

Restoring bog wetlands & heathlands for climate adaptation

Results of changes implemented to the 'Den Rooy' site by Natuurpunt



UNDERSTANDING THE CATCHMENT

Peat bog can only occur under permanent wet conditions and a water level that does not fluctuate more than 30 cm on an annual basis. This used to be the case in De Rooy, situated in the larger Mark catchment at the Belgian border. The peat bog lies in a depression at the basis of a drifting sand dune complex where the difference in height causes groundwater seepage to the bog. In the past, the depression could hardly drain because it was squeezed between higher grounds. Under these permanently wet and anaerobic conditions, plant material breaks down very slowly and forms layers of peat.

From the Middle Ages onwards, peat was cultivated in the Campine region, including Hoogstraten (e.g. 13th century in Kalmthout). Peat was used as an alternative fuel to firewood, because all but a few domains had been cut down. This was accompanied by the construction of drainage ditches to make the area mineable and cultivable. In the case of Den Rooy, a ditch was dug through the peat bog relict and into the stream "Heerlese loop", whereby the water-retaining organic layer on the bottom was cut through. With the construction of the ditch, the vertical and horizontal resistance to water flow disappeared, causing the area to dry out.

PRIORITISING LOCATIONS FOR CLIMATE ADAPTATION MEASURES

The restoration of this bog relict and valuable wetland 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 infiltration area, several ditches were filled in so that the rainwater is no longer excessively drained from the area and the higher grounds can recharge with water during rain periods. As a result, more water is retained in the infiltration area and the potential difference between the high grounds and the depression is greater, which increases the seepage pressure in the bog.

In the depression, the central ditch was filled with the water-retaining materials bentonite (or swelling clay). Finally, part of the pine wood plantation in the infiltration area was restored to heathland and deciduous forest edges in a corridor connecting two heathland areas, to increase the local groundwater supply and increase connectivity.

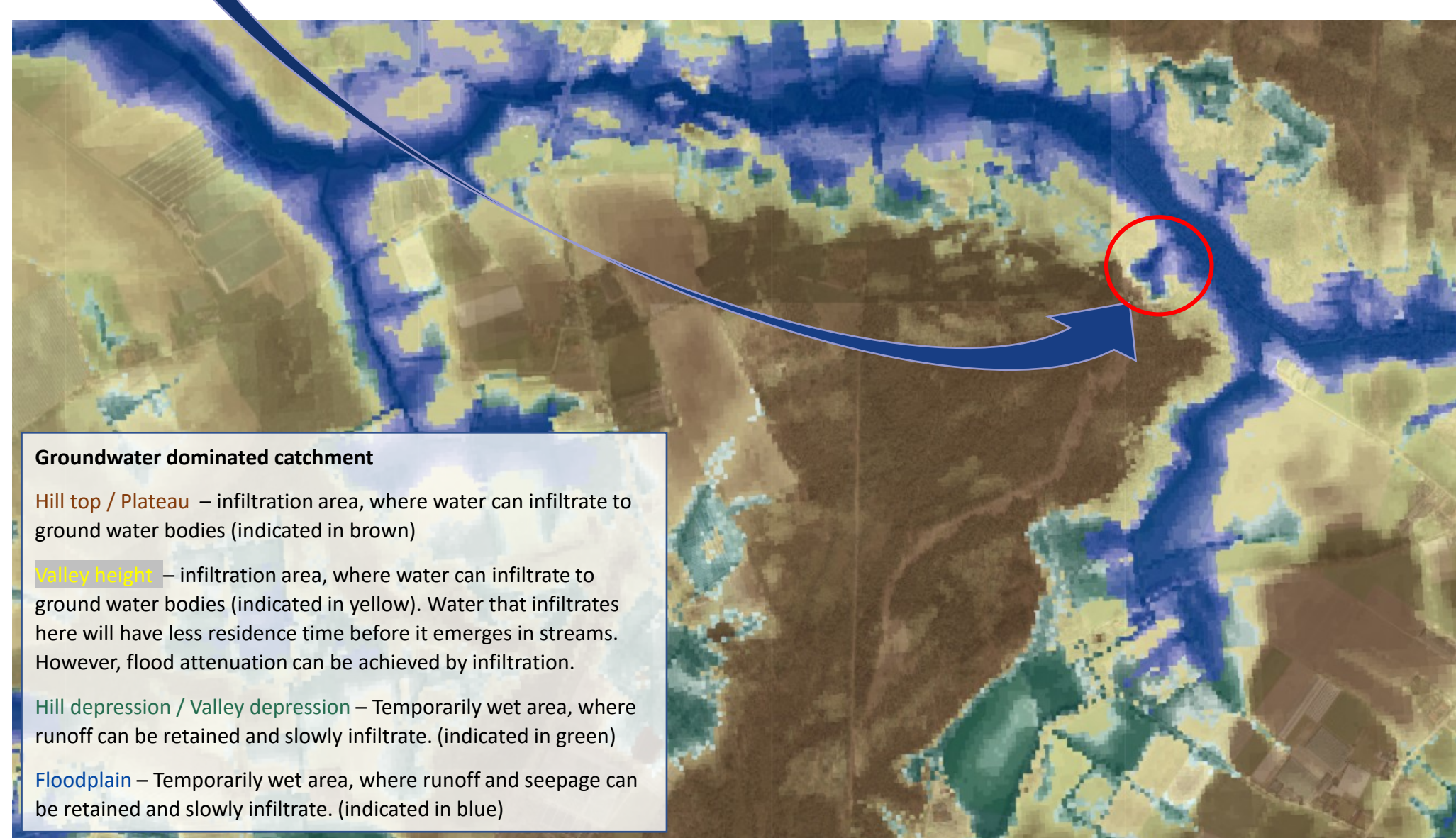
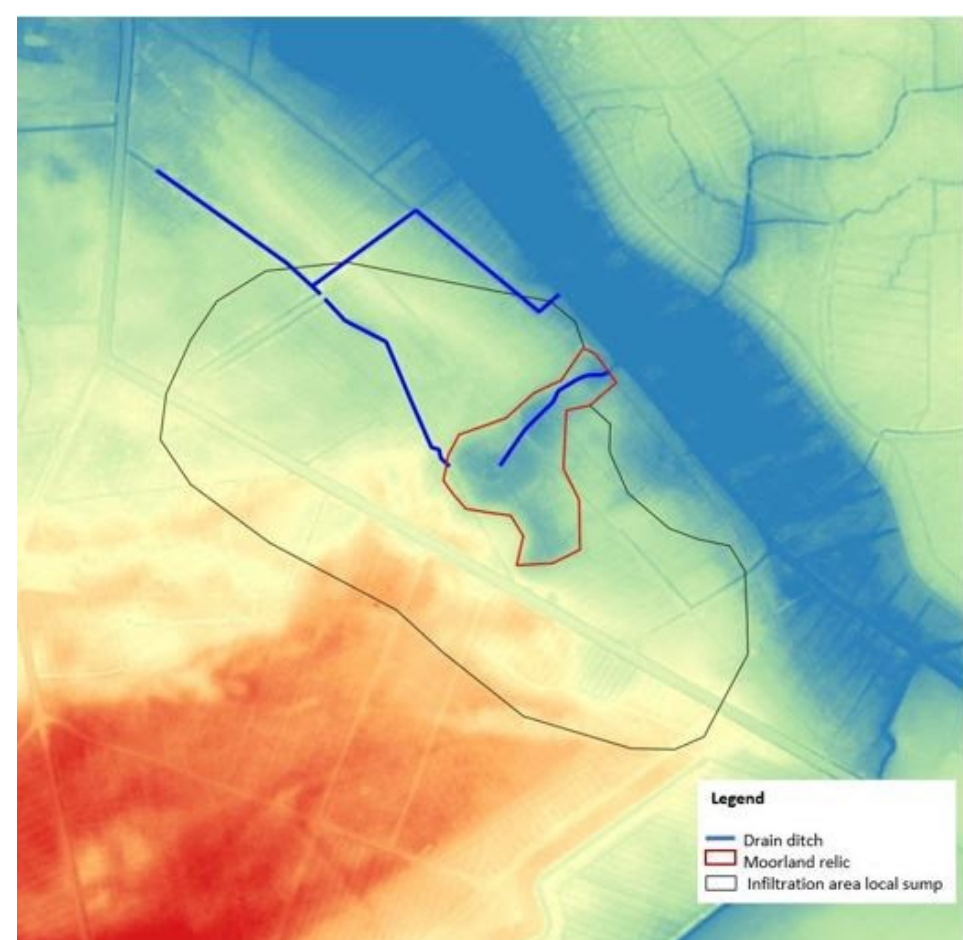
MONITORING & EVALUATION

The works were carried out in the summer and autumn of 2020. Since then, the water level has increased significantly and fluctuations were smaller in 2021. This may also be due to the wet summer of 2021. However, nature's reaction spoke volumes. After an inventory in October 2021, no less than 7 species of peat moss were observed! Including the rare papillose peatmoss (*Sphagnum papillosum*). The large quantities of peat moss that cover large areas under water after just one year gives cause for hope.

Despite these successes, external measure can still threaten the restored bog at Den Rooy. To the northeast of the restored bog flows the stream "Heerlese loop", which is cleared of vegetation annually and lies very deep in the landscape. As a result, large quantities of groundwater are drained. This is detrimental to the restored bog, the bordering alluvial forest and wet grasslands. Moreover, the excessive draining is detrimental to the groundwater levels and thus water resources for both nature and human usage. There are different measures to solve this, including compartmenting the ditch system allowing delayed infiltration in the ditches, and making excessively draining streams and ditches broader and more shallow.

More Ecosystem-based Adaptation measures, such as this bog & heathland restoration, in the Mark catchment would further stabilise groundwater levels, making it more feasible to keep enough water for nature and the ecosystem services it provides as well as allowing extraction for human usage.

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



The water system map, applied to the demonstration site. The restored bog is situated in the blue zone. The restored deciduous forest edge and heathland are situated in the adjacent brown and yellow zones.

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.

