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Excursion Map
Damvallei
Excursion Damvallei Nature Reserve

(Destelbergen and Laarne, Oost-Vlaanderen)

10 September, 2008
Location of excursions

Detail Damvallei
DAMVALLEI NATURE RESERVE (DESTELBERGEN AND LAARNE, O. VI.)

1. Short description of the area

1.1. name, municipality

Destelbergen & Laarne (prov. Oost-Vlaanderen)

1.2. biogeographical region

Ecoregio of the Pleistocene river valleys

1.3. management authority

Natuurpunt (since 1994)

1.4. protection status

Natura 2000 (protected under the Habitat directive), integral nature zone on physical, planning map and designated in the Flemish Ecological Network, acknowledged private nature reserve (90 ha private nature reserve managed by Natuurpunt); supported by LIFE-funding, the Flemish Government, the province Oost-Vlaanderen and the municipalities Destelbergen and Laarne.

1.5. ecological characteristics

soil type

Different gradients from wet to drier soil types do occur in Damvallei; clay, loam and sand are all present in the area.

ecological key processes

Natural habitats in the valley are fed by base-rich seepage water. Differences in height, nutrient content of the soil and soil type give rise to a profound diversification within these habitats.

historical information

Peat digging in a terrestrialised fossil meander of the river Schelde around the end of the 18th century created about 45 rather small sized ponds, hosting important Hydrocharition and Magnopotamion vegetations. Surrounding valley grounds were mainly covered with vast areas of wet grasslands. In the lowest parts of the valley, different ditches were made. Only a very small part of the valley was covered by woodland.
This situation held on from Middle ages until around 1960. Then, in a very short time, land use and landscape changed by abandoning or intensified use of grasslands, implant of poplar plantations, intensive use of almost every pond for angling activities, dumping of material, introduction of non-native bird and plant species.

**important nature values**

About 45 peat ponds (surface ±15ha), that were dug out around the middle ages, have undoubtedly the highest intrinsic ecological value. Until about thirty years the majority of the ponds it had been characterised by vast fields of *Stratiotes aloides*.

About 10 species of *Potamogeton* and numerous other water plants were responsible that these ponds could be considered as a type example of vegetation rich ponds.

Unless deterioration, nowadays some ponds are still richly for both botanical as faunal reasons, with *Hydrocharis morsus-ranae*, *Potamogeton lucens*, *Rhodeus sericeus* and about 29 species of dragonflies (so that it is a very hot-spot for dragonflies in Flanders).

Two ditches, Damsloot and Mostbeek, with their many branches, are important especially for the populations of *Cobitis taenia* and *Rhodeus sericeus*. On certain parts water quality is still very good. Here we can find dominant *Characeae*, *Potamogeton*-vegetations and *Hottonia palustris*.

Near the banks of ditches and ponds, tall sedge and Phragmites vegetation and species like *Acorus calamus*, *Sparganium emersum* are present.

On some locations, transition mires with *Ranunculus lingula*, *Menyanthes trifoliata* and *Sphagnum squarrosum*, *S. palustre* and *S. fimbriatum* can still be find.

On the extremely wet, regular overflowed parts of the area Magnocaricion communities are present including species like *Pedicularis palustris*, *Carex vesicaria*, *Cyperus fuscus*, *Stellaria palustris*, *Veronica scutellata*.

On higher, ground-water influenced areas, we find Calthion vegetation with *Senecio aquaticus*, *Bromus racemosus*, *Carex disticha* and *Thalictrum flavum*. Gradients to Eu-Molinion vegetation on the poorer places can be recognized on species like *Molinia caerulea*, *Valeriana dioica*, *Succisa pratensis*, *Galium uliginosum*, *Juncus acutiflorus* and *J. conglomeratus*, *Achillea ptarmica*, *Carex oederi* and *Carex panicea*.

On the highest and more or less dry land, Arrhenatherion grassland was up to about fifty year known by the largest population of *Orchis morio* of Flanders. Although *Orchis morio* disappeared, still a variety of regionally rare species can be found, such as *Carex caryophyllea*, *Carex pallescens*, *Carex vulpina* and *Carex flacca*. At the poorest places we find gradients to Nardetalia with incl. *Dactylorhiza maculata*, *Luzula multiflorum*, *Viola canina*, *Polygalà vulgaris*, *Succisa pratensis*, *Danthonia decumbens*, *Potentilla erecta* and *P. anglica*, *Molinia caerulea* tje), *Cuscuta epithymum* and already earlier mentioned *Carex* types.

Both Nardetalia and Eu-Molinion are of a particular type. Due to the alluvial past the soil is rich to minerals. This let to the presentation of species of mineral rich milieux as *Carex caryophyllea*, *Cyperus fuscus*, *Orchis morio* in a vegetation which is generally mineral arm.

Concerning nearly the whole gradient we can retrieve finally all kinds of bunch types among which some very nicely developed *Alnion glutinosa-incanae*.
Under the breeding birds most especially the population *Alcedo attthis* is mentioned. Up to the sixties of past century also *Acrocephalus shoenobaenus* was commonly.

**important ecological constraints**

During the last decennia the ecological value of mesotrophic aquatic communities strongly deteriorated due their exploitation as fish ponds with high densities of planktivorous and benthivorous fish. Since the late sixties of past century poplar plantations and abandonment (on wet soils) or intensification (on dry soil) of agriculture practice were responsible for the deterioration and disappearance of species-rich alluvial and groundwater fed grassland types throughout the valley. After restoration, the large number of *Branta Canadensis* is a treat for sustainable results and needs a persistent management plan to remove the whole population. The Flemish government should take a coordinating and implementing role in collaboration with necessary partners. The area of Damvallei has very high natural concentrations of most nutrients, especially phosphate. However, overall nutrient availability by the phosphate fraction that is not complexed with iron molecules. Nutrient leaching from agricultural neighbouring areas lowers the iron availability and may as such result in eutrophication.

1.6. **ecological objectives for the area** (see also numbers on map with management codes)

Restoration of mesotrophic aquatic communities, with special focus on Hydrocharition, Magnopotamion and Characeae vegetations and expansion of suitable habitat for fish species like *Cobitis taenia* and *Rhodeus sericeus*. Restoration of structure rich alder forest, transition mire and a greater area of Arrhenatherion, Eu-molinion and Nardetalia grasslands.
2. Map with excursion programme
3. Management/restoration objectives and techniques

**Location 1**

Starting point and restoration measures
Peat digging in the terrestrialised meander of the Schelde around the end of the 18th century created about 45 ponds, hosting important Hydrocharition and Magnopotamion vegetations. During the last decennia their ecological value strongly deteriorated due their exploitation as fish ponds with high densities of planktivorous and benthivorous fish. After a physicochemical study restoration measures were taken, including removal of these adverse fish populations, introduction of pike, removal of woody bank vegetation and re-introduction of native populations of the “flagship” species *Stratiotes aloides*.

Period
2003-2008

Supporting authorities:
EU (Life) / province of East-Flanders / municipalities of Destelbergen and Laarne / Flemish Government

Objectives
Restoration of mesotrophic aquatic communities, with special focus on Hydrocharition, Magnopotamion and Characeae vegetations and expansion of suitable habitat for fish species like *Cobitis taenia* and *Rhodeus sericeus*

Management measures
None, unless monitoring results suggest otherwise

Evaluation
The reduction of benthic- and planktivorous fish populations resulted in a steady increase in water transparency, followed by an abundant presence of macrophytes (*Potamogeton crispus, Ceratophyllum demersum*) in the ponds. For some ponds, formerly extinct plant species reappeared (e.g. *Potamogeton natans, Sparganium emersum*). Within a period of five years population densities of the formerly dominant fish species *Rutilus rutilus, Abramis bramis* and *Cyprinus carpio* remained low, while densities of *Esox lucius* strongly increased.

Re-introduction of *Stratiotes aloides* appears to be very successful but only when reintroduced in specific cages, which indicates the predicted suitable water quality for this species. The less successful reintroduction of non-caged plants points to the presence of mechanic disturbance, likely bird predation by *Fulica atra* or the exotic species *Branta canadensis*. The latter is present in large number and has a very negative impact on the restoration of aquatic and other Natura 2000 habitats, especially the expansion of several target species.

The area is a regional hot spot for dragonflies. After restoration the abundance of some threatened species increased considerably (e.g. *Coenagrion pulchellum, Erythromma najas, Cordulia aenea*). Previously extinct and threatened species such as *Aeshna isosceles* and *Brachytron pratense* are occasionally observed. Whether they have already established a breeding population remains unsure however.
Abiotic conditions
An extensive physicochemical study was carried out to investigate whether the abiotic conditions allow successful pond restoration and to test the effects of changing water quality. Sediment, sediment pore water, surface water as well as ground water was sampled and all relevant chemical parameters were determined. Results of this study demonstrated that the area has very high natural concentrations of most nutrients, especially phosphate. However, overall nutrient availability is only determined by the phosphate fraction that is not complexed with iron molecules. Nutrient leaching from agricultural neighbouring areas lowers the iron availability and may as such result in eutrophication.

Public support
Communication towards several stakeholders is an important part of the restoration project (information activities to local government, guided visits, etc.). This was especially important for the replacement of local angling clubs to artificial ponds.

Location 2

Starting point and restoration measures
Poplar plantations and abandonment or intensification of agriculture practice were responsible for the deterioration and disappearance of species-rich alluvial and groundwater fed grassland types throughout the valley. Until around 1950 these grasslands were well known for their large numbers of rare species such as Orchis morio, Silaum silaus, Briza media, Succisa pratensis and Dactylorhiza majalis. Restoration measures included:
- Removal of c.15 ha of poplar stands;
- Restoration of c.15 ha old abandoned grassland and transition mire by tree and scrub removal;
- Removal of waste material and nutrient enriched top layer of the soil on c. 1 ha;
- Restoration of the original hydrology by dredging c. 500 m of silted ditches.

Period
2003-2008

Supporting authorities:
EU (Life) / province of East-Flanders / municipalities of Destelbergen and Laarne / Flemish Government

Objectives
Restoration of structure rich alder forest, transition mire and Arrhenatherion, Eu-molinion and Nardetalia grasslands.

Management measures
Mowing once or twice each year
Evaluation
Although the restoration project is not finished yet, the first results of restoration measures indicate a successful recovery of the originally present habitats and many of the target species:

- *Menyanthes trifoliata*: strong increase of the relic population;
- *Pedicularis palustris*: after an exponential increase, several populations disappeared (now only a few left);
- *Dactylorhiza majalis* and *Dactylorhiza maculata/D. fuchsia*: both species colonised new places;
- *Potamogeton natans, Hydrocharis morsus-ranae, Myriophyllum spicatum, Groenlandia densa*: after dredging ditches these species colonised the new open water habitats; the last record of *Groenlandia densa* dates from the beginning of the 20th century;
- *Potentilla anglica/erecta*: locally disappeared, but also increase of the population on other places;
- *Ranunculus lingua* and *Valeriana dioica*: very strong population increase of both species;
- *Silalum silaus*: local, small population status-quo;
- *Rhinanthus angustifolius*: exponential expansion throughout the whole project area;
- *Senecio aquaticus*: small variations yearly;
- Reappearance of many rare and threatened species from the seed bank: e.g. *Carex caryophyllea, Carex demissa, Carex flacca, Carex panicea, Carex vulpina, Polygala vulgaris, Cuscuta epithymum, Luzula multiflora, Potentilla erecta, Viola canina*.

Public support
Successful collaboration with local farmers could be achieved for sustainable grassland management in the driest parts of the area.

Tom De Beelde, Frederik Hendrickx, Dirk Bogaert
Natuurpunt