards. The resources include 27.2% settlement and traffic area, 52.0% agriculture and fruit growing, 19.3% forest, 0.6% waters and 0.9% wetlands and other land uses.

The environmental administration in the federal state Baden-Württemberg provides the Ministries for Environment and Traffic and Rural Areas, the technical and scientific branch with the Regional Office for Environmental Protection

(Landesanstalt für Umweltschutz), the Regional Council (Regierungspräsidium) as upper conservation authority, the District Office (Landratsamt) as lower conservation authority and last but not least the communal offices for environmental protection (Kommunale Umweltschutzämter) in bigger cities such as Friedrichshafen.

Our main work is public participation, education, Local Agenda 21, environmental impact assessment and sustainable settlement development, water and nature management, protection and climate protection. Out of our fields of activity and action some examples are given:

Water protection

Within the past 10 years a network of 280 km running waters was analysed and a digital mapping undertaken. Great efforts were made to connect all households via the canal network to the sewage treatment plant. The water quality has significantly improved between 1993 and 1999. Currently at almost all water sampling locations the water quality is good or satisfactory. From 1990 to 2000 the Town of Friedrichshafen has invested 70 Million Euro for

wastewater drains and sewage works. For all running waters water development plans were established to reduce the high structural deficits. Meanwhile more than a 6.5 km long stretch of the 70 km long main water network was upgraded rather close to nature or renaturated. 4.2 Million Euro were raised with the support of state subsidies. More than 1,5 km out of 11 km long Lake Bodensee shoreline have been restored by the Gewässerdirektion (Water Management Directive).



The main task for the future is the restoration of eco-morphologically highly affected water sections, wetlands and shore lines. In the Water Quality Report development goals for all water bodies were formulated.

Settlement development

Decisive for future development are the land use plan (Flächennutzungsplan) and the landscape plan (Landschaftsplan). Environmental compatibility and environmental reports (Umweltbericht nach BauGB) or Environmental impact assessments (Umweltverträglichkeitsprüfungen) of local development plans are lawfully required. This needs our analysis and investigation of different parameters such as animals, plants, habitats, soil, climate, ground and surface water, recreation and landscape quality, technical infrastructure, sealing and emissions such as light and noise. Many projects can only be realised with compensatory measures.

Besides the nature reserves protected by law and the NATURA 2000 areas (SPA, Habitat-Directive EU) also the noncommittal town habitat mapping (Stadtbiotopkartierung) is important to preserve and develop landscape structures and vulnerable cultural landscape such as orchards, bigger meadows, parks and green spaces, avenues (12% of boundary area). Although the biodiversity declines, loss of old orchards cannot be stopped. Intensified farming

and new building development areas are reasons, why the little owl (*Athene noctua*) died out.

Environmental education and Local Agenda

This topic is very important for us. To gain sustainable results we need cooperation, partnership, public relations and idealism for a long time, e.g.

- Weekly market with regional products,
- Explorative learning “green classroom” – a project to promote immediate nature experience in primary schools in Friedrichshafen. More than 160 excursions with 2,500 children were offered in 3 years.
- Visitor guidance through nature trails, boards of the Bodenseepfad (Lake Constance Trail) as well as standardised signs for the hiking tracks in the region.
- Project house martin (Mehlschwalbe) – a talisman worth protecting. Participation of the citizens on the protection of species.

Climate protection

Our communal energy savings and support programmes provide citizens support in the fields of photovoltaic, warm water collector, thermal insulation, geothermal energy, heating and wood chips furnace. From 1998 to 2003 0,6 Million Euro paid subsidies for 1,100 measures induced private investments of 14.4 Million Euros. The combination of win-win-effects such as energy saving, working places, living quality and less Carbon dioxide makes the programme very successful and established. That means 12.2 Million KWh less energy consumption or 3,200 t less CO₂ emission which is the bonding capacity of 2,600 ha forest.

Conclusion

Reflecting on the tri-national area of Lake Constance and Friedrichshafen, it is obvious that we need further intense public relations, partnerships and cooperation with citizens, NGOs, policy makers, offices, industry and economy to match the most urgent problems which are: urban sprawl and shore line sealing, high pressure on green spaces because of land price explosion, change of landscape and decrease of species, structural impoverishment of cultivated landscape, fragmentation of landscape nature and local recreation areas through new building development and traffic routes. Although the demographic development is negative in Germany, the crowding effects in the climatic and structural attractive Lake Constance

Region are apparent. The environmental conscience needs support and ascertain measures. Let's do our job and take action!

Zusammenfassung:

Friedrichshafen wurde 1811 gegründet und ist eine junge, dynamische und wachsende Stadt am Nordufer des Bodensees. Das gesamte Gebiet ist rund 70 km² groß und zählt ca. 57.000 Einwohner. Das entspricht einer Bevölkerungsdichte von 814 Einwohnern pro km². Bekannt ist die Stadt durch den Zepelin, aber auch durch die Ansiedlung weltweit führender Anbieter aus den Sektoren Automobilzubehör, Ingenieurwesen und Luftfahrt, wodurch insgesamt ca. 26.600 Arbeitsplätze bereit gestellt werden. Die stattfindenden

Messen sowie der Flughafen zählen zu den größten im Südwesten von Deutschland. Weiterhin bietet die Region verschiedene Ressourcen, insbesondere landwirtschaftliche Erzeugnisse. Die Stadt ist um eine Reihe von Umweltthemen sehr bemüht. Im Vordergrund stehen dabei der Schutz der Ressource Wasser, die Entwicklung von Siedlungsflächen, Umweltbildung und Lokale Agenda 21 sowie der Klimaschutz.

4. Introduction to the EU LIFE Project

Udo Gattenlöhner

Executive Director of Global Nature Fund, Germany

The EU Life project "Living Lakes - Sustainable Management of Wetlands and Shallow Lakes" was launched in 2001 in the framework of the Living Lakes network. Living Lakes is a partnership of public and voluntary organisations for the protection of lakes and wetlands introduced in 1998 by the Global Nature Fund (GNF), a non-profit NGO. Currently the network comprises 35 lakes and wetlands spread across five continents. Aim of the network is to foster and promote sustainable development objectives at international level. The overall intent is to further the exchange of know-how, technologies and experiences between NGOs and other stakeholders like governments, scientists and businesses moving Agenda 21 objectives from paper to practice. Supporters at international level are Unilever, DaimlerChrysler and the Deutsche Lufthansa.

The EU Life project "Sustainable Management of Wetlands and Shallow Lakes" is co-funded by the European Commission under the LIFE Environment programme. Project areas are the lagoons La Nava and Boada in Spain and the

Nestos Lakes in North-eastern Greece. Both sites are typical for a great number of wetlands and shallow lakes in Europe.

Wetlands and shallow lakes are among the most important and most threatened ecosystems on earth. They provide habitat for a rich diversity of animal and plant life. But people as well need lakes and wetlands for many reasons - they provide products from fish to reeds and drinking water; they help prevent floods and play an important role in filtering and cleaning water thereby reducing levels of pollutants. But they are also very sensitive and vulnerable - over 60% of the European wetlands have been destroyed since the beginning of the 20th century. Many of the remaining areas are imminently threatened by nutrient enrichment, water abstraction pollution and lack of management.

Project objectives

GNF has started this EU LIFE pilot project in order to demonstrate that it is possible to manage wetlands in ways which enhance their natural value while benefiting the social and eco-

nomic needs of the local community. The principal objective of the project is the restoration and long-term sustainable development of the demonstration wetlands in Spain and Greece. Long term goals are the improvement of the water quality of the shallow lakes and wetlands as well as the protection and conservation of biodiversity and wildlife in the areas. A central aspect of the project is the development of a management plan for each wetland according to the objectives of the EU Water Framework Directive which requires, that all partners in a given river basin manage their waters together in close cooperation. Almost all of the project measures are transferable to other areas inside and outside the European Union.

Key deliverables and outputs

To achieve the project goals management plans for each of the wetlands in Spain and Greece were developed. Key activity fields of the management plan are wetland management, sustainable tourism, sustainable agriculture and environmental education. In both areas, the reduction of nutrients (mainly nitrogen and phosphorus) from non-point run-offs as well as concentrated effluents like sewage water is of great importance. To reduce the negative effects of nutrients, newly installed buffer zones and "vegetation filter strips" play an important role. In addition, a long-term concept for the extensification of agricultural land in the watershed and the development of sustainable tourism activities is part of the management plan.

Project team structure

The project team consists of the main applicant and seven partner organisations:

- Global Nature Fund (GNF) - The Global Nature Fund co-ordinated the project and was responsible for the financial aspects as well as for the reporting.
- Fundación Global Nature Spain - The Fundación Global Nature Spain was responsible for the local coordination and implementation of the project in Spain.
- EPO (Society for Protection of Nature and Ecodevelopment) - EPO was responsible for the local coordination and implementation of the demonstration project in Greece.
- Broads Authority - The Broads Authority provided expert knowledge and organised two training courses and one workshop in England.



- Bodensee-Stiftung (Lake Constance Foundation) - The Lake Constance Foundation contributed expert knowledge gained from their experience in the field of extensive farming and sewage treatment in constructed wetlands and organised two training courses in Germany.
- Fuentes de Nava - The Community of Fuentes de Nava owns land at the La Nava lagoon where the restoration measures were carried out.
- Boada de Campos - The small community Boada de Campos is an owner of the area of the Boada wetland. Both communities were actively involved in the installation of the buffer zones and in the planning and implementation of the workshops and the training courses in Spain.
- AENAK - Development Agency of the Prefecture of Kavala - The AENAK was involved in the installation of the buffer zones and in the planning and implementation of the workshops and the training courses in Greece.

Zusammenfassung:

Das EU LIFE Projekt „Lebendige Seen – Nachhaltiges Management von Feuchtgebieten und Flachwasserseen“ wurde im Jahr 2001 ins Leben gerufen und ist eingebettet in das „Lebendige Seen Netzwerk“. Die Projektregionen des EU LIFE Projektes, La Nava und Boada sowie die Nestos Seen, befinden sich in Spanien bzw. Griechenland. Mit Hilfe der finanziellen Unterstützung der Europäischen Kommission konnte gezeigt werden, dass eine Verknüpfung von ökologischen, sozialen und ökonomischen Interessen möglich ist. Dies setzt ein angepasstes Management voraus, welches in Anlehnung an die Wasserrahmenrichtlinie für die Regionen von den acht Projektpartnern erarbeitet wurde.

5. Development of the Project "Sustainable Management of Wetlands and Shallow Lakes " in Spain

Fernando Jubete and Antonio Guillem

Project Manager of Fundación Global Nature, Spain

In June of 2002 the European Union approved the LIFE-Environment project Sustainable Management of Wetlands and Shallow Lakes of the Global Nature Fund of Germany; Fundación Global Nature was the partner responsible for implementing the project in Spain.

LIFE-Environment projects are essentially demonstrative projects that support pioneering and innovative initiatives whose results, whether positive or negative, can be extrapolated to other areas.

Mediterranean wetlands are one of the scarcest and most threatened ecosystems in the European Union. They are vital enclaves for millions of birds that use these areas as a resting place on their migratory routes between Europe and Africa. They harbour unique communities of living beings like aquatic flora and are welcome and precious landscapes in places where water is scarce.

There are hundreds of wetland recovery or management experiences in Europe. In the Eurosiberian region, wetlands are typically humid, deep-water areas with conservation problems are very different from those faced by Mediterranean wetlands. For that reason, our project provided an excellent opportunity for acquiring knowledge about this type of humid area.

The wetlands of La Nava and Boada

The La Nava and Boada wetlands are located in an endorheic river basin that was the La Nava Lagoon (Lagunas de La Nava) until the middle of the twentieth century. The primeval area was a magnificent steppe wetland with an extension that ranged from 2,000 to 5,000 hectares depending on yearly precipitations. The promoters of agricultural development of the time took note of the "swamp" and turned a blind eye to the thousands of heads of cattle it provided pastureland for, the hunting and fishing that it generated, and its value as a water storage area. They felt no hesitation or compunction about draining it and turning the land that was never more than marginally productive farmland.

In 1990, Fundación Global Nature initiated a bold project: the recovery of the first 60 hectares of a region that, until development enthusiasts laid eyes on it, had been generally known as the "Mar de Campos" due to its likeness to an inland sea. The idea at first had many detractors, as well as key supporters like the mayor of Fuentes de Nava, who believed, correctly, that the future of Fuentes lay not only in farming and livestock, but needed elements to diversify the local economy.

A year later, the Regional Office of the Environment entered the project thanks to an ACMA project prepared by the Fundación Global Nature and submitted to the European Union. The economic support of these two institutions guaranteed the continuation of the wetland recovery project. Since then, the regional government has assumed responsibility for managing the wetland, while the Fundación Global Nature actively participates in scientific follow-up and restoration interventions.

In 1998 the Fundación Global Nature initiated another wetland recovery project in Boada. The work here was easier because of our previous experience with La Nava and the community was already familiar with the benefits that wetlands could bring it. In addition, the foundation had acquired know-how with wetland projects. Here again the support of the Boada municipal council was vital for guaranteeing the success and viability of the project.

These interventions have made it possible to recover 367 hectares of wetland, 307 in La Nava and 60 in Boada. This is far less than the original area of the La Nava wetland, but it undoubtedly marks a historical turning point in wetland policy in Spain and has established a very promising precedent.

From a biological point of view the recovery of both enclaves was an unprecedented success from the start. Guided by an instinct that is still a mystery to human science, within a short time thousands of water birds were feeding or laying over in the shallow waters of La Nava and

Boada. The two wetlands are now among the most important in Spain. During the wintering-over months, there have been concentrations of more than 30,000 common geese, together with thousands of ducks, including species such as the mallard, shoveler, teal, and pintail.

Once the initial recovery work began, it was necessary to plan for management in order to improve the natural conditions of both wetlands and their surroundings and guarantee effective protection measures. The project LIFE-Environment "Sustainable Management of Wetlands and Shallow Lakes" was presented as a way of developing these goals. I will now describe some of the more important interventions and achievements of this project.

Actions carried out within the framework of the LIFE-Environment project

I. Buffer zones

The Tierra de Campos region in recent years has experienced the devastating effect of several land consolidations that resulted in intensive farming that has transformed the landscape and erased every vestige of forest or brush. This situation has eradicated ecotone areas such as the boundaries between land holdings, hedges, and areas of uncultivated land.

The biological function of these strips of vegetation is important because they provide a refuge for many vertebrate and invertebrate species, thus increasing the abundance and biological diversity of the area. Another important function of these areas is to act as a thermal regulator by raising barriers to wind and creating shady areas that are needed during the torrid summers. In the case of wetlands, the buffer function of these vegetation zones is particularly notable because they reduce the amount of nitrates, phosphates, and pesticides from farming practices that enter the water.

The Fundación Global Nature is managing a total of 24 hectares as buffer zones around the La Nava and Boada wetlands and we are expecting to add another 15-20 hectares soon.

The following interventions were carried out in these buffer zones:

- Reforestation work consisting of planting 16,460 trees and shrubs of more than 20 in the winters of 2002-2003 and 2003-2004.
- Experimental thistle plantations (*Cynara cardunculus*) on two lots. This plant species is characterised by a deep pivotal root system made up of several main roots arising

from the initial root that can extend for several metres in depth. The stem can grow up to 2.5 metres high, usually attaining 1 metre in the first year and 1.5 to 2.5 metres in later years. This type of vegetation is an important deterrent to run-off erosion and contributes greatly to eliminating nitrates and phosphates from diffuse pollution. In addition, it creates an interesting habitat as a refuge and feeding area for many animal species.

- Creation of uncultivated areas. Some lots close to the wetland have been left uncultivated, allowing them to be flooded by the wetland or colonised by natural vegetation.

II. Water analysis

Water quality is undoubtedly the most important element to consider in wetland management.

The Boada wetland receives its water from run-off and an artificial supply that is provided by a water concession from the Castile canal. This water is of excellent quality, but it mixed with the waters of the Lobera stream, which collects the effluents from the town of Villarramiel before reaching the Boada wetland. This town of barely 1,000 inhabitants has several tanneries that discharged their effluents without any control or water treatment. The presence of substances such as tannins for colouring the skins contributed a heavy organic load to the stream that received their effluents, which sometimes included high heavy metal concentrations.

In order to closely control the quality of the water supply to the Boada wetland, the Fundación Global Nature planned for three annual water tests that included the points of origin of the effluents and the water finally entering the wetland basin. The water tests were made by the Research Support Services of the University of Corunna.

In addition to these analyses, three analyses were made in October of 2001 and in April and December of 2002. This information gives us some idea of how water quality is evolving in the wetland and provided conclusive evidence of the problem of the tanneries in Villarramiel de Campos. As a result of formal complaints made to several administrative offices, the tanneries of Villarramiel were required to install treatment filters in each factory discharging effluents into sewage lines. Thanks to this measure we have been able to remarkably improve the quality of the water used to flood the Boada wetland annually.

III. School conferences

The project included environmental education and awareness raising as an instrument for cultivating environmental values and publicising problems associated with wetland ecosystems like La Nava and Boada. The aim was to nurture attitudes and actions in the students that would have a positive impact on the surroundings.

For several months, one-hour conferences were given in the schools of the municipalities in the wetland area. The talks have been particularly useful in highlighting the importance of wetlands and of the actions being carried out within the framework of the LIFE project "Sustainable Management of Wetlands and Shallow Lakes". The monitor who gave these talks used 11 transparencies and 61 slides, as well as a text on the material covered by the conference.

This educational initiative reached 317 school-children age 8 to 13 years-old (please note that the population density of our region is lower than 15 inhabitants/km²). The results of our educational activities can be summarised by the following points:

- We have been able to raise the awareness of students and encourage their respect for the environment around them.
- Special emphasis was placed on the value of the La Nava and Boada wetlands as unique areas of great importance due to the biological, landscape, and socioeconomic values that they exemplify.
- The students gained knowledge of some of the most representative species of flora and fauna in the region.
- The students also learned about the management activities and improvements achieved by the Regional Office of the Environment and Fundación Global Nature in the La Nava and Boada wetlands.

IV. Work camps

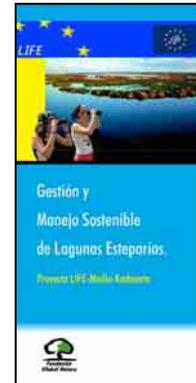
In the summers of 2002, 2003 and 2004, three international work camps were held with the participation of more than 80 young people from Spain, France, Germany, Italy, Great Britain, Morocco, Ireland and Norway.

The activities carried out by the participants centered on activities designed to give them "hands on" knowledge of the natural values of the area as well as the economic motors, like farming and livestock raising, that support the local community. The young people also helped

in management and investigational activities in the La Nava wetland like collecting refuse and ringing birds.

V. Pamphlets

In 2002 we prepared ten thousand copies of a three-part pamphlet entitled "The La Nava and Boada Wetlands Recovery Project". In the summer of 2004 another ten thousand pamphlets were prepared in English and Spanish entitled "LIFE-Environment: Sustainable Management of Wetlands and Steppe Lakes". This 16-page pamphlet summarises all the achievements of the project.



Both pamphlets target the general public, with special attention to young people of school age in the area of influence of the La Nava wetland. The distribution of the "The La Nava and Boada Wetlands Recovery Project" pamphlet at the meeting of the contracting parties to the Ramsar convention held in Spain in November 2002 deserves special mention.

VI. Travelling exhibit

A total of eight information panels on the LIFE project and twelve panels focusing on the demonstration project were designed and executed for the La Nava and Boada wetlands. These panels have texts in Spanish and English for international visitors. The exhibit opened at the Ramsar conference held in Valencia in November of 2002. It was later sent to many different localities in the Tierra de Campos region.

VII. Information panels

As part of the LIFE-Environment project, four panels were designed and constructed for the nature trail that joins the town of Boada de Campos with the "Los Ánsares" bird observatory. The panels alluded to the following themes:

- Steppe birds
- Farming
- Adobe architecture
- Mammals, amphibians, and reptiles

It is estimated that about 10,000 visitors come to the Boada wetland each year and they now have more detailed information about the natural values of the region.



VIII. Management plan

A management plan is a document that is drafted, discussed, and approved by stakeholders. It describes a region or space and the problems and opportunities inherent to attempts to preserve its natural values and the geomorphologic landscape by targeted management. The aim of a management plan is to use this information to set goals and a timetable so that these goals can be reached by working purposefully as planned.

The Fundación Global Nature has prepared a management plan as an essential tool for managing the La Nava and Boada wetlands.

The first stage of preparation of the management plan for the La Nava and Boada wetlands required an analysis of the existing natural and socioeconomic resources in the zone and a diagnosis of its current state. This diagnosis was technical in nature and later submitted for discussion with the social agents involved either directly or indirectly with different aspects of managing the area.

Once a diagnosis of the problems, needs, and potentials of the area was established through this participatory process, a series of general and specific goals were set that were used as the basis for structuring the guidelines of the management plan.

After identifying management priorities, the Action Plan was developed, which consisted of a series of operative programmes that were further broken down into specific proposals.

The management plan has been submitted to the regional authorities responsible for implementing the plan.

IX. Agro-environmental programme

If the Natura 2000 Network (Directive 92/43/CEE) is really to be effective as a conservation instrument, farmers will have to become involved in the management of the spaces that make up the network and programmes will have to be developed that make sustainable use and the conservation of biodiversity compatible.

The Fundación Global Nature has drafted a "Proposal for the Application of Agro-environmental Measures in the La Nava and Boada Wetlands Area".

This proposal, if it is eventually approved by the authorities responsible for the areas involved, will entail taking land out of production. Two types of zoning have been foreseen:

- High-priority conservation areas. These are the land holdings for a 300 metre radius around the wetlands that will be set aside as buffer areas.
- Less important conservation areas. In these areas, extensive farming practices that are respectful of the wetland environment will be used.

Conclusions

The LIFE-Environment project "Sustainable Management of Wetlands and Shallow Lakes" has given an opportunity for developing conservation and management interventions in the La Nava and Boada wetlands. Some of these interventions are the creation of a nature trail, reforestation work, and talks in local school to promote environmental awareness among young people. In addition, the LIFE project made it possible to accomplish different interventions of a clearly demonstrative nature. Once these interventions have been critically analysed, they should continue to be applied in the natural area. This is the case of the creation of buffer zones and periodic water testing.

Finally, the "Management Plan" and "Agro-environmental Programme" that have been developed should become the basis for correct management of the area and the introduction of environmentally friendly farming practices that will enhance the income of land owners and show how wetland conservation can be compatible with traditional production activities.

I would like to conclude by noting that we now know that wetlands are dynamic ecosystems with complex management problems and that they require regular interventions to identify and resolve problems of conservation, management, and monitoring.

Zusammenfassung:

Im Juni 2002 bewilligte die Europäische Union das EU-LIFE-Environment Projekt "Nachhaltiges Management von Feuchtgebieten und Flachwasserseen in Spanien". Bei dem Projekt geht es um Mittelmeer-Feuchtgebiete, die zu den seltensten und bedrohtesten der Europäischen Union gehören. Die hier vorkommenden Feuchtgebiete unterscheiden sich von Eurosibirischen Feuchtgebieten, was im Rahmen dieses Projekts näher untersucht wird. In der Präsentation werden die Feuchtgebiete La Nava und Boada sowie die bisherigen Arbeiten innerhalb des EU Life Projektes vorgestellt. Auf einer Fläche von ca.

24 Hektar wurden beispielsweise Pufferzonen eingerichtet, in denen 16.460 Bäume und Büsche gepflanzt und eine Distelart (*Cynara cardunculus*) zur Minderung von Erosionen und erhöhten Nährstoffgehalten eingesetzt wurde. Weitere Maßnahmen sind Wasseranalysen zur Qualitätskontrolle, Schulkonferenzen zum Thema Umwelt mit spezieller Ausrichtung auf die betroffenen Regionen, Sommercamps für Jugendliche, die Gestaltung und Verteilung von PR-Material sowie eine Wanderausstellung. Darüber hinaus wurden ein gebietsbezogener, umfassender Managementplan und ein Programm für umweltverträgliche Landwirtschaft erarbeitet.

6. Experiences in Management Planning and Wetland Restoration at the Nestos Lakes and Lagoons in the Frame of a Life Environment Project

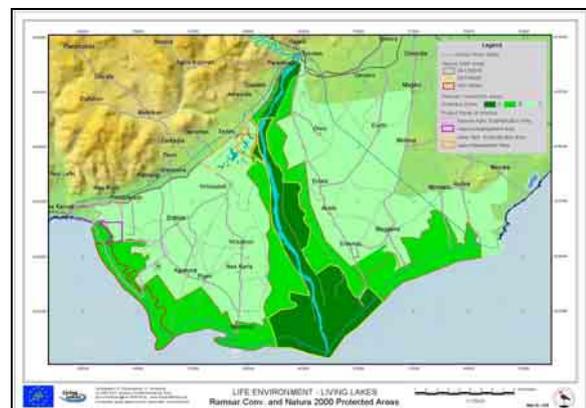
Hans Jerrentrup

Project Manager and Director of EPO, Greece

Introduction

Global Nature Fund and six partner organisations/authorities have received a grant from the EU Life Programme to carry out a wetland rehabilitation project in Spain and Greece with the title "Living Lakes: Sustainable Management of Wetlands and Shallow Lakes". The project areas are the lagoons La Nava and Boada in Spain and the Nestos Lakes and Lagoons in north-eastern Greece. The main goal of the project is to demonstrate how wetlands can be restored and managed wisely in ways that are compatible with sustainable development.

I. The Nestos Delta Wetlands



The Nestos Delta in north-eastern Greece expands over 500 km² and has a coastline of 50 km with the Aegean Sea. The river Nestos in-

side the delta is about 30 km long. Four main ecosystems characterise the delta:

- The riverbed with large riparian forests, sandy islets, branches of running and still waters, oxbows, meadows, reed beds, tamarix scrubs, inland dunes of ca. 4,000 ha,
- A coastal strip with beautiful white sand dunes, that are the largest in Northern Greece,
- 8 shallow lagoons (2,700 ha) with extended salt marshes, wet meadows and tamarix scrubs,
- And 18 small freshwater lakes and ponds (near Hrysoupolis) with reed beds, floating vegetation of water-lilies and other rare water plants, dry and wet meadows, small bushy forest patches and traditional agriculture.

Large parts of the central delta plain have been drained in the 20th century and are intensively used by agriculture, irrigated with water from the Nestos river. The Flora and Fauna of the Nestos Delta is extraordinary rich due to the variety of biotopes and the geographical location at the eastern edge of the Mediterranean Basin, where three bio-geographical regions overlap: the Mediterranean, the East-central European and Asia Minor. The area holds the strongholds of the Greek population of Golden Jackal and Otter. More than 320 bird species have been observed, of which about 110 are breeding, 180 are migrant visitors and about 120 species are wintering in the area. Nestos is a very important stop-over place for Palaearctic bird migration for raptors, waders, terns, storks, herons, pelicans and many songbirds. The wintering species reach up to 50,000 aquatic birds: ducks, geese, swans, divers, Pygmy cormorants and numbers of large raptors like Imperial-, Spotted- and White-tailed Eagles.

II. Established Protection Orders

The Nestos Delta with its wetlands is protected by a number of international and national laws and treaties, like:

- The Ramsar Convention for Wetlands of International Importance,
- The European Wild Birds Directive, (EEC/79/409/1979) as "Special Protected Area",

- The European Flora-Fauna Habitats Directive (EU 92/43) as a "Natura 2000" Site,
- Area of "Special Interest" for European Ornitho-fauna - IBA,
- Two large zones where hunting is prohibited,
- Two totally protected, fenced riparian forest areas of 1,000 ha, especially for wildlife,
- In 1996 Nestos Delta was declared a National Park (ministerial decree for 2+1 years), but unfortunately no presidential law followed, leaving the area without efficient National Park status. Now a new decree for the National Park is under release.

III. Conservation Problems of the Nestos Wetlands

Generally, the main problem is the lack of protection measures, a coordinating and powerful administration and management authority, clear zones for land use and the missing determination of boundaries of protected areas with indications of allowed and prohibited human activities. In consequence the following activities often cause serious threats and deterioration of natural areas:

- Intensive agricultural practices with growing need of fertilizers, pesticides and irrigation water cause eutrophication, pollution and lack of freshwater in lagoons and lakes.
- Drainage and land reclamation schemes still devastate natural biotopes.
- Excavation works at lagoons for intensifying fisheries destroy salt marshes and dunes.
- Illegal hunting causes serious losses of rare and protected fauna species and disturbs especially wintering aquatic birds, forcing them to continuous movements during winter.
- Intensive grazing in the riparian forest & dunes causes problems to soils and vegetation.
- Illegal woodcutting inside the riparian forest is still a common habit of local people.
- Arbitrary building-up areas (without permissions) at the Nestos mouth and along coasts devastate biotopes, as well as the expansion of the building zones of coastal villages.
- The construction and operation of two hydroelectric dams on the main course of Nestos in the mountains result in reduction

of water supplies and change of natural flow regime in the delta and in the loss of sediments, necessary to render the delta's coast line.

- Over-fishing of stocks in the sea and the lagoons.
- Illegal uncontrolled garbage and sewage dumps near many villages and generally widespread garbage in landscape and nature.

The Actions of the EU Life Environment Programme at Nestos

This Life programme was scheduled to have the following long term outputs:

- Improving the ground and surface water quality of lakes and lagoons,
- Reducing the over-abstraction of water by the promotion of extensive agriculture and organic farming in the catchment area and around some of the lakes and lagoons,
- Integrating sustainable wetland use into the land use plans of the communities and the regional authorities,
- To increase public motivation and positive awareness of the importance of proper preservation of wetlands,
- To establish a continuous, fruitful and lasting debate with all parties involved in the management of the wetlands,
- The actual function of environmentally friendly methods of purification of waters going to the wetland,
- To spread out the accumulated expertise and experiences of all project partners.

The following actions and measures were carried out in cooperation with AENAK – the Development Agency of the Prefecture of Kavala, partner to EPO in Greece, that played an important role in the local implementation of the project measures, like the organisation of stakeholder meetings and the permissions to use public land for the installation of buffer zones.

I. Management Plans

As the Nestos Delta is a very large area and the funds for the project were restricted, it was decided to elaborate management plans for representative parts of the delta with the option of later being adapted and implemented on a lar-

ger scale. Three management plans were developed by EPO with the support of GNF and an number of experts and scientists and were discussed with various stakeholders in a number of team meetings of two working groups: wetland conservation-management with agricultural extensification and sustainable tourism development. The plans include the following areas (see Table 1) and activities:

- A voluntary integrated management plan for the conservation/management of two representative wetlands areas of the Nestos Delta was developed for about 500 ha of wetland zones at 4 (total 18) lakes and 1 (of 8) lagoons, including proposals for visitor management.
- A concept for the extensification of 4,000 ha agriculturally used land around the wetlands and concrete measures for an agri-environmental extensification scheme have been proposed. Around the lakes an ongoing land reorganisation scheme has set-a-side areas of low agricultural value for conservation/management, creating natural biotope bridges between the different small lakes. This is the first time in Greece that a land reclamation scheme results in major benefits for conservation. At the lagoons intensively farmed land is proposed to be involved in extensification measures with clear financial incentives for farmers.
- For the development of sustainable tourism in the Nestos area an inquiry was carried out to describe the existing infrastructure and find out problems of tourists and tourism businesses. Then a sustainable tourism management plan was established and discussed with local stakeholders.

II. Buffer Zones

In rural areas agriculture is the main source of Nitrate and Phosphate loads to lakes and lagoons. Therefore, practical demonstration of management measures were part of the programme including the creation and plantation of buffer zones between agricultural fields and the wetlands.

- At the lakes ca. 4 hectares of buffer zones were densely planted close to the shores with different tree species for erosion control and non/point agro effluents. The buffer zones had to be fenced to prevent damage by grazing herds. At the same time these zones function as "biotope bridges" for wild-

life species reconnecting the different lakes with natural habitats.

- At the lagoons a vegetated buffer filter strip of ca. 6 ha was created and planted to remove Nitrogen and Phosphorus loads from more concentrated effluents of drainage canals. In this newly installed zone, more than 50,000 water plants (*Typha angustifolia*, *T. latifolia* and *Phragmites* sp.) were planted in three adjacent basins. In the phase of remodelling landscape it was necessary to construct a field path to get access to the area with heavy machinery and more than 770 m of old drainage canals were filled in to guarantee controlled water flow in the three constructed successive basins. Between the last basins and the lagoon an overflow with an additional earth-gravel filter was constructed. The filter strip was flooded and drained with fresh water three times to wash out surface salt. Afterwards it has been flooded permanently. The vegetated filter showed a very positive side effect for nature and wildlife as already in the first spring the new “marsh” was populated with many freshwater species like 4 different frogs and toads and was intensively used by rare birds like Glossy Ibis, Purple Heron, Black-winged Stilt and many other waders.

All measures described above were mapped in detail and a series of bilingual GIS Maps were produced for the management plans, presentations and publications.

the local authorities, as the nearby town intends to create recreation facilities close to some of the lakes. The trail with a wooden observation tower was constructed during one of the international youth work camps at Nestos.

IV. Monitoring and Water Analysis

Water quality measurements are carried out regularly in the lake and lagoon areas to verify the situation of water quality before, during and after the management measures taken. At two of the lakes an 80 m long wooden floating foot-bridge was constructed through the reeds for access. This constructions allowed measurements at these lakes for the first time in their history!

V. Dissemination

- In Autumn 2003 a workshop about wetlands management took place in Hrysoupolis with 130 participants, including speakers from 6 countries of Living Lakes Partner Lakes. In the course of the workshop two field trips to the wetlands and the action sites were organised.
- A mobile exhibition with 20 boards was produced, describing bilingually in detail the Nestos and La Nava wetlands, functions and values of wetlands and the main activities and measures of this LIFE project with an emphasis on wetland management, the management plans, water quality and monitoring.
- A bilingual brochure on Nestos was elabo-

Table 1: Overview of Project Action Areas at Nestos Lakes & Lagoons

PURPOSE	SURFACE AT THE LAKES	SURFACE AT THE LAGOONS	TOTAL SURFACES
Areas for Nature Conservation (Management Plan – Part I)	252.3 ha	246.2 ha	498.5 ha
Areas for Agricultural Extensification (Management Plan – Part II)	1,321.8 ha	2,654.6 ha	3,976.4 ha
Areas for planting Buffer Strips	3.9 ha	6 ha	ca 10 ha

III. Interpretation trail

A nature trail at the Nestos Lakes showing the different biotopes and human activities was drafted and discussed with representatives of

rated, describing the project, its objectives, the measures like management plans, filter strips and buffer zones, monitoring, environmental education, stakeholder involvement and the achievements, problems

encountered and lessons learned. The brochure is widely disseminated to pupils, tourists and locals to guarantee high transferability of the project results.

- Also a video/DVD documentation in 4 languages of the whole project with all important measures, events and meetings has been produced for wide distribution.
- A good practice book on “Guidelines for the Preparation of a Management Plan” is published, that other wetlands can benefit from the experience gained during the Life Programme.
- Three youth work camps have been carried out involving young people into wetland conservation, management, cultural events and nature experience.
- During 4 training courses for wetland managers and 2 Living Lakes Conferences 17 important persons from the regional authorities and administration participated, helping to exchange the knowledge and expertise available in the partner regions Broads and Bodensee.

VI. Environmental Educational

Environmental education with school classes from the bordering towns and villages is a very important activity to “spread the message” and get more people involved into the concerns of nature conservation and management. Educational packages for basic schools, including presentations (talk, slides, maps, games) inside the schools and a full day excursion to the wetlands of the Nestos Delta were organised, involving about 2,070 pupils and 119 teachers of 52 schools. Four different leaflets/flyers were produced and used for the environmental education activities: a brief sheet about the LIFE project, an information leaflet about the Nestos Lakes, Lagoons and the Delta, a list of the Fauna species of the Lakes/Lagoons and a slide series about the Nestos Lakes and Lagoons. In Xanthi a great event for the presentation of all environmental works of the basic schools of was organised in the central square of the town.

VII. Other Benefits of the Life Programme

The construction of the vegetated filter strip at the lagoon showed quickly very positive results and generated a positive feedback from local people, especially local fishermen of the cooperatives, responsible for the management of five large lagoons. They asked for an intensive collaboration to identify further programmes

for the installation of similar filter strips at other lagoons in the delta with similar problems. Positive comments were also contributed from the local water management board, suggesting to use irrigation water for future filter strips at the other Nestos lagoons. This gives some evidence for the great demonstration effect of this Life project.

Challenges

The programme has carried out within a relatively short period of time (40 Months) and with very limited staff a large variety of actions. Many new conservation strategies, methods and tools have been tested and opened options for their implementation in the future, avoiding the existing constraints. Some of the major challenges for the future of the protected Nestos wetlands are:

- To further develop and fully implement the management plans in the sense of the European environmental policy and in a participatory approach,
- To further develop and apply the practiced methods of planting buffer zones for the protection of wetlands and the improvement of water quality,
- To continuously run and scientifically monitor the vegetated filter strip in the next few years,
- To keep the balance between touristic development and nature conservation,
- To intensify the coordination of all development and conservation measures in the area to avoid conflicts, overlapping and even damage to the wetlands,
- To increase the personnel, equipment and authority of the recently inaugurated National Park Management Body.



Future Opportunities

The Life Project has shown and opened new opportunities for sustainable development and nature conservation in the Nestos Area, some of them are listed below:

- New larger vegetated filter areas have been requested by local people for the improvement of water quality of the lagoons,
- A better wetland biotope management has paved the way for the benefit of conservation and sustainable tourism development,
- The better involvement of local communities and NGOs in decision making processes offer solutions to arising conflicts between stakeholder groups,
- The new support for agricultural extensification measures with full farmers compensation is coming with the enforcement of the new EU Structural Funds, giving chances for the wider implementation of the management plans in a closer zone around the wetlands.

Zusammenfassung:

Die Flora und Fauna des Projektgebietes Nestos ist aufgrund klimatischer Gegebenheiten besonders reich. Mehr als 320 Vogelarten leben, brüten, oder rasten hier, 50.000 Wasservögel überwintern im Nestos-Delta. Es beherbergt das größte Goldja-ckal und Ottervorkommen Griechenlands.

Größtes Problem sind fehlende koordinierte Schutzmaßnahmen in genau definierten Schutzgebieten und Angaben über erlaubte und verbotene Aktivitäten der Menschen, mit der Folge einer bedrohlichen Verschlechterung des ganzen Gebietes. Das EU LIFE Projekt hatte zum Ziel, das Nestos Seen- und Lagunengebiet langfristig zu bewahren. Zu diesem Zweck wurden u.a. Managementpläne für repräsentative Teilgebiete des Nestos erarbeitet. Um die Wasserqualität langfristig zu sichern, wurden Pufferzonen zur Verringerung der großen landwirtschaftlichen Nitrat- und Phosphateinträge ausgeführt, die Extensivierung der Landwirtschaft, nachhaltiger Tourismus und gezielte Umweltbildung gestärkt und gefördert. Durch die Einbindung der Bevölkerung in alle Überlegungen und Maßnahmen soll gewährleistet werden, dass die Umsetzung des Managementplanes zum Schutz dieses einzigartigen Gebietes konfliktlos erfolgen kann.

7. The EU Water Framework Directive: More Protection for our Waters, More Participation of Citizens

Dr Helmut Blöch

Head of Sector Water, European Commission, Belgium

Introduction

By the Water Framework Directive, the EU has restructured its water protection policy, building on principles with a long-established tradition in many regions of Europe, but also further developing them:

- water protection for all waters, groundwaters and surface waters,
- obligation to achieve/maintain 'good status' for all waters; 'good status' is defined in a comprehensive way – for surface waters in terms of biology (microfauna, microflora, fish fauna), chemistry and morphology, for groundwater in terms of chemistry and quantity (balance between recharge and abstractions); non-deterioration principle,
- water management based on river basins, across administrative and political borders,
- water quality classification based on typology, not just one and the same system e.g. for mountain rivers and lowland rivers,
- combined approach of emission controls and water quality standards, with the more stringent criterion to prevail,
- pricing for water-related services such as water and waste water to reflect the principle of cost recovery and this to support protection of resources,
- involvement of citizens, local communities and stakeholders to be an obligation of the authorities when deciding on river basin management plans.

The Water Framework Directive – a transparent process step by step

The Water Framework Directive provides for an ambitious objective – as a rule, this objective is to be achieved by 2015; at the same time it establishes a continuous and transparent process for planning and action:

2003: formal transposition into national legislation (article 24); designation of outer boundaries of river basin districts and of responsible authorities (article 3)



2004: first assessment and economic analysis (article 5 and annexes II+III; register of protected areas (article 6)



2006: monitoring system (article 8); latest date for public participation (article 14)



2008: draft river basin management plans



2009: definitive river basin management plans and programme of measures (article 13)



2015 / 2015+: environmental objective achieved, where necessary after revision of river basin management plans and programmes of measures

These deadlines for the Water Framework Directive are valid for all 25 EU Member States, for the 'old' EU15 as well as for the 'new' ones which joined the EU on the 1st of May 2004. As a result of accession negotiations, this is providing a clear signal, on the one hand for the protection of the environment, and on the other hand against distortion of competition by differing national standards for the environment.

Implementation of the Water Framework Directive – a cooperative process of all involved parties

Parallel to the final adoption of the Water Framework Directive, European Commission, Member States and Candidate Countries agreed – in a so far unprecedented move – on devel-

oping a strategy for the implementation of the Directive and on setting on track a comprehensive cooperation for all relevant aspects of the Directive. Only four months after publication of the Directive, this strategy has been accepted. From the beginning, involvement of interested and involved parties and environmental organisations has been ensured.

Looking back at three years of joint work within the Common Implementation Strategy, we see

- identification of all involved with work and deliverables,
- successful development of a range of guidance documents,
- beginning of practical testing in pilot river basins,
- considerable interest, and a multitude of initiatives providing a good basis for future challenges,
- importance of work within the International River Commissions and the
- challenge of best use of EU funding instruments - LIFE, Structural and Cohesion Funds, but for the first time also the new EU Agricultural Policy.

This contribution reflects the opinion of the author and not necessarily that of the European Commission.

Zusammenfassung:

Gewässerschutz, Wasserwirtschaft und Gewässergütebewertung sind einige der Themen, die in der Wasserrahmenrichtlinie behandelt werden. Die damit verbundenen Aufgaben sollen bis zum Jahr 2015 von den 25 EU Mitgliedstaaten umgesetzt werden. Dies setzt eine Strategie zur Umsetzung der Richtlinie voraus, an deren inhaltliche Gestaltung alle Parteien beteiligt sind. Im Jahr 2004 soll hier eine erste Bestandsaufnahme und ökonomische Analyse stattfinden. Die Arbeit der ersten drei Jahre macht deutlich, dass die Bereitschaft aller Beteiligten groß ist. Eine Vielzahl von Initiativen bilden bereits jetzt schon eine gute Grundlage für die kommenden Herausforderungen.

8. Participatory Approach to Managing a Wetland National Park

Dr Michael Green

Director of Research & Strategy, Broads Authority, Broads National Park, UK

This presentation focuses in recent and ongoing experience in the Broads to develop and implement a 20-year Strategic Plan and supporting 5-year Action Plan for its management. Participation in the process of developing and implementing the Plan is considered fundamental to its effective delivery.

Independent consultants were engaged early on in the process in order to guide its design, facilitate dialogue with stakeholders and raise the credibility of the exercise. In order to secure wide support for preparing and, importantly, implementing the Broads Plan, considerable efforts were made to ensure that the process was transparent, participatory and inclusive from the outset. Thus, the process was designed to:

- bring together a wide range of organisations and individuals to create a common purpose and collective responsibility for the future of the Broads;
- generate consensus around a set of objectives, based on a shared vision for the future of the Broads; and
- engender a strong sense of ownership amongst organisations and individuals in the objectives of the Plan.

Three main groups of stakeholders were identified for close involvement in the process:

- people with information or skills relevant to the Plan and its preparation,

- people affected by what happens as a consequence of the Plan and
- people with authority or resources to help implement the Plan.



These groups comprised the following types of stakeholders:

- those who live or work in the Broads Executive Area,
- visitors to the Broads,
- partner organisations (governmental, non-governmental and corporate),
- local authorities and parish councils and
- the wider public.

The different types of stakeholders were able to participate in the process through a range of

mechanisms of which they were made aware. In designing participatory processes it is important to be clear about the different of types of engagement with stakeholders, ranging from information provision with no opportunity for stakeholders to influence the outcome to open dialogue in which stakeholder aspirations can be met and decisions shared (Table 1). The process for developing the Broads Plan was designed to be an open as possible, beginning with dialogue bounded only by the legal responsibilities of the Authority and other partner statutory agencies and moving into consultation mode once the Broads Plan had been drafted.

Following the launch of the new Broads Plan in 2004, the Authority is now in the process of establishing a Broads Plan Advisory Group whose principal purposes will be to:

- coordinate business planning among partner organisations in order to integrate priorities for the Broads,
- monitor and evaluate the implementation of the Broads Plan and
- advise the Authority on key strategic issues of common interest.

It is envisaged that this will add credibility to the independence of the evaluation and provide for consensus building and collective action on priority issues. From the Authority's perspective, it also provides a mechanism for shared responsibility for successes and shortcomings among key partners.

Table 1: Spectrum of types of engagement with stakeholders and their respective potentials for influencing decisions

TYPE OF ENGAGEMENT	FEATURES	STAKEHOLDER RESPONSE
Open dialogue	Decisions shared by stakeholders	Needs/Aspirations ↑ Opinions ↓ Reactions
Bounded dialogue	Decisions influenced by stakeholders	
Consultation	Stakeholders have limited influence	
Information gathering	Stakeholders provide information to inform decisions - no influence	
Information giving	Stakeholders have opportunity to react	

Zusammenfassung:

The Broads, Englands größtes, nationales Schutzgebiet in den östlich gelegenen Bezirken Suffolk und Norfolk besteht seit 1989. Um auf die verschiedenen Bedürfnisse der involvierten Zielgruppen und Ansprechpartner eingehen zu können bedarf es eines integrativen Managementplans. Anvisiert sind sowohl ein 5-Jahres-Aktionsplan und ein 20-Jahres-Strategieplan innerhalb derer es verschiedene Möglichkeiten gibt, Ansprechpartner mit jeweils unterschiedlichem Einfluss einzubeziehen. Wichtiger Bestandteil ist hierbei der Austausch von Informationen, der, wie die Präsentation aufzeigt, unterschiedlicher Art sein kann.

9. Ecological Quality Assessment of Lakeshores - Requirements of the EC Water Framework Directive and the Natural Habitats Directive (FFH)**Dr Wolfgang Ostendorp**

Arbeitsgruppe Bodenseeufer (AGBU) and Limnological Institute, University Konstanz, Germany

In this contribution the overall importance of the lake shore zone for nature conservation and water pollution control is presented, in light of the EU-Water Framework Directive and the Natural Habitats Directive or the Natura 2000-Reserve Network System, respectively. Although both directives aim to contribute to an improvement of the situation on e.g. the lake shore, already at the start of the implementation there is a deficit in coordination and agreement. An example of this can be found in the ecological description of the condition and the evaluation of lake shores. This contribution recommends an evaluation system, which is orientated on the guidelines of the Water Framework Directive, but, which also takes the uses and influences from the land side, as well as conservation aspects, into account. The expert knowledge of local nature conservation associations (NGO's) could be useful in the development of such an evaluation system. In view of this, they should become more involved in the regional implementation of the Water Framework Directive than they are at present.

Zusammenfassung:

Im vorliegenden Beitrag wird die übergreifende Bedeutung der Seeuferzone für Naturschutz und für Gewässerschutz vor dem Hintergrund der EU-Wasserrahmenrichtlinie und der FFH-Richtlinie bzw. des Natura 2000-Schutzgebietssystems untersucht und dargestellt. Obschon beide Richtlinien zur Verbesserung der Situation an den Seeufern beitragen wollen, mangelt es bereits zu Beginn der Umsetzung an gegenseitiger Koordination und Abstimmung. Hier empfiehlt sich ein Bewertungssystem, das sich zwar an den Vorgaben der Wasserrahmenrichtlinie orientiert, aber auch die landwärtigen Einflüsse sowie naturschutzfachliche Aspekte einbezieht. Bei der Entwicklung eines solchen Bewertungssystems könnte auch das Expertenwissen der lokalen Naturschutzverbände von Nutzen sein, die deshalb stärker in die regionale Umsetzung einbezogen werden sollten.

10. Constructed Wetlands Treatment Plants: Requirements, Operation Modus, Costs, Servicing

Dr Andreas Bally
BiCon AG, Switzerland

Nature-based wastewater treatment technology uses mainly natural processes and energy sources. The methods aim to reinforce natural self-cleaning processes. Soil, vegetation, ponds and processes occurring in these ecosystems are utilized for purification purposes. Soil infiltration and pond systems are already known since the 19th century and have been continuously improved. Käthe Seidel invented constructed wetlands in Germany in the 1960ies. A decade later Kickuth's «root zone process», which uses natural (loamy) soil as filter substrate, turned into the wrong direction, resulting in very negative reputation in the 1980ies. But having learned from such bad experience the modern wetlands technology was developed and turned out to be very successful when sand or gravel are used as filter media. Many planted gravel and sand beds have been installed in the last two decades all over the world from New Zealand, Australia, Asia, South Africa to America, where the most and the biggest of such wastewater plants are in operation. It is an appropriate technology especially for rural areas where inexpensive land is generally available and skilled labour is either less available or expensive. Pond and wetland systems are used to treat a wide variety of wastewater including domestic, communal, industrial, agricultural, mine drainage, landfill leachate and urban stormwater. Therefore, there is no general construction design; every case is different from each other and has to be carefully evaluated. Wetland systems can be designed as highly efficient treatment works or as «gentle conversion of the landscape» to control point and non-point water pollution.

What are constructed wetlands?

Constructed wetlands treatment systems are engineered near-natural systems that have been designed and constructed using the same processes that occur in natural wetlands. Some of these systems have been designed and operated with the sole purpose of treating wastewater, while others have been implemented with multiple-use objectives in mind, such as using treated wastewater effluent as a source for

creation and restoration of wetland habitat for wildlife.

Constructed wetlands can be most simply subdivided into two main categories: surface-flow (or free water surface) and subsurface-flow (or soil-based) design. In surface-flow wetlands, the wastewater flows through a shallow «pond» (or «channel») planted with emergent plants such as bulrushes, reeds or sedges. The contaminated water to be treated in this pond-like system is visible and directly exposed to the atmosphere. In subsurface designs, the wetland is filled with sand, gravel or similar substrate, and the marsh plants grow rooted in the permeable medium; the water level is maintained below the top of the treatment media.



Performance

In a properly designed wetlands treatment system the microbial community in the soil filter and the filter media (sand or gravel) itself as adsorption and filtration medium are able to reduce suspended solids, BOD, COD, nitrogen, phosphorus and pathogens in the same order as good working technical sewage treatment works. Even small wetland systems remove phosphorus and denitrificate. The effluent of wetland systems meets the German and Swiss discharge standards and limitations for purified wastewater, even in the cold season.

Operation and maintenance

Maintenance of wetland systems is generally limited to the control of unwanted plants. Harvesting of plants is generally not required, but annual removal or thinning of vegetation or

replanting of vegetation may be necessary to maintain flow patterns and treatment functions. Soil-based beds can become populated by animals like mice, muskrats etc. A fence and an annual increase of the water level above the soil surface for approximately two weeks scare off such unwanted intruders. Constructed wetland systems require short weekly inspections of the wetland cells and periodic control of the effluent water quality.

Combining different designs

Surface-flow wetlands are cheaper to construct but generally have lower purification efficiency than subsurface-flow wetlands. Because the wastewater remains below the surface in the subsurface systems, there is less probability for human or wildlife contact with wastewaters and less potential for insect infestation. The disadvantage of subsurface-flow systems is the possible clogging of the filter media depending on the amount of solids in the wastewater and the grain size of the filter medium.

The use of hybrid designs incorporating both surface and subsurface-flow sections has become more common as well as the combination

with pond systems or technical electrically powered treatment steps.

Zusammenfassung:

Die natürliche Behandlung von Abwässern mittels Pflanzenkläranlagen begann bereits in den 60er Jahren. Es handelt sich hierbei um gestaltete, naturnahe Systeme, die auf natürlich vorkommenden Prozessen beruhen. Grundsätzlich lassen sich zwei Typen unterscheiden, einerseits Anlagen direkt an der Oberfläche und andererseits Anlagen unter der Oberfläche. Beide Typen zeichnen sich spezifische Vor- und Nachteile aus. Aus diesem Grund wird die Nutzung von kombinierten Anlagen immer üblicher, da so die Vorteile von beiden Systemen genutzt werden können.

11. Programme of Action for the Restoration of Upper Swabian Lakes

Albrecht Trautmann

Director of PRO REGIO Oberschwaben GmbH, Germany

There are almost 2,300 stillwaters (lakes and ponds) in the southern part of Upper-Swabia, north of Lake Constance. These lakes and ponds make up over half of all stillwaters in Baden-Wuerttemberg. All of these stillwaters have been heavily burdened with high levels of nutrients especially in the past half-century. The results of this have been excessive growth of algae and Higher Water Plants, loss of biodiversity, unfavourable composition of the fish stocks, partial fish dying, strongly increased production of digestive sludge and very fast siltation.

In 1989 a research programme, the 'Programme of Action for the Restoration of Upper-Swabian Lakes' was started by the environmental ministry of Baden-Wuerttemberg. For 33 selected stillwaters and their catchment areas, a project group consisting of staff of the water management and agricultural offices, carried out sur-

veys, developed restoration concepts and the necessary measures to implement these. In the year 2000, 15 lakes had been successfully cleaned up and were taken out of the programme. In the same year 41 new stillwaters were added to the programme. The management of the project was transferred to a private organisation, the Pro Regio Oberschwaben GmbH.

Waste water treatment plants are not allowed to drain their water into lakes, excess rainwater basins should be optimised. The major impacts on lakes and ponds now come from agriculture. Active consultation in the areas of fertilization and cultivation, creation of enough storage capacity for solid and liquid manure and the extensivisation of critical areas can lead to changes in the farming behaviour and can significantly reduce nutrient input. At the

moment a total area of over 860 hectares surrounding about 50 lakes are reserved for extensive farming by contracts. 260,000 Euro compensation is currently paid for these areas.

The renaturation of regulated and technically enhanced rivers in the catchment area of the lakes and ponds is another important measure. In a few cases sedimentation ponds and flooding areas have been created upstream of stillwaters. These are most useful during heavy rainfall when they can filter out the erosion sediment which is carried in the tributaries.

Use of the ponds for fishing should be adapted to the demands of the restoration measures. The management of artificially created and drainable ponds should follow traditional cleaning methods (regularly draining the pond every 3-6 years). As well as the reduction of the nutrient input, a further measure used in some cases is the removal of fish (bio-manipulation). The use of the ponds for recreational purposes should not affect the ecological stability of the ponds. It is recommended that regional concepts which regulate the recreational use and the environmental protection of the ponds are put in place.

Conclusion

The restoration of small lakes and ponds by reduction of the diverse nutrient input from the catchment areas is to be preferred to measures taken inside lakes and ponds which only affect the symptoms. The implementation of measures on a voluntary basis takes up a lot of manpower and is not always easy to carry through but especially in the area of agriculture, can lead to sustainable improvements and manageable costs.

Zusammenfassung:

In Oberschwaben, im südöstlichen Baden-Württemberg gelegen, existieren ca. 2.300 Stillgewässer, die durch einen hohen Gehalten an Nährstoffen belastet sind. Um diesem Zustand entgegenzuwirken wurde 1989 vom baden-württembergischen Umweltministerium ein Renaturierungsprogramm ins Leben gerufen. Zu Beginn des Programms wurden 33 Stillgewässer ausgesucht, von denen bis zum Jahr 2000 etwa die Hälfte erfolgreich saniert wurden. Das erfolgreiche Projekt wurde dann auf 41 weitere Seen ausgeweitet. Mittlerweile wurde das Programm an die private Pro Regio Oberschwaben GmbH übergeben.

12. Agri-Environmental Measures for Villacañas Wetlands

Eduardo de Miguel

Director of Fundación Global Nature, Spain

Through the LIFE Programme, the European Commission has supported the project of Fundación 2001 Global Nature for the recovery of the Villacañas wetlands, a group of three seasonal ponds: Laguna Larga (107 ha), Tirez (98 ha) and Peña Hueca (126 ha).

The three Villacañas wetlands have been declared Special Protection Area for birds (SPA). These wetlands are home to many birds listed as priority species in the European Directive of Birds. The saline steppes that surround the Villacañas wetlands constitute unique

plant communities. They are protected by the European Directive of Habitats and their preservation is a priority.



The restoration of the wetland complex has involved activities such as:

- creation of a green filter to improve the quality of water entering Laguna Larga,
- recovery of the natural vegetation along margins,
- establishment of nesting islets,
- debris removal,
- land purchase and rental,
- community awareness raising,
- surveillance

One of the main goals of the project was to implement certain agro-environmental measures to create a buffer zone around the Villacañas wetlands complex. This project should serve as a demonstration project illustrating how this important financial tool can be used to restore and protect other wetlands in Central Spain.

Environmental impact of agriculture around the Villacañas wetlands

Seventy percent of the erosion in Spain is generated in cultivated farmland using conventional techniques (although farmland occupies only 40% of the Spanish territory). Aerial detail of the Tirez wetland: ploughing in the same direction as a steep slope has originated an erosion ditch and caused sediment to enter the pond.

There is no significant problem with excessive use of fertilisers or pesticides. The farmland around the wetlands is dedicated to cultivation of low-yield dryland crops which require little input. However, as local farmers are indifferent to organic farming in this region, we prefer to focus on other more urgent agro-environmental measures that are easier to implement. Measures such as extensification, complete set-aside, increasing fallow land, or new tillage methods make it possible to reduce agro-chemical products.

Overgrazing affects only certain plots around the Laguna Larga and Tirez wetlands. In Laguna Larga a rental and compensation contract was signed to eliminate grazing in the most sensitive areas. Sheep are grazed mainly on fallow land and stubble fields. Natural vegetation areas are only marginally used. Consequently, agricultural set-aside is a much more important measure for recovering the natural habitat than sheep reduction programmes.

The replacement of natural habitats by CAP subsidized crops is the main ecological problem

in the area of influence of the wetland complex. Conservation of fallow land should be one of the main goals here. In Villacañas, many endangered species use fallow land as nesting and feeding habitats, such as the canastera (*Glareola pranticola*). Ploughing fallow land in spring destroys nests and is one of the main dangers for some of these species. Consequently, it is fundamental to establish a programme for increasing the area of fallow land and preventing useless tillage during nesting periods. Early harvesting can also damage populations of steppe birds such as Great Bustard

The new agro-environmental scheme of Spain

This new programme was issued on January 12, 2001. It is based on 9 different measures, applicable throughout the country.

1. Extensification
2. Preservation of endangered varieties of cultivated plants
3. Reduction of agrochemical use
4. Erosion control
5. Protection of wetland flora and fauna
6. Traditional farm systems in the Canary Islands
7. Irrigation water saving
8. Landscape protection and fire control
9. Integrated management of livestock production

Measures applicable to Villacañas

After conversations and discussions with Villacañas farmers, we have concluded that the following measures are more practical and applicable:

- 1.1: Agricultural extensification - Improvement of traditional fallow land: environmental fallow land
- 1.2: Agricultural extensification - Protection of flora and fauna and actions to improve steppe bird habitats
- 1.4: Set-aside - Recovery of wild flora and biodiversity.
- 4.1: Fight against erosion in arboreal crops
- 4.2: Fight against erosion in herbaceous crops
- 9.1.1: Integrated management of livestock production - Actions in pasture and stubble fields

Specific proposals to apply the environmental scheme in Villacañas

As a practical step, after studying legal incompatibilities of the measures, we proposed the application of the following measures:

- 1.4 - Environmental set-aside
- 1.2. Agriculture extensification - Protection of flora and fauna: Actions to improve steppe bird habitat, combined with measure 4.2, Fight against erosion in herbaceous crops, and measure 1.4, Set-aside of herbaceous crops.
- 1.2. Agricultural extensification - Protection of flora and fauna: Actions to improve steppe bird habitat.

These proposals were quantified and sent to the regional Government of Castilla-La Mancha as a potentially effective tool for the protection of other interesting and important wetlands in this region.



Conclusions

One of the main objectives of nature restoration in Castilla-La Mancha should be the recovery of saline habitats around wetlands. The only feasible measure for achieving this goal is set-aside. Other measures may improve the habitat of steppe fauna adapted to extensive dry land agriculture. The set-aside measure must be modified to eliminate some of its commitments, such as the conservation of ploughing or grazing plots. The elimination of commitments reduces the farmer's conservation costs and increases the grant. The Regional Administration has decided to propose set-aside as a single measure for restoring wetland habitats:

1. Although set-aside is one of the most expensive measures, it achieves visible and effective environmental results in a short period. The 5-year costs of set-aside for grain crops or olive groves in Villacañas are around 48,000 EURO, an average of 16,000 EURO per medium-size lagoon (90-100 hectares).

2. It is the easiest measure to verify, thus minimizing the cost of controlling compliance. Villacañas belongs to the Site of Community Interest called "La Mancha Wetlands" (12,226.57 ha). It has at least 28 important lagoons. The extension of the programme to all these wetlands would theoretically cost the Regional Administration 93,000 EURO/year.

However, it should be noted that this a theoretical study demanding further improvements and considerations.

Inclusion of transhumance in the Spanish Agro-environmental Programme

One of PROJECT 2001's main outcomes was the approval in 1995 of a new Law on Drovers' Routes. After different efforts, we could include a 60 EURO/ha grant for transhumance as a special measure in the new agro-environmental programme.

The main problem of this measure is that it does not differentiate between transhumance on foot or by truck or train.

Zusammenfassung:

Die Villacañas Feuchtgebiete umfassen drei saisonale Teiche, die sich auf eine Gesamtfläche von ca. 330 Hektar belaufen. Die Wiederherstellung der Teiche wurde durch das EU LIFE Programm gefördert und bestand u.a. aus Landschaftspflegemaßnahmen, dem Einsatz von Filtern zur Verbesserung der Wasserqualität und dem Kauf bzw. der Pachtung der Fläche. Umweltrelevante Auswirkungen entstehen hier durch landwirtschaftliche Methoden wie dem Einsatz von subventioniertem Saatgut. Auch die Nutzung als Brachfläche, von der viele vom Aussterben bedrohten Arten profitieren, wird vernachlässigt. Dem soll das am 12. Januar 2001 verabschiedete Programm entgegenwirken, welches u.a. den Schutz von selten vorkommenden Pflanzen und der Landschaft vorsieht.

13. Sustainable Tourism: Policy Instruments and Best Practice

Marion Hammerl

Executive Director of Lake Constance Foundation, Germany

Our wetland or lake is part of the tourism destination – or should become part of a sustainable tourism development. Therefore the main focus within our Management Plan should be the stay and activities at the destination:

Stay at the destination

- Construction of accommodation
- Maintenance and operation of accommodation
- Supply with food and other goods
- Disposal of waste

Activities at the destination

- Construction of tourism facilities
- Maintenance and operation of tourism facilities
- Local mobility
- Tourism activities linked to facilities
- Tourism activities not needing special facilities

Main problems concerning tourism and sustainable development are tourism transport (access to destination and return travel, local mobility in the destination), carrying capacity (land use, biodiversity, tourism activities), use of energy, use of water, solid waste management, social and cultural development, economic development and institutional governance.



Instruments and positive examples

In the course of the LIFE Visit-Project (Voluntary Initiatives for Sustainability in Tourism), Friends of Nature International collected and evaluated an exhaustive list of indicators used in different regions or suggested by previous studies on tourism and destination development. The VISIT-experts identified a set of key indicators. www.yourvisit.info

The European Eco-label for tourist accommodation service was created in May 2003 to reward accommodation services and tourists that respect the environment. It signals environmental good performance as it is an added quality value when consumers are choosing a resort. Enterprises bearing the Flower Logo have officially been distinguished as being amongst the most environmentally friendly in their area.

http://europa.eu.int/comm/environment/ecolabel/product/pg_tourism_en.htm

The EC Eco-Audit, also called EMAS, is a voluntary management system for businesses and organisations that wish to improve their operational environmental protection measures on a continual basis beyond the practices called for by law. The revised EMAS II includes all the aspects of the international ISO 14001, but in some respects has higher requirements, for example employee participation and the publication of an environmental report.

www.europa.eu.int/comm/environment/emas

VISIT: Ten of the most important ecolabels in Europe started cooperation with the VISIT-Initiative to work on a common basic standard regarding the organisation, contents and procedure of their ecolabels and to collaborate intensely in the fields of marketing and promotion of the products awarded with an ecolabel.

www.yourvisit.info

Reisepavillon Hannover: Today it is the most important international fair for sustainable tourism with an interesting programme about new trends, studies and projects, discussion forums and seminars. At Reisepavillon Hannover you can inform yourself, exchange experiences and promote environmentally friendly tourism offers

in your wetland or lake region.
www.reisepavillon-online.de

ECOTRANS – European Network of NGOs and experts working in the field of tourism, environment and sustainable development. More than 300 positive examples in Europe about sustainable tourism.

www.ecotrans.org

ECOCAMPING: Initiative to implement environmental management for camping sites. Actually 104 camping sites were or are participating in the qualification programme.

www.ecocamping.net



Zusammenfassung:

Da unser Feuchtgebiet in einer touristisch attraktiven Zone liegt, ergeben sich daraus u.a. Probleme in den Bereichen Verkehr (Anreise, Mobilität vor Ort), Belastbarkeitsgrenzen in Bezug auf Flächennutzung, Biodiversität, Freizeitaktivitäten) Wasser- und Energieverbrauch, Abfallwirtschaft sowie soziale und wirtschaftliche Entwicklung.

Im Rahmen des LIFE Visit-Projektes (Freiwillige Initiativen für nachhaltigen Tourismus) wurden Indikatoren in den verschiedenen Regionen gesammelt und evaluiert und Schlüsselindikatoren erarbeitet. Das europäische Eco-Label wurde 2003 für Hotelbetriebe und Freizeiteinrichtungen eingeführt, die dem Gast besondere Umweltanstrengungen des jeweiligen Betriebes signalisieren, ebenso das Blumen-Label. Eco Audit, auch EMAS genannt, ist ein Label für Betriebe und Organisationen, die über die gesetzlichen Bestimmungen hinaus unter Einbeziehung der Belegschaft aktiven Unternehmensumweltschutz betreiben und jährlich einen Umweltbericht veröffentlichen. Weitere Label sind ECOTRANS, ein europäisches Netzwerk von NGOs, das sich für nachhaltige Entwicklung einsetzt und ECOCAMPING, das umweltfreundliche Campingplätze auszeichnet.

14. Elements of Management Plans for Wetlands – Action Programme Lake Constance 2004 to 2009

Dr Heinz Gerd Schroeder

Director of Institute for Lake Research, Langenargen, Germany

Lake Constance is the second largest prealpine European lake by area (536 km²) and volume (48 km³) and is shared by Germany, Austria and Switzerland. About 1.2 Million inhabitants, local high-tech industries, intensive agriculture and 2 Million tourists per year frame a drinking water reservoir for more than 4 Million people. Due to increasing human impact the lake and its catchment underwent drastic ecological changes causing a reaction of the inhabitants and their representatives.

The international commission for the protection of Lake Constance (IGKB) was established in 1959 as a result of an international agreement between Baden-Wuerttemberg, Bavaria, Austria and Switzerland.

The main duties of the IGKB are:

- Observation of the lake
- Confirmation of the causes of its pollution
- Recommendation for co-ordinated preventive measures
- Discussion of the planned utilisation of the lake

As consultant agency the commission cannot decide on rules and actions connected with environmental protection but by agreement the regional governments are obliged to transform the recommendations of the IGKB into national law.

In the past IGKB has mainly concentrated its efforts on the problem of eutrophication. In order to preserve the lake ecosystem from further degradation more than 4 Billion EURO have been invested for sewage treatment facilities. The result is a significant reduction of the phosphorous concentration in the lake and a recovery of the lake ecosystem.

Actually a survey of what has been accomplished so far was prepared to draw up a programme with prospective activities: the IGKB Action programme 2004 – 2009. Aim of this long term programme is an improvement of the ecological quality of the littoral zone of Lake

Constance. Up to now almost half of the shoreline is heavily modified by human infrastructures such as harbours, buildings, walls, etc.

To avoid further degradation of the shores and to revitalize damaged areas a 3 phase programme was invented by the IGKB in 2004.

In a first step a limnological evaluation of the entire littoral zone is planned until 2006. Parallel and thereafter public information on the evaluation results will be offered to local authorities, stakeholders, administration and politicians in a second step. From 2007 onwards an initiative for lakewide revitalization of the littoral zones will be launched in a last phase. Base for this initiative will be a manual on revitalization of the different shore types existing at Lake Constance.

Zusammenfassung:

Im Dreiländergebiet zwischen Deutschland, Österreich und der Schweiz befindet sich Europas zweitgrößter voralpine See, der Bodensee. Mit einer Fläche von ca. 536 km² versorgt er 4 Millionen Menschen mit Trinkwasser. Da der anthropogene Einfluss immer negativere Auswirkungen auf das ökologische Gleichgewicht des Sees hatte, entstand 1959 die IGKB (Internationale Gewässerschutzkommission für den Bodensee). Die Länder Bayern, Baden-Württemberg, Österreich und die Schweiz verpflichteten sich hierin nicht nur die Gründe der Verschmutzung des Sees herauszufinden, sondern auch Präventivmaßnahmen sowie erlaubte Nutzungen des Sees festzulegen. Hierfür soll bis zum Jahr 2006 eine limnologische Evaluierung der Uferzone durchgeführt werden. Des Weiteren sollen die Bevölkerung, die verschiedenen Interessengruppen etc. über die erzielten Ergebnisse kontinuierlich informiert werden.

15. Evaluation and Monitoring of Natural Resources

Dr Argiris Kallianiotis

Fishery Research Institute (INALE), Kavala, Greece

Coastal lagoons comprise 13% of the world coastal coastline and are located anywhere, from tropical waters to the poles. They are enriched by marine and continental inputs and are among the most productive ecosystems in the biosphere. Generally the lagoons and most of the wetlands are shallow and communicate with the sea by small canals, maintained open during the wet season in the north hemisphere or in other cases by permanent branches of the near river. Today, only few coastal lagoons and wetlands are still in natural conditions but many of them changed in their topography and hydrographic morphology, after several decades of human interventions. These include plans for their drainage or technical works aiming to adapt the water bodies in conditions favourable for extensive or semi intensive aquaculture. In the Mediterranean coast almost the 10% of the general fish production comes from the lagoons or other coastal shallow biotopes. Fortunately only few of them are transformed until today in intensive aquaculture units. The undamaged areas allow the coexistence of a natural ecosystem with a traditional fishery system. Even if this human intervention is considered from some naturalists as a violation of the natural ecological cycle, the local fisher communities and their extensive fishery system are recognised as an essential part of these areas, ensuring the safety control of remote areas, the decrease of illegal hunting, the water equilibrium and, in long term, the conservation of this fragile ecosystem.

Lagoons produce more fish than most ecosystems in the world. Their continuous enrichment with nutrients, the interaction of fresh water and salt-water, and ideal physicochemical conditions bring it about that fish are attracted to these lakes and their numbers and biomass increase rapidly, thus providing the opportunity for their populations to be exploited. The exploitation of lagoons for fishing is very significant for the local economy.

Besides their high productivity, lagoons have one more advantage in terms of fishery management: it is easy to catch fish that are found in them. This occurs because the species living in

lagoons are usually migratory euryhaline species that can live in waters whose salinity fluctuates greatly. Thus, they migrate to the lagoons when they are young fry and return to the sea as mature adults for reproduction. During the reproductive season a large number of fish move towards the sea and are caught in the fish barriers especially installed for this purpose in the passages communicating with the sea. Today, these installations are made of concrete and aluminium grids, while in former times wooden structures were used consisting of stakes driven into the bottom of the lagoon in order to support a grid made of reeds which led to the fish traps. For the duration of approximately 3-4 months each year, usually from February to May, fishermen open these fish barriers and other passages situated between the lake and the lagoon, in order for new fish to be harvested.

Fisheries is an important part of their management and therefore some general rules should be applied to allow their natural conservation and in parallel to maintain healthy the local fishery communities

The most important characteristic in a wetland and the lagoons is their hydrological regime and water quality, a characteristic essential for fishery. Fresh water plays a vital role, given that it enriches the lagoon waters with nutrients, increasing their biomass and attracting young fry. It is necessary to study and acquire in-depth knowledge of the movement of fresh or sea-water in lagoons so that projects aimed at improving the living conditions of the fish populations and increasing their production can be planned and implemented. When we intend to apply a new management system in a coastal wetland or lagoon, some data are essential as for example the knowledge of the seasonal hydrological cycle, data on the rain season, the current direction, the tidal regime and the seasonal temperature profile in the water. Local data on the main wind direction combined with water temperature, could easily explain the thermal situation in the water: anoxic state, permanent water stratification and ice coverage of

the surface all dangerous for the fishery production. The water salinity and the oxygen depend in part on the temperature and the main local wind pattern.

In order to maintain a healthy, extensive exploitation of the coastal lagoons, some prerequisites are needed such as good water distribution, good knowledge of the migration seasonality, application of some general restrictions in the exploitation of the nearest coastal area and in particular cases the controlled introduction of young fish seasonally. The coastal zone close to the edges of the inner part of the lagoon is essential not only for the local birds. Many young fish use to spent part of their early life in these areas for foraging purposes. The appearance of this area is a good index of the lagoon health. Polluted lagoons or eutrophic water bodies show a disturbed image with dead organic matter in semi decomposition or concentration of various pollutants.

Zusammenfassung:

Lagunen in Küstengebieten umfassen ca. 13% der Küsten weltweit und befinden sich überall, von tropischen bis hin zu den polaren Breiten. Dadurch, dass sie sowohl von mariner als auch terrestrischer Seite mit Nährstoffen versorgt werden, sind sie die produktivsten Ökosysteme der Erde. Nach mehreren Jahrzehnten menschlichen Eingriffs wird dieser durch veränderte Topographie und hydrografische Morphologie sichtbar. Grund hierfür ist z.B. die sogenannte Aquawirtschaft (im Gegensatz zu Landwirtschaft), die in den Lagunen des Mittelmeers ca. 10% ausmacht. Fischerei ist dennoch ein wesentlicher Bestandteil der hiervon lebenden Bevölkerung und trägt zum Erhalt dieses zerbrechlichen Ökosystems bei.

16. Dissemination and Transferability

Udo Gattenlöhner

Executive Director of Global Nature Fund, Germany

Most wetlands and lakes in Europe are exposed to similar threats and have to face the same problems. The goal of this EU LIFE project was to demonstrate sustainable management practises for wetlands and shallow lakes by providing practical measures and solutions. One objective was to motivate small communities with water shortage or pollution problems within the EU to restore and preserve wetlands as a contribution to sustainable water management. In the current project the project partners have gained important experiences and know-how concerning waste water treatment, cleaning of polluted lakes and lagoons, preservation of wetlands, extensification of agriculture, visitor's management and sustainable tourism. All these experiences were disseminated to other areas in the EU with similar problems.

Within the Living Lakes network experiences have been made that the exchange of know-how and the cooperation at international level

are an enormous motivation for local stakeholders to solve problems in their own area. Therefore, a core element of the project was the continuous exchange of know-how between experts and other stakeholders with respect to the management of wetlands. The results of the project were disseminated and spread through training courses, workshops, international conferences, publications and other communication techniques such as a website to other organisations, municipalities and enterprises working in wetland and lake areas as well as the general public. The following communication techniques were used to address the target groups:

Exhibitions

In both areas the project partners produced an exhibition as a tool to inform local people as well as an international audience and experts. The bilingual boards are describing in detail the functions and values of wetlands, the restoration measures and the EU LIFE programme. They

are displayed in regional communities, environmental education centres, schools and on international events such as the Ramsar Conference in 2003 in Valencia. The exhibition was offered for download on several websites.

Brochures

In both areas a project brochure (16 pages) was designed in order to describe the measures and the results of the project. The target groups of the brochure are local residents as well as guests (visitors, work camp participants etc.) and an international audience. The brochure was disseminated via partner organisations, schools, municipalities and through information centres and tourist information offices etc.. Different leaflets for various target groups (information flyers, species lists, etc.) have been produced and used for environmental education activities.

Environmental interpretation trail

In Spain a 1.1 km long "interpretation trail" was set-up and now connects the village of Boada de Campos with the Boada wetland. The information panels (1.5 m x 0.9 m) with a focus on flora and avifauna were installed in winter 2003/2004. In Greece a small nature interpretation trail at the Nestos Lakes was built in autumn 2004.

Work Camps

Two annual work camps for young people and adolescents were carried out in both regions. On average 10 – 20 participants from Spain, Greece, Germany and other EU countries took part in the camps. Various activities took place during the three weeks work camps such as:

- Workshops about managing wetlands,
- Construction of an observation platform,
- Monitoring and ringing of birds and construction of a "Helgoland Trap".

Environmental education and school classes

An important aspect of the project is the regional acceptance of the measures. Therefore environmental education in schools has an important effect on the long-term strategy to make local residents understand the role and functions of their wetlands and to enhance the willingness to conserve them. Every year 20 – 30 lectures were given in local schools (or on day excursion to the wetlands with the pupils), reaching more than 1,000 children.

Workshops

More than 100 participants from six countries took part in the regional workshops in October 2003 in Greece and January 2004 in Spain. A multilingual publication containing all presentations was published and circulated.

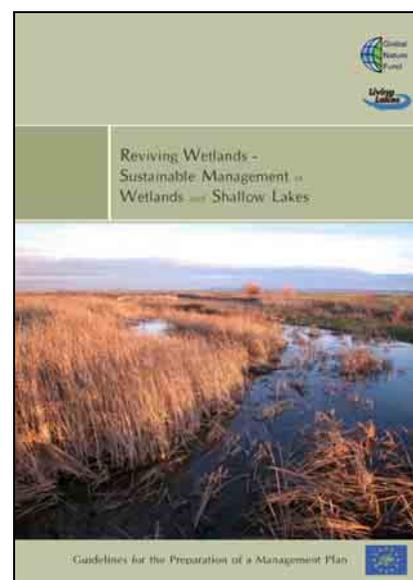
The international EU LIFE Workshop "Planning and Implementation of Wetland Management" in England in September 2003 was an important opportunity to present the results of the project to experts, multipliers and the worldwide media. The Workshop was attended by 52 participants from 15 countries. In a survey the majority of the participants assessed the workshop as very positive for their work ("very useful" 38% and "useful" 58%). A printed documentation of the workshop is available.

Project Video

A multilingual documentary (45 minutes - English, Spanish, Greek, German) was produced in 2004 on DVD and on VHS tapes. Footage of the regions (landscapes, flora and fauna, environmental problems) and of all relevant project activities (planting, water analyses, etc.) was recorded by local film crews as well as a German film team.

Manual

A multilingual handbook (English, Spanish, Greek, German) for the development of management plans for the restoration of wetlands was produced in autumn 2004 and is provided as a hardcopy version (140 pages) and on CD.



Website

The LIFE project is presented in the World Wide Web with an own website that was continuously up-dated (www.livingwetlands.org). The website is available in English, German, Spanish and Greek. In addition the project is extensively described on the partner's websites, i.e. www.globalnature.org and www.fundacionglobalnature.org and is linked to a number of other websites. A final statistics for the website is not yet available – an estimation on the basis of the monthly visitor statistics shows, that more than 5,000 people visited the website each year.

Press & Media Work – Regional, national and international level

A large number of articles in newspapers, newsletters and magazines, radio interviews and TV reports about the EU LIFE project have been published in Spain, Greece and on international level. In total more than 100 newspaper articles, 20 radio interviews and 10 reports on TV about the EU LIFE project "Sustainable Management of Wetlands and Shallow Lakes" were documented and compiled in a detailed media report.

Visitor Information

Approximately 10,000 people visit La Nava and Boada annually. The "Tierra de Campos - Environmental Studies Centre" in Spain was continuously open for visitors.

International Events

The project was presented at various public events with presentations, lectures, exhibitions and printed material circulated, i.e. during the last 18 months on:

- World Water Forum 2003 in Japan (March 2003)
- Lakeshore 2003 in Konstanz, Germany (June 2003)
- Lake 2003 in Chicago, USA (June 2003)
- Antifouling Symposium, Friedrichshafen, Germany (Sept. 2003)

- 8. International Living Lakes Conference in England (Sept. 2003)
- UN Year of Freshwater 2003 in Bonn, Germany (Oct. 2003)
- Brau 2003 in Nuremberg, Germany (Nov. 2003)
- Naturschutztage 2004 in Radolfzell, Germany (Jan. 2004)
- Reisepavillon 2004 in Hanover, Germany (Feb. 2004)
- Ibero-American Conference in Mexico (March 2004)
- BALWOIS Conference in Macedonia (May 2004)
- 9. International Living Lakes Conference in Canada (Oct. 2004)

Zusammenfassung:

Ziel des EU LIFE Projektes war es, Methoden für ein nachhaltiges Management von Feuchtgebieten und Flachwasserseen aufzuzeigen. Da die meisten europäischen Feuchtgebiete und Seen gleichen Gefahren und Problemen ausgesetzt sind, wurden Maßnahmen erarbeitet, die auf andere Gebiete übertragen werden können. Der Austausch von Erkenntnissen und Erfahrungen war durch Trainingskurse, Workshops, internationale Konferenzen und Publikationen gewährleistet und besaß internationalen Anspruch. Ausgehend von diesen Faktoren übertrug sich die Motivation, lokale Probleme eigenständig zu lösen, auf die betroffenen Regionen. Es entstand eine umfassende, viersprachige Internetpräsenz (www.livingwetlands.org). Neben Online-Medien wurden aber auch Print- und audiovisuelle Medien genutzt, um somit sowohl auf regionaler als auch auf nationaler und internationaler Ebene auf das EU LIFE Projekt aufmerksam zu machen.