BDO2

PONDSCAPE

Towards a sustainable management of pond diversity at the landscape level

DURATION OF THE PROJECT
Phase 1: 15/12/2006 – 31/01/2009
Phase 2: 01/02/2009 – 31/01/2011

BUDGET
1.180.871 €

KEYWORDS
Ponds - regional biodiversity - sustainable management - stakeholder perception - biodiversity architecture

CONTEXT

Water is needed in all aspects of life (article 18.2 of Agenda 21). The biota of freshwater habitats constitute a large component of overall biodiversity: more than 8% of all described species for only 0.01% of total surface area. Recent research (Williams et al. 2004, Biggs et al. 2005) has pointed out that ponds, despite their small size, contribute significantly to the aquatic biodiversity at the regional scale. In comparison to lakes, rivers, streams and ditches, ponds were found to harbour relatively high local species richness (alpha diversity) when sampling is standardized for area. Furthermore, and even more importantly, ponds harbour a significant proportion of the total species richness of plants and macro-invertebrates that are present at larger spatial scales. Finally, up to 60% of all rare freshwater species in the UK are found in pools.

PROJECT DESCRIPTION

Objectives

PONDSCAPE will provide scientifically underpinned recommendations for a sustainable management approach (Göteborg strategy) that will reconcile desires to protect and increase biodiversity levels at various spatial scales (CBD, RAMSAR convention on wetlands, EU Water Framework Directive) with the need to sustain economic activities and ensure economic growth (Lisbon strategy with renewed impetus from the European Council meeting in Brussels 2005). Operational objectives are :

- To study the organization of pond biodiversity, including ecosystem functioning, in Belgium and Luxembourg at multiple spatial scales and relate it with important driving variables, with special reference to pond age
- To quantify the effects of management strategies on local and regional pond biota biodiversity and to broaden our knowledge on the prevalence of pollutants and the effects they have on pond biota
- To obtain insights into the way stakeholders value risks and benefits of ponds, and how the creation and maintenance of ponds can be promoted in a sustainable way.

Methodology

PONDSCAPE has divided the work over 7 work packages.

WORKPACKAGE 1: Biodiversity at multiple spatial scales: patterns and driving variables.
Our strategy to study the spatial organization and multiscale drivers of pond biodiversity will consist of three major components:
(1) (Re-) analysis of extant databases.
(2) A nation wide survey of pond biodiversity that is specifically designed to reveal the spatial scales at which most pond biodiversity is manifested.
(3) A case study on a model system with extremely high degree of connectivity in order to pinpoint important drivers of beta-diversity.

WP 2: Biodiversity and pond age
We will compare community composition of sets of ponds that vary in age. Such analyses will also allow to determine to what extent the staggered creation of new ponds in a regional setting may contribute to high regional diversity, and thus will allow the design of more efficient strategies for the creation and protection of ponds.

WP 3: Biodiversity and ecosystem functioning
We look for relationships at the phenomenological level, i.e. as they can be observed and quantified in the field. We will focus on qualitative and quantitative aspects of resource use and other functional attributes of the microbial communities to characterize the functioning of selected pond ecosystems.

WP 4: Assessment of management techniques
We will monitor the effects of several pond management actions in a large number of ponds. The data will be combined with the data obtained from WP1 and WP2 and computer simulations will be used in order to evaluate how local management techniques and the creation of new ponds can be applied to maximize biodiversity at the regional scale.

WP 5: Pond biodiversity, management and pollution
PONDSCAPE will extend the number of investigated pesticides during the MANSCAPE project and it will study the temporal dynamics of pesticides in relation to application schemes in the agricultural sector.

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	WP1	WP2	WP3	WP4	WP5	WP6	WP7
RBINSC	X	X			X	X	WPL
KULEUVEN	WPL	X		WPL	X		X
UGENT	X	WPL	X		X		X
FUNDP	X	X		X	WPL	WPL	X
LUX	X	X	WPL		X		X

WP 6: History of social and economic relevance of ponds to stakeholders
PONDSCAPE will first determine how ponds have gained or lost their objective value in a more or less recent history. Perceptions of stakeholders (farmers, nature conservation agencies, local authorities, local people) concerning several aspects of farm land ponds will be analysed through semi-directive interviews, probing the viewpoints of stakeholders about the socio-economic characteristics of ponds: costs versus revenues, importance in the farm economy and beyond, management practices and issues, the opportunity of financial compensations.

WP 7: Valuation of results, policy measures, management recommendations
The results of all of the previous work packages will fill into WP7. This WP will summarize al results and will translate them to an output, which will meet PONDSCAPES' strategic objectives.

INTERACTION BETWEEN PARTNERS

WPL = workpackage Leader, X = involved in the activities of that workpackage

EXPECTED RESULTS AND DELIVERABLES

Various deliverables have been identified. The sampling protocol developed by Manscape will be updated for the present project. Databases with measurements on abiotic variables, biodiversity measurements, stakeholder interviews etc will be drafted and be made available to the BBPF. Results of analyses will be published in primary scientific literature, but will also be disseminated through popular press, general PONDSCAPE meetings and through the Follow Up Committee.

PARTNERS - ACTIVITIES

The Royal Belgian Institute of Natural Sciences, Freshwater Biology, coordinates PONDSCAPE and previously also coordinated the MANSCAPE project. The RBINSc also deals with analyses of the benthic part of the animal biodiversity in the pools. The Catholic University of Leuven, Zoology department has a large and long-standing expertise in ecology of zooplankton (mainly Cladocera) of ponds and pools. Both RBINSc and KUL organise the major part of the sampling effort in Belgium and Luxembourg. University of Ghent analyses the phytoplankton and the Bacterial part of the pool-biodiversity. The microbial loop is investigated together with the University of Luxembourg. The University of Namur (FUNDP) has a dual function in PONDSCAPE: this partner deals with both the eco-toxicological and the socio-economic questions of the project. Natuurpunt vzw, Instituut voor Natuur- en Bosonderzoek, University of Liege and The National Botanical garden are associated partners.

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Follow-up Committee

For the complete and most up-to-date composition of the Follow-up Committee, please consult our Federal Research Actions Database (FEDRA) by visiting http://www.belspo.be/fedra or http://www.belspo.be/ssd

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