Global Nature Fund

Bodensee Stiftung

Living Lakes

Documentation of the Training Course

SUSTAINABLE MANAGEMENT OF WETLANDS AND SHALLOW LAKES

Überlingen
Lake Constance, Germany

8 – 12 June 2004

With the contribution of the LIFE financial instrument of the European Community

Contents

1 Introduction

In early June 2004, a training course was carried out by Lake Constance Foundation in cooperation with Global Nature Fund in the scope of the EU LIFE funded project *"Living Lakes: Sustainable management of wetlands and shallow lakes"*.

Wetland managers and stakeholders from European countries and Africa gathered in Überlingen, a small town on the northern shore of Lake Constance, to learn about issues of management and rehabilitation of lakes and wetlands, sustainable tourism and promotion of organic agriculture in wetland areas.

The broad aim of the EU-Life project is to develop and implement management plans for La Nava/ Boada Lakes in Spain and for lakes and lagoons of the Nestos wetlands in Greece, with the intensive involvement of local communities. One of the major tasks of the project is the dissemination of know-how to interested parties primarily at European level. The Lake Constance training course was one of four courses carried out in this context.

Readers interested in project details are welcome to visit our project website www.livingwetlands.org.

The training course participants waiting for a trip on solar ferry Ra (Picture by Annie Peyzanova)

Facts about Lake Constance

Origin	Ice age: glacial river erosion	**Lake Constance Area**	4,367 square km
Age	16,000 years	**Land use**	75 % Cultural landscape, 25 % forests
Surface	540 km^2	**Fish**	39 species
Catchment	12,000 km^2	**Nesting birds**	151 species
Salinity	fresh water	**Waterfowl max**	274,000 (1988)
Maximal depth	252 m	**Inhabitants lake area**	1.3 million
Mean temperature	8.6°C	**Registered watercrafts**	55,907 (1998)
Largest in-flow	Alpine Rhine (70 %)	**Lake water**	Drunk by 4.5 million people
Outlet	1 (Rhine)	**Biggest problem**	Population growth
Precipitation per year	800 mm (western part), 1,400 mm (eastern part)	**Greatest success**	Reduction of phosphate loading

In total 55,000 boats are registered on Lake Constance

2 Presentations

2.1 Environment and nature protection at Lake Constance

Harald Jacoby, Lake Constance Foundation

Lake Constance as a farmed ecosystem

The cultural and natural Lake Constance region holds a special status: this special lake is shared by three countries who are jointly responsible for it. In the past, the perception and the respect of people for Lake Constance has fluctuated greatly. Even today the economic and the ecological demands made on the lake stand in stark contrast to each other. Some important functions of the lake are outlined below:

Ecosystem: Lake Constance is one of the most important habitats for the flora and fauna of European fresh-water lakes. Large parts of the lake meet the criteria of the EU 'Natura 2000' directive.

Settlement area: The population density is more than 500 people/km^2 around the lake shores. Three million people live in the international Lake Constance region.

Economic area: Agricultural use of the landscape is mainly characterised through intensive fruit plantations, vegetable plots and vineyards. Industrial settlements (textile factories, metalworking industry and car factories) were established early on. Tourism has recently become an important source of income.

Drinking water reservoir: Lake Constance supplies drinking water for 4.5 million people.

Holiday region: In excess of 80 million overnight stays are registered in the region per year. 1.5 million people visit the flower island 'Mainau' each year. At the same time the lake region is very important as a recreational area for the people living in the area.

Water sports: Over 55.000 sport boats have been registered on the lake (not counting small boats and surf boards). Two-thirds of the registered boats are equipped with an engine.

Sewage water: Even in the 1980s the lake was still being exposed to high concentrations of agricultural run-off which lead to a very dangerous nutrient over-load in the lake. Today the lake still has to deal with nutrients present in treated sewage water which drains into the lake.

Traffic: As an important transport node, the Lake Constance region has one of the highest road densities in rural areas of Germany.

Transport: Shipping on and across the lake has always been important. It was not until the 1970ies that the plan to create a link for freight ships between Lake Constance and the North Sea was dropped.

Transport obstacles: Even in the 1960ies there was still discussions about building a bridge across Lake Constance.

Rubbish tip and land reclamation: Up to the 1950ies, shore areas of Lake Constance were used as rubbish tips which were later filled in to be built on. To 'restore' the lake, lake coves were still being filled up in the 1960s.

Reservoir: The natural capacity of lake Constance to store water was to be made controllable through a weir to regulate the water in and out-flow. The water was then to be used for projects not otherwise connected to the lake, such as shipping on the Rhine, and water quality improvement of other water bodies.

Trans-boundary environmental policy at Lake Constance

The most important motor for trans-boundary cooperation was the joint concern regarding the drinking water quality. It is no secret that without this interest in using the lake for drinking water by both Switzerland and Germany, there would not be much reason to celebrate the success of joint environmental policy.

Especially apparent is the lack of a binding trans-boundary agreement to define joint environmental quality goals in the context of an ecologically orientated economic region Lake Constance. A consequence of such an agreement would be an adjustment of economic activities in the immediate surroundings of the lake as well as in the entire catchment area.

A good example for cooperation in the field of trans-boundary water protection, is the work of the 'Internationale Gewässerschutzkommission für den Bodensee' (IGKB, International water protection agency for Lake Constance). The commission has been continuously monitoring and analysing the water quality of Lake Constance since 1959. In 1960 all countries bordering the lake signed a contract 'Übereinkommen über den Schutz des Bodensees gegen Verunreinigungen' (Agreement on the protection of Lake Constance against contamination). Most of the work of the commission is now focussed on work to control potential sources of contamination before it becomes a problem. It is especially important for Lake Constance, as an important European source of drinking water, to be given the protection status 'Wasserschutzgebiet' (Water protection area).

Future perspectives for trans-boundary environmental policy

The protection of the lake from contaminants is one of the main priorities of the Lake Constance environmental policy. Unfortunately the environmental damage prevention measures are still underdeveloped in comparison to the measures carried out to repair past damages. 4 billion Euro have been spent to date on installing waste water treatment plants in the catchment area of the lake. The very high rise in phosphor levels in the lake in the 1960s and 70s have been stopped and are now dropping fast. 1979: 87 mg/m^3 , 2001: 13 mg/m^3 . The level of phosphor the IGKB (International Commission for the protection of Lake Constance) wants to achieve, is 10 mg/m^3.

This success should not detract from the fact that many other problems have not been solved as yet. Especially the problems in the area of agriculture are still far from being solved. Even though there have been many individual measures taken by farmers to reduce nutrient and pesticide input, there are still no grants and subsidies available which would make organic farming more attractive to the broad mass of farmers.

The pressure of land use in the region is still high and shore areas, and the relationship between shore regions and the hinterland is being devalued through settlements, industrial estates and road-building projects. The highly sensitive and ecologically valuable shoreline and shallow water areas are particularly endangered and need comprehensive protection.

Joint concepts and measures for the regional re-orientation of local transport policy have not been agreed on as yet. First steps towards a Bodensee-S-Bahn (a train all around Lake Constance) is the 'Seehas' (Hegau - Lake Constance line) and the 'Geißbockbahn' (the Goat Line) or the Bodenssee-Oberschwaben-Bahn (Lake Constance Upper Swabia Line).

The Lake Constance Guidance Plan 1994 (Bodenseeleitbild) postulates the following aim for regional planning: 'What is needed is a sustainable, i.e. permanent environmentally friendly protection and development of the Lake Constance area as a European space'. This idea is in line with the perceptions of the environmental organisations. What is needed is a trans-country regional planning initiative which is orientated towards the development profiles designed for the Lake Constance area. But the non-committal nature of the Lake Constance

Guidance Plan puts the value of important development goals and many good guidance concepts in question.

The natural resources of Lake Constance should be efficiently protected as irreplaceable basis for the regional eco-system. As drinking water reservoir, important recreational area not just for the locals, and as habitat for a diverse flora and fauna, Lake Constance is of European importance. These ecological functions of highest value must be given priority to ensure lasting security for the cultural and natural basis of the Lake Constance region.

The international Lake Constance Conference with all the various commissions it includes, must work towards the fast implementation of the regional environmental policy as it is proposed in the Lake Constance Guidance Plan. Especially from the environmental commission, stronger momentum to forward trans-boundary environmental policy would be good.

Protection of the shore and shallow water eco-systems

The Baden-Wuerttemberg law for the protection of biotopes (§ 24 of the Naturschutzgesetz [environmental protection legislation]) stresses the vulnerability and the importance of protecting 'the natural shallow waters and shorelines of Lake Constance'. Decisive for the status of an area is the definition of it as Protection Zone I or Protection Zone II as laid out in the Bodenseeuferpläne (Lake Constance Shoreline Plans) of the regional authorities of the Hochrhein-Bodensee (Upper Rhine-Lake Constance) and the Bodensee-Oberschwaben (Lake Constance – Upperswabia). These are areas of which the shore lines are mostly still in their natural state, either through a largely intact reed belt or an alternative indigenous form of vegetation *(*hair grass *-deschampsietum rhenanae* or plantain – *plantaginaceae* population*)* which have self-cleansing functions in shallow lake areas and fulfil the definition of fishing and spawning areas.

For these areas a qualified protection plan has to be developed in accordance with the already existing spatial protection laws. It is also important to protect and encourage the existing flora and fauna populations through adequate care.

Recommendations for land and biodiversity protection

The country borders still represent grey areas in the eco-system of Lake Constance. The harmonisation of rules in existing, at times even neighbouring, zones of nature protection have still only been partly implemented. The recommendation of the Lake Constance Guidance Plan in 1982 and then again in 1994, have not been followed.

It is essential to establish the same laws of nature protection in Switzerland as in Germany. Beyond the importance of establishing laws for single cases, the countries bordering Lake Constance should decide on a joint concept and a plan for swift implementation for protecting the lake, based on international treaties for biodiversity and biotope protection (Ramsar-Convention, EG-Bird protection directive, Habitat-Directive).

To implement a trans-boundary land - and bio-diversity protection plan, the non-governmental environmental protection organisations around the lake which are represented in the Lake Constance environmental council, have developed the following guidelines and measures:

- Observe the international responsibility for the protection of endangered habitats and species
- Formulate a trans-boundary land protection concept for the entire shore- and water area

- Define joint areas of nature protection and harmonising existing areas on both sides of the border
- Harmonise existing nature protection laws e.g. laws for regulating water-sports and hunting
- Comprehensive protection of endemic 'shorelawn societies' (Strandrasen gesellschaften) and a consistent regard for them during any renaturalisation projects.
- Putting the importance of Lake Constance as a very important site for migratory birds in the centre
- Strengthening the trans-boundary cooperation in official and private nature protection

Western Lake Constance Biosphere Reserve – A perspective for the future?

The western Lake Constance area offers optimal conditions for a bio-sphere reserve of trans-boundary importance especially as the area is not only of high cultural importance but is also of outstanding natural value. In spite of the land-use pressure (urbanisation, transport, agriculture, tourism, water sports), the area has maintained its highly valuable natural basis. In the German-Swiss trans-boundary areas, they are large nature protection areas, water bird gathering sites of international importance, and other large ecological priority areas (Natura 2000 areas as designated by the EU). What is still missing is a trans-boundary concept which structures all current individual initiatives under one main concept. With the project 'Untersee life' (life on lower Lake Constance) which is supported by the EU, the attempt is being made to connect seven spatially non-connected nature protection areas with a total area of 942 hectare. The underlying idea is to create a 'Lebensraumverbund Westlicher Untersee' (habitat of the western lower Lake Constance) by designing a common management scheme and optimising this over the coming years.

On top of this, the administrative district of Constance has been chosen as a PLENUM-Region (Project of the State of Baden-Wuerttemberg, to preserve and develop nature and the environment). In these regions, nature protection goals for 'cultivated landscapes which are close to nature and therefore especially valuable can be protected, without having to define them as nature protection areas'. The aim is an environmentally supportable and economically viable, i.e. sustainable use of the region.

These German planning and implementation initiatives are complemented on the Swiss side by 'Landschaftsentwicklungskonzepte' (landscape development concepts) (LEK) which are currently being developed. The best pre-conditions exist for the creation of a trans-boundary biosphere reserve 'cultural landscape lower lake Constance/ Western lake Constance'. It would be the first lake-ecosystem in central Europe to be declared a biosphere reserve. The western Lake Constance region is very typical of other central European lake regions. The land use ranges from shallow water zones and shore areas with no human influence through shallow water zones and shore areas with limited human influence, to intensively farmed agricultural zones.

Not only has it been possible to protect large areas of the region from degradation, but it has also been possible to extensify and to successfully renature already degraded areas. On the level of regional decision-making, both public and private initiatives have been in existence for many years which have been working towards creating the biosphere reserve. This is why there is a very tight cooperation between tourism, agriculture and conservation in the Western Lake Constance area. Private environmental initiatives currently protect nature reserves including the following, covering a total area of 2.800 hectares in the Western Lake Constance region: Wollmatinger Ried (marsh area), Untersee-Gnadensee , Mindelsee (small glacial lake), Mettnau Penisular and the estuary of the Radolfzeller Aach.

What the environmental organisations do

The development at Lake Constance is a good example of the fact that how the public view the value and the expert knowledge of environmental organisations is influenced by years and even decades of previous work.

Between the 1970s and the 1990ies, the work of the environmental organisations at Lake Constance were characterised in the media by calls-to-action and protest activities of the environmentalists and conservationists. The 1990s have seen a change of position of the environmental organisations towards a cooperation with the communal, regional and private intentions taking place in the region. The 'image of the enemy', which had been present in peoples heads faded in almost all cases. An important supportive factor for this was probably the continuity of the involved people – sometimes this was also a negative factor.

Once the Lake Constance Environmental Protection Project (Bodensee-Umweltschutzprojekt) of the German Environmenal Aid Association (DUH) was started in 1990, it was possible to put together a professional team for the organisation and the coordination of the project, to intensify the trans-boundary cooperation of organisations. 18 private organisations from Germany, Austria and Switzerland created the environmental council (Umweltrat) for Lake Constance and worked together in the Lake Constance Environmental Protection Project (Bodensee-Umweltschutzprojekt). The project could be realised due to a generous donation of the Lever GmbH (now called: Lever Fabergé).

The environmental council for Lake Constance was founded to be able to deal with the diverse ecological, political and administrative relations in the Lake Constance region. Information is now exchanged in regular intervals at meetings. Such meetings are also used to formulate positions on trans-boundary topics, coordinate individual projects and decide on further measures. All cooperating institutions keep their individual sovereignty but join forces to pursue a joint interest.

This cooperation was the basis in 1994 for the foundation of the 'Bodensee-Stiftung, Internationale Stiftung für Nature und Kultur' (Lake Constance Foundation), which had the following organisations as founders: the 'Schweizerischen Bund für Naturschutz' (Swiss League for Nature Conservation) which is now called Pro Natura, WWF Switzerland, the Austrian Nature Conservation League (ÖNB), the German arm of Birdlife International (NABU), and Friends of the Earth Germany and the German Environmental Aid (DUH). The Environmental Council of Lake Constance kept its technical role and is now part of the Lake Constance Foundation as advisory council (Beirat).

The aim of the foundation is the 'support of activities to preserve and develop nature, landscape and natural resources – especially by promoting sustainable economies – in the international region of Lake Constance'. By combining the traditional task of environmental organisations as watchdog with real competences in the field of sustainable regional development, the Lake Constance Foundation is set clearly apart from classical environmental organisations.

The Lake Constance Foundation has managed, in a few years, to strengthen its reputation as a qualified body for questions relating to Lake Constance, as a partner in trans-boundary discussions and cooperations and as a partner of regional businesses.

2.2 ECOLUP: Environmental Management for Land Use Planning

Marion Hammerl, Lake Constance Foundation

ECOLUP:

Environmental Management for Land Use Planning

Budget	**793.225 Euro**
Financing	**50 % by LIFE-Programme**
Duration	**July 2001 until March 2004**
Partner	**Lake Constance Foundation**
	Fachhochschule Nürtingen
Germany:	**City of Constance, City of Überlingen**
Austria:	**City of Dornbirn, Municipality of Wolfurt**

ECOLUP:

Overall goal is to establish preparatory and legally binding sustainable land use planning through the development and introduction of an environmental management system according to EMAS

- **Is (EU-Eco-Management and Audit Scheme) applicable to planning processes?**
- **Will the urban land use planning though eco-management be more sustainable? Benefit for environment?**

ECOLUP and EMAS

Who can get the certification?

According to EMAS II the municipality as the process manager of urban land-use planning. Competent authorities are the specialist department, the municipality council and the mayor

What is being certified?

The planning process and (partly) the results. Land use planning includes development and building plans. Additional plans and informal plans can be also included.

ECOLUP - Project goals

- **Development and introduction of an EMS in four municipalities**
- **Test-certifications in four municipalities**
- **Improve possibilities of citizens participation / more transparency**
- **International exchange of experience**
- **Transferable results to municipalities in other regions**
- **Continuation and extension of the project after LIFE**

ECOLUP: Methodology / Contents

- Environmental teams in every municipality
- SWOT-Analysis to define actual situation regarding all relevant environmental aspects in every municipality
- Discussion of the SWOT-results and setting priorities in every municipality
- Local workshops with the environmental team to discuss all relevant environmental aspects, to develop aims and measures for each relevant environmental aspect (environmental program)
- Indicators to measure and to verify aims and targets
- Approvement of environmental policy and –program by municipality council
- Four international workshops to exchange experience

ECOLUP: Communal Workshops

- Introduction of environmental management
- SWOT-Analysis
- Land use planning
- Sealing /Green belts
- Traffic /Mobility
- Energy / Climate
- Landscape / Water
- Implementation environmental management system
- Participation / Civil involvement

ECOLUP:Example Überlingen
Goals for land use planning and green belts

- **Avoidance of urban fallow land**
- **Closing of building gaps in the city**
- **Reduction of traffic areas**
- **Economical land saving site development**
- **Protection of forest areas**
- **Unsealing of private and comercial areas**
- **Establishing connexions between green spaces**
- **Control measures of green structure plans**

ECOLUP: Deliverables

- **ECOLUP guide and software**
- **ECOLUP exhibition and brochures**
- **Evaluation of measures to improve citizens participation**
- **Report for registered EMAS-verifier**
- **Evaluation of the ecological, economical and social effects of the project**

EMAS	ECOLUP
Relevant aspects	**environmental aspects influenced directly or indirectly by planning**
Internal Environmental audit	**SWOT – Analysis**
Documentation Consumption	**Indicators (land use, impacts, process**
Environmental goals	**On the base of SWOT-Analysis,**
Environmental policy	**to define during local workshops**
Environmental program	
Environmental statement	**Approved by Municipality Council**
Environmental representative	**Director of planning administration or delegate**
Involvement of employees	**Environmental team**
And stakeholder	
First Verification	**Test verification supported by auditor**

Costs of EMAS implementation (Ecolup estimation)

Target	Working days		External costs
Analysis of current situation = collection of relevant data, SWOT-Analysis	Project Team Municipality	20 20	SWOT 7.200
8 communal workshops (define aims, measures, programme, structure) with Environmental Team = 10 Persons	Project Team Municipality Environm.Team	40 40 80	Speaker fees 4.000
Internal audit, documentation, Preparation of validation process	Project Team Municipality Environm.Team	10 15 10	
EMAS Validation	Project Team Municipality	5 5	Official auditor 3.000 – 4.000



ECOLUP Experience: EMS-Implementation Problems

- **Lack of harmonised data**
- **No measurable aims, no use of key data, no monitoring**
- **Lack of sound control system, to guarantee that all environmental guidelines of a building plan and land use plan are really respected during the implementation (= Separation of planning and implementation – absence of plan evaluation)**
- **During the discussion in the municipality council (appreciation order) very often environmental aspects are the looser in oposite to social and economical arguments**
- **Lack of horizontal co-operation (between administrations/ departm.)**
- **Lack of financial and personnell resources**
- **Lack of motivation of citizens to participate in strategical planning**
- **Agenda groups receive not enough feedback and see only few „real" results coming out of their participation / input**



EMAS and strategical processes (ECOLUP)

<u>EMAS implemented into planning processes = strategic planning</u>

- **Environmental policy = Vision**
- **Environmental programme = Measurable environmental aims for all relevant direct and indirect environmental aspects and concrete measures to fullfil the aims**

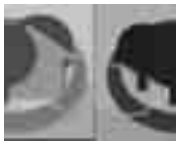
<u>The requirements of EMAS management system help to make sure that strategic aims will be taken into account in the daily work</u>:

- **Definition of responsibilities (who needs to do what)**
- **Documentation of the processes**
- **Feedback /control regarding the results of measures**
- **Monitoring of the results and functioning of management system**



EMAS and Sustainable Management

- **The key elements of EMAS-system can be integrated into existing municipality structures. EMAS is an open system in which other tools easily can be integrated.**
- **EMAS is an environmental management system, but other aspects of sustainability are implicit included: During the process to define the environmental aims and measures, all social and economical aspects are taken in consideration**
- **From EMAS to IMAS : the EMAS system would be also valid and useful for social and economical improvements. Only extension of contents, no systematically change necessary.**


Management systems and Auditing

- **Official, neutral auditing is positive within EMAS and positive for all management systems**
- **Evaluation and verification should never depend on political circumstances**
- **Official, neutral auditing = pressure to motivate the municipality council not to forget the environmental programme which they approved.**

Management systems and Monitoring

- **Monitoring is necessary for EMAS and all other management systems (to assess actual situation, to measure results) but very often meaningful data is not available**
- **Taking into account to difficult financial situation of municipalities, it does not make sense, that every municipality creates it´s own monitoring system**
- **Implementation of a standard monitoring system for municipalities with few but meaning ful key data would be useful**
- **Monitoring should be responsability on supra-municipality = regional level (Sustainable Urban Agency)**

Sustainable Urban Agency = regional agency for local and regional Monitoring

Analysis of the yearly key data received from the municipality

- **feedback = monitoring report with advise on problematic aspects**
- **situation of the municipality in the context of the whole region**
- **benchmarking / setting of standards within the municipalities of the region**
- **Neutral and low cost auditing of Sustainable Urban Management System of each municipality in the region**

Transfer of data to a national and or european Institution:
- **monitoring on national and european level**
- **create european standards and benchmarking system**



ECOLUP Project-Team

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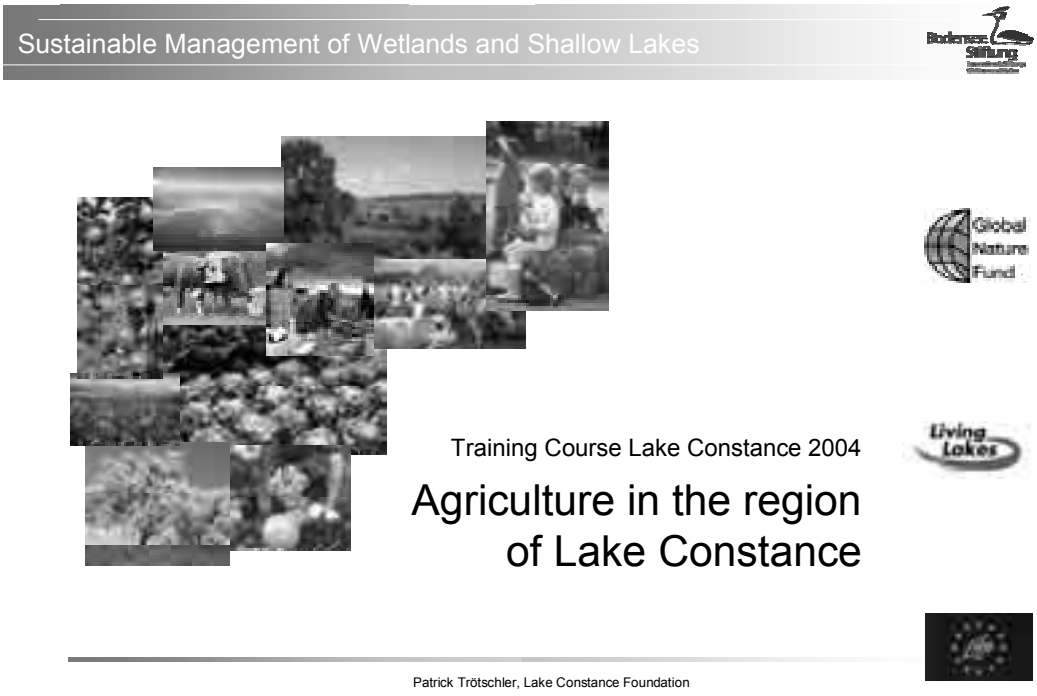
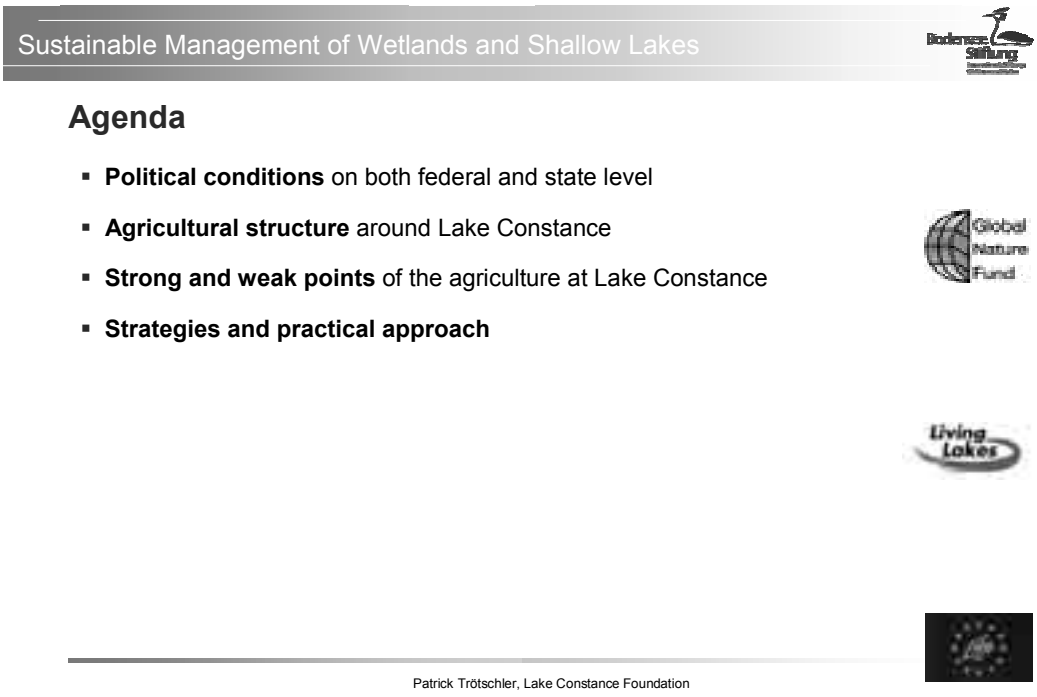
Support	**SSWP, Constance** **Österreichisches Ökologie Institut, Bregenz**

2.3 Agriculture in the region of Lake Constance

Patrick Trötschler, Lake Constance Foundation





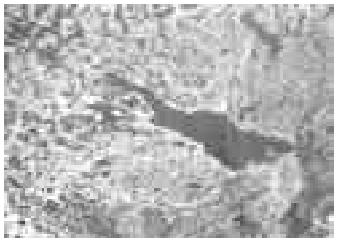
Political Conditions in Germany

- **On federal level**
  - new goals: 20 % organic agriculture, more consumer-oriented
  - nation-wide quality label for organic products
  - nation-wide competition: 18 case study regions
  - nation-wide programme: Organic Farming
- **On state level**
  - MEKA-programme for agricultural extensivation
  - PLENUM-regions (5 case study regions, 2 of them around Lake Constance
- **On EU level**
  - INTERREG IIIa-programme „Alpenrhein-Bodensee-Hochrhein“

Sustainable Management of Wetlands and Shallow Lakes

Political Conditions in Austria & Switzerland

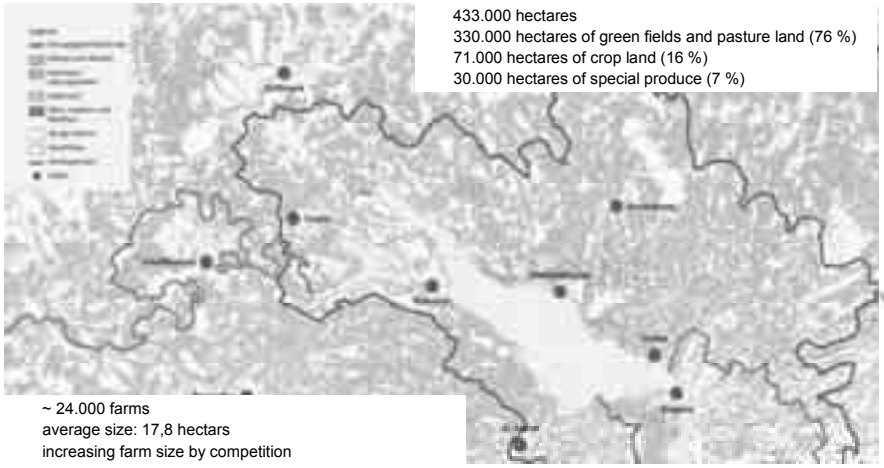
- **Austria**
  - similar to Germany
  - more ecologically-sound farming



- **Switzerland**
  - subventions only for ecological farming and „friendly“ livestock husbandry (multifunctional agriculture)
- **On EU level**
  - INTERREG IIIa-programme „Alpenrhein-Bodensee-Hochrhein“

Patrick Trötschler, Lake Constance Foundation

Agricultural structure around Lake Constance



433.000 hectares
330.000 hectares of green fields and pasture land (76 %)
71.000 hectares of crop land (16 %)
30.000 hectares of special produce (7 %)

~ 24.000 farms
average size: 17,8 hectars
increasing farm size by competition

Patrick Trötschler, Lake Constance Foundation

Sustainable Management of Wetlands and Shallow Lakes

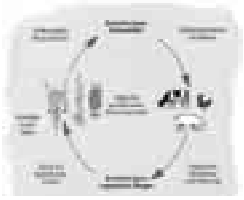
Agricultural production around Lake Constance: product variety like in paradise

- Meat (veal, beef, pork, lamb, fowls, wild game, …)
- Dairy Products (milk, cheese, butter, cream, yoghourt, ...)
- Fish (from Lake Constance and from aquacultures)
- Cereals (wheat, barley, oat, rye, spelt
- Fruits
- Vegetables
- Wine
- Hop / Beer
- …

Patrick Trötschler, Lake Constance Foundation

Agricultural variety in production systems

- **Conventional agriculture**
  - compliance of the actual laws
- **Integrated agriculture (IP-Production)**
  - economic principles with ecological effects
  - reducing chemical fertilisers and pesticides
  - big differences in IP-standards between A, CH, GER
- **Organic agriculture**
  - principle of a closed stock circulation
  - no chemical fertilisers and pesticides
  - friendly livestock husbandry



Strong & weak points

- **Production**
  - ☺ high productivity
  - ☺ wide diversity of products
  - ☺ high number of organic farmers
  - ☹ pollution of the environment
  - ☹ high potential for ecological problems
  - ☹ missing concepts for rural management

Strong & weak points

- **Marketing**
  - ☺ high potential for regional marketing (population and tourism)
  - ☺ Lake Constance as a BRAND
  - ☹ no regional marketing system for regional-organic food
  - ☹ no frame of reference for regional-organic food

Strategies & practical approach

- **to develop new markets for organic and regional food**

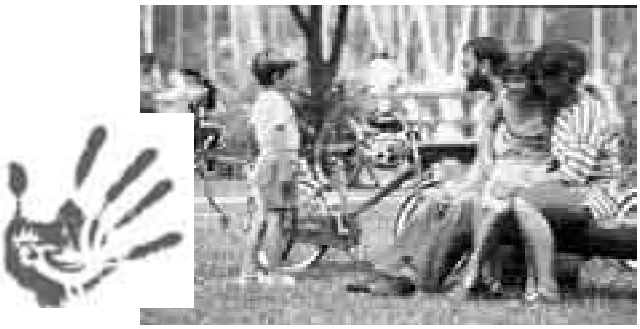
- **to inform and to sensitise the consumers**

Sustainable Management of Wetlands and Shallow Lakes

Strategies & practical approach

New market TOURISM

- **Model project „Erlebnisradeln am Untersee“**
  (Adventure biking tour around Lower Lake Constance)



Patrick Trötschler, Lake Constance Foundation

Sustainable Management of Wetlands and Shallow Lakes

Strategies & practical approach

New market GASTRONOMY

- **Model project „Untersee-Genüsse“** (Lower Lake Constance Delights)

Patrick Trötschler, Lake Constance Foundation

Strategies & practical approach

New market CANTEEN KITCHENS

- Information campaign „Klasse für die Masse“

- Model project „Lieferservice Bodensee“

- Model project „Tafelfreuden Bodensee“
  - Model project „Management und Nachhaltigkeit in Großküchen“

2.4 Model Project Constance Ltd – A case study for the promotion of sustainable regional development at Lake Constance

Michael Baldenhofer, Project Director, Office „PLENUM Westlicher Bodensee“, Regional place of coordination for the Lake Constance Agenda 21.

The **Modellprojekt Konstanz GmbH** (Model Project Constance Ltd) initiates and supervises projects aimed at the sustainable protection and development of cultural landscapes around the Western part of Lake Constance. The work of the case study is based on the understanding that landscape conservation, nature- and resource protection can only be realised on a large scale in cooperation with farming and with other relevant regional partners. This is the reason why the model case study Constance gathers representatives of municipalities, farming, nature protection, tourism, trade and business together to decide on strategies for implementing joint projects.

One focus of the “Modellprojekt Konstanz GmbH” is to maintain the caring capacity of the cultural and recreational landscape thereby strengthening the rural areas and to balance the economic needs with the urge to preserve and improve the natural environment. A main activity field of the project during the last decade was the marketing of regional products, goods and services through the establishment of close co-operations between producers, refiners, traders and consumers.

Farmers Markets

The privileged climatic situation of the Lake Constance region allows the cultivation of a wide range of agricultural products. Nevertheless the local farmers have great difficulties earning their living and building up long-term economical perspectives through farming only. In the framework of the project two so-called “farmers markets” had been launched, offering fresh regional agricultural produce. The intention of these farmers markets is to provide additional income by direct marketing thus guaranteeing a secure living of small family businesses and at the same time offering the opportunity to buy daily fresh and high quality regional food to the consumers.

The farmers market Radolfzell is located very central and offers a wide product range at competitive prices. Five regional full-time farmers - within a radius of about 25 kilometres - are running the market, traders are not accepted. The goods offered in the market are produced by the five farms involved. It was agreed upon the possibility to buy-in vegetables during the vegetation break in winter, but only the same kind of vegetables that is cultivated by the five farmers. Foreign produce such as citrus fruits are not offered. All dairy products are produced outside the region (neighbouring district) as there are no dairies in the district of Constance.

The distribution of the general costs (general investment costs, rent, staff, PR) is made by a very complex formula on the basis of the size of the area and the expected annual turnover. Each farmer keeps track of his own costs.

An important element of the comprehensive marketing concept of the farmers market is a very strong Corporate Design (CD). The developed logo (brand) is seen everywhere in the shop, on wall tiles, freezers, on the shop windows, on wrapping material, product package and in press advertising. In an early project phase consultations took place with the municipal authorities, the Office of Economic Promotion, Economic Control Department and the Public Veterinary Service. So differences and possible later costs for alterations could be avoided.

A campaign together with the regional daily paper was organised to introduce the farmers involved in the project. An annual budget of about 5.000 € is allocated for press advertising. Changing, individually designed adverts (110 x 90 mm) are being published every second week in the two local newspapers with a circulation of 40,000 respectively 15,000.

The farmers market concept can be assessed as very successful. The real turnover exceeded the calculated break-even point from the first year and increased since then. An additional value of the market was the stimulation of the pedestrian zone and the creation of new jobs for shop personnel.

	Farmers Market Radolfzell	**Farmers Market Constance**
Size (sales area) in m^2	110	350
Investment	€ 1,000 per m^2	€ 750 per m^2
Subsidies	Small subsidies (< 10%) from a Rural Development Program (ELR)	None
Calculated Turnover Breakeven Point	€ 380,000 per year	€ 1,500,000 per year
Annual Turnover in the first year	approx. € 500,000	approx. € 1,000,000
Inauguration	October 1996	May 1999
Main Product Range	Vegetables, fruits, sausages, meat, bread, beverages, pastries, dairy products, honey	Vegetables, fruits, sausages, meat, bread, beverages, pastries, dairy products, honey, fish
Opening hours	Mon-Fri 8.00-18.00 Sat 8.00-13.00	Mon, Tues, Thur 9.30-18.30 Wed 9.30-14.00 Fri 9.00-18.30 Sat 8.00-15.00
Average customers	200 per day	350 per day
Slogan	…da kauf' ich natürlich… („...where I buy naturally...“)	...hier isst das Leben… („...here eats life...“)

Timetable for Radolfzell's market

April 95	The project idea “Bauernmarkt Radolfzell” (Farmers Market) was born and discussed with interested farmers of the Constance district.
Summer 95	In several meetings with interested farmers a concept was developed and an action group was formed. A charter and market regulation was created.
October 95	Development of a first concept for the interior decoration, furnishing and facilities.
Winter 95/96	Meetings with the authorities in charge (Economic Control Department, Public Veterinary Service, Municipal Public Affairs Office, Office of Economic Promotion of Radolfzell).
February 96	Foundation of the Association “Bauernmarkt Radolfzell e.V.”
April 96	An adequate location was found and rented
May 96	Final planning of the shop equipment and PR concept (name, logo, slogan, PR and packaging material).
Summer 96	PR campaign with the local media (articles, quiz etc.)
May– Sep.	Renovation of the shop in accordance with the official regulations. Interior installation by local craftsman and experts.
October 96	Opening and Inauguration of the market
June 1997	Client survey (250 customers interviewed).
August 97	A four-colour consumer leaflet was published.
September 2000	Second Client survey

2.5 Programme of Action for the Restoration of Upper Swabian lakes

Dipl. Ing. Albrecht Trautmann, Pro-Regio Oberschwaben

The rich lake diversity of Upper Swabia

There are almost 2300 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. Many of them are leftovers of the 'Würm' glacier, but some of them were artificially created by monasteries and noble families in the middle-ages.

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.

History of the Programme of Action

The Regional Association of Bodensee-Oberschwaben (lake Constance - Upper-Swabia) kick-started the programme and supported the first measures in 1986.

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 (the programme was coordinated by the Regional Council in Tübingen). For 33 selected stillwaters and their catchment areas, a project group consisting of staff of the water management and agricultural offices, carried out surveys, developed restoration concepts and the necessary measures to implement these.

From research to implementation

Since 1995 the lake programme has been continued on the basis of an agreement based on public-law (county and municipalities) with the main emphasis on the implementation of further restoration measures.

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).

Restoration measures

Mains connections are also planned for sewage to single houses (‘pumps and tubes’). 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 extensivation 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 770 hectares surrounding about 50 lakes are reserved for extensive farming by contracts. 225.000 Euro compensation is currently paid for these areas.

The renaturalisation of regulated and technically enhanced rivers in the catchment area of the lakes and ponds, is an 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 effect 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.

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2.6 Lake Constance: Role of the International Commission for the Protection of Lake Constance

H. Gerd Schröder, Institute for Lake Research (ISF)

„The boundaries between countries result from historical events, and, therefore, they do not coincide with the boundaries of the watersheds. As a consequence, several lakes and rivers mark the boundaries between countries or cross them. To effectively manage these water resources and protect them against pollution, the governments of the countries concerned must agree upon common rules and actions concerning this problem." (RAVERA et al,1980)

Physical and limnological data

Lake Constance is the second largest prealpine European lake by area and volume after Lake Geneva. The lake basin is situated in the Molasse basin of the northern Alpine foreland and was mainly formed by water and ice activity during the last Quaternary glaciation period more than 15.000 years before present.

The catchment area of Lake Constance is about 11.000 km² (= 20times the lake surface) and covers the territories of the three European countries Germany (28%), Switzerland with Liechtenstein (48 %) and Austria (24%).

Lake Constance is traditionally divided into Lower Lake Constance and Upper Lake Constance. More than 90% of the water flow originates from the Alps by the three inflows Alpenrhein, Bregenzerach and Dornbirnerach in the eastern part of the Upper Lake.

Morphometric data of Lake Constance (47°39'N, 9° 18'E) and its catchment area:

	Upper lake	Lower lake	total
Altitude a.s.l (m) at middle water level	**395.33**	**395.11**	**--**
Surface area of water (km²)	**472.3**	**62.4**	**571.5**
Volume ($10^9 m^3$)	**47.637**	**0.810**	**48.49**
Maximum depth (m)	**253.3**	**40**	**--**
Mean depth (m)	**101**	**13**	**85**
Mean range of annual water level fluctuation (m)	**1.50**	**1.48**	**--**
Length of shoreline (km)	**186**	**87**	**273**
Mean outflow ($10^9 m^3$/yr)	**11.1**	**11.7**	**11.7**
Residence time (yr.)	**4.3**	**(0.07)**	**--**
Catchment areas (km²)	**10919**	**568**	**11487**

Lake Constance is oriented from Northwest to Southeast and the water body is strongly influenced by wind-activity. It is a phosphorus-low, mesotrophic hard water lake with calcite precipitation due to biogenically induced increase of the pH. Electrical conductivity of the water typically ranges between 260 and 300 µS/cm². The minimum and maximum concentrations of main chemical water constituents in Lake Constance are:

	mg/l	mol/l
Ca^{2+}	36.1 - 56.1	$0.9 - 1.4 \times 10^{-3}$
Mg^{2+}	4.9 - 9.0	$0.2 - 0.37 \times 10^{-3}$
Na^{b}	3.4 - 4.6	$0.15 - 0.2 \times 10^{-3}$
K^{-}	1.0 - 1.3	$0.26 - 0.33 \times 10^{-4}$
Sr^{2+}	0.39 - 0.48	$4.4 - 5.4 \times 10^{-6}$
HCO_3^{-}	142.2 - 155.6	$1.68 - 2.55 \times 10^{-3}$
SO_4^{2-}	31.0 - 35.5	$0.32 - 0.36 \times 10^{-3}$
CL^{-}	4.8 - 5.9	$0.13 - 0.16 \times 10^{-3}$
NO_3^{-}	3.4 - 4.8	$0.5 - 0.7 \times 10^{-4}$

The phytoplankton succession indicates a spring bloom followed by the clear water phase with very low phytoplankton concentrations due to zooplankton grazing, and a variable summer. In total, diatoms contributed up to 90% of the phytoplankton biovolume in spring and approximately 5 % during the clear water phase. Phytoplankton and bacteria, the crustaceans are the most important contributors of biomass in Lake Constance. In Winter, copepods dominate the zooplankton biomass and in spring and summer cladocerans represent the ruling phytoplankton consumers. Besides the crustaceans, protozoa and rotifers are distinct but less important participants of the zooplankton community. About 30 species of fish contribute to the fauna of Lake Constance. The dominant species are whitefish and perch. During summer, zooplankton is the main food source for most fish in Lake Constance even for those species which normally consume other food.

Human impact and Eutrophication

6.500 years ago the first lake settlements built on stilts in the lake were built on the shorelines of Lake Constance. Continuous settlement started about 4.000 years ago during the Bronze Age and about 2.000 years before present the Romans built military bases and harbours around the lake.

Alemannic tribes conquered the region some hundred years later and during the Medieval Period most of the modern cities and villages were founded.

During the twentieth century the population density significantly increased from 50 to 120 inhabitants per km² on average. Nowadays the region of Lake Constance serves as environment and place of work for more than 1.2 million inhabitants. Local industries (engines, aircraft- and spacecraft equipment) and agriculture (hop, apple trees, vineyards) together with the inhabitants discharge sewage water equivalent to 3.2 million people.

Fishery has a long lasting tradition in Lake Constance starting with the first human settlements about 6,000 years BP. Today, about 170 professional fishermen and more than 10.000 anglers annually catch more than 1,000 metric tons of fish from the lake. Furthermore the lake is a major tourist attraction for more than 2 million visitors per year and is used by some 55,000 boats mainly for leisure activities. Last but not least Lake Constance is one of the most important drinking water reservoirs in Central Europe for more than 4 million people.

There was a long tradition of limnological investigations of Lake Constance, that began with first observations of phytoplankton at the end of the last century. Regularly, the lake was studied since 1919 by two Institutes in Langenargen and Constance. At this time Upper Lake Constance was considered as a typical oligotrophic lake. Therefore a fertilisation with liquid manure was suggested to increase the production of fish.

Only one and a half centuries later a fertilisation of the lake due to pollutants from the inhabitants and their industries around the lake, became obvious. During the 1930s changes in phytoplankton composition and oxygen budget were observed. In the 1950s the phytoplankton biomass strongly increased, some algal species disappeared and new ones appeared. Algal blooms combined with increasing zooplankton and fish populations characterised the new process of eutrophication. The contents of Orthophosphate in water rose from 2-3 mg/m³ in 1950 to 9 mg/m³ in 1959. Although this development seems neglectable compared to later phosphorus concentrations clear-sighted scientists and politicians apprehended a severe danger for the health of the lake. It was clear that this danger could only be banished with the co-operation of all countries around the lake.

International Commission for the Protection of Lake Constance (IGKB)

On behalf of the international law, Lake Constance is a curiosity. Clearly defined national frontiers between Switzerland and Germany exist in the Lower lake. In the Upper lake only the shallow water area from the shoreline to 25 m water depth is national territory of the bordering countries. The major part of Upper Lake Constance is considered as common property, a so-called „condominium“. This fact plays an important role for co-operation in the protection of the lake.

In order to preserve the lake ecosystem from further degradation the International Commission for the Protection of Lake Constance (IGKB) was founded in 1959 by the three bordering countries Austria (Vorarlberg), Germany (Bavaria and Baden-Württemberg) and Switzerland (St. Gallen and Thurgau).

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

The commission has a chairman and is composed of delegates from member governments and a limited number of high officers of those governments. The chairmanship changes after 2 years. As a rule the commissions meet at least once a year and the deputies determine measures by the principle of unanimity. 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.

A technical and scientific board of experts serves as official consultant to the commission. The experts study the scientific and technical problems proposed by the commission and examine the research carried out by other organisations. They elaborate on the research program and prepare reports on the research sanctioned by the commission. The board of experts has 3 working groups for studying special problems concerning the topics „Lake“, „Catchment Area“ and „Accident defence“. The working results are summarised and published in so called green reports (annual investigation data of the lake monitoring) and blue reports (case studies and special topics).

Fortunately in the early 1960s phosphorus was already recognised as the main factor responsible for eutrophication. Thus the first steps could be taken to optimise reduction of phosphorus loads entering the lake. Until the early 1970s the major part of sewage entered the lake without any treatment. Therefore the IGKB desired to purify the waste water around the lake with uniform guidelines and common programmes for the construction of canalisation and sewage plants.

During the 1970s the phosphorus concentration of the lake water increased even more and at times an annual increase of 15% phosphorus could be observed. As a result, algal growth increased greatly. In 1972 during a phase of unfavourable climatic conditions and extremely low water load an oxygen depletion beyond 2 mg/l occurred in the deepest part of the lake. In 1979 phosphorus reached its maximum value of 87mg/m³.

During that time channel systems and efficient sewage plants with three purification stages (mechanical, biological and chemical purification) were built in the whole catchment area. More than 6 billion Swiss francs were invested to connect almost 92% of the inhabitants to these plants. So effective sewage treatment and the ban of phosphorus in detergents were important steps towards a sustainable development of the lake and stabilised the ecosystem to withstand a succession of years with unfavourable climatic conditions resulting in an incomplete vertical water circulation.

From 1980 onwards the phosphorus increase was stopped and its concentration sunk from 87 mg/m³ in 1979 to 15 mg/m³ in 1999.

Nevertheless the true scale to estimate the effect of restoration is not the reduction in phosphorus but the biological response of the lake, especially that of phytoplankton. For some years algal biomass has shown a decreasing trend. For example in the shallow water zones and in the area of river mouths the success has been very convincing. The success can be ascertained to a reversal of the lake development towards a state typical of a lower nutrient level. The continuous data sets show that the phytoplankton composition and its seasonal distribution has changed to a situation known from the times of a more oligotrophic lake.

With increasing numbers of inhabitants the problem of growth of the remaining phosphorus and other harmful substances becomes topical. Therefore the IGKB 'Guidelines' from 1987 demand on the base of a holistic view to include the catchment area and all fields affecting the lake, especially in industry, agriculture, settlement and traffic. In addition to the stress caused by substantial loads the stress by structural interferences is to be considered in the same way. Preventive measures should be realised before harmful effects occur.

All these efforts may serve to develop lake Constance so that it is stable against anthropogenic stress couples with unfavourable climatic conditions, which have increased during the last years. To obtain this state it is necessary to improve the quality of the whole lake with its pelagic, littoral and profundal zones. At the moment Lake Constance can be looked at as an ecosystem in transition. The various uses such as production of drinking water, fisheries and recreation can be maintained only by means of an ecologically stable state of the lake.

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2.7 Visit to the nature protection area Wollmatinger Ried: Development, management and visitor steering (Document from the last Training Course, 2002)

Dr. Ulrich Zeidler, NABU – Birdlife Germany,
(www.birdinggermany.de/wollmatinger_ried.htm)

The nature protection area Wollmatinger Ried is one of the most prominent reserves of Lake Constance. On its area of approximately 8 km^2 it covers an interesting variety of different wetland biotopes, such as shallow water zones with macrophytes, vast reed areas and wetland marshes with different sedge formations. With its diversity of 600 plant species, 250 night butterfly species and its abundant bird life the reserve is outstanding within Europe and therefore awarded with the European Diploma. It is also part of the RAMSAR convention and part of the Natura 2000 protected areas.

Since the most diverse parts of the reserve are leftovers of an old cultural landscape that has been created by human use of land, a steady management is required to keep the diversity throughout modern times. The management of the Wollmatinger Ried is based mainly upon three cooperating units. First there is a professional management in the nature conservation centre of the Wollmatinger Ried. This institution was established by the Naturschutzbund Deutschland (NABU) which is Germany's biggest NGO in terms of nature protection. Second there's a number of around 25 voluntarily active members of the local NABU group. Third is the ministry of environment with several local subdepartments of the state of Baden-Württemberg.

Among a lot of other things the management is in charge of the organization and realization of measures within the wetlands, monitoring of plants and animals and public relations. Lake Constance is one of south Germany´s favoured tourist areas. In addition to extensive tourist activities the whole region has experienced a tremendous growth in population, industry and traffic. The NABU is politically active with varied success, to secure sufficient biological corridors between the reserve and the surrounding countryside.

Since the Wollmatinger Ried is restricted to public access, a large number of guided tours and a whole programme of nature activities is offered by the NABU. The participants of the wetlands training course will be lead through the reserve and various aspects of the management will be discussed.

2.8 ECOCAMPING: Environmental Management on Camping Sites

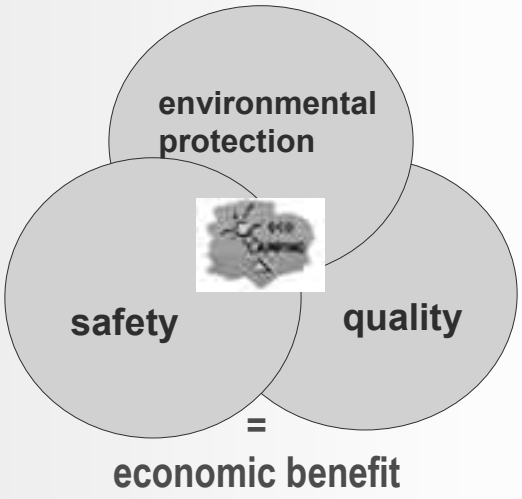
Carina Barthle and Marco Walter, Director of the Ecocamping Association

ECOCAMPING Association

- ECOCAMPING projects and network
- partner in Tourbench
  European LIFE project for benchmarking in tourist businesses
- future plans:
  - Enlarging the ECOCAMPING network
  - European ECOCAMPING project focusing on individual consultation at campsites
  - ECOCAMPING for large biological reserves

ECOCAMPING e.V.

Goals of ECOCAMPING



ECOCAMPING e.V.

ECOCAMPING workshop topics

- **environmental management and legal compliance**
- **waste management and recycling**
- **energy consumption and alternative energies**
- **water consumption and cleaning**
- **design and conservation of natural campsites**
- **safety standards**

ECOCAMPING e.V.

ECOCAMPING environmental management

- **basic qualification** by ECOCAMPING workshops and individual consultation
- nomination of an **environmental representative** and determination of **responsibilities**
- **information** and **participation** of employees, guests, external assistance, state authorities and public
- development of an **environmental policy**
- **analysis of administrative structure, legal compliance and environmental performance** with ECOCAMPING consultants

ECOCAMPING e.V.

ECOCAMPING environmental management

- development of an **environmental program** (3 years)
- **structured documentation** of annual consumption data of water, waste, electricity and fuels
- **annual environmental report**
- **continuous further qualification** by special workshops
- **review** of environmental management system by ECOCAMPING consultants (every three years)

ECOCAMPING e.V.

ECOCAMPING offers many possibilities

UMWELT MANAGEMENT

ISO 14001

EMAS

Viabono

2.9 Effects of the Restoration of the Radolfzell Aach on Waders and Waterfowl

Gerhard Thielcke, Honorary President of the Global Nature Fund

In 1988 a dam of disused weir broke. It was probably the work of muskrat. As a consequence of the breach, the Aach river began to meander. This led to the elaboration of the "River Corridor Restoration Concept" for most of the 35 km long Radolfzell Aach. The course of the river has already been altered several times, before 1495 in one section of the course, and starting from 1860 the whole middle course underwent changes. In 1965 the last negative human interventions occurred when in lower course several meanders were cut through by hydraulic engineers.

In the 1.4 km long section of the Radolfzell Aach that is described hereafter, within the frame of the restoration concept, a weir and a fishpond were removed, an artificial riffle, two meanders and a grit chamber were built. In one section of the channelled Aach a dead arm of the river was restored. Through the momentum of the river the river banks were demolished in five places, grit islands and flood channels developed. Meanwhile in one section the Radolfzell Aach is three times as wide as its channelled course before. Along the Aach, we have created moist meadows, its water is channelled through a restored ditch, two more ditches were revitalised. Three small areas with tree and bush vegetation will be developed as riverside woodland. Since 1988 sections 2 and 3 of the Radolfzell Aach have developed a momentum of their own and since 1997 the sections 1, 4 and 5 have almost developed a momentum of their own. From October to December 2001 eleven bog-pools and four nesting platforms for white storks were installed.

Since the dam breach of 1988 to 2001 three observers have ascertained the number and species of waders and waterfowl breeding at the Radolfzell Aach, and of migratory birds. Since May 2000 meadows along the Aach river covering a total surface of five hectares are irrigated – partly, and with interruptions. The observations made in these areas and in the nature reserve Weitenried (205 hectares) are included in this evaluation. The Weitenried conservation area borders the Radolfzell Aach or one could even say includes the river. The Weitenried survey comprises the same observation period as that of the Radolfzell Aach assessment, for some species the observation started in 1979.

Among waders and waterfowl since 1983 Snipe and since 1992 Curlew have stopped breeding in the Weitenried area. Lapwing has not been breeding in the past 14 years except in 1995, 1996, 2000, and 2001. Until 1985, Weitenried was a very important moulting place for lapwing. Along the Radolfzell Aach we ascertained nests or territories of 11 wader and waterfowl species. These are remarkably many for a stretch of 1.4 km length. Within at least four years 30 species of migratory birds were recorded in the survey area, 13 more species were seen over a period of one to three years. Among the wintering birds the occurrence of 66 Wigeon is exceptional in Southern Germany.

In the moist meadows flooded (with interruptions) since May 2000, 60 Snipes were observed, 45 on one day at the most, a lot for Lake Constance area. Presumably a group of Snipe were moulting in the area. Most valuable were these areas for Wood Sandpiper, and White Stork, of high importance for Curlew and Kingfisher (the ditch), Heron, Mallard, and Jack Snipe. For the first time, on two days, one Temminck's Stint was seen. Quite a few species were found in several river sections, river sections and moist meadows or river sections, moist meadows and meadows.

The restoration, revival of natural momentum and the moist meadows have contributed to the revival of the natural course of the Radolfzell Aach. On the basis of the observed waders and waterfowl the steps taken can serve as model for measures to be taken at other rivers/river

sections of the Radolfzell Aach. The success of this project is due to the close cooperation between the Land of Baden-Wuerttemberg with BUND, and many others. The ecological changes in the observation area are examples for the implementation of the directives for EU NATURA 2000 sites.

For the assessment of the rivers according to the water directives (EU Council 2000) a DIN bird list – additionally to the already existing DIN saprobes list – should be elaborated.

A wildly held opinion that arable land adjacent to rivers is bad for the development of momentum is not true. On the contrary: farmland is ideal for it.

Muskrat should be awarded a nature conservation prize and not chased anymore because it is thanks to the breach in the dam (presumably caused by muskrat) that the River Corridor Restoration Concept was developed.

2.10 Restoration of the shoreline, Creating biotope networks and maintaining species variety in Radolfzell

Isolde Korb Office for Environmental Issues City of Radolfzell

Within the town of Radolfzell‘s boundaries, the last few years have seen the restoration of the longest stretches of shallow-water shoreline yet undertaken on Lake Constance. The Markelfingen “Winkel“ (corner) initiated the process in the winter of 1993-94, followed by the shoreline restoration around Herzen in 1996-97. The process of coming to an agreement with the sporting club located there took a great deal of time, extending over a period of three years. On the Mettnau peninsula, the restoration of the area surrounding the lakeside bathing area began in 2000-2001, then Seehalde and Mettnau-Kur joined the process. Just recently the restoration of the shoreline in the area of the “Mettnau“ shoreline recreational area was completed (winter of 2003-04).

A blueprint for the restoration of the last stretch of Mettnau’s shoreline has already been drawn up and is currently being discussed by the committees responsible for its execution.

The alterations that had been made to the shoreline in the past were in part in desolate condition with collapsed walls and unattractive stones lying at their feet. In addition, they did not conform to the demands of ecologically friendly building practices and represented a considerable danger to those using those parts of the shoreline.

The international commission for the protection of the bodies of water in the Lake Constance region and limnological specialists have continually emphasised the importance of restoring the shallow-water zones along the Lake. By supporting the shoreline area and the species animals and insects living there contribute to the reduction of the levels of toxic substances otherwise difficult to eliminate. We are convinced that these measures to restore the shoreline make sense and that they are to the city’s advantage. It took a great deal of time to conduct the preparatory negotiations with those parties using the shoreline to convince them of the necessity of these measures, as they were naturally concerned about effects on their property.

The extent of shoreline lying within the boundaries of the city of Radolfzell amounts to a total of 15 km, only 3 km of which remain in a non-natural condition.

Creating Biotope Networks and Maintaining the Landscape

As early as the end of the 80‘s, the then still-voluntary environmental representative in Radolfzell recognised how important retaining biotope structures and the networks between them is for securing the survival of a variety of species and of the landscape’s traditional appearance in the long term. As an aspect of holistic water protection measures, the transitional areas of the Lake also deserve our attention. Starting in 1990, the Office of Environmental Issues commissioned the successive drawing-up of an all-encompassing plan for the maintenance of biotope networks.

The city has a surface area of 5,858 ha, 2,297 ha of which are used for agricultural purposes. The forested surface area totals 1,683 ha.

Gradually, the measures necessary to ensure the creation of biotope networks have been conducted in agreement with farmers and forestry. Within Radolfzell, there are ca. 25 active full-time and 50 part-time farmers. 74% (ca. 1,700 ha) of the surface area used for agriculture receives state subsidies to the extent determined by the federal state Baden-Württemberg’s *Marktentlastungs- und Kulturausgleichsprogramm* (MEKA). This funding may only be granted when the farmers conform to given conditions and agricultural practices.

The city's programme for landscape maintenance supports primarily those farmers and property owners (110 ha) who do not qualify for MEKA. The primary difference between the programmes is that the city has forbidden the general use of fertilisers and insecticides/herbicides and requires that mowing occur only at given times.

The properties participating in the city programme are above all natural fruit orchards, strips of land along roads and bodies of water, as well as mowing meadows in exposed locations. For these, fertilisers, pesticides, and herbicides have been forbidden under all circumstances. This means that the average nitrogen level of 70 kg pro ha does not apply to these green areas. In this manner, the environment is spared 5-7 tons of mineral nitrogen fertiliser each year and the negative results, such as the pollution of groundwater and the endangering of many species, are reduced.

Since 1991, the number of farmers in Radolfzell has decreased by almost one half. An increasing number of larger businesses with larger, faster-working equipment are farming slowly disappearing agricultural land. For one thing, this land is being converted into building parcels and for another, sloping properties are being given up as too inefficient for farming and are becoming overgrown with bush. The city's mowing meadow program has attempted to put a stop to this development.

In Markelfingen, Güttingen and Liggeringen, all part of Radolfzell, the use of meadows as grazing areas for different kinds of animals (sheep, cattle, goats) had led to the enrichment of the landscape. Vegetation typical for grazing meadows has developed that has also had a positive effect on the landscape's appearance. In addition, this usage allows guests and local residents to come into direct contact with farm animals. Old and young observe with great pleasure the animals' behaviour in the fields.

These efforts to maintain the variety of species and the landscape's appearance compliment one another mutually and have been met with growing acceptance on the part of residents.

In respect to securing the natural presence of many plants and small animals and insects, we can claim a number of successes. That endangered species such as the *Wiesenknopf-Ameisenbläuling* (maculinea nausithous and maculinea teleius; the dusky and the scarce large blue gossamer wing) butterfly have returned to the area is the happy result of our environmental policy supporting the maintenance of small-scale structures.

Above all today, on the "Day of Species Variety", we are very glad that our efforts have resulted in this great success.

In Conclusion, Information on the Costs:

Because the city presented the federal state of Baden-Württemberg with plans for biotope networks drawn up by experts, it was awarded grants to implement them, some even for the completion of the final plans.

Thus, we have received a total of ca. 400,000.- € in grants over the course of 10 years. This accounts for 70 % of the total costs, i.e. the city has had to contribute 30% as co-financing (ca 170,000 €). The costs for the development plants for bodies of water are included in these numbers. At the height of the compensation payments to farmers in 1998-99, the town distributed 70,000. - € to each one.

Through consulting efforts and information provided for the farmers on new subsidies in agriculture, the city has been able to transfer many contracts with local farmers to the federal state (MEKA), so that as of 2003, its expenses had been reduced by a total of 43,000-- € per year.

Included in this sum are measures having to do with the "eco-account".

2.11 Lake Constance: Tourism and Recreation

(Document from last Training Course, 2002)

Tourism, with approximately 10 million overnight stays, around 350 million Euro gross turnover per year and about 15,000 full-time jobs, is among the most significant economic factors in the Lake Constance region (figures = only German Lake Constance region). About 27 million day-trippers (vacationers plus day guests) visit the region each year, mainly in the months of July to mid-September.

During the past years, the Lake Constance region had a slight increase in overnight stays – in average the guests stay 5,5 days (3,2 days in Germany in average.)These day guests are undertaking outings above average in number and in length; their average length is 8.7 hours (German average = 8 hrs.) and the average amount of kilometres covered is 91 (German average = 70 km). 85% of these vacation and recreational trips are undertaken by car.

The lake and its harbour regions are the most important magnet for vacation guests and locals in their leisure time. 60 % of the annual visitors are concentrated on the ten most attractive places for outings. These visitors cause important environmental problems especially in the field of traffic. Up to now, the measures to inform and sensitise these visitors have been inadequate.

The introduction of the “BodenseeErlebniskarte“ as an all-inclusive-card by the “Internationale Bodensee-Tourismus GmbH” could have been a valid groundwork for tourist mobility which protects the environment, but up to now train and bus systems are not properly added to the package. In 2001 the Lake Constance Foundation (Bodensee-Stiftung) created “BodenseeClick“, a web-based information system, which for the first time was able to combine public transportation schedules with destinations in the international region of interest for tourists. Unfortunately the Internationale Bodensee Tourismus GmbH (Lake Constance Tourism Association) did not assume the management and continuation of BodenseeClick.

One of the few successful projects towards environmentally friendly tourism is the ECOCAMPING-Project initiated by Lake Constance Foundation. Within ECOCAMPING, the Lake Constance Foundation developed an environmental management system for camping sites, oriented according to the EU-EMAS Eco-Audit Scheme. ECOCAMPING started in 1999 with 14 camping sites around Lake Constance. Now 49 camping sites in Baden-Württemberg and Bavaria are participating in this project and camping sites in other regions will start in 2003/2004 to create ECOCAMPING working groups.

As a favourite venue for water recreation, Lake Constance has at present 55,000 officially registered watercrafts, two thirds of which with an engine. Recreational facilities such as buoy fields, harbours and jetties, but also buildings and parking lots take up about 45 km of the lakeshore in Baden-Württemberg alone. A further 30 km are used by beaches, camping grounds and lakeshore walkways. Along with the structural changes in and resulting damage to the shore zone and the shallows, the sport and recreational activities cause disturbances and damage to the sensitive animal and plant populations.

Particularly the lake’s shallow bays are favourite places to anchor boats or for bathing, but are preferred habitats of endangered plants and animals, as well. Today, the most valuable shore regions and shallows are closed to water sport or recreation either temporarily or throughout the year.

Lessons learned

1. In order to support ecologically sound mobility in tourism, attractive fees are necessary. A first required step is the introduction of an international “Lake Constance Day Ticket“ which would be valid within all public transportation systems in the Lake Constance area.
2. In order to reduce the burden of mobile recreational traffic, the public routes leading from the area around the lake to the lakeside communities must be greatly improved.
3. No introduction of new tourism infrastructures on the shore of Lake Constance
4. The environmental quality of accommodation and recreational facilities should be improved by the introduction of environmental management systems and incentives.
5. The linking and the exchange of experiences among sustainably working tourism business should be promoted cross-border.

Key lessons of relevance for other lake regions:

Lately tourism has been considered to be the best answer to all problems. It is, however, recommended not to overestimate the positive effects of tourism but to be aware of possible negative effects. The international tourism is a short-lived, sensible and extremely competitive economy sector, susceptible to trends and all kinds of crises.
Currently environmentally sound tourism offers exceed the demand.

A long term tourism development planning with regular monitoring of the efficiency is necessary.

Promotion of environmentally sound and socially acceptable tourism: recognised Ecolabel, i.e. European VISIT-Standard (www.yourvistit.info), environmental management systems (EMAS, ISO 14001), Soft-Mobility-Concept (www.soft-mobility.com).

Destination Monitoring: What is required for implementing sustainability policies in tourism is knowledge about the impact of tourism at global and local level and policies and measures designed to respond to this impact. Therefore it is necessary to analyse the process of tourism and to use indicators which show how this process is affecting sustainability within a specific area in a positive or negative way. Within the LIFE-VISIT Project, ECOTRANS developed a set of indicators for tourism destinations including process indicators for sustainability policy, environmental performance indicators (transport, land use and biodiversity, energy, water, waste), social and cultural performance indicators and economic performance indicators. Further information:www.yourvisit.info.

Information and sensitisation of locals and guests by pointing out interactions (e.g. regional agricultural products and the preservation of the landscape), environmentally sound offers (your choice makes the difference), providing tips for environmentally friendly and socially acceptable behaviour etc.

Entrepreneurs should get interested in sustainable tourism activities. A good example is ECOCAMPING, an environmental project for camping grounds. This project has been running since four years very successfully and will be extended within the next years. A whole branch of trade throughout Germany became interested in this topic. It is crucial to plan such projects for the long term. The time frame of the enterprisers has to be taken into account as well – they will only be ready to cooperate during the off-season. By combining technical advice, workshops and a wide public relations work these projects could also work other lake regions.

Boating/Water Sports

Recreational and professional boating must employ the highest standards of current environmental technology i.e. biocide-free underwater coatings and emissions-free or low-emissions motors. Navigational infrastructure must be established in accordance with the needs of nature and the landscape, i.e. no extension of the harbours along Lake Constance and the realisation of the Lake Constance Model (Bodensee-Leitbild)

Key lessons of relevance for other lake regions:

All aspects mentioned for Lake Constance are also relevant for other lakes!

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3 Evaluation of the participant's-questioning of the training course in 2004

Regarding the training course in general

Visit to the Seenforschungsinstitut (Lake Constance Research Institute) would have been a good overview in the beginning of the course

ECOLUP (Environmental management for land use planning) is such a complex item; too complex for the start of the course

More information about management of shallow lakes was expected

More information about regulations and control systems would be interesting

Training course Items

ECOLUP: Environmental Management for local land use planning

Positive aspects

- Interesting and innovative matter of management
- Precautionary principle: see mistakes of the past and avoid them for the future
- Focus on public participation

Transferability

- Municipalities at Lake Vortsjärv are going in the same direction. ECOLUP-System will be a good structure to follow
- Greece: too far ahead. Environmental management systems are still not known within administrations
- Lot of resources needed (time, money) which are not available today

Critical Aspects

- Education in university does not promote sustainable development. How bigger the construction – better for the image of the engineer
- Lack of appropriate legal framework on national or regional level

Environmental Friendly agriculture

Positive aspects

- Combination of agriculture and biomass energy
- Hay hotel and events to reach a wider audience
- Mr. Müller´s positive philosophy
- Farmers Market: all products in one store (supermarket) and quality

Transferability

- Agri-environmental programme similar to Upper Swabian Lakes Programme would be useful for La Nava and Boada
- Organic Products such as vegetables transferable to Greece/Nestos region
- Network for organic products
- Information for local people how to grow organic products in their own garden

Critical Aspects

- Gen manipulation and environmental friendly agriculture
- Average size of a farm at Nestos is only 4 hectare. Too small for extensive agriculture. Intensive production needed to survive
- Greece; no phosphorus pollution, but nitrate loads
- National and regional governments do not implement agri-environmental measures and programmes because of co-financing (= 25 %)

Tourism /ECOCAMPING

Positive aspects

- Ecotourism as development strategy to benefit local people
- Ecocamping network to motivate group feeling, to know each other, to exchange experience
- Ecocamping: clear structure and clear benefits for participants
- Information about legislation for camp sites and control, if camping sites comply with legislation

Transferability

- Only for camping sites in tourism destinations in Greece
- Environmental quality for tourism development at Lake Vörtsjärv and at Lake Baikal needed

Critical aspects

- Tourism development in nature reserves – where are the limits?
- Tourism development: two sites of the coin = jobs, infrastructure, etc. and higher prices for everything, traffic problems, etc. How to maintain the balance?
- How to involve local people into tourism development?
- Convincing people is not enough. Appropriate legal framework is needed,
- Misinterpretation of carrying capacity within tourism development
- To reduce big environmental impacts – big investment is needed

Restoration / management

Positive aspects

- Public-Private partnership: management contract for NABU (NGO) to manage protected area (Wollmatinger Ried)
- Co-operation between NGOs and administration in the case of river Radolfzeller Aach
- Commitment and budget of city of Radolfzell for shore line restoration

Transferability

- Restoration of riparian forest at Nestos
- GEF project for wetland restoration in Danube /Persina, Bulgaria
- Worldbank-Project to develop a cataster in Bulgaria
- All measures showed are transferable

Critical aspects

- Restoration work = need to convince the government; is not a priority issue in new EU Member states at the moment
- To install buffer zones in Greece = compensation for farmers needed

Konstanz, August 2004

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