


GREEN QUAYS



Action plan to nature inclusive and participative urban development

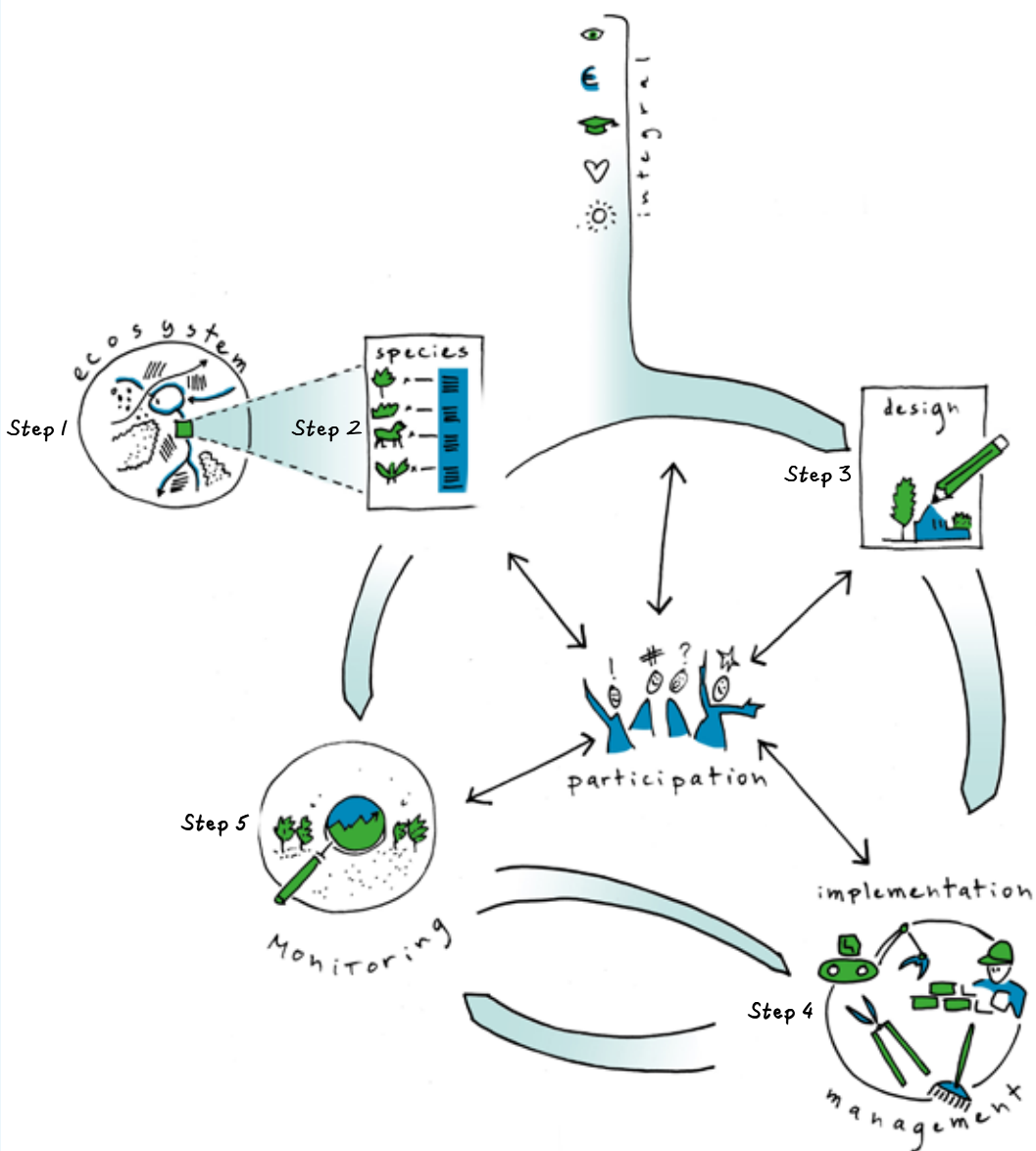


Introduction tot the steps

The proximity of nature in neighbourhoods benefits a city's build environment. Plants bind particulate matter, thus improving the air quality. It also stimulates biodiversity, making the ecosystem more resilient and diminishing the probability of plagues (e.g. the oak processionary). The proximity of nature also reduces the effects of extreme conditions like heat stress, superfluous water and prolonged drought. Research shows that a natural environment benefits the mental health of the city's residents.

The proximity of nature is no longer considered exclusively for the country side; more and more, nature becomes an integral component of cities. The city forms its own ecosystem wherein buildings and natural elements come together. The densification of the city makes the inclusion of nature in the urban environment all the more a necessity. Whilst working on the city, it makes sense to make nature an integral part of it.

But how can this been done the right way? In the GreenQuays project, the project partners have been practising this. This guide shares their experiences. Five steps describe the process that leads to nature inclusive urban development.



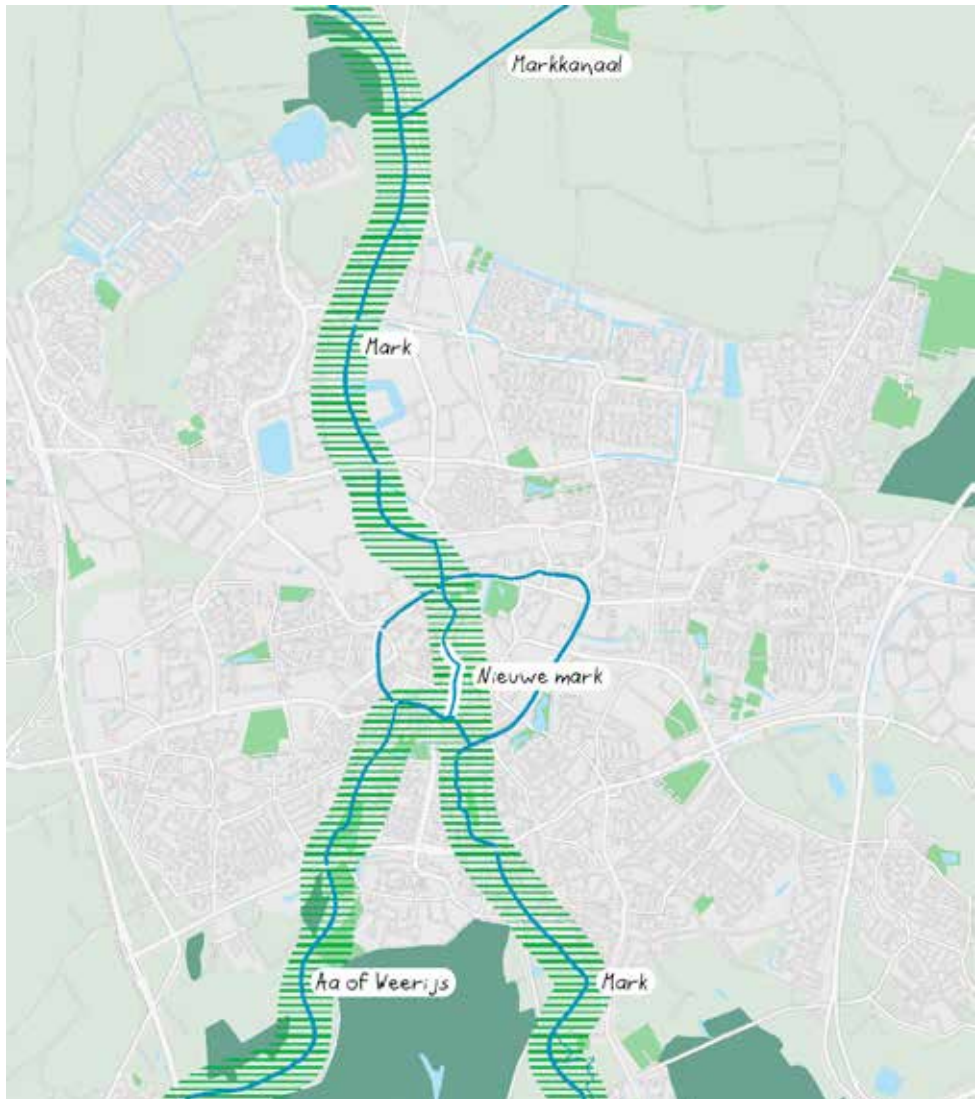
Step 1: the ecological context

The process starts with making an inventory of the ecological context. Which (original) landscape types exist in the designated area and its surroundings? This will define the different species one will find. In the woods won't live the same plants and animals as in a stream valley or a historic urban neighbourhood.

Taking stock of the existing habitats for these species is an important first step. In the urban environment, fragmentation makes these habitats often relatively small and isolated. So it's vital to identify the bottlenecks and find out how different areas can be connected (stepping stones or corridors), or how existing connections can be improved.



The harbour, as seen from the Spanjaardsgat. An important habitat for both fishes, that live in Breda's streams, and wall plants. Fish migration is hampered because, at one end, the harbour has no connection with the town canal.



The Mark and Aa of Weerijjs are important ecological connections between nature reserves close to the Belgium border and the Wijde Biesbosch. For this, the canals of Breda form an important link. The realisation of the Nieuwe Mark adds an extra connection straight through the city centre, offering chances to strengthen the ecological connection. The nature inclusive set up with its green quays is designed to make that work, and also improves the biodiversity in the city in general.

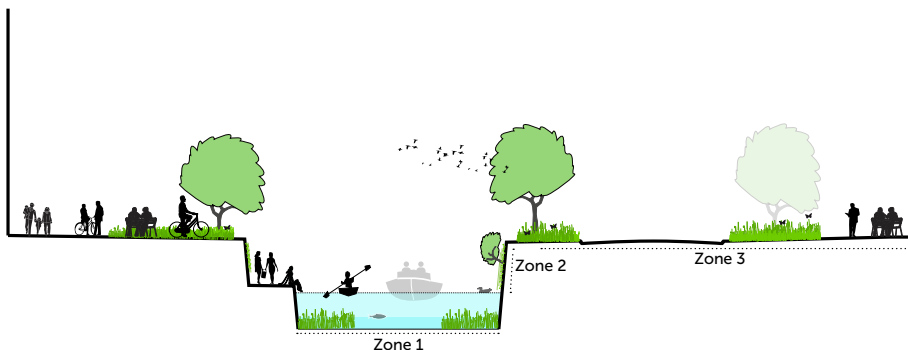
Step 2: the target species

Based on the ecological context, the target species can be established. Which plants and animals will be going to live in the area? Which conditions do these species need to take root and to maintain – which requirements do they need? Think about hiding places, conditions of the soil, possibilities to nest and brood. The list of target species and the requirements of their habitats is added to the program of requirement and wish list. This program contains, apart from the target species, the prior conditions and set up goals for the area, for example goals regarding climate adaptation and conditions considering traffic. Thus, a solid foundation for an integral plan is laid.

Apart from improving biodiversity, adding nature to a city has numerous other positive effects, the so called ecosystem services. For example, nature can play a role in water management (infiltration and storage), in the fight against plagues, in capturing particulate matter, and in countering heat stress. Furthermore, nature has positive health effects and can contribute to the food supply in the city. For that, the list of target species can be completed with species that provide important ecosystem services.



To find out which plants will, in time, be able to thrive along the Nieuwe Mark, volunteers of Natuurplein de Baronie have inventoried the natural values upstream along the Mark and the Weerijds. These banks are the source of seeds of target species that, transported by the streams, can eventually root along the Nieuwe Mark.



Regarding the list of target species, the planning area is divided in three zones:

Zone 1

*Water and bottom
of the Mark and
banks that can
potentially flood*

Zone 2

*Banks and quays
(level that will
always stay dry)
and bottom of the
bridges*

Zone 3

*From quays tot
fronts*

Step 3: the design procedure

The city is never finished; there's an ongoing process of adaptations. In general, the design goals of a city can be described meticulously. In designing and creating nature, this is a slightly different story. Main aim is to create conditions that accommodate the natural process of colonisation, growth and adaptation.

Specifically identify the different ecosystem services in the design process. Often these are strong arguments in negotiations with building partners and policy makers regarding budget and space needed for environmental development. Green interventions should never be an addition to the design, but an obvious and integral part of the plan. Adding them afterwards is always more expensive and seldom results in aesthetic solutions.

To make sure the design is nature inclusive, it is paramount to send along with the program of requirements clear views and preconditions. For that, the habitat conditions for the colonisation of target species will be translated into design criteria that will be included in the design procedure.



Melitta nigricans

The list of target species has been one of the starting points for the plant scheme. For insects (butterflies and bees) it is important that there are host plants for the targeted species. Especially for oligolectic bees, that are dependent on one specific plant species. The bee Melitta nigricans for example is one of the target species for which the host plant Lythrum salicaria has been included in the planting scheme.

Before



After



Step 4: implementation and management

Following the implementation, the management of the area starts. In the end, successful management is key to achieving the set goals of the masterplan. Therefore it's key to draft a solid management plan, and take notice of this plan during the design phase. The parties responsible for implementation and management of the plans will be briefed about the underlying ideas. Make sure there's a sufficient management budget at the forefront of the process.





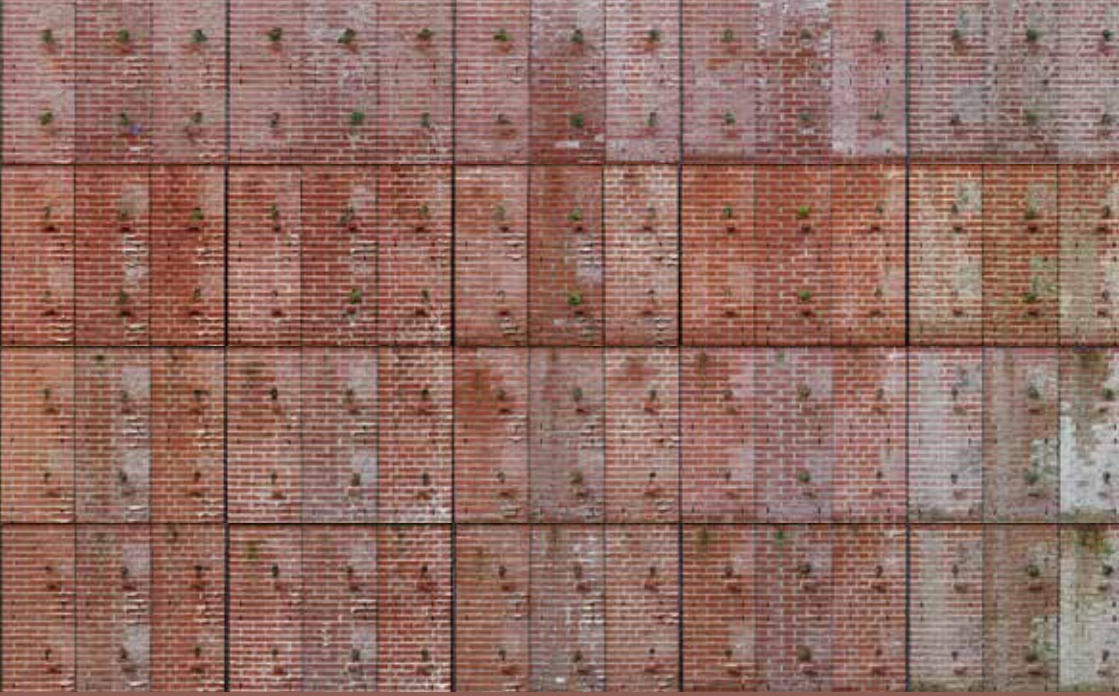
Before wall plants can take root, mosses will appear on the walls. So it is important to not annually hose down the quays; by doing so, the process of colonisation would have to start from scratch over and over.

Step 5: monitoring

By monitoring adequately, one can check if the set goals or the masterplan will be achieved. Take a baseline measurement prior to implementation, to provide insight into the changes. Counts can be done by local environmental organisations or other volunteers and local residents. Collecting data this way is called citizen science. Apart from counts, a (digital) survey can be hold, asking local residents about health and experiences. Share successes on social media or in a newsletter. The input monitoring has provided, can be used to finetune the management plan. Often there are also lessons to be learned for future design briefs.



By asking local residents to also perform counts in their own gardens, they can monitor the changes that take place. A couple of times a year they can participate in garden counts. To inform the residents about these events, a Garden count calendar has been made. There has also been a workshop to make them familiar with citizen science and counts. Field trips introduced local residents to the versatile nature of the city.



The baseline measurement of wall plants in Breda's haven showed that these plants like to take root in movement joints. By incorporating in the design of the new quays that the joints should be left open, the colonisation of the targeted wall plants can be fast-tracked.



Participation

Raising public support is an important condition for the success of the project. Communication and participation go hand in glove. A sustainable maintained outdoor space can raise questions, e.g. because residents can consider it messy.

To make optimal use of all the knowledge, perspectives, interests, and creativity, the degree of participation can be finetuned for each step. The various steps can be measured against the ladder of participation (inform, consult, advise, coproduce, inspire). For each step, the specific stakeholders will be identified. Participation is always made-to-measure, and can come in many forms (open day, field trip, debate, webinar, project information board, news letter, survey, and so on). Always inform participants about the outcome of their input, to increase their engagement.

More and more, the environment is managed by local residents. They get involved through field trips, workshops and counts or are encouraged to make their own contribution (e.g. small front gardens, Sedum roofs).



To involve local residents in the philosophy of nature inclusive design, they could participate an series of nature inclusive design sessions, during both live meetings and online. In these sessions they were informed which measures to improve biodiversity are incorporated in the design of the Nieuwe Mark. The participants were also shown examples of measures they can apply in their own houses and gardens.



This guide has been written based on our experiences with the GreenQuays-project.

Colophon

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Gemeente Breda

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