Ponderful
PONDS FOR CLIMATE

BELGIUM

PONDSCAPE : TOMMELEN

Pond Ecosystems for Resilient Future Landscapes in a Changing Climate

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WHAT IS A PONDSCAPE ?

DEFINITION

A pondscape is a network of ponds with spatial proximity (“connectedness”) and the surrounding landscape matrix.

The boundaries of a pondscape may be determined by physical or ecological settings (a valley, a catchment, a set of ponds in a nature reserve) or even determined by societal or political criteria (urban ponds, provincial or national boundaries).

PRESSURE/THREATS ON PONDS AND PONDSCAPES

50-90% of pond have been lost from European countries over the past century. Ponds are largely neglected in water- and nature-related national and EU policies and strategies, including the EU-WFD.

WHY IS IT IMPORTANT TO PROMOTE THEM ?

BIODIVERSITY ENHANCEMENT

Largely neglected and generally undervalued, ponds are remarkably important for biodiversity conservation. Pondscapes represent biodiversity hotspots.

DISASTER RISK REDUCTION

Ponds and pondscape play a fundamental role in mitigating flooding and also constitute a water reserve to fight fires.

HUMAN HEALTH

Ponds and pondscapes provide a wide range of co-benefits for human societies such as support for human health and quality of life, spaces for physical activities, or social interaction, but also aesthetic experiences and educational and recreational activities.

CLIMATE CHANGE MITIGATION AND ADAPTATION

Given their abundance and their high productivity, ponds influence markedly the carbon cycle by acting as both carbon sinks and sources.

WATER MANAGEMENT

Pondscapes provide a water reserve that is particularly important in the context of water scarcity. It is particularly useful for watering animals and for irrigation.

CONTEXT

The bombcrater pondscape has been created unintentionally in 1944 during World War II and was designated as a nature reserve in 2006. It is currently owned by the municipality of Hasselt and has been managed by the nature conservation NGO 'Natuurpunt' since 1996.

Name of the pondscape : Tommelen
Name of neighboring large town (in a 30 km radius):
Hasselt (80'000 habitants)
Bioclimatic zone : Atlantic

Dominant land use :
Pondscape - extensive grazing land with some forest patches
Surrounding environment - urban

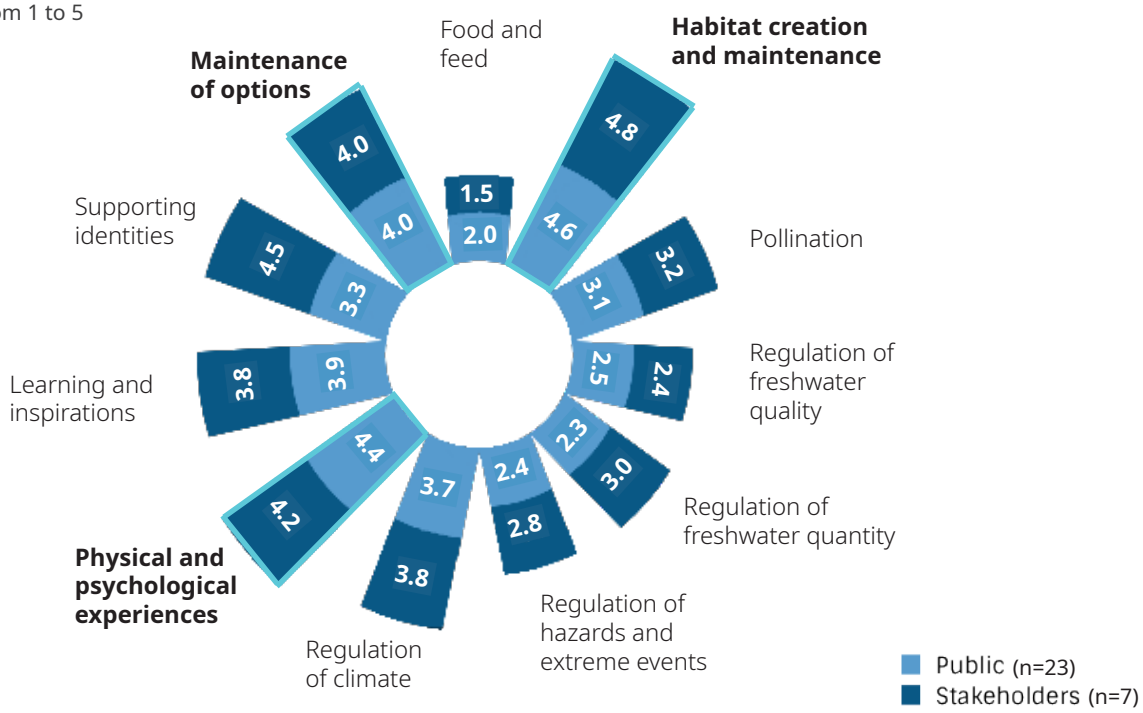
Pondscape area : 0.18 km^2
Pond : number: 144
density: 800/km^2
surface areas : 1 to 150 m^2
depths : 10 to 85 cm
ages : 5 to 70 years

Land owner : Municipality Hasselt
Land manager : Natuurpunt (NGO)
Public access : ~5% of the area is accessible (95% of the nature reserve)
Public amenities : several foot paths, picnic spots, information panels and an observation tower

LOCAL COMMUNITY EXPECTATIONS

The 11 Nature's contribution to people (NCPs)

Scale : scores from 1 to 5



The expectations rely mainly on (i) the provision of habitats for biodiversity and (ii) the direct use of these natural areas by people (physical and psychological experiences).

LOCAL POLICIES

The pondscape is owned by the municipality Hasselt and was leased as pasture to farmers until 1995. From 1996 onwards, it was managed by a nature conservation NGO (now 'Natuurpunt'). Tommelen has officially been designated as nature reserve in 2006 because of its high ecological and historical value.

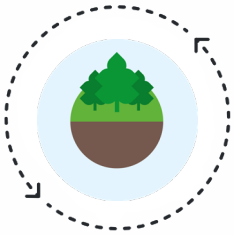
The management is financed by subsidies from the Flemish government (after agreement on management proposal). Budget for habitat restoration and creation comes from additional projects. Natuurpunt provides additional funding from their own overall budget if needed. The day-to-day management is done by a local team of volunteers. Current management involves maintenance of existing ponds by periodic dredging, cutting back trees, and mowing of bank vegetation. Biodiversity is regularly monitored.

-The bombcrater pondscape has been created unintentionally in 1944 during World War II.

-Large populations of seven species of amphibians are present.

-Currently it is a unique nature reserve in a highly urbanised setting.

MAIN CHALLENGES AND OBJECTIVES



BIODIVERSITY ENHANCEMENT

Especially amphibians (most notably Crested newt, more recently also Tree frog).

HUMAN HEALTH

A place for recreation close to the city that can be used for short walks, picnics, and nature observation.

NATURE BASED SOLUTIONS (NBS)

New pond creation and their management are here the Nature-based Solutions put in practice to address the two identified societal challenges.

NEW POND CREATION

2019

Creation of one new pond.

PONDS AND PONDSCAPE MANAGEMENT

- Protection status as nature reserve.
- Pond restoration.
- Maintenance of forest clearings.
- Removal of alien plant species (specifically, *Crassula helmsii*).
- Filling of two ponds with large population of *Crassula helmsii.*
- Mowing of pond edges.
- Dredging of terrestrialised ponds (in 2009-2010, in 2021-2022).
- Restrict access of cattle to a subset of ponds by fencing .
- Maintenance and creation of overwintering habitat for amphibians (such as *Rana esculenta synklepton, Rana temporaria, Bufo bufo, Triturus alpestris, Triturus cristatus,Triturus vulgaris and Hyla arborea).*
- The creation of additional new ponds (n=3) is planned in 2024.

- Maintenance of walking paths.
- Creation of observation tower.
- Installation of picnic spots.
- Creation and maintenance of information sheets.

- Installation of sluice on drainage ditch.

NATURE CONTRIBUTIONS TO PEOPLE AND MEASURED INDICATORS

AQUATIC BIODIVERSITY

SPECIES RICHNESS
Aquatic plants : **49**
Dragonflies : **2**
Families of invertebrates : **13**
Amphibians : **7**
(*Rana esculenta synklepton, Rana temporaria, Bufo bufo, Triturus alpestris, Triturus cristatus,Triturus vulgaris and since 2021 also Hyla arborea)*

AMOUNT OF
Conservation priority species (N) : **2**
Species on Habitat Directive Annexes (N)**: 2***
Triturus cristatus, Hyla arborea (Amphibians)
Invasive alien species (N): **2** *(Crassula helmsii, Ludwigia grandiflora)*

FLAGSHIP SPECIES :

Triturus cristatus

NATURE CONTRIBUTIONS TO PEOPLE AND MEASURED INDICATORS

PHYSICAL AND PSYCHOLOGICAL EXPERIENCE

Number of people visiting the pondscape for walking and nature observation (nb/year) **7'300**

5% Area inside the pondscape accessible to the public

Self-reported satisfaction and well-being (scale 1 to 5) **3.8**

Most popular activities :
hiking (52%), idleness (11%), biking (9%), wild-life observation (9%)

LEARNING AND INSPIRATION

10 Number of groups of students and schools/universities visiting the ponds-cape. (The visits are only partly linked to ponds)

Number of studies for acquisition of knowledge on biodiversity and pond ecology (nb/year). Studies from NGO (Natuurpunt) and universities (VUB and KU Leuven) **3**

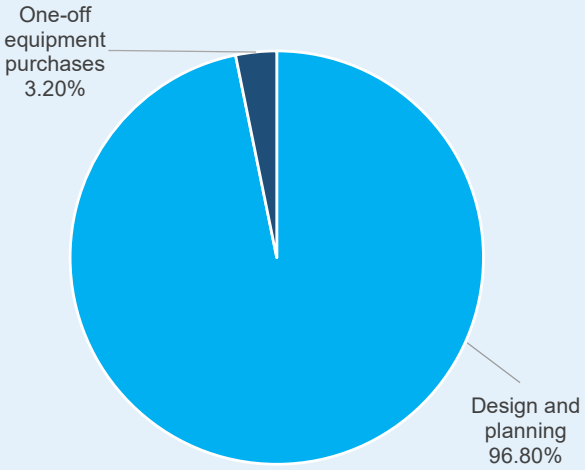
WATER QUANTITY

1 Creation of sluice on drainage ditch to slow drainage and keep more water in the ponds-cape

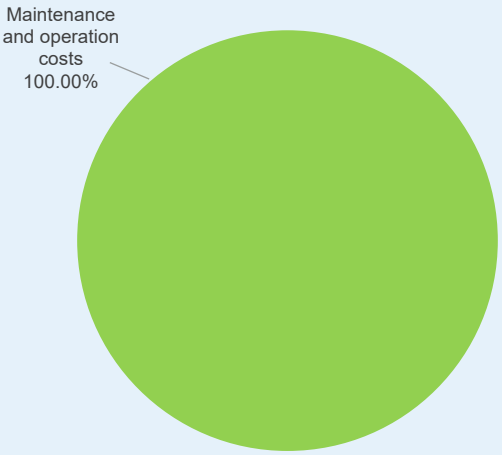
COSTS AND BENEFITS ANALYSIS

OVERALL COSTS ASSESSMENT

SHARE OF COSTS FOR NBS ACTION

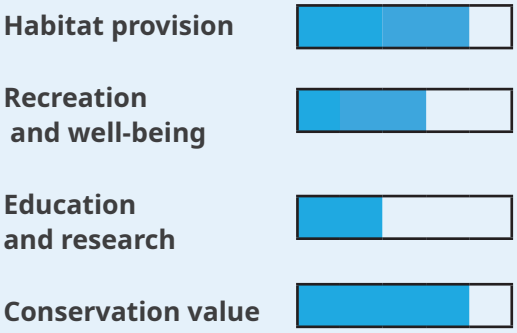


Relative cost of NbS creation measures



Relative cost of ongoing NbS management measures

BENEFITS ASSESSMENT



SUITABLE FINANCE INSTRUMENTS TO REDUCE THE GAP

- ☑ **1. Voluntary contributions /donations**
- ☑ **2. Subsidies**
- ☑ **3. Grants**

REMAINING THREATS

1. The impact of people on biodiversity, including waste dumping and entering closed areas.

2. Accelerated decline of water levels and lower availability of water due to impact of climate change. An increasing number of ponds have shifted from being permanent to temporal.

3. It is a challenge for Natuurpunt to balance conservation and recreation in the pondscape.

SUCCESS STORY AND TRANSFERABILITY

DESIGNATION AS A NATURE RESERVE IN 2006

The designation of the pondscape as 'nature reserve' (approximately 80% of the area currently under protection status) has been a first major step in the effective protection of the pondscape. This also resulted in the creation of a management plan that targets biodiversity conservation and provides access to essential financial funding to maintain the region. While the land is owned by the city of Hasselt, the management is conducted by the NGO Natuurpunt, which largely relies on a team of local volunteers that maintain the pondscape. Part of the area is fenced from the public to reduce disturbance by visiting people. The designation has also resulted in the creation of walking paths to enhance the satisfaction of close by living people. Tommelen is now an important 'green space' in close proximity of the city and is frequented by people for recreation and nature observation.

LONG TERM CONSERVATION OF GREAT CRESTED NEWT AND THE RECENT RE-COLONISATION OF THE PONDSCAPE BY TREE-FROG HYLA ARBOREA

Tommelen is highly recognized for successfully hosting a relatively large population of Crested newt for several decades already. More recently (2021), the pondsape has been recolonized by *Hyla arborea*. Tommelen hosted a small local population of Tree frog (*Hyla arborea*) until 1980. Afterwards, the species has not been observed anymore, despite suitable habitat being available. The lack of protection in earlier times likely resulted in local extinction, while re-colonization was likely strongly hampered by the isolated nature of the pondscape being located in an urban setting and surrounded by heavily used car roads and a railway. In 2022, a few individuals have suddenly been heard; and in 2023; the population seems to have increased massively.

The sudden recolonization of Tommelen by Tree frog might be driven by the overall increase in occurrences and overall population density of Tree frog in the region (province Limburg), and might have been facilitated by the rather wet spring in 2022, in which several small ditches could have acted as dispersal pathways. The aim for the future is to maintain amphibian species diversity in the pondscape through expending ongoing management interventions such as periodic pond dredging and cutting back bank vegetation. Moreover, targeted actions will be led to create suitable overwintering habitats in the pondscape, and to promote the connectivity of the pondscape with other waterbodies.

HANDBOOK :

APPENDIX :

PHOTOS CREDITS

Triturus cristatus, cover, p.5 © Pieter Jan Alles
Hyla arborea, p.8 © Wim Dirckx
Tommelen, cover, p.2, p.3, p.6, p.8, back cover © Filip De Clercq

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