

Most visitors to the Mooi Binnenveld follow the marked footpath to the iconic 7,000-year old bog oaks, often with a diversion along the walkway to spot some birds and plants. As it happens, this is the most species-rich vegetation to be found in the ‘new-nature’ areas – although of course not yet on a par with the Bennekomse Meent.

In July 2021, we had the privilege to spend several days walking the length and breadth of this area to conduct a vegetation survey. This is an essential element of the monitoring that needs to be done to fulfil the terms of the grant from the province. The method employed involves recording a list of selected indicator species in each 50 m by 50 m square which are typical of a specific vegetation type.

After the topsoil removal and landscaping that was done it can take years for the desired vegetation to develop. To speed up the process, mowings of fresh hay were imported from nearby nature reserves and spread across the parcels. In this particular parcel, mowings of fresh hay were brought from different sources – to the east of the walkway hay from ‘de Hel’ and ‘de Blauwe Hel’ and to the west of the walkway from the ‘Bennekomse Meent’. In addition, seed of a few selected species were imported from the Groene Grens, notably Marsh lousewort (*Pedicularis palustris*) was sown to the East and Marsh gentian (*Gentiana pneumonanthe*) to the West of the walkway. This management was clearly a success! As can be seen in the table below, the distribution of some species is clearly determined by the origin of the mowings.

	West of the walkway	East of the walkway
	<i>Mowings: Bennekomse Meent</i>	<i>Mowings: (Blauwe) Hel</i>
Sneezewort (<i>Achillea ptarmica</i>)	Frequent	Rare
Kingcup (<i>Caltha palustris</i> ssp. <i>palustris</i>)	Absent	Frequent
Star sedge (<i>Carex echinata</i>)	Absent	Occasional
Greater tussock sedge (<i>Carex paniculata</i> ssp. <i>paniculata</i>)	Absent	Occasional
Brown knapweed (<i>Centaurea jacea</i>)	Abundant	Rare
Marsh cinquefoil (<i>Comarum palustre</i>)	Rare	Absent
Crested dog’s tail (<i>Cynosaurus cristatus</i>)	Absent	Occasional
Rigid eyebright (<i>Euphrasia stricta</i> s.l.)	Occasional	Absent
Marsh gentian (<i>Gentiana pneumonanthe</i>)	Frequent	Absent
Marsh pennywort (<i>Hydrocotyle vulgaris</i>)	Absent	Occasional
Fen ragwort (<i>Jacobaea paludosa</i>)	Occasional	Absent
Purple moor grass (<i>Molinia caerulea</i>)	Occasional	Absent
Tubular water-dropwort (<i>Oenanthe fistulosa</i>)	Rare	Occasional
Marsh lousewort (<i>Pedicularis palustris</i>)	Absent	Frequent
Milk parsley (<i>Peucedanum palustre</i>)	Rare	Frequent
Small fleabane (<i>Pulicaria vulgaris</i>)	Locally-abundant	Absent
Devil’s-bit scabious (<i>Succisa pratensis</i>)	Frequent	Occasional
Meadow rue (<i>Thalictrum flavum</i>)	Frequent	Occasional
Moerasviooltje (<i>Viola palustris</i>)	Absent	Occasional

Typical fenland species such as Marsh pennywort (*Hydrocotyle vulgaris*), Milk parsley (*Peucedanum palustre*), Marsh lousewort (*Pedicularis palustris*), Greater tussock sedge (*Carex paniculata*) and Star sedge (*Carex echinata*) have germinated from the mowings from the Blauwe Hel east of the walkway. To the west of the walkway some species of poor-fertility grassland like Devil’s-bit scabious (*Succisa pratensis*), Marsh gentian (*Gentiana pneumonanthe*), Purple moor grass (*Molinia caerulea*) and Rigid eyebright (*Euphrasia stricta*) have established, which were not or hardly found to the east.



Marsh gentians flowered this year in the Mooi Binnenveld for the first time (photo Ken Giller).

Some indicator species, such as Brown bent (*Agrostis canina*), Marsh thistle (*Cirsium palustre*), Meadowsweet (*Filipendula ulmaria*), Fen bedstraw (*Galium uliginosum*), Sharp-flowered Rush (*Juncus acutiflorus*) and Marsh ragwort (*Jacobaea aquatica*), were fairly evenly distributed over the area. During the breeding season (May-June), the yellow and pink sheen of the flowers of Greater yellow-rattle (*Rhinanthus angustifolius*) and Cuckoo-pint (*Silene flos-cuculi*) made it possible to see from a distance that they were present throughout the area.

The location of ditches which marked the old field boundaries is clearly visible from the vegetation. One crosses the walkway close to where it bends to the east; another former ditch lies to the north of the walkway. Many of the remnant species found here, such as Reed (*Phragmites australis*), Purple small-reed (*Calamagrostis canescens*), Brown sedge (*Carex disticha*), Bottle sedge (*Carex rostrata*) have regrown from underground, creeping rhizomes. The Lesser water-parsnip (*Berula erecta*) also occurred mainly along the line of this old ditch, which also marks the extent of distribution of introduced seed. The area to the north of this boundary was much wetter with deep standing water, and the vegetation is much less species-rich. Here Common rush (*Juncus effusus*) dominates, whereas in the

drier areas to the south Compact rush (*J. conglomeratus*) and hybrids of the two (*J. x kernreichgeltii*) are more frequent.



Searching among the rushes. On the left in the background the bog oaks can be seen (photo by Ken Giller)

Species with wind-blown seed, have been able to colonise the area without assistance. The Narrow-leaved ragwort (*Senecio inaequidens*) and Common ragwort (*Jacobaea vulgaris*) were found throughout the area. Saplings of willows and poplar establish in open patches in the summer. Despite the earlier efforts made by volunteers, it was once again necessary to remove young willow and poplar plants this year. As long as the vegetation has not formed a closed mat, colonisation by woody saplings will remain a point of concern.

It is possible that some species have re-established from the seed bank. After decades of absence, the Fen violet (*Viola stagnina*) germinated in 2003 from the seed bank in a ploughed field in the hay meadows of Bennekom. Last year, one specimen of Fen violet was found during vegetation recording to the west of the walkway. This year we did not find this species here, but in the more northern parcels this nationally very rare, species was found in several places.



*The Fen violet is one of the rarest species found in the Mooi Binnenveld
(photo by Henk Kloen).*

Another feature of note is a wet depression in the western portion of the parcel. Thanks to the heavy rains in the first half of July a sort of wet fen developed with Common spike-rush (*Eleocharis palustris*) around the edge and Bulbous rush (*Juncus bulbosus*) in the centre. A surprising find here was an abundance of Small fleabane (*Pulicaria vulgaris*). The combination of Bulbous rush, a species of wet sandy ground, and Small fleabane, a species of dry muddy banks along the rivers, is quite exceptional. At the western boundary of the parcel, close to the excavated course of the old river, the Kromme Eem, the substrate changes from peat to riverine clay. Here Strawberry clover (*Trifolium fragiferum*) is found, a species typical of riverine flood plains. This area lies a bit higher and was very dry throughout the summer, as were the riparian strips along the Kromme Eem.

According to the provincial Nature Management Plan, this subarea should be managed to support the development of "quaking bog". This is a species-rich fen vegetation where the root mat floats on water or on a water-saturated layer of peat. Whether the vegetation will develop into quaking bog depends to a large extent on whether the groundwater level can be kept at a sufficiently high level throughout the year. In addition, the groundwater must be neither too nutrient-rich nor too acidic. In the past, such conditions were realised by allowing alkaline groundwater to rise to the root zone through seepage or by inundation with unpolluted surface water. In the very wet summer of 2021, large parts of the area did become ponded, but this was probably mainly due to stagnant rainwater, which does not have the desired quality. Especially in dry summers, such as those experienced in 2018-2020, it will be difficult to maintain a high enough water level which is a concern for the future.