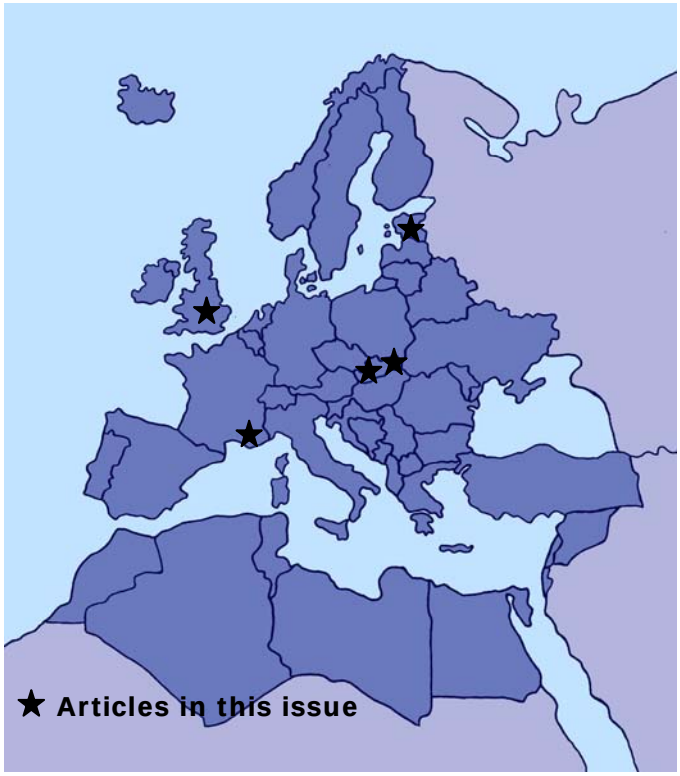
European Pond Conservation Network Newsletter

No. 2 Winter 2008/09

This second issue of the EPCN newsletter has a distinct Eastern European flavour, with articles from Estonia, Slovakia and the Tatra Mountains. We also have reports from a flying biologist working in Guyana, and rather interesting macabre ponds from the south of France!

See also the back pages for conferences and training courses announcements for 2009, and short news items.

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 pond workers to join the network.



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Tiny pools, big prospects

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Information about ecological interactions in relation to environmental variability can be gleaned only with great investment of time, effort and money. Therefore, creative approaches are required to extract the greatest insight into these changes from as little data as possible. Recent high-impact studies suggest that big conclusions can be drawn from the tiny but realistic ecosystems that flourish in plant-held waters ("phytotelmata"). Many species of Bromeliads (Bromeliaceae) have tightly interlocking leaves forming wells that hold rain water. These monocotyledon plants are represented by 1500 – 3000 species, mostly restricted to the Neotropics and Florida. Most of them are epiphytes. Because tank-bromeliads collect rain water, leaf litter and dead invertebrates, they provide a habitat for aquatic species among which unicellulars, insect larvae, microcrustaceans, annelids and poison frogs are well represented. The detritus provides a source of nutrients for the aquatic community, as well as the bromeliad itself (nutrients are absorbed by specialized trichomes). Tank-bromeliads are thus discrete habitats which contain distinct aquatic communities. The main advantage of studying these natural microcosms is their abundance in any given area. Moreover, owing to their small size, the entire aquatic community from each plant can be quantified with a degree of accuracy not possible in larger systems. Researchers from Univ. Toulouse, Univ. Clermont Ferrand (France) and CNRS-French Guiana are currently studying these systems from soil to canopy in French Guiana. Emphasis is on the biological interactions between the host terrestrial plant and its aquatic biota (including feedbacks), and their outcomes in terms of food web structure and plant *fitness*. At the same time, this work is expected to shed interesting new light on the ecology of miniature pools in natural environments.

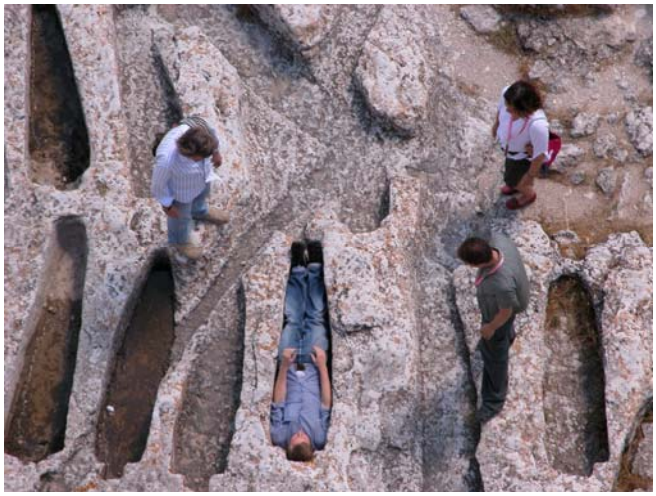
EPCN member looking for canopy bromeliads in a primary rainforest (French Guiana).

When rock tombs became ponds: the Gothic ponds of Montmajour

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

Close to the Camargue, five kilometres north of Arles in the south of France, there is a fortified Benedictine monastery built between the 10th and 13th century that was famous during Middle Ages as an important site of pilgrimage. This monument, called "Abbaye de Montmajour" (http://montmajour.monuments-nationaux.fr/) is particularly original because of its cemetery, built near the main chapel, on which we listed 48 tombs and other smaller holes dug directly into the rock.

Most of the tombs have been cut in the shape of human bodies, with a space for the head, shoulders and feet, others are simply rectangular. Filled by rainfall during spring and autumn, these are real ponds, which are all slightly different from each other because of their shape, depth (maximum of 46 cm) and substrate permeability. Sunshine length, run-off connections between ponds and birds nesting above the area (which results in an increase in organic nutrients), all play a role in making each pond unique.



By monitoring these small ponds, we found that most of its biota was invertebrates, mainly Diptera (dominated by Ceratopogonidae), Rotifers and Crustaceans. However, we also recorded only one amphibian species: the treefrog (*Hyla meridionalis*) that is abundant in southern France. The tadpole shrimp *Triops cancriformis* also occurred in 12 out of the 48 ponds at the site. This species is present in all Europe and known in abundant populations in eastern end southern France.

Colonization of rock tombs is probably linked to the close proximity to the Camargue and to the high proportion of rice fields around the Abbey. It's not entirely surprising that these tombs became ponds: we know that in medieval times Montmajour was an island (43 meters high) surrounded by freshwater and brackish marches and was only accessible by boat. Still, it's amazing to see that these rock tombs became a really important spot for freshwater life!

Because of the interest the abbey visitors have for these ponds, particularly due to the presence of tadpole shrimps, we suggested to the site manager that a brochure should be produced to inform the public about the importance of ponds for freshwater biodiversity conservation, and to explain the functioning of this rock pond ecosystem.

This site, added to the UNESCO list of World Heritage Sites in 1981, receives many visitors because of its historical interest, and it hosts many cultural events throughout the year. Places such as this, where cultural and biological interests meet, are important for communicating pond conservation issues to a public that is often quite different from the one we would find in nature reserves.
The brochure, available in French, can be obtained in PDF format by emailing the author (see above) or directly on the EPCN website

Illustrations from Cyril Girard http://cyril.girard.dessin.naturaliste.chez-alice.fr/

Creating and restoring ponds for threatened amphibians in Estonia - experience from a LIFE-Nature project

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Two European-wide threatened species – the crested newt (*Triturus cristatus*) and the common spadefoot toad (*Pelobates fuscus*) have been in a severe decline in Estonia during the last decades. Historically both species have been widely distributed and numerous in southern and south-eastern Estonia, where the landscape is hilly with mosaics of forest, grasslands, small extensively used fields and farmlands and a great number of different water bodies: small lakes, beaver ponds, natural depressions, cattle-watering ponds, garden ponds, sauna ponds and ponds historically used for flax soaking. During the second half of the 20th century, the number of ponds suitable for amphibians decreased as cattle husbandry declined, many small ponds became overgrown, or fish were introduced to them or they were filled in.

In 2005, we carried out a pond inventory and 405 small water bodies were studied in southern Estonia, where the population density of crested newt and common spadefoot toad is the highest nationally. During the inventory, crested newt was found in 24% and the common spadefoot toad only in 2% of small water bodies sampled. Forty-eight percent of the examined ponds were stocked with fish, 15% of the examined ponds were completely overgrown with dense vegetation and/or bushes, 15% were eutrophicated, silted up or completely shaded. Altogether only 22% of the 405 ponds were of high-quality for amphibian breeding.

To halt the decline of these species and to save the small and isolated populations of the common spadefoot toad from extinction at the northern edge of its distribution range, LIFE-Nature project "Protection of *Triturus cristatus* in the Eastern Baltic Region" was launched together with Finnish and Danish colleges in 2004. Since then, 230 ponds have been restored (22 ponds) or created (208 ponds) in southern Estonia, in the distribution area of two target species.

We have followed four main principles while constructing the ponds:

(1) to increase colonisation probabilities and preserve existing populations, we constructed ponds in clusters (at least 4 ponds in each), with distances between ponds no more than 500 m and at least one constructed pond within 200 m of a source pond of a target species. Land cover within 50 m from any constructed pond was mainly to consist of a mosaic of forest and (semi)natural grassland (for the crested newt) and (semi)natural grasslands and small extensively used potato fields or vegetable gardens (for the common spadefoot toad).

(2) to ensure different hydroperiods of the ponds, improve the quality of ponds for amphibians and to fit them into the landscape – as we worked in the nature protected areas, it was very important that the ponds and the clusters of ponds also look nice in the landscape. Therefore they were shaped according to the natural micro relief of the

area. Never square ponds were made, for example. We constructed ponds of various depths, sizes, slopes, shapes, and widths of shallow littoral zone.

(3) none of the constructed ponds was allowed a connection to running water (ditch, stream, river) to avoid fish introduction or sedimentation.

(4) as each pond construction was unique (depending on the relief, soil, hydrology, presence of drainage system, surrounding habitats etc.), it was guided in the field by experienced amphibian experts.

We let the ponds fill with rainwater, and allowed colonization and succession to take their course.

By 2008, successful breeding of the great crested newt had been recorded in 23 of 25 clusters (92%), and of the common spadefoot toad in 17 of 21 clusters (81%). The constructed ponds situated closer to the source pond were colonised more quickly than ponds that were further away both in the case of the crested newt and the common spadefoot toad. In addition, the crested newt preferred to colonise ponds with presence of submerged vegetation and surrounded by forest or mosaic of forest and open habitats. The colonisation rate of the crested newt increased after submerged vegetation was established – in their third year after construction, 71% of the ponds were colonised by the species. The common spadefoot toad favourably colonised ponds with transparent or clear water.

Altogether, in only three years when 22 of the existing ponds were restored and 208 new ponds created, the number of ponds occupied by the common spadefood increased 6.5 times and the crested newt 2.3 times.

There were probably four main factors that contributed most to the success of our project:

1) the restoration areas and habitats were carefully selected, hosting the strongest, not the weakest, remnant populations in the region, and protected areas with a high forest cover and a low-intensity agriculture were chosen to improve the long-term perspectives.

2) we restored ponds in clusters, taking into account the relatively limited dispersal abilities of the target species. The clustering of ponds was apparently an effective way to increase the density and number of breeding sites both at the local population and the landscape level.

3) the constructed ponds were separated from running water to avoid fish introduction, sedimentation or pollution.

4) and finally, we suggest that the participation of experienced experts in the field was essential for achieving good results.

The recovery of alpine ponds and lakes after acidification, Tatra Mountains (Slovakia, Poland)

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Study of recovery of freshwater ecosystems after acidification stress is one of the major issues of current limnology research. Compared with other European mountain ranges, the Tatra Mountains have been exposed to the strongest effect of acidification pollutants for more than a half of century[1]. At the beginning of the 1990s, changes in water chemistry appeared as a consequence of a large drop in emissions of sulphur and nitrogen compounds throughout Europe.

Recently, the reversal from acidification stress dominates the processes affecting water chemistry in the impacted waterbodies in the Tatra Mountains. Despite the first signs of biological recovery in some lakes[2,3], the process has not been identified in all waterbodies. The next few years are a unique opportunity to study the continuing biological processes in the Tatra Mountain freshwater ecosystems, and enable a prediction of their future development.

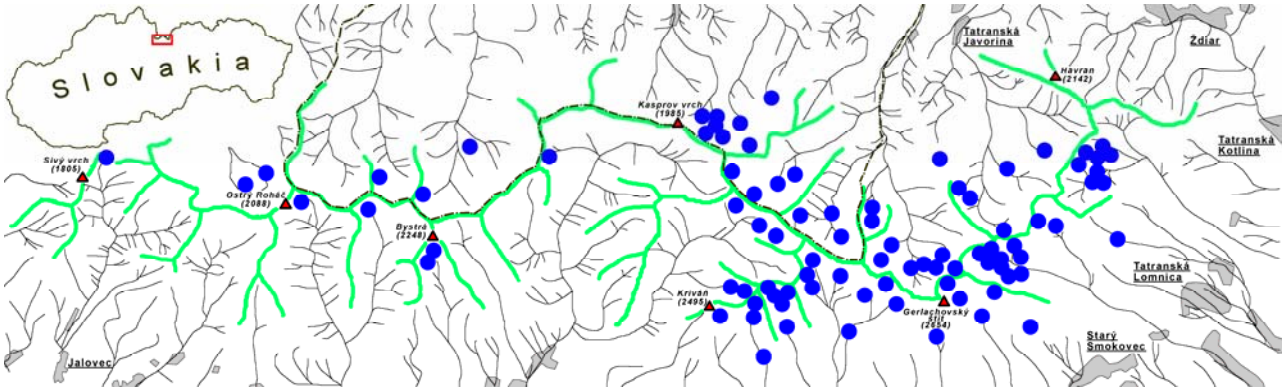

Fig. 1. Location of the most important lakes and ponds in the Slovak and Polish part of the Tatra Mountains (blue circles).

At this time, more than 40 alpine lakes and ponds[4] of glacial origin are under investigation to establish the extent of biological recovery in these waterbodies. A total of eight ponds situated at high altitudes on the Slovak and Poland sides of the Tatra Mountains were selected, because data on chemical parameters and littoral benthic macroinvertebrates for these ponds were available.

Primarily, we compared the macroinvertebrate assemblage composition observed in 2000 with the data obtained in 2004. The preliminary results seem to be encouraging. The ponds that experienced considerable changes in water chemistry during the last 15 years showed higher shifts in the assemblage composition recently. In contrast, the ponds with little change in their environmental conditions supported stable assemblages. However, acid-sensitive species re-appeared rather sporadically.


Left: Strongly acidified pond Vyšné Terianske pleso (2109 m a.s.l.). Values of pH increased from 4.8 in 1984 to 5.6 in 2004, and the first sensitive species re-appeared in 2007. Right: Non-acidified pond Pusté pleso (2055 m a.s.l.). Buffering system of this lake prevented acidification and its littoral macroinvertebrate assemblages have remained stable.

Investigations of the ponds were performed also in the middle of September 2007 and 2008. Providing the data in time series, results of the study would be an empirical evidence of biological processes following chemical recovery from acidification stress. More significant signs of biological recovery, such as the appearance of sensitive species of benthic insects (e.g. *Drusus trifidus*, *Apatania fimbriata*) are expected to take place.

This study is supported by the Scientific Grant Agency of the Ministry of Education of Slovak Republic; project No. 1/4334/07 "Planktonic and benthic communities in period of changing human impacts on Tatra Mountain lake ecosystems".

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Košské mokrade wetlands: mining-induced biodiversity

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The upper Nitra River Basin (central Slovakia) is a region which has been critically affected by past economic activities associated with negligence in protecting the environment. After the Second World War, river regulation, intensive agriculture and industrial development all contributed to reduce the biological diversity of the landscape[1].
Paradoxically, mining, which is the major industry of the region, has also contributed greatly to the recent increase in biodiversity. Indeed, extensive underground coal mining operations brought about changes to surface landforms and created a relatively dense pond system called Košské mokrade wetlands (Fig. 1). The first flooded terrain depressions appeared in 1986 and quickly became a "hot spot" for regional biodiversity. Over a 100 plant species[1], 8 amphibian and more than 180 bird species[2] were recorded from this area, many of them endangered or rare (e.g. *Bulboschoenus maritimus*, *Schoenoplectus mucronatus*, *Egretta alba*, *Himantopus himantopus*). Although Košské mokrade wetlands are recognised as regionally important[3], their invertebrate fauna has however received little attention.

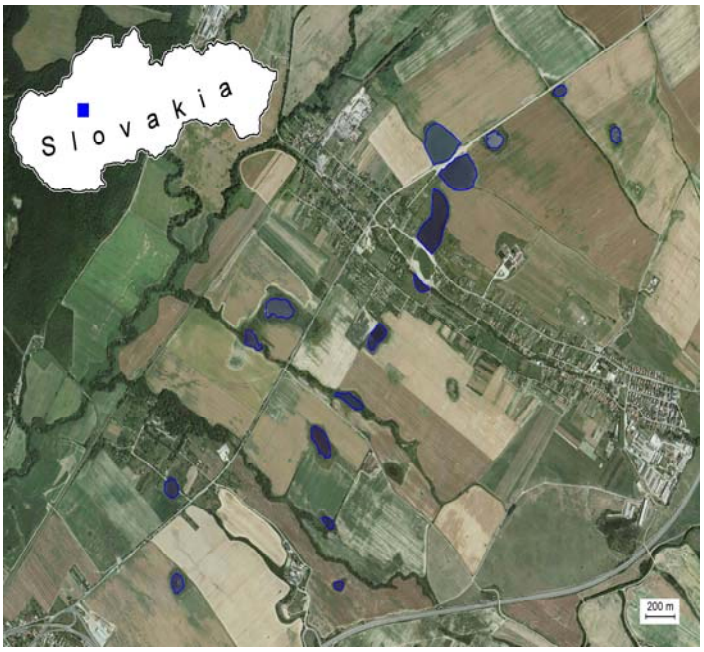

Fig. 1. Aerial photograph showing the location of Košské mokrade wetlands. Different terrain depressions after coal mine subsidence are visible. Ponds surveyed under the Institutional projects of Technical University in Zvolen are highlighted (blue color). Source: Google Earth.

To address this, we decided to focus our attention more closely on the diversity and structure of pond macroinvertebrate assemblages as part of two projects of the Technical University in Zvolen (I-07-028-00 and 04/08 IPA TUZVO). We first sampled 16 ponds for their invertebrate fauna and environmental conditions (Fig. 1). The spatial and temporal variability of the pond assemblages was then considered. The preliminary phase of our research showed a high variability in environmental conditions between sites. The ponds ranged widely in age (4–22 years), size (0.6–6 ha), depth (0.5–3.6 m), pH (7.5–9.9), oxygen (3.6–25.1 $mg.l^{-1}$), nutrients (0.06 – 5.28 mg $P.l^{-1}$) and other investigated parameters.

Fig. 2. One of the studied ponds

The ponds surveyed supported a relatively rich assemblages with more than 100 species of aquatic macroinvertebrate species recorded[4,5,6,7], some of them on the national Red List of threatened species (e.g. *Anax imperator*, *Lestes virens vestalis*, *Ischnura pumilio*, *Agrypnia obsoleta*). Age and hydrological regime appeared to be the predominant factors shaping assemblage composition. Generally, young, permanent ponds supported a greater diversity of invertebrates.

Underground mining activities in the area will continue for at least several years. Thus, creation of new ponds beneficial to wildlife can be expected. Despite their high biological value, the Košské mokrade wetlands have no conservation status at the time. Unfortunately, under national law, the mining company has to return land to agriculture after mining operations have ended. Emerging conflict between nature conservation and agriculture will probably need to be addressed though cooperation at the ministry level[8].

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The Million Ponds Project: creating clean water ponds for freshwater wildlife

Pascale Nicolet, National Project Coordinator, Pond Conservation, pnicolet@pondconservation.org.uk

A century of decline

Over the last 100 years, almost three quarters of ponds have been lost and many of those remaining are badly damaged by pollution. Pond quality is still in decline: the latest Countryside Survey results (see news in brief in this newsletter), published in November 2008, show that only 8% of countryside ponds are currently in good condition and the quality of lowland ponds went down between 1996 and 2007. The damage and decline of ponds is very worrying because they are critical for sustaining freshwater biodiversity. Ponds provide a home for at least half of all freshwater species, and over 80 pond-associated plants and animals which have Priority Status under the UK's Biodiversity Action Plan (BAP).

Natterjack Toad (*Bufo calamita*), a UK BAP species (Photo: Fred Holmes)

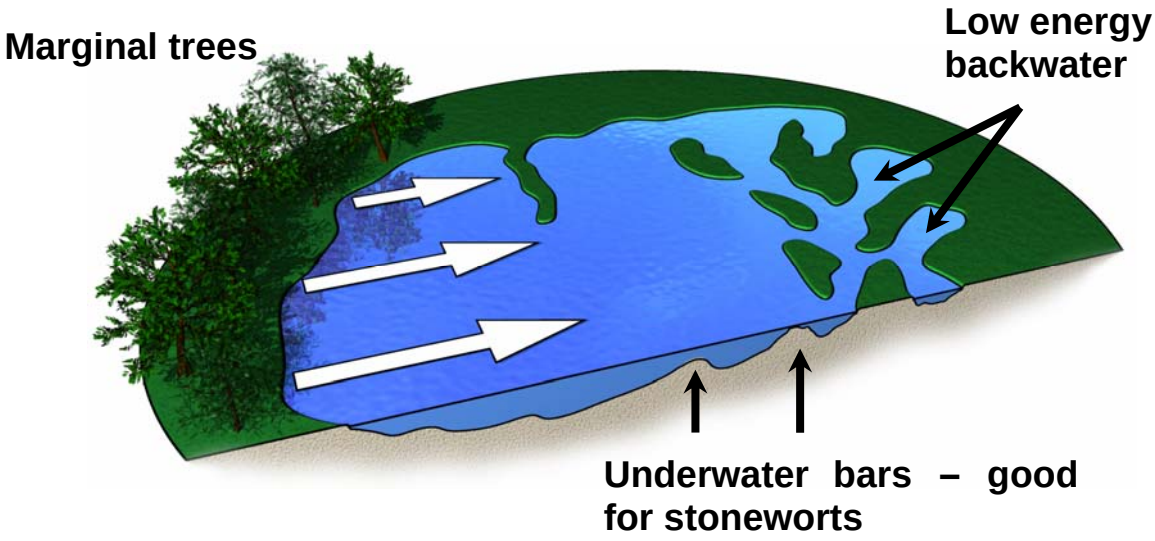
The Million Ponds Project

So, what should we do to help freshwater wildlife? It's simple: make more ponds! This is exactly what the visionary Million Ponds Project is aiming to achieve: return the number of ponds to one million by 2050. And by making sure new ponds are located in good places, away from pollution, we will start putting back *clean water* in the landscape. Clean water is now extremely rare, and difficult to achieve with habitats which have large catchments, like rivers or lakes. In contrast, ponds are small, cheap to make and easy to locate where they will have a clean water source.

A new pond at Hothfield Common Site of Special Scientific Interest (SSSI) in Kent (left) and a farm pond in North Wales (right).

The first phase (2008-2011)
The first phase of the Million Ponds Project was launched on 19 February in London. The project aims to create a network of 5,000 ponds in England and Wales. One fifth of these will be specially designed for BAP species. The project is supported financially by the Tubney Charitable Trust and is a partnership of government agencies, environmental organisations and land managers led and coordinated by Pond Conservation.

The Million Ponds Project provides freely available illustrated information on clean water pond design and creation (The Pond Creation Toolkit, see below), and offers training and on-site advice to partner organisations and for larger creation schemes. A pond-digging fund is also being established, which will include funding specifically for creating ponds designed for BAP species.



Example from the Pond Creation Toolkit, Sheet 4 (Design): Pond design to reduce wave wash

To download the Pond Creation Toolkit factsheets, or for more information about project partners, pond-associated BAP species or any other aspect of the Million Ponds Project, please visit www.pondconservation.org.uk/millionponds

News in brief

France : Future of the Pôle Relais Mares et Mouillères

By Olivier Scher, Pôle-relais Mares et Mouillères de France,
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In the last Newsletter, I presented the difficulties facing the Pôle-relais Mares et Mouillères de France. Things are now getting a lot better because, in early 2009, the "Pôle-relais" is merging with a new organisation, the national federation of French regional parks (www.parcs-naturels-regionaux.tm.fr/fr/accueil/). The good new is that the work of the "Pôle-relais" will now include larger ponds (we previously only worked on ponds less than 5,000 square meters) and will be extended to include alluvial valleys. As a result of these modifications, we will create a new website and there will be many more new activities. We will let you know how things are going when we will have more information, and you can always visit our current website at www.pole-mares.org/.

UK: Countryside Survey finds decline in pond quality

Results of the UK's Countryside Survey 2007 show that good quality, wildlife-rich ponds have gone from many parts of the countryside. The survey was commissioned by Defra and NERC, and carried out by the Centre for Ecology and Hydrology. The results show that only 8% of ponds are currently in good condition and that the biological quality of lowland ponds went down between 1996 and 2007.

Countryside Survey 2007 also found that the number of ponds in Britain has gone up by 11% since 1998. This begins to redress the historic loss of ponds that took place in the last century, but we don't know how many of these new ponds will provide the clean, unpolluted water that is essential for keeping ponds in good condition in the long term.

For more details of the Countryside Survey, see www.countrysidesurvey.org.uk and for a highlight of pond results, visit www.pondconservation.org.uk/News/pressreleases/tenyeardeclineincountrysidequality.htm

Climate link to amphibian decline

a major study shows that amphibians are in decline at Yellowstone National Park and suggests that climate-warming is responsible, read more from http://news.bbc.co.uk/1/hi/sci/tech/7693381.stm

SIL and ponds

Read 'Thoughts on Ponds' from Brian Moss, SIL President. John Downing's work on the importance of ponds as a global freshwater resource and for carbon storage was presented at the EPCN Valencia Conference in 2008:
www.limnology.org/news/circular2009.pdf

Announcements

Interested in garden ponds?

Keep up to date with the world's best (pond) blog on www.pondconservation.org.uk

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 2009. You can download a brochure from www.fba.org.uk/index/training.html

Conferences

The Island's Council of Menorca and the Government of the Balearic Islands are organizing an International conference on **Mediterranean temporary ponds**. The Conference will take place in Menorca from 6th to 8th of May, 2009. See www.cime.es/lifebasses/en/index.php

Keep your diary free for the next **EPCN Conference** on the conservation of ponds in May 2010. The conference will take place in Berlin - further information will shortly be available on the EPCN website: www.europeanponds.org.uk

Pond Manifesto

The English version of the Pond Manifesto and a summary in four languages can be downloaded from www.europeanponds.org. Please send it to your contacts in national or regional water and conservation agencies. German, French, Spanish and Italian versions are also being produced, and will be available to download from the EPCN website over the next few months.

Guidelines for submissions to the EPCN newsletter

- **Submissions can include news items or longer articles about, for example, an organisation, 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 pnicolet@pondconservation.org.uk.

Next deadline for submission: 24 April 2009