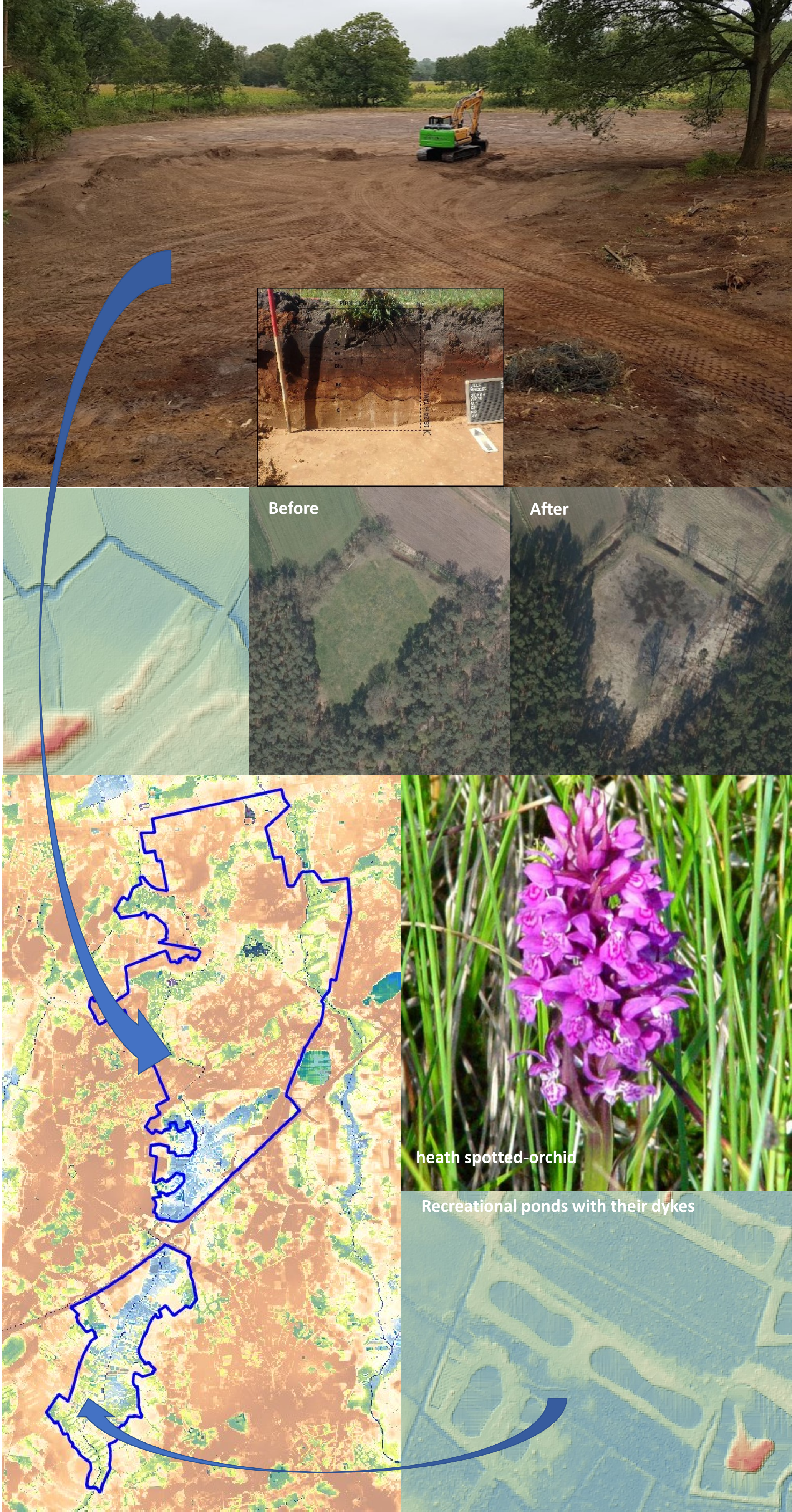


Restoring natural depressions for climate adaptation

Results of changes implemented to the 'Visbeekvallei' site by Natuurpunt



The water system map, applied to the demonstration site. The infiltration zones are red, seepage zones are blue and temporal wet areas are yellow-green.

UNDERSTANDING THE CATCHMENT

The Visbeekvallei is located in the Campines, an area dominated by Tertiary and Quaternary cover sands that are intersected by brook valleys and rifts, leading to a variety of hydrological conditions. This diversity is enforced by iron and (locally) chalk rich sands that charge the groundwater with these minerals.

The majority of the land functions as infiltration area but at the lowest parts regional groundwater comes to the surface year-round. Between these two extremes there are temporal wet areas where delayed infiltration takes place. These areas are fed by local surface water and groundwater during wet periods and are very important for infiltration. The duration and intensity of the wet periods on these soils depends on the available water quantity, the height gradient and the water permeability of the soil. This heterogenic and changing landscape results in a very unique nature area with rare plants and animals like orchids and adders.

Despite the value for nature and water infiltration the area is threatened by drainage from streams and ditches. The drainage structures were dug in the 18th, 19th and early 20th century. After the Second World War the wettest parts of the valley with seepage were abandoned by agriculture leading to rewetting because the ditches were not managed anymore. On the other hand drainage increased in the temporal wet areas with delayed infiltration due to intensification of agriculture. Finally recreational ponds were dug in the '1960, '1970 and '1980 with additional drainage as result.

PRIORITISING LOCATIONS FOR CLIMATE ADAPTATION MEASURES

The restoration of historical depressions (temporal wet areas) in the landscape by Natuurpunt is an Ecosystem-based Adaptation measure and part of the Interreg 2 Seas project PROWATER. Ecosystem-based Adaptation (EbA), a Nature-based approach to climate change adaptation, harnesses ecosystem services to increase resilience and reduce the vulnerability of human communities and natural systems to the effects of climate change. These EbA measures can be integrated into adapted agriculture, forestry and environmental management.

In the temporal wet areas with delayed infiltration, historical depressions were restored by removing the nutrient-rich topsoil. These historical depressions were identified by detailed soil drillings and cross-sections of the soil (cf. figure of soil profile). At one location the Scottish pines on an adjacent inland dune were cut to increase the infiltration capacity to the restored depressions. In the depression species-rich grasslands orchids will develop whilst the dunes will be covered by heath after 5 years.

On three other locations in the south dykes cut the contact between recreational ponds and the surroundings. The dykes were created with the soil that came out of the ponds. To restore the contact and decrease the drainage effect on the groundwater, the dykes were removed and the soil was used to shallow the ponds. On two of the three locations the vegetation can now spontaneously develop to alder carrs. The third location will be mowed yearly and develop to species-rich grassland.

MONITORING & EVALUATION

The works were carried out in the summer and autumn of 2021. Since then, surface water accumulates in lower parts because groundwater levels are high in winter and early spring.

Despite these successes, external measures can still threaten the restored sites. Parts of the infiltration areas are drained by intensive agriculture leading to decreased infiltration in winter and drought stress for the crops in summer. Where land use other than nature-like recreation and agriculture borders streams like the Visbeek (e.g. residential or industrial land use), rewetting to this extent is not possible.

More Ecosystem-based Adaptation measures, such as this restoration of historically wet depressions, would further stabilise groundwater levels, making it more feasible to keep enough water for nature and the ecosystem services this natural environment provides, as well as allowing extraction for human usage.

FOR MORE INFORMATION: • www.pro-water.eu/output-library
• <https://www.pro-water.eu/visbeekvallei-be>

A cross-border cooperation

From November 2017 to March 2023, 10 partners from Flanders, the Netherlands and the United Kingdom work together on PROWATER. The project has a budget of more than 5.5 million euros. In each country, water production companies, governments and research institutes as well as land managers are involved in order to achieve a supported vision for Ecosystem-based Adaptation (EbA).

The project PROWATER receives 3.315.974 € through the Interreg 2 Seas fund, co-funded by the European Regional Development Fund (ERDF), to work on climate change adaptation and to increase resilience against droughts and extreme precipitation based on ecosystem services.

