



European Pond
Conservation Network

European Pond Conservation Network Newsletter

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In preparation for the EPCN Conference in Berlin this June, this issue of the EPCN newsletter considers some of the challenges facing the conservation of ponds. This includes some thought provoking articles on the recognition of ponds as an important biodiversity resource, and the public perception of pond restoration. We also have examples of man made and natural pond habitats which are of international importance for biodiversity.

See the back pages for breaking pond news, conferences and training courses in 2010.

This newsletter is for both EPCN members and non-members, and anybody can download it from our website. Please help us raise awareness of pond conservation issues by sending this newsletter to your colleagues and contacts, and by encouraging other pond workers to join the network.



★ **Articles in this issue**

Contents

A focus on ponds in the context of the International Year of Biodiversity.....	2
Volunteers and the conservation of amphibians and reptiles in the UK.....	4
“Pond” ecosystem and network connectivity: a study from Northern France...7	7
The summer drainage of Nesyt Fishpond in 2007: a successful conservation measure or ecological catastrophe?.....	10
Montiaghs Moss: An Important Pond Area (IAP) in Northern Ireland	12
Man-made irrigation ponds as habitat for waterbirds.	14
Pond landscapes in the Eastern Carpathians.....	16
News in brief.....	19
Announcements	21

A focus on ponds in the context of the International Year of Biodiversity

Olivier Scher, Pôle-relais Mares et Mouillère de France, mares@maisondelenvironnement.org

« The United Nations declared 2010 to be the International Year of Biodiversity. It is a celebration of life on earth and of the value of biodiversity for our lives. The world is invited to take action in 2010 to safeguard the variety of life on earth: biodiversity »

In such a context we can wonder about the role of ponds for the conservation of freshwater biodiversity. Ponds are diverse and numerous in all kinds of landscapes, including intensively modified and artificial landscapes such as agricultural or urban areas. These two characteristics explain the huge variety of habitats these ecosystems support and the potential they offer to all kinds of organism, from plankton and invertebrates to birds and mammals for living, breeding and feeding.

Taken at the landscape scale, collectively ponds (and their terrestrial margins) support more species and more uncommon species than other freshwater ecosystems (Williams *et al.* 2004). Indeed many plants and animals found in ponds are listed on national red data books (mainly plants, dragonflies, amphibians and birds). However, many invertebrates, an important component of the pond community, are not covered by any legislation.

At the European level the importance of ponds as a biodiversity resource is being recognised to some extent. For example, Mediterranean temporary ponds are a priority habitat under the EC Habitats Directive. However, legislation such as the Water Framework Directive continues to ignore them (Cereghino, *et al.* 2008). So how do we protect important areas for ponds outside of designated areas? Recent publications focusing on agricultural landscapes (Brainwood & Burgin 2009, Davies *et al.* 2008, Ruggiero *et al.* 2008), highways (Le Viol *et al.* 2009) and golf courses (Colding *et al.* 2009) have shown the role of these ponds in supporting a huge species richness, even in degraded landscapes. These observations again related to the regional scale, highlighting the role of ponds as stepping-stone ecosystems.

The year 2010 is a good opportunity to talk about ponds and biodiversity, and to spread the message to a wider audience. It is already possible to label projects linked to biodiversity with the International Year of Biodiversity logo, in order to make them more visible to the public. For example, we labeled the first issue of the French pond network newsletter, to highlight the importance of ponds for biodiversity.

Together we can make 2010, the year of biodiversity... and ponds !



Biodiversity is life
Biodiversity is our life

Websites

International Year of Biodiversity 2010 <http://www.cbd.int/2010/welcome/>

Le portail français de l'Année Internationale de la Biodiversité 2010
<http://www.biodiversite2010.fr/>

French Pond Network newsletter

<http://kletterws.kaliop.net/html/RQpfjnk2SjuTw43-%29%28-%29%28-3-%28%29-%28%29-jhrg==.htm>

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Volunteers and the conservation of amphibians and reptiles in the UK

David Orchard and Jim Baker, Amphibian and Reptile Groups of the UK, david.orchard@arc-trust.org

Volunteering and the enthusiasm of amateur naturalists has always been an important part of the conservation movement in Britain and this tradition is still very much alive and well. Despite the relatively limited number of amphibian and reptiles found in the UK (only seven amphibian and six reptile species), there are many volunteers and enthusiasts who work tirelessly for their conservation. Volunteers in the UK play a significant role in the conservation of their native amphibians and reptiles, and by working alongside professional organisations they achieve conservation targets that would otherwise be impossible due to the lack of funding for conservation work.



The Conservation of Amphibians and Reptiles in the UK

Amphibian and reptile conservation across the UK is undertaken by a number of different organisations. The government's statutory bodies are responsible for coordinating policy and guidance relating to all wildlife issues, which includes the licensing of work in relation to European Protected Species.

The main non-governmental organisation involved in implementing amphibian and reptile conservation projects is the national charity Amphibian and Reptile Conservation Trust (ARC) (www.arc-trust.org formerly the Herpetological Conservation Trust). This organisation owns or manages many of the best reptile sites in the UK (mainly in southern England), and has turned around the fortunes of national rarities - including the natterjack toad (*Epidalea calamita*), great crested newt (*Triturus cristatus*), smooth snake (*Coronella austriaca*) and sand lizard (*Lacerta agilis*) - by safeguarding habitat and restoring the species to areas from where they had become extinct. ARC runs and supports projects involved with the conservation of all the amphibians and reptiles found in the UK and it does this by working in partnership with a number of organisations, most notably ARG UK.

ARG UK (Amphibian and Reptile Groups of the UK) is a network of over 40 independent groups, dedicated to the conservation of amphibians and reptiles, and organised by county. All ARGs are made up of volunteers and their membership includes both amateur naturalists, carrying out projects in their leisure time, and professional ecologists who contribute their expertise free of charge. The groups vary in their activities and abilities which are dependent on the skills, interests and experience of their members.

ARG UK works closely with ARC and both organisations are now working in partnership with Pond Conservation on the Million Ponds Project, which aims to create 5,000 high quality ponds in England and Wales by 2012. ARG volunteers have helped to find new sites for pond creation and have managed projects in South Wales and Lancashire.

To demonstrate the range of activities carried out by ARGs, three examples are given here.

Great crested newt (*Triturus cristatus*) monitoring in Derbyshire

In the north of England, Derbyshire, volunteer surveyors from the Amphibian and Reptile Group have been working with staff from the Peak District National Park on a landscape-scale pond restoration project. Historically, ponds in this area were created for livestock, but with the onset of piped water many of these landscape features have become neglected. Volunteers have carried out surveys to determine the local distribution of great crested newts which has helped to target pond restoration work. Continued volunteer effort has allowed the restored ponds to be monitored for great crested newt colonisation.



Training of new volunteers is an important part of ARG activities.

Reptile recording in Surrey

In the south-eastern county of Surrey, reptile survey work is coordinated by Steve Langham. Steve has been using reptile records to determine the known ranges of the different species within Surrey. He is comparing these records with habitat information to determine the potential ranges of these species. This approach could be applied, for example, to help meet the reporting requirements for European Protected Species as specified under the Habitats Directive. Steve has also established a national project to monitor the non-native wall lizard (*Podarcis muralis*).

Raising awareness in South Wales

A new ARG group was established in South and West Wales in 2008. This group came into being through collaboration of a handful of motivated individuals working within local government and Swansea University. The group has trained local volunteers to carry out amphibian and reptile surveys. They have also organised a number of pond creation and restoration projects and have organised a conference aimed at staff working in local government. This conference raised awareness of the legal protection of amphibians and reptiles within the planning system and highlighted opportunities to enhance habitat on land owned and managed by local authorities.

The annual conference

To keep volunteers motivated and informed, ARGs organise a series of regional conferences. The main event of the year for all those involved in the conservation of amphibians and reptiles in the UK is the annual Herpetofauna Workers Meeting (HWM) which is usually held on the last weekend in January. This year's HWM was probably the best yet, thanks to an excellent venue, some first class speakers and generous support from Amphibian and Reptile Conservation.

The HWM is a two-day event with a series of speakers on the Saturday and a selection of interactive group sessions on the Sunday. Topics this year included pond management, summaries of ongoing survey projects and an update on threats from amphibian disease. A summary of the conference presentations is available at www.arg-uk.org.uk.

This year the conference was very pleased to host Hauke Drews from the Stiftung Naturschutz Schleswig-Holstein who gave an excellent presentation on the LIFE-Bombina-Project (2004-2009) that has done so much to further the conservation of the fire-bellied toad (*Bombina bombina*) in Germany, Denmark, Latvia and Sweden. As part of the project, Hauke worked closely with Lars Briggs on a programme of pond creation, drawing from Lars' huge experience of creating ponds across Europe. The key messages from the Life Bombina project were well received by the conference delegates, who are keen to work more closely with their European counterparts in future.

Planning for next year's HWM will start in mid-summer, so if you'd like to give a presentation at this event, or if you'd simply like to join us and meet some amphibian and reptile enthusiasts from the UK, you'd be very welcome.

If you'd like to receive information about ARG UK or next year's HWM, please contact David Orchard at: david.orchard@arc-trust.org

"Pond" ecosystem and network connectivity: a study from Northern France

Devigne Cédric¹, Bourel Benoît¹, Julve Philippe¹, Follet-Dumoulin Anne¹, Chassat Sophie¹, Devigne Laëtitia¹, Deville Pascal¹, Da Silva Sophie¹, Milhau Bruno¹, Dupont-Wargnier Sophie²

1. EA 3609 - Laboratoire Environnement & Santé - FLST/ICL- 41 rue du Port - 59046 Lille - <http://flst.icl-lille.fr/laboratoires-recherche/Laboratoire-Environnement-et-Sante.asp>

2. EA 3609 - Laboratoire de Biotechnologie des micro-organismes - ISA - 48 Bd Vauban - 59046 Lille - <http://www.isa-lille.fr/index.php?id=labobio>

Context of the study

The "Laboratoire Environnement & Santé" of the "Faculté Libre des Sciences et Technologies (FLST)" of the Catholic University of Lille is starting a pond study in the Regional Nature Park "Caps et Marais d'Opale" (PNRCMO). This project (2008-2011) is financed by a Franco-British cross-border cooperation Interreg IVA France (Channel) - England. This paper aims to present our project, and in doing so, we hope to encourage networking and feedback from other pond researchers.

Introduction

More than 1200 ponds have been inventoried by the PNR (Ammeux, 2008; Lafitte, 2004). These ponds are very diverse in terms of their physical characteristics as a result of historical and agricultural practices. This diversity needs to be maintained and, to do this, the characteristics of each pond or, more realistically, of each kind of ponds needs to be defined.

Our project aims to determine if, in spite of this diversity of pond type, there are some common biological structures or communities which can be observed. Hence, some possible well-defined group of ponds could be identified or, on the contrary, the particularity of each kind of ponds would need to be acknowledged. Our study will help understand the "pond ecosystems", facilitate biodiversity monitoring, and could enhance the future management of the ponds in the PNR.

Our project consists of two main parts:

- 1) A study of the global biodiversity of ponds in **4 types of ponds defined by their surrounding landuse (ponds located in forest, in meadow, in dune and in urban areas)**
- 2) A detailed study of one type of ponds in a network by **analysing their connectivity.**

Typology of ponds

During this three year the study, we will survey 40 ponds (10 ponds for each pre-defined type). The types of ponds have been chosen to represent the majority of ponds located in the PNR (nearly 80% of ponds are one of the four selected types).

A global analysis of the pond ecosystem will be carried out. From each site, **physical data** will be collected describing water body area, **chemical analysis** will be made in order to characterise the waterbodies (conductivity, pH, temperature, dissolved oxygen, nitrate-nitrogen, orthophosphate, COD, BOD5 and TSS). These chemical analyses will be carried out once every two months. However to have a better understanding of natural variations in water chemistry, one pond per type will be

analysed three times a day each month. For each pond, a **phytosociological study** will take a census of plant and plant association diversity. The phytosociological lists will be made as a function of the depth of ponds. Moreover, a same study in the environment of each pond will complete the information about the ponds and their surrounds. The collection of animals will be carried out both in the pond and in the pond surrounding land at each site: (i) **aquatic macroinvertebrates** will be sampled by vigorously netted each mesohabitat, (ii) **amphibians** will be inventoried, and (iii) **terrestrial arthropods**, who may depend on the pond habitat, will be sampled thanks to transects observation and by using a range of traps (Malaise, light, Barber, yellow pan).

We will be using methodologies compatible with Pond Conservation (Biggs *et al.*, 1998) so that our results can be compared with those obtained in the UK (Biggs *et al.*, 2005). The data collected will also enable us to set up a baseline to develop a monitoring method similar to the new IBEM (Indermuehle *et al.*, 2008).

Connectivity of ponds network

The development of corridors in order to reconnect the landscapes is one of the main roles of the PNR. In this context, a part of our study will be to improve the knowledge about the connectivity in a ponds network. We will begin by using existing models to investigate network connectivity for **odonata** (Angelibert, 2004; Angelibert & Giani, 2003; Watts *et al.*, 2006; Watts *et al.*, 2007; Watts *et al.*, 2005). In addition, we wish to (i) develop **a plant model** and (ii) make some capture-mark-recapture of **aquatic coleoptera** by using passive traps.

Conclusion

This study should help improve our knowledge about pond ecosystems. The comparison of different types of pond will bring out the general trends about ponds but also the characteristics of each type of ponds. We will compare our results to national UK data to evaluate the potential to generalise trends from similar studies. Our study of the pond connectivity will help us develop ecological corridors in the PNR. Finally, this study will provide a database of reference sites which will allow the development of a standard protocol for pond monitoring and management at the regional scale.

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The summer drainage of Nesyt Fishpond in 2007: a successful conservation measure or ecological catastrophe?

Jan Sychra & Jiří Danihelka

Department of Botany and Zoology, Faculty of Science, Masaryk University. Kotlářská 2, CZ-611 37 Brno, Czech Republic; dubovec@seznam.cz, danihel@sci.muni.cz

The Lednice Fishponds National Nature Reserve, established in 1953, is one of the most important wetland sites in the Czech Republic. These ponds are situated in the south-eastern part of the country, on the north-western edge of the Pannonian Basin, which has a typically dry and warm continental climate. This pond system consists of five large lowland ponds (a total area of about 550 ha) and is home to many interesting wetland plant and animal species.

The Reserve was established in order to protect the many species of waterbirds, such as greylag goose (*Anser anser*), red-crested pochard (*Netta rufina*) and black-crowned night heron (*Nycticorax nycticorax*) breeding at the ponds and the important numbers of waterfowl and waders staying there during the spring and autumn migration. Endangered wetland plants, mainly those of periodically flooded saline eulittorals (e.g. brookweed (*Samolus valerandi*) and swamp pricklegrass (*Heleochoa schoenoides*) are also important subjects for protection. The presence of sulphates and chlorides in the tertiary sediments also induces the occurrence of some typically halophilous species, such as the gutweed algae (*Enteromorpha intestinalis*) and the copepod *Arctodiaptomus bacillifer*.



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Drainage of Nesyt fishpond created suitable habitat for many wetland halophilous species, including small-flowered melilot (*M. dentatus*).



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Brookweed (*S. valerandi*)

Since the beginning of the 20th century, the Lednice Fishponds have been attracting the attention of naturalists, and in 1922 a biological research station was established there. Since then, many botanical and ornithological studies have been conducted, including the International Biological Program in the late 1960s and early 1970s. The international importance of the ponds is demonstrated by the fact that they are designated as a Ramsar site, part of a UNESCO Biosphere Reserve and a Natura 2000 site.

Despite this, the fishponds were not spared the intensive fish-and-duck farming, eutrophication and subsequent decrease in aquatic plants and birds populations during the second half of the 20th Century. Since the 1990s, conservation management has been targeted on the conservation of threatened

wetland communities. An important move towards this aspiration came with a new management plan for 2007–2011, which brought about lower fish stocks and periodical summer drainage of each pond.

The first of these new management measures was the summer drainage of the Nesyt Fishpond in 2007. The aim was to create suitable environmental conditions for halophilous plants of exposed pond substrates and especially for some threatened wetland birds. The Nesyt Fishpond (290 ha), was gradually drained from March to May 2007. The water level finally sank about 2.5m below the normal water levels, due in part to extremely hot and dry weather during that spring.



© Karel Fajmon

Narrowleaf dock (*R. maritimus*) in the central part of Nesyt fishpond during its summer drainage.

Different vegetation types associated with exposed pond beds developed in the drained pond, depending mainly on substrate type. Altogether, 20 red-listed species of the Czech flora were recorded, among them small red goosefoot (*Chenopodium chenopodioides*), *Heleochoa schoenoides*, fleabane (*Pulicaria dysenterica*), narrowleaf dock (*Rumex stenophyllus*), *Samolus valerandi*, and salt sandspurry (*Spergularia salina*). Most of these species survive in pond sediments for decades; however, periodic drainage is necessary to restore the long-term soil seed bank.

The summer drainage also created very suitable conditions for breeding waders, such as lapwing (*Vanellus vanellus*), common redshank (*Tringa tetanus*) and pied avocet (*Recurvirostra avosetta*). In the dry reed beds abundant breeding of bluethroat (*Luscinia svecica cyanecula*) was recorded. During the whole season thousands of waterbirds, especially waterfowl and waders, were present on the exposed pond bed and shallow pools. Some of these birds, including many rare species, were present in numbers never seen before in the Czech Republic. The monitoring of Lednické rybníky fishponds in 2008, the year following the summer drainage, has shown that this measure also supported populations of aquatic macroinvertebrates, which were very abundant in the recovered submerged vegetation.



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Pied avocet (*R. avosetta*) last bred in Nesyt fishpond in 1961, 46 years ago. In 2007, during the summer drainage, 2-3 breeding pairs were recorded.

From the point of view of nature conservation, the summer drainage of Nesyt has to be considered a very successful measure. However, its opponents were able to present it as an “ecological catastrophe” in national and local media, emphasizing the “traditional economic importance of fish farming” and “crucial importance of the water storage capacity of fishponds in the arid climate of southern Moravia”, gaining considerable support from the general public. We need to raise the public’s awareness and understanding of the importance and benefits of pond conservation measures such as these.

Montiaghs Moss: An Important Pond Area (IAP) in Northern Ireland

Naomi Ewald¹ and Bob Davidson²

¹Pond Conservation: The Water Habitats Trust. c/o Oxford Brookes University, Gipsy Lane, Headington, Oxford. UK. OX3 0BP. newald@pondconservation.org.uk

²Northern Ireland Environment Agency. Cromac Avenue, Gasworks Business Park, Belfast. NI. BT7 2JA.

The Important Areas for Ponds (IAP) concept was proposed and developed by Pond Conservation to raise awareness of geographic regions that support ponds of national or international biodiversity importance. These areas can then be used to help focus strategies for pond monitoring, protection and appropriate management and creation.

In 2009, a report was prepared by Pond Conservation and the Natural Heritage Research Partnership, Quercus, for the Northern Ireland Environment Agency (Keeble *et al.* 2009). In total 9 IAPs were identified as being important complexes of ponds in Northern Ireland. Of these, Lough Neagh Peatlands IAP was notable for the unusual pond sites it encompassed, including Montiaghs Moss.

Montiaghs Moss (pronounced munchies and known locally as "The Montiaghs") is a cutover lowland raised bog in south west Co. Antrim. The site consists of a mosaic of bog heath, grassland, scrub and wet woodland, interspersed by many hundred of isolated pools and a network of drainage channels. These were created around the middle of the 18th century by the removal of peat for turf. Commercial peat cutting came to an end in the mid 20th Century but some peat cutting still takes place on a much smaller scale for domestic use and conservation purposes.



Montiaghs Moss: high densities of small bog pools created as a result of peat puddling.

These habitats support a wide range of plant and animal communities associated with both acidic and more base rich waters. In fact Montiaghs Moss is the richest site for still-water aquatic macro-invertebrate species in Northern Ireland. Fifty-eight species of aquatic Coleoptera have been recorded. These include the Red List species *Acilius canaliculatus*, *Dytiscus circumcinctus*, the nationally scarce *Agabus melanocornis*, *Gyrinus minutus*, *Ilybius aenescens*, *Rhantus grapii* and *Gyrinus natator* which is considered extinct in Britain and rare in Europe. Fourteen species of aquatic Heteroptera (pond skaters and water boatman) have been collected, including the pond skater *Limnoporus rufoscutellatus* which is confined to Northern Ireland. The Irish damselfly *Coenagrion lunulatum* which is also a restricted species occurs in good numbers at the site, along with 12 other Odonata species.

In addition, the wetland complex supports a rich flora, including frogbit (*Hydrocharis morsus-ranae*), fat duckweed (*Lemna gibba*), greater duckweed (*Spirodela polyrhiza*), common meadow-rue (*Thalictrum flavum*), lesser bladderwort (*Utricularia minor*) and cowbane (*Cicuta virosa*).



Montiaghs Moss SAC boundary.

In spite of this wealth of biodiversity The Montiaghs was overlooked for a long time, and lacked any formal designation up until the late 90s when it was given Area of Special Scientific Interest status. It has now also been afforded protection under the Habitats Directive due to the presence of the marsh fritillary butterfly *Euphydryas aurinia*. In 2009 it was identified as part of the Lough Neagh Peatlands IAP because of the exceptional assemblage of wetland invertebrates which occur there (Keeble, *et al.* 2009).

The extent of wetland habitats at The Montiaghs can be attributed to the high water table and several centuries of traditional practices. The loss of these traditions resulting in scrub

encroachment and threats from water abstraction, poor water quality and uncontrolled burning were threatening to undermine the quality of the site. However, a long term management plan by the Department of the Environment Northern Ireland (2009), who own a proportion of the site, and cooperation from private landowners are set to ensure that Montiaghs Moss remains one of the most important areas for freshwater biodiversity in Europe.



Most pools on the site are small with vertical sides. This very long pool (length 330m) was created as a firebreak and one bank has been profiled. The horsetail *Equisitum fluviatile* has quickly colonised and is used by Odonata when emerging in the Spring. It is planned to encourage the pondweed *Potamogeton polygonifolius* as it is used by dragonflies and damselflies for egg-laying.

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Northern Ireland Environment Agency (2009) Neagh Bann River Basin Management Plan. Water Dependent Features of Natura 2000 sites (SACs & SPAs) in Neagh Bann River Basin District.

Man-made irrigation ponds as habitat for waterbirds.

Esther Sebastián-González^{1,2}, Karen Luisa Alexander², José Antonio Sánchez-Zapata² and Francisco Botella²

¹ Doñana Biological Station-CSIC, Américo Vespucio s/n 41092 Sevilla, Spain. E-mail: esebastian@umh.es

² Ecology Area, Department of Applied Biology, Miguel Hernández University. Cra. Beniel Km 3.2 03312 Orihuela, Alicante, Spain.

The south-east of Spain is a semi-arid area with low precipitation where water is considered a limited resource. It has traditionally been an extensive agricultural area. In the 1980s, an inter-river water transfer was built to bring water for irrigation and residential purposes.

Since then, over 2700 ponds have been constructed to store the water received and the area has turned into a mosaic of intensive agricultural fields, artificial ponds and housing developments. Several natural wetlands still persist in the area as they enjoy regional environmental protection (as Natural Parks or Protected Places), and international status (SPAs and RAMSAR sites) because of their importance in supporting threatened species and important numbers of waterbirds

<http://ramsar.wetlands.org>.



Aerial photograph of part of the study area. Irrigation ponds are clearly visible as dark rectangles in the landscape.

Besides the negative effects of agricultural intensification for biodiversity conservation, the constructed irrigation ponds in the region have become new available habitat for the waterbird community^{1,2}. These ponds vary in size (from 100 to 6600 m²) and degree of naturalization. Some of them hold shore and submerged vegetation whereas others are kept rather "aseptic", depending on the owner. They

are all fenced and permanently full of water, contrasting with the high temporal variability of water availability in the natural wetlands.



An irrigation pond in Vega Baja Valley in southeast Spain.

We have surveyed a group of ponds for 7 years in the breeding and wintering season and found up to 45 different species of waterbirds using them. The abundance of most of the species at the ponds was not high, but some numbers were higher at the ponds than at the natural wetlands within the area (i.e. the black-winged stilt *Himantopus himantopus*).

Moreover, we verified the reproductive success of 7 species: little grebe (*Tachybaptus ruficollis*), black-winged stilt (*Himantopus himantopus*), little-ringed plover (*Charadrius dubius*), moorhen (*Gallinula chloropus*), common coot (*Fulica atra*), common shelduck (*Tadorna tadorna*) and mallard (*Anas platyrhynchos*). We think that these waterbodies could also be important for some gulls and terns which breed at the natural wetlands but use these artificial ponds to forage.



Waterfowl and waders making use of an irrigation pond.

In summary, even if irrigation ponds are only managed for irrigation purposes and they have never been considered for conservation purposes, they are permanently used by waterbirds. Here they find food, breeding sites and refuge from predators. As natural wetlands are being altered, irrigation ponds, if well managed, can guarantee alternative habitats for some waterbirds, especially in dry years.



A pair of black winged stilt next to an irrigation pond and another which has built its nest on the shore of an irrigation pond.



Irrigation ponds and citrus farms.

References

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Pond landscapes in the Eastern Carpathians.

László Demeter, Sapientia University, 530104 M-Ciuc, pta. Libertății 1, domedve@gmail.com

Natural ponds, in addition to their value for biodiversity, are fascinating in terms of geomorphology and ecological history. Ponds on flat terrains like lowlands and floodplains are quite obvious, but ponds on slopes and hilltops are more challenging, especially in areas with no glaciation in the Pleistocene.

My story begins a decade ago in Romania when one had to map ponds based exclusively on fieldwork. Very few ponds were marked on 1:5000 scale topographical maps, and most of them were not marked at all.



Figure 1: Location of the study area in the Eastern Carpathians (three tectonic mountain basins).

When I started to map the distribution of the common frog *Rana temporaria* in a mountain basin of the Eastern Carpathians in the late 1990's, I found a few shallow ponds (a few hundred m² large and about 30-50 cm maximum depth) on the surface of a fluvial terrace. I called these terrace ponds for a long time, and mapped more than a hundred in my research area. I wasn't even sure whether these were natural or man-made. Natural seemed more plausible because of the large number and relatively big surface area.



Figure 2: Digital elevation model of the Gheorgheni, Ciuc and Brasov basins. Mapped ponds (more than 600) are marked.

What I didn't notice before a geologist friend came along was that most of these ponds were situated not on the terrace, but on the end parts of long slopes, called alluvial fans. Alluvial fans are formed by streams and rivers especially where the slope of the terrain changes suddenly, e.g. where a mountain meets a lowland. A divergent surface water network develops, so the result looks a bit like a riverine delta on a slope.

In the mountain basin that I study (the Ciuc Basin, Fig. 1), the lower end of the alluvial fans is often wavy and this is where the ponds are, in groups of a few to dozens. My geologist friend immediately associated this with periglacial phenomena. At this latitude (46.2° N) and altitude (650-800 m), there was no complete glaciation in the Pleistocene. Glaciers developed only above roughly 2000 m. However, tundra climate was present in the whole area, including permafrost and long winters. Tundra or periglacial landforms include solifluction, ice wedges, palsas and pingos. We started to think that the ponds are thermokarst features, the

remains of ice wedges after permafrost was gone. This theory implied that the ponds are at least 10,000 years old. So we started coring them. And yes, the bottom sediment was peat-like mud, up to 2.5 m deep, followed by a compact greyish clay and then gravel. We had a few samples from the bottom of the ponds radiocarbon dated, and the results were between 6,000 and 12,000 years BP. Based on more detailed observations we have abandoned the thermokarst theory and now favour a late Pleistocene / early Holocene landslide origin of the wavy surface. What we don't know is the role played by the permafrost in this process. In the mountain basin where most fieldwork was done, 85% of the alluvial fan ponds are found on the western part of the basin. Because of the geological asymmetry of the basin, volcanic rocks on the west and sedimentary on the east, one can speculate that rock composition plays a role in the process.

However, this year we started to map ponds in the mountain basin north from our basin, the Gheorgheni basin (Fig. 2). Now we have new tools: GPS and high-resolution aerial photographs are available for the whole country, used originally for agricultural land-based and agri-environmental payments. Apparently the Gheorgheni basin is very similar to the Ciuc basin. Surprisingly enough, after scanning the aerial photographs, we found only one large pond cluster. This was not on the western slope

of the basin, but rather symmetrically distributed, and more abundant on the eastern side. Looking on digital elevation models of the areas (like the one on Fig. 2); it seems that the width of basin could be important for pond formation, by influencing the slope of alluvial fans. Alluvial fans with steeper slopes seem to be associated with pond clusters. After a little talk with another geologist, it seems that the tectonics of the area can also be important as the ultimate factor for pond formation (the local sinking determines the formation and position of alluvial fans relative to the fluvial terrace).

Peculiarly enough, almost no one has studied these ponds before us, so we have the honour and burden of exploring all aspects, from biodiversity to paleoecology, and from geomorphology to water chemistry, as well as preparing the field for environmental education, ecotourism and conservation.

Based on experience only, some basic pond subtypes of the alluvial fan ponds are:

- sedge ponds without tussocky sedges, which are often mown by local semi-subsistence farmers, with *Carex vesicaria*
- tussocky ponds, dominated by *Carex elata*
- cattail ponds with *Typha latifolia* and *Utricularia vulgaris*
- bog ponds with *Carex rostrata* and *Sphagnum* sp
- marsh-like ponds with *Glyceria* sp.



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Figure 3-5: Examples of alluvial fan ponds, more available at www.tocsa.eu.

Water quality ranges from oligotrophic to hypertrophic, the latter indicated by huge *Volvox globator* blooms. Hydroperiod ranges from temporary (2 months) to semi-permanent (dry out once in a few years).

Characteristic invertebrates include large branchiopods (8 species detected so far) and calanoid copepods (5 species). Five of these crustaceans were new for the fauna of Romania. Two different fairy shrimp species *Drepanosurus hankoi* and *Chirocephalus shadini* are shown in Fig. 6. *Lepidurus apus* and *Eoleptestheria ticinensis* are shown in Fig. 7.

Four amphibians breed in these ponds regularly: common frog (*Rana temporaria*), moor frog (*R. arvalis*), common newt (*Lissotriton vulgaris*) and great-crested newt (*Triturus cristatus*). This area and this pond type hold the largest populations of *R. arvalis* in Romania – over 5000 adult females at one site (based on spawn counts) (Fig. 8).

In 2009 we started a project for the mapping, biodiversity survey and conservation of these ponds. We thank the generous support of Dr Barbara Knowles
<http://www.treasuresoftransylvania.org/>.
 More details at www.tocsa.eu.



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Figure 6: Fairy shrimp - ♀ and ♂ *Drepanosurus hankoi* and ♂ *Chirocephalus shadini* (horizontal position).



© Juhász Ágota

Figure 7: *Lepidurus apus* and *Eoleptestheria ticinensis*.

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Figure 8: Moor frog (*R. arvalis*) spawning in an alluvial fan pond.

News in brief

IMPORTANT ANNOUNCEMENT FOR EPCN MEMBERS

The European Pond Conservation Network has now been registered as an association in Switzerland. Please read the statutes on the EPCN website at <http://campus.hesge.ch/epcn/history.asp>.

We will have a General Assembly in Berlin in June 2010, during the EPCN conference. The time and place will be noted in the conference programme. At this meeting, the present activities and future direction of the network will be discussed...

...so please come along and give your views.

Pro-pond Project: Important Areas for Ponds (IAP) in the Alpine ARC and Mediterranean regions.

One of the main aims of the EPCN is to raise the profile of ponds and guide national and supra-national policies for their protection. A crucial first step towards this aim is to identify where the most important areas for pond biodiversity are within a region.

A preliminary report is being produced using expert knowledge to identify important ponds or clusters of ponds in (i) in the Alps and (ii) in the Mediterranean region. This will be available on the EPCN website in July 2010.

To make sure that your site is recognised as an important area for ponds in this report, send your suggestions to Dr Naomi Ewald newald@pondconservation.org.uk by the 21st May 2010.

International Conference on Mediterranean Temporary Ponds.

A very successful conference was held in Menorca in May 2009. It brought together experts and researchers from around the world to discuss the study, preservation and sustainable management of temporary ponds. The proceeding and abstracts of this conference have now been published and are available to download.

Visit the conference web page:

<http://estanquestemporales.menorca.es/>

Download a copy of the conference proceedings and abstracts:

http://estanquestemporales.menorca.es/WebEditor/Pagines/file/Recerca%2014_Conference%20Proceedings%20and%20Abstracts.pdf



Ecological restoration of the Midden-Limburg pond area using the triple E-approach.

The LIFE programme has contributed over 1,000,000€ to the restoration of Midden-Limburg, in the North-East of Belgium. This Natura 2000 site has the highest density of ponds in Belgium, including oligotrophic and mesotrophic standing waters. These support high levels of biodiversity, including bittern (*Botaurus stellaris*) and tree frog (*Hyla arborea*).

The key to the restoration of this habitat will be the continued participation of private landowners and stakeholders involved in the management of the area. This will be achieved through a combination of ecology, education and the local economy, the triple E-approach. These are sustainable policies which could be applied to many other areas of importance for pond conservation.

For more information visit:

<http://ec.europa.eu/environment/life/news/newsarchive2010/april/index.htm#eee>

LIFE and Europe's reptiles and amphibians - Conservation in practice

In 2009 a report was produced in the LIFE Focus series which presented some of the projects for amphibians and reptiles which have been co-funded by LIFE since 1992. These projects have covered all aspects of amphibian and reptile conservation including habitat restoration, captive breeding, education and reintroduction programmes.

http://ec.europa.eu/environment/life/publications/lifepublications/lifefocus/documents/reptiles_amphibians.pdf

Looking to the future, it is hoped that Member States will take advantage of new opportunities for the funding of projects dedicated to reptile and amphibian species under the Commission's LIFE+ programme. The application guide for 2010 submissions will be available on the website from the 5th May 2010.

<http://ec.europa.eu/environment/life/funding/lifeplus.htm>

Mediterranean temporary ponds: Conservation and management in Menorca

Menorca has been the focus of an unprecedented project to catalogue the temporary ponds of the island and to undertake conservation and restoration projects along with increasing awareness of this unique and fragile habitat.

The LIFE co-funded project came to an end in 2009, culminating in the publication of a book which presents the main results of the project. An outstanding piece of work, it sets the benchmark for other pond projects. For more information visit:

<http://www.cime.es/lifebasses/en/index.php>



Announcements

EPCN training courses

Advanced course in pond conservation and management

ITALY: Trieste Natural History Museum, 14-16th June 2010.

This training course will provide up-to-date information on all aspects of pond conservation and management. It is anticipated that participants will be pond conservation researchers and/or practitioners who will contribute to the workshop discussions. Places are limited and priority will be given to EPCN members.

For more information and to book a place, please contact Nicola Bressi, bressi@comune.trieste.it.

FBA training courses

The Freshwater Biological Association training programme offers a range of training courses in aquatic invertebrate and plant identification and survey methods in 2010. You can download a brochure from www.fba.org.uk/index/training.html



Conferences

GERMANY: 1st-4th June 2010: The 4th European Pond Conservation Network (EPCN) Conference. In 2010, the Year of Biodiversity, the EPCN Conference will bring together pond experts to exchange experiences and ideas on the conservation of ponds as an important biodiversity resource <http://www.4epcn2010.de/>

Pond Manifesto

The Pond Manifesto is now available in English, French, German, Spanish and Italian. All these can be downloaded from www.europeanponds.org. Please send it to your contacts in national or regional water and conservation agencies and to other pond workers who may be interested in joining the network.

Guidelines for submissions to the EPCN newsletter

- **Submissions can include news items or longer articles about, for example, an organisation or person, a project, a pond site, pond-related species etc.**
- **Submissions should be no more than 400 words in length.**
- **Articles should be written in an informal style (not like an academic paper; if you want to add references, use Word footnotes).**
- **Articles should include illustrations such as photographs, maps, line drawings etc.**

Just email articles or queries to Pascale Nicolet
pnicolet@pondconservation.org.uk.

Next deadline for submission: 30 June 2010

