

# tussen Duin & Dijk



Connection and defragmentation

Nature in Noord-Holland. Volume 17 3 ● 2018



# Volunteers

Figure 1. Research sites for monitoring bank biodiversity 2013-2017.

Previously, these banks would have been evened out and reinforced. Research has shown that natural banks contribute to better water management, help prevent erosion and promote recovery, lead to increased biodiversity and can serve as green corridors connecting different areas. Hoogheemraadschap Hollands Noorderkwartier (HHNK) has created natural banks as well. They wanted to map the biodiversity of banks and increase awareness among citizens about natural banks. The combined surface area of the

natural banks above the North Sea Canal that are managed by HHNK amounts to 1,835 hectares. Natuurlijke Zaken (NZ), part of Landschap Noord-Holland, has been studying bank biodiversity since 2013. With the help of a large group of volunteers, 40 different banks and the adjacent bodies of water were studied for their biodiversity. The sites in this study are all located in Noord-Holland above the North Sea Canal, which is where HHNK operates (figure 1). Each of the research sites ran from 3 metres inland from

## Volunteer success story

In addition to the collection of data on biodiversity and the amenity value of the banks, HHNK also wanted to increase the involvement of individual citizens in managing and creating these banks. This made the participation of volunteers in the project a goal in itself. After an initial limited data collection project by Ecologisch Onderzoeks- en Adviesbureau Van der

# measure the biodiversity of banks and shores



● Volunteers on excursion.



● Research site Heiloo 2015.

Goes and Groot in September 2013, the continuation of the biodiversity study was carried out by volunteers. Recruitment started in early 2014. To everyone's surprise, the first meeting already attracted more than 80 volunteers. 'Doing your bit' by being in the outdoors and walking along the waterfront sporting a scoop net is an idyllic picture that appeals to a lot of people. The volunteers were given serious training by NZ. During courses and excursions they learned fieldwork techniques and how to identify a whole range of species. This meant they could work well independently. The enthusiasm and the enormous interest in monitoring of the natural banks lasted throughout the research period: impressively, all in all, 275 volunteers participated in the study. The year 2016 was truly exceptional, with as many as 86 volunteers active at 36 sites.

## Research

The volunteers collected data for eight groups of species: flora, fish, amphibians, macrofauna species such as dragonfly larvae and water beetles, birds, dragonflies, butterflies and mammals.

The cover of plants was estimated for both the aquatic and waterside

plants. The fish, amphibians and large macrofauna species have been collected using a scoop net and identified with the aid of a cuvette. The birds, dragonflies and butterflies have been sighted with the aid of binoculars and a camera. The bats were counted using a bat detector. Finally, a camera trap (the 'Mostela' method) was used to capture mammals like mice and small mustelids. Undesirable species along the banks have also been included in the study. These undesirable species could be invasive noxious weeds that end up out-competing native species in the system, or species that negatively affect the condition and upkeep of the banks. For HHNK it is very important to know about these, so effective action can be taken in time.

## Assessing the amenity value

In order to give HHNK an impression of the quality of the banks, the so-called 'Stadswatertoets' was used (STOWA, 2001). This is an ecological assessment system for urban bodies of water. Even though not all banks in the study border on urban bodies of water, this assessment method was deemed appropriate as it covers amenity value in addition to biodiversity.

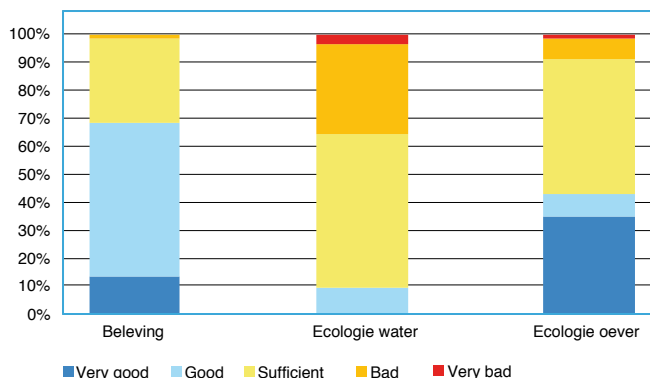
The value judgement that is the

amenity value is achieved by collecting information on litter, unpleasant odours, trampling and spatial factors. Plants with ornamental value also count as a plus. The ornamental value is determined on the basis of a subjective assessment ('What would grandma like?'). Excessive numbers of city ducks or geese will lower the score. Excessive would be if they account for more than 30% of the waterfowl and also in case more than 10 individuals are present. The success of the bank as a whole is assessed by means of an expert assessment, performed by experts from NZ, which also takes into account the findings of the volunteers. This assessment is used to evaluate bank management and make adjustments where appropriate.

## Results

Within these four years (2014-2017), the volunteers on average identified 494 species per year (see table 1). The year 2016, at 603 species, was a striking exception. This number needs to be seen in context though, as that year also had the highest number of active volunteers and the highest number of sites being monitored.

It turns out the number of species



● Figure 2. 2016 Results for amenity value, bank ecology and water ecology.



jaar	sites	observations	average number of observations/locations	species
2013*	15	865	58	135
2014	22	1330	60	396
2015	30	2146	72	450
2016	36	2880	80	603
2017	22	1904	87	527

● Table 1. Number of sites studied, number of observations, average number of observations per location and number of species per location per year.

\* professional research in September, not done by volunteers.

varies considerably between sites, ranging from only 4 to as many as 122 species. In 2016, a combined 2,225 individuals were found across

The banks that were monitored tend to score well when it comes to amenity value (figure 2). Only 2%, which was one bank, scored badly.

### For many plants, the banks are a safe haven amidst the intensively used land.

all banks that were monitored. These represented 603 unique species. It is interesting to note the amount of species that have been observed, because it says something about biodiversity. The information becomes even more valuable once we know more about the kind of species we are referring to. Are they critical species, protected species or actually harmful species? The presence of critical plant species, determined according to the Red List and their location, is also a factor included in the *Stadswatertoets*. The presence of critical animal species or undesirable species, however, is given less attention in this assessment system. In order to still be able to assess these factors properly, they have been given specific focus in the expert assessment.

### Natural banks of high amenity value

The amenity value is determined on the basis of the plants with ornamental value, cover, litter, unpleasant odours, views, floating layers, aquatic plants and animal species.

The banks tend to have an attractive appearance, because they feature plenty of plants with ornamental value, they are covered with vegetation which has not been trampled on, there is no or hardly any litter and the water does not smell bad. All good news for HHNK. This leads to favourable results for the individual bank sites, and hence a positive contribution to the landscape and the surrounding area.

### Banks score better than water in terms of ecology

The assigned value for the bank's ecology is determined by the number of species and the presence of critical species. The banks with the highest scores sport more different species and those species are often on the Red List or have protected status. Examples of these extra plant species include western marsh orchid (*Dactylorhiza majalis* subsp. *majalis*), long-leaf speedwell (*Veronica longifolia*), marsh splurge (*Euphorbia palustris*), marsh willowherb (*Epilobium palustre*) and southern marsh orchid (*D.m.*

subsp. *praetermissa*).

Nearly half of the banks achieved a satisfactory score and 9% received a lower score (figure 2). HHNK can use this data to determine whether the management could be improved. The *Stadswatertoets* also assessed the water ecology. The assigned value for the water ecology is determined by the water clarity, aquatic plants and the species present. A high degree of coverage by underwater plants increases the score. The presence of floating algal beds and other algae leads to a lower score. What also emerges from the *Stadswatertoets* is that water sites tend to score lower than the bank sites: no less than 36% scored poorly to very poorly and only 9% scored well (figure 2).

The *Stadswatertoets* pays little to no attention to a number of groups of species, while their presence does say something about the biodiversity and quality of the natural banks. Consequently, we have also included other groups of species in the study. Interesting Red List species that were found are the Dutch tundra vole (*Microtus oeconomus arvensis*), brown argus (*Aricia agestis*) and fish species such as crucian carp (*Carassius carassius*), European bullhead (*Cottus gobio*), belica (*Leucaspis delineatus*) and European bitterling (*Rhodeus amarus*). In addition, thirteen Red List bird spe-



- Red swamp crayfish (*Procambarus clarkii*).



	Red List species	Protected species	Exotic spp.	Plague species
species	25	23	28	16
observations	65	97	57	71

● Table 2. Number of Red List species, protected species, alien and harmful species found in 2016.

cies were found, including the barn swallow (*Hirundo rustica*), common kingfisher (*Alcedo atthis*), black-tailed godwit (*Limosa limosa*), common redshank (*Tringa totanus*) and common tern (*Sterna hirundo*). For these species, natural banks of course play an important role as a link between different areas, particularly for fish and butterflies. The same goes for the Dutch tundra vole, although for this species, links may also have negative consequences, because they also enable competitors such as common vole (*Microtus arvalis*) to explore new areas. The listed species are all protected under the Dutch Nature Protection Act (Natuurbeschermingswet). The protected species that were recorded, but not on the Red List, are natterjack toad (*Epidalea calamita*), lesser ramshorn snail (*Anisus vorticulus*), common pipistrelle (*Pipistrellus pipistrellus*), Nathusius's pipistrelle (*P. nathusii*), common noctule (*Nyctalus noctula*), pond bat (*Myotis dasycneme*), Daubenton's bat (*Myotis daubentonii*) and serotine bat (*Eptesicus serotinus*). Noxious weeds on the banks would typically include well-known species like nettle (*Urtica*), bitter dock (*Rumex obtusifolius*) and creeping thistle (*Cirsium arvense*). Species like water fern (*Azolla filiculoides*), zebra mussel (*Dreissena polymorpha*), quagga mussel (*Dreissena bugensis*) and several species of American crayfish (*Orconectes spp.*, *Procambarus spp.*) may negatively affect the water system. They are often invasive alien species that may disrupt the balance in the water system (photo).

### Natural banks as ecological connections

The five-year study has shown that the banks' biodiversity is overwhelmingly deemed either sufficient or good. Many animals and plants use them. For many plants, the

banks are a safe haven amidst the intensively used land. The relatively tall and dense vegetation on the banks can, in turn, create a place for animals to take shelter, breed and find food.

Noord-Holland is criss-crossed by watercourses. All those bodies of water have banks, which occur in all shapes and sizes. Due to their positions along waterways, they form long ribbons snaking through the countryside and serve as a link between areas, shaping connections by water as well as by land. The natural banks can be excellent ecological connections for many plants and animals.

### Discussion

This study does not go into the value of natural banks as ecological connections. The study does show favourable biodiversity scores. We are of the opinion that the natural banks included in the study have the potential to make a contribution to the provincial ecological network. This would require successful co-ordination between the HHNK, the provincial powers and other parties. Further research could clarify the potential of the current natural banks and identify what measures may be necessary in order to further optimise their ecological connection function. Applying a specifically targeted management approach could make the existing 1,835 ha of

natural banks suitable quite easily and by making some adjustments to the reed banks that surface could be enlarged by a further 2,159 ha.

Kees Dekker  
Dorien Hoogeboom  
d.hoogeboom@natuurlijkezaken.nl

### Reference literature

- DEKKER, K., 2013. Oevermonitoring HHNK, veldonderzoek 2013, Landschap Noord-Holland, Heiloo.
- DEKKER, K., 2014. Biodiversiteitsmonitoring natuurlijke oevers HHNK, veldonderzoek 2014. Landschap Noord-Holland, Heiloo.
- DEKKER, K., A. COPIER & L. WIJNANTS, 2016. Biodiversiteitsmonitoring natuurlijke oevers HHNK 2015. Natuurlijke Zaken, Heiloo.
- DEKKER, K., W. NON & C. VAN DEN TEMPEL, 2016. Biodiversiteitsmonitoring natuurlijke oevers HHNK 2016. Natuurlijke Zaken, Heiloo.
- DEKKER, K. & C. VAN DEN TEMPEL, 2017. Biodiversiteitsmonitoring natuurlijke oevers HHNK 2017. Natuurlijke Zaken, Heiloo.
- STOWA, 2001. Ecologisch beoordelings-systeem voor stadswateren. Gebruikershandleiding. STOWA, Utrecht.
- <http://minez.nederlandsesoorten.nl/content/rode-lijsten>
- <https://www.rijksoverheid.nl/onderwerpen/natuur-en-biodiversiteit/wetgeving-voor-natuurbescherming-in-nederland>
- <http://www.werkgroepexoten.nl/soorten.php>
- <https://www.wsrl.nl/binaries/content/assets/wsrl---corporate/common/water-schap/taken/schoon+water/nota-bestrijding-inheemse-en-exotische-plaagsoorten>