T-FACTOR
PARTICIPATORY FUTURES
CO-CREATING CITIES THROUGH MEANWHILE SPACES

T-FACTOR HAS RECEIVED FUNDING UNDER HORIZON 2020 RESEARCH & INNOVATION PROGRAMME WITH GRANT AGREEMENT NO. 868887

Amsterdam Science Park Biodiversity

Mapping wildlife observations using Citizen Science tools

LAND Research Lab,
June 2022

T-CYCLE 1 in Amsterdam Science Park
ANIMAL AIDED DESIGN IN URBAN PLANNING

Within the framework of T-Factor, T-Lab 4 is leading the T-Cycle 1 in Amsterdam Science Park, with the support of T-Lab 3 and T-Lab 5.

As agreed with the Pilot, the referring Mission is "Alternative Masterplan" and "DIT Eco practices".

T-Lab4 will support the Pilot in using Animal Aided Design in Urban Planning. This contribute will support the process of getting from the starting actual point to the moment when the HUB will be an acknowledge and permanent center for eco practices.

In order to foster capacity building in the pilot team and local stakeholder network, T-Lab 4 provides a method which includes:

- **a first phase focusing on biodiversity mapping,** based on citizens' science, considering the broader framework of EU's 2030 Biodiversity strategy as well as the local "Amsterdam green vision 2050";
- **a second phase consisting of a portfolio** of two families of possible solutions for animal aided design, according the possibility of "building" solutions or "adapting" existing spaces creating new habitats.

The EU's 2030 Biodiversity Strategy

In the last four decades, global wildlife populations fell by 60% and almost three quarters of the Earth's surface have been altered, squeezing nature into an ever-smaller corner of the planet (Italian National Institute for Environmental Protection and Research, 2019)

EU's Biodiversity Strategy aims to put biodiversity on the path to recovery by 2030 by protecting and restoring nature with 3 main objectives:

1 - Establish protected area

2 - Greening urban and peri-urban areas


Biodiversity corridor Montreal ©LAND

3 - Restore degraded ecosystems


Lura Retention Basin ©LAND

Amsterdam Green Vision 2050

Amsterdam is one of the greenest cities in Europe. But changing lifestyles, growth and overcrowding in the city, and climate change call for new approaches to green space in the city. The large areas of existing green space have gained additional functions for leisure, work, socializing, sports, play, celebration, and growing and learning about food.

Amsterdam Green Agenda sets out the ambitions for climate proofing and increased biodiversity by developing:

- Green roofs
- Greater rainwater absorbance
- Protection of healthy trees
- Increased ecological connections
- More nature-friendly buildings
- More and improved green space
- Urban farming
- Green neighborhood initiatives


Amsterdam Green Agenda

The value of urban biodiversity

The rapid urbanization and spread of urban areas has profoundly changed landscape structure causing habitat loss and fragmentation and threatening its capacity to carry life.
Nevertheless, ecological research showed that the urban environment can host a wide range of wildlife species, providing ecological niches and recognizing the potential of urban environment for biodiversity conservation (Convention on Biodiversity, 2012).

Falco peregrinus nesting on the heights of a skyscraper in Milan

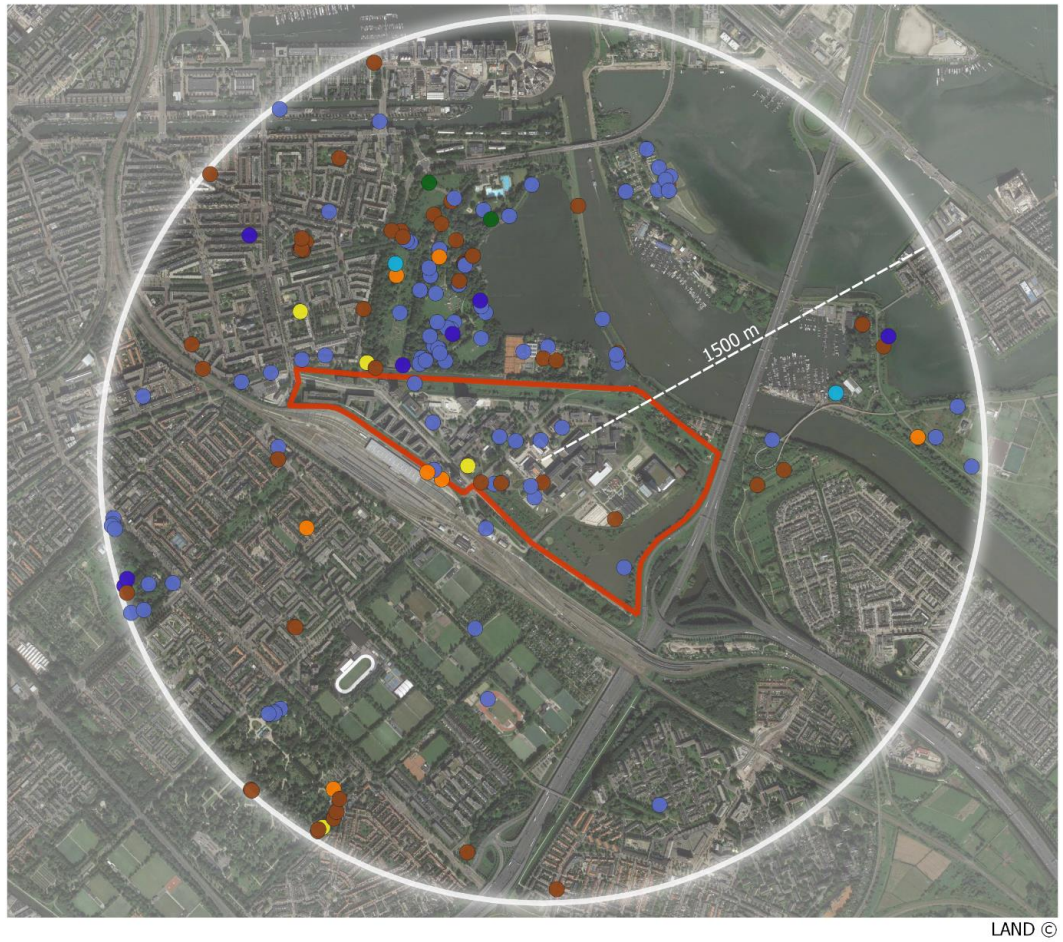
Biodiversity mapping is a powerful tool to study and monitor the presence of wildlife in urban built-up areas, allowing to evaluate the urban ecosystem suitability to host non-human guests or the specific impact of urban greening practices in a neighborhood.

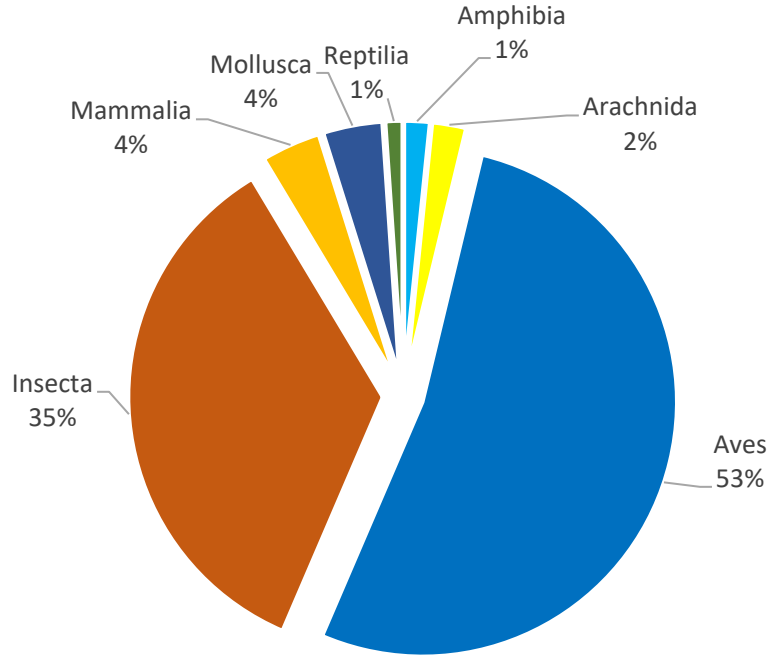
Wildlife observations mapping

Wildlife mapping has been realized using **iNaturalist** dataset, a global species observation platform based on citizen science. In the specific case of Amsterdam city, more than 9000 biodiversity observations are available to study in a georeferenced environment. The aim of the mapping is to study wildlife presence inside Amsterdam Science Park area, allowing to dress the biological portrait of species of interest and to develop a portfolio of solutions to enhance their presence in the area.

Aerial view of the Amsterdam Science Park,
Photo Credits Flying Focus

Wildlife observations around Science Park area



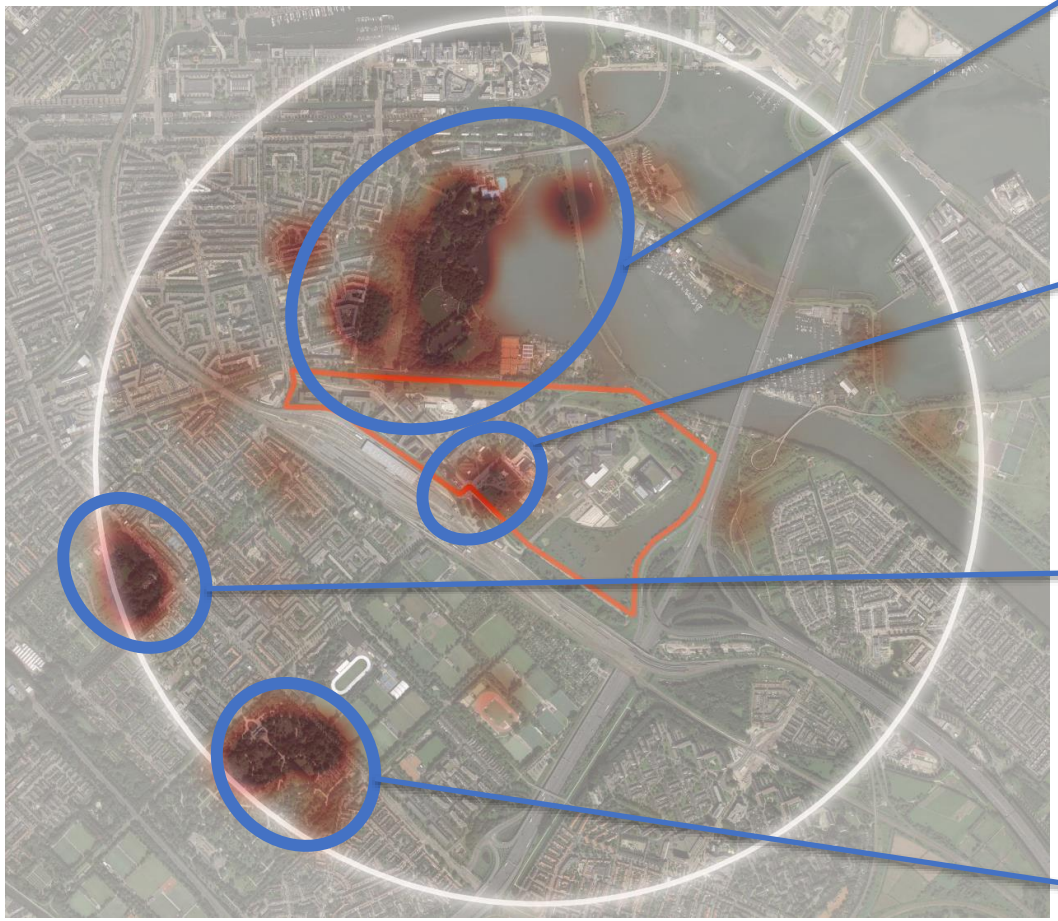


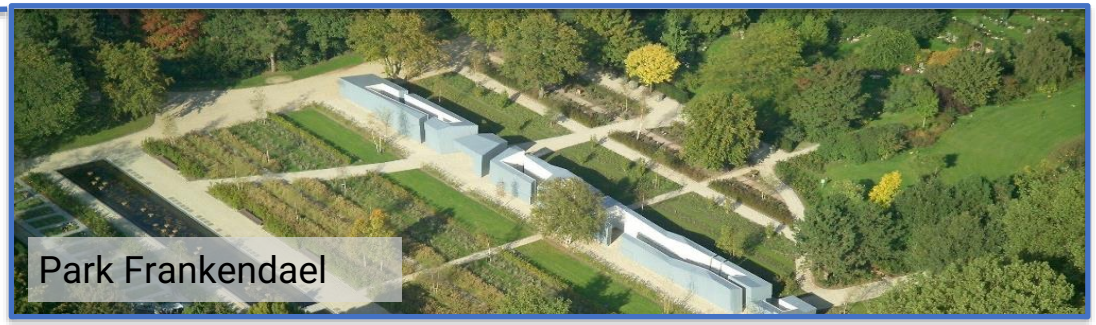
Wildlife taxonomic classes featured:

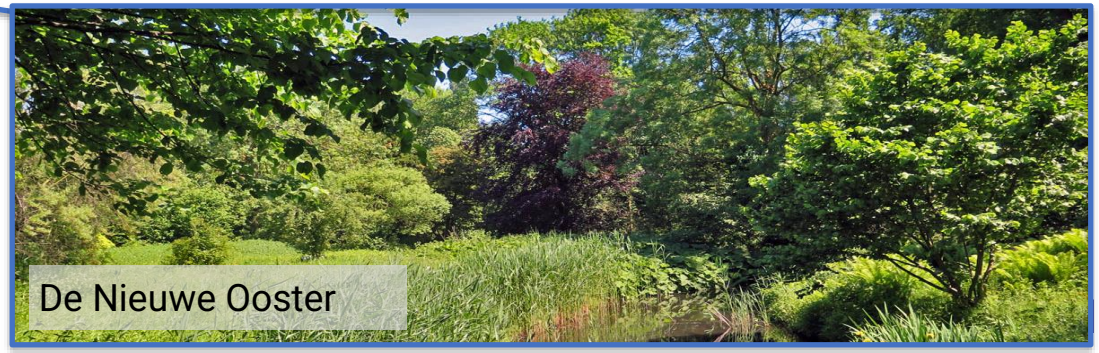
- Amphibia: 3 observations
- Arachnida: 4 observations
- Aves: 98 observations
- Insecta: 65 observations
- Mammalia: 7 observations
- Mollusca: 7 observations
- Reptilia: 2 observations

Total: **186 observations** in the buffer area

The value of urban parks

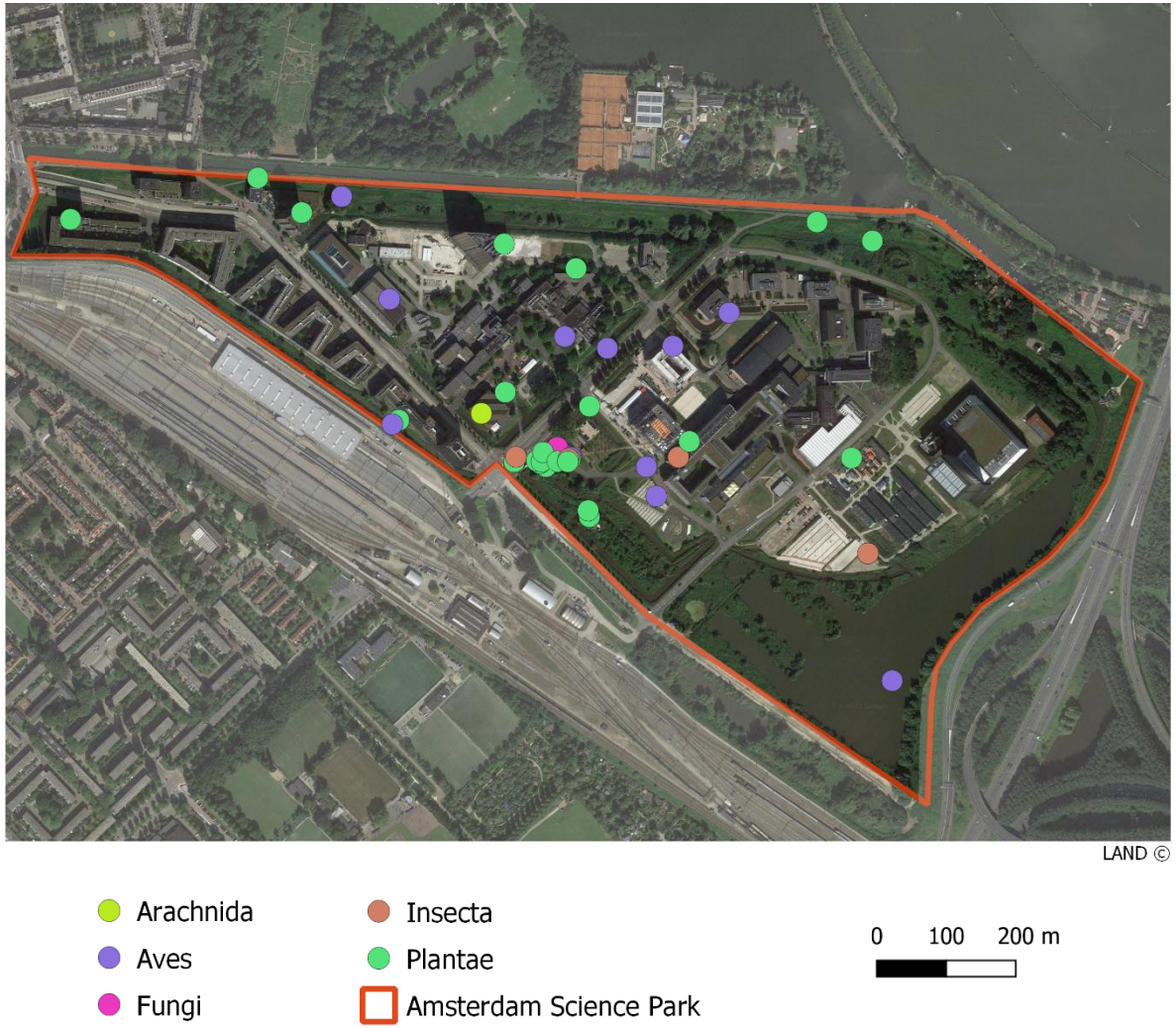


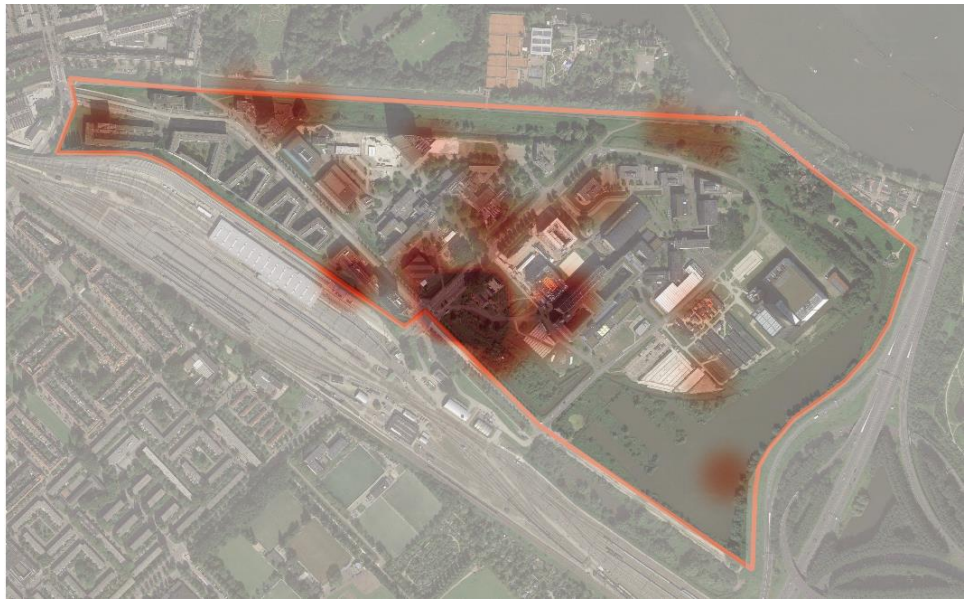




Wildlife observations are mostly distributed around urban green areas. This indicator allows to assess the environmental quality and suitability for non-human users of green spaces. Citizen science observations also provide useful information about accesibility and frequentation of urban parks.

Biodiversity observations in Amsterdam Science Park



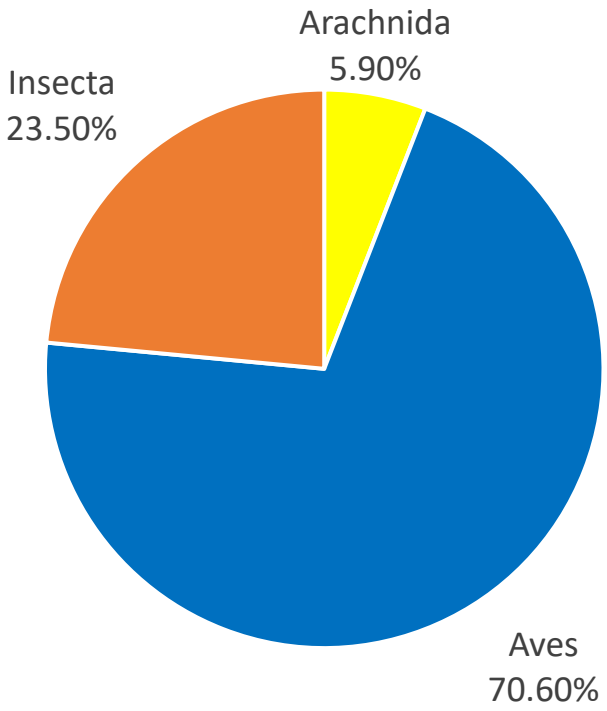


Biodiversity taxonomic classes featured:

- Arachnida: 1 observation
- Aves: 12 observations
- Fungi: 1 observations
- Insecta: 4 observations
- Plantae: 23 observations

Total: **41 observations** in the area

Focus on wildlife observations

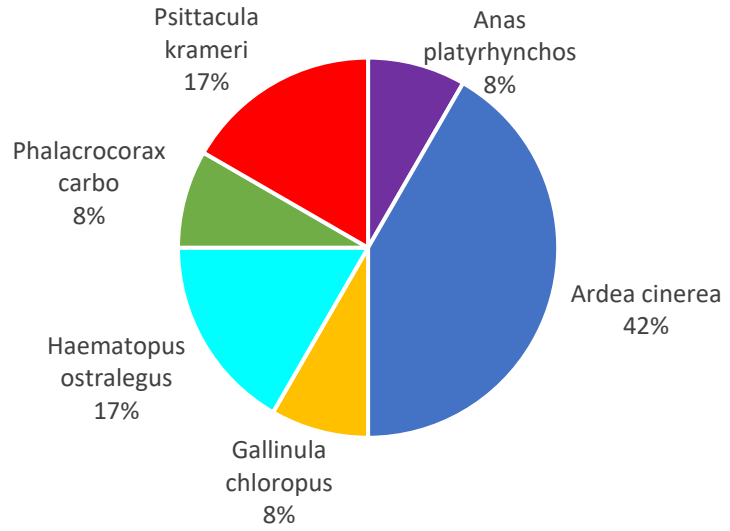


Wildlife taxonomic classes featured:

- Arachnida: 1 observation
- Aves: 12 observations
- Insecta: 4 observations

Total: 17 observations in the area

Wild birds inside Amsterdam Science Park



Mallard

Grey heron

Common moorhen

Eurasian Oystercatcher

Great cormorant

Rose-ringed parakeet

Insects and arachnids in Amsterdam Science Park

European garden spider

Non-biting midge

Mint beetle

Potter wasp

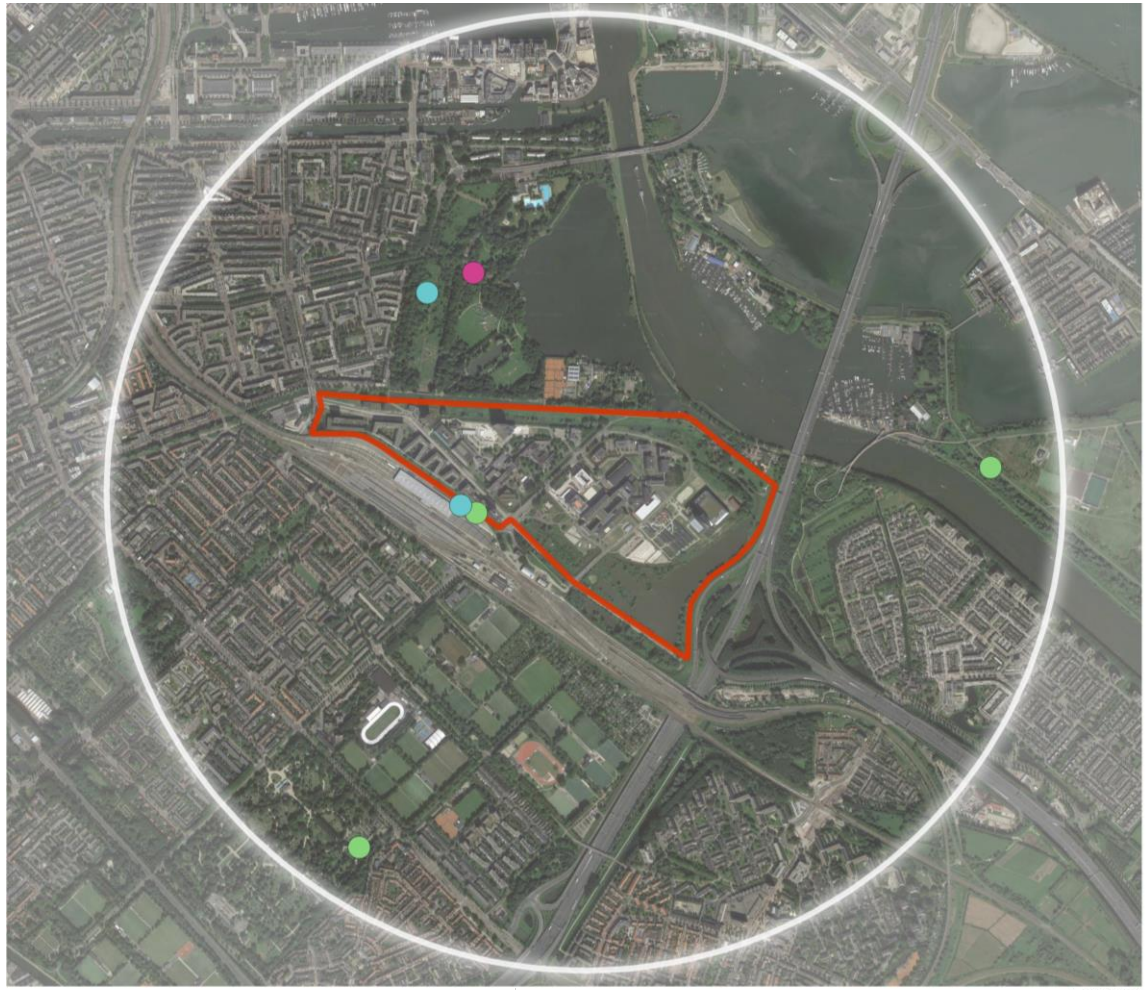
Ant

Amphibians around Science Park area

Natterjack toad

Grass frog

Mammals around Science Park area

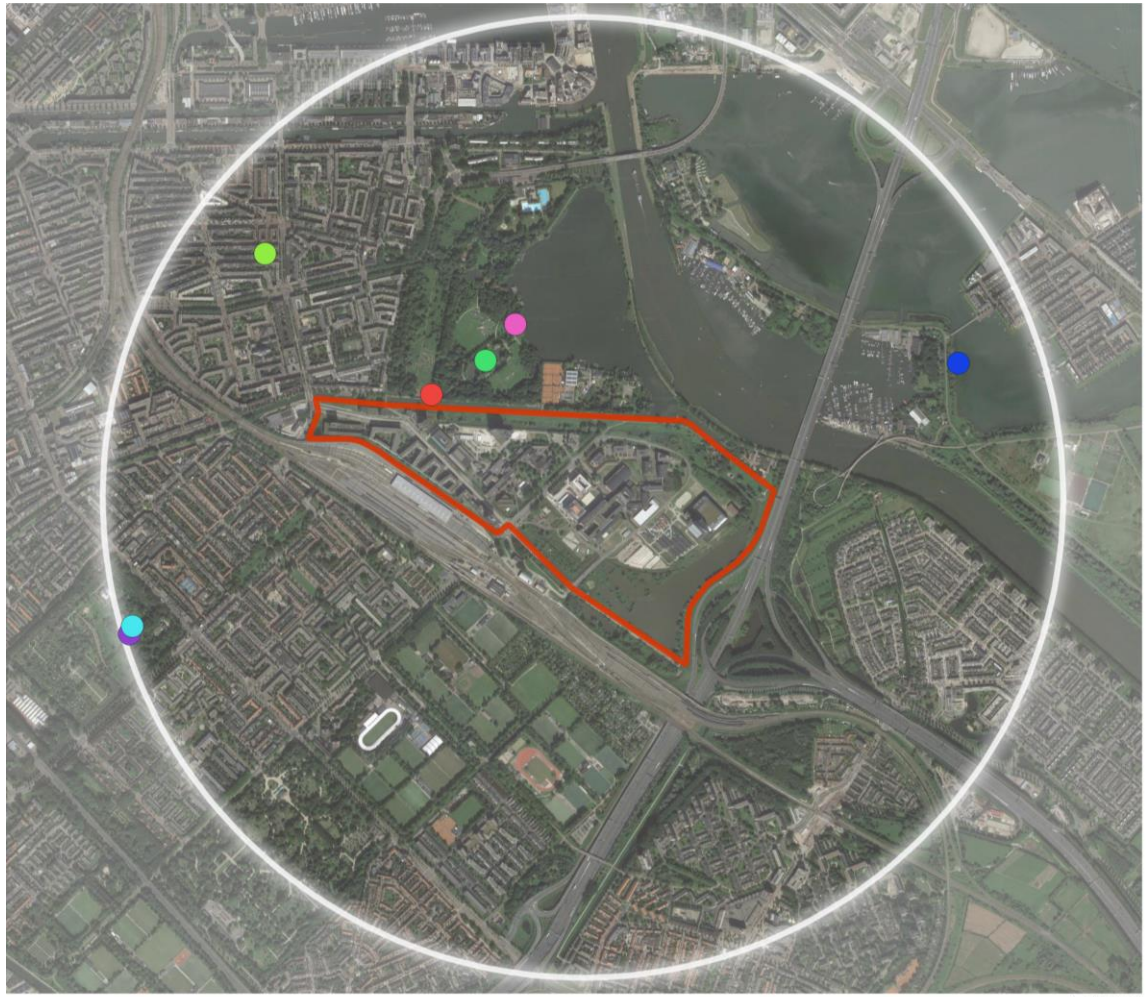


Common noctule

European rabbit

Red fox

Molluscs around Science Park area



Grove snail

Garden snail

Ash-black slug

Amber snail

Duck mussel

Red slug

Reptiles around Science Park area

Red-eared slider

Yellow-bellied slider

Interpretating wildlife observations

Since they rely on users contributions, Citizen science tools such as iNaturalist provide only certain informations about urban biodiversity and the observations must be therefore interpreted.

The presence – or the absence – of common or threatened animal species must be intended as an indicator of the environmental quality of urban settlements and as a complementary data source for studying urban ecosystems ecology.

Biodiversity mapping allows to consider the environmental quality of the ecological habitats and to better understand which animals can rely on those ecosystems.

Assessing the presence of wildlife species into a project area by mapping biodiversity observations is only the first step of broader strategies to increase animal co-existence in urban open spaces.

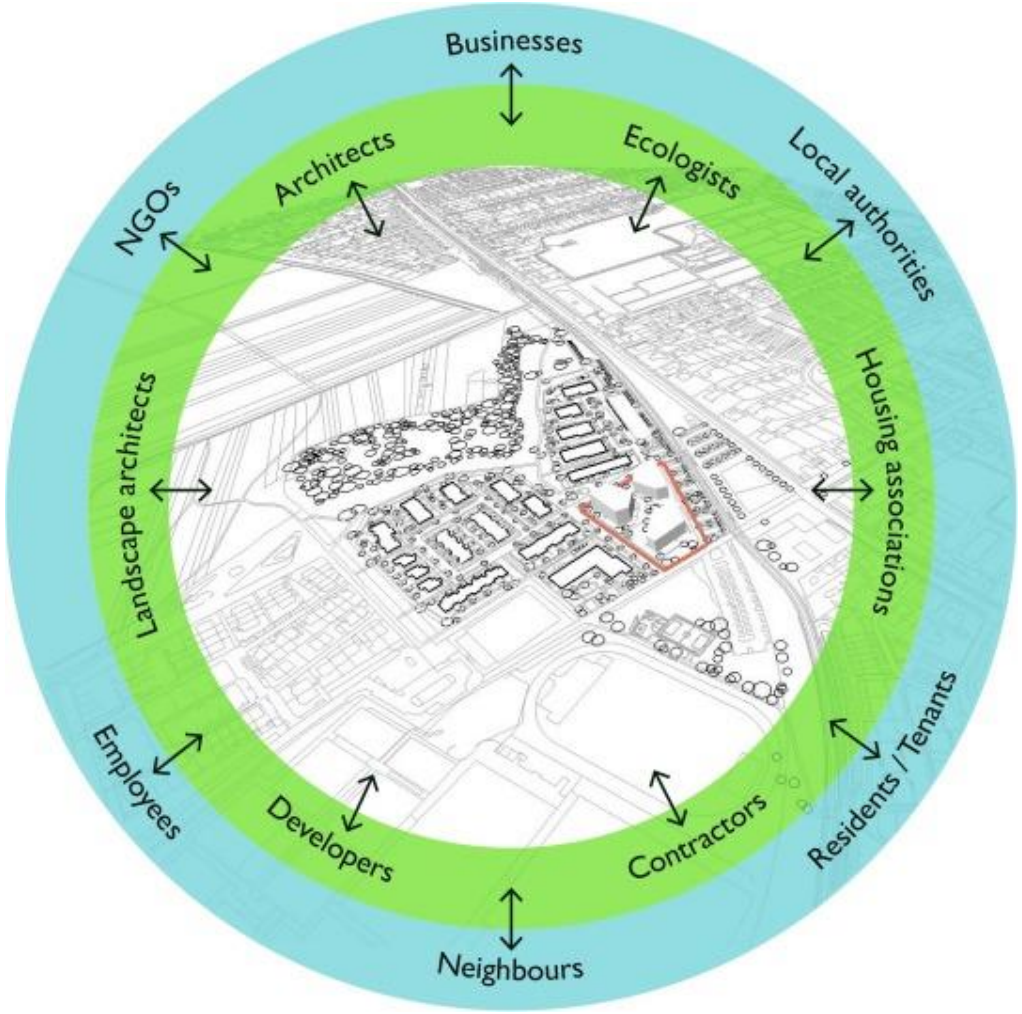
Urban herons of Amsterdam, The Guardian

Mainstreaming biodiversity into urban open spaces

Wildlife-inclusive Design is a multidisciplinary methodology aimed at mainstreaming biodiversity into urban open space design through participatory processes.

Dressing the biological portrait of a selected group of locally present species can contribute to foster wildlife co-existence in urban cities by identifying their critical needs. This operation is aimed at including the biological needs for habitat, feeding and breeding of the target species into urban open space design processes, that are generally not considered as wildlife conservation areas.

Fulfilling the identified needs of various species in the project area increases the chances of a positive interaction between humans and non-humans and enhances the Natural Capital of Amsterdam Science Park.



Animal-Aided Design Studio, Berlin

Species portraits: mammals

The hazel dormouse

Moscardinus avellanarius

Description: small mammal native to Europe and Asia. It can reach the lenght of 15 cm including its tail and it is a nocturnal creature. It hibernates from October to April-May

Habitat: Hazel dormouse is particularly associated with decidous woodlands but also inhabit hedgerows and scrub.

Shelter: The nests are located on the ground, under piles of leaves or logs or in the base of old trees. Nests in cavities, log piles, old trees.

Food habits: berries, nuts but also young leaves and flowers or insects as aphids and caterpillars). Management of green spaces during winter hibernation can disturb these rodents.

Predators: raptors, foxes and domestic cats.

Curiosities: the hazel dormouse spends most of its life sleeping; when not, it stays among the branches looking for food. These creatures love hazelnuts.

Common noctule

ASP

Nyctalus noctula

Description: migrating and insectivorous, this bat species is common throughout Europe and Asia. They have a wingspan of about 40 cm and they spend the winter hibernating.

Habitat: it prefers small-sized woodlands, but can forage up to 20 km away at night. It can also live in built-up areas.

Shelter: old trees cavities, abandoned buildings, artificial nests and cavities

Food habits: mainly insects as beetles, moths and winged ants). Management of dead wood in green species during winter hibernation can disturb these bats.

Predators: raptors, domestic cats, snakes

Curiosities: only females are migrating, males not. Sometimes summer territories and hibernating places are hundreds of kilometres apart. They can eat up to 3000 insects per night, providing natural defense against pests and mosquitoes.

Species portraits: birds

Barn swallow

Hirundo rustica

Description: known for its singing and widespread throughout the world, the swallow is a migrating bird of open country that live in close association with humans.

Habitat: they prefer open country with low vegetation, such as pastures, meadows and farmland, with nearby water. They avoid densely built-up areas.

Shelter: accessible open structures such as barns, stables, or culverts.

Food habits: mostly aphids and other flies). Barn swallows have used man-made structures to nest since time immemorial.

Predators: raptors, foxes and domestic cats, they prey especially their eggs.

Curiosities: they tend to return to the same wintering locality every year. As they feed on flies, they provide a natural protection against mosquitoes in public spaces

House sparrow

Passer domesticus

Description: native to Europe, this bird is strongly associated with human presence. Its population declined by 50% since the second half of the 1990s in Amsterdam.

Habitat: it reaches its greatest densities in urban centres, but they prefer the suburbs since there are more insects to prey.

Shelter: presence of cavities in trees or shrubs but also thee eaves of houses where they can nest

Food habits: they mostly feed on insect and seeds of grain and weeds but they eat whatever foods are avaible). They also feed on food provided by human and they can nest in artificial structures. Presence of dust and water.

Predators: raptors and other birds, foxes, squirrels, cats.

Curiosities: sparrows are very social and they live in colonies. They adapted to human settlements to have a constant supply of food.

Species portraits: insects

Bumblebee

Genus *Bombus*

ASP

Description: Larger than honeybess, bumblebees are tipically found in temperate climates. They are important since they provide pollination services to agroecosystems.

Habitat: cosmopolitan species, they nest undeground or above ground, avoiding direct sunlight. They prefer tree holes or thick grasses.

Shelter: dry, dark cavities, even underground. Bee nesting boxes have achieved some success in bumblebees conservation.

Food habits: they feed on flowers nectar while pollen is used to feed their young).

Predators: many species of birds, some spiders.

Curiosities: they feed thanks to a proboscis that is folded under the head during flight. Pesticides and habitat loss caused a decline in bumblebees populations.

Green-eyed hawker

Aeshna isoceles

ASP

Description: native to Europe, this small hawker dragonfly has green eyes and clear wing. These insects are indispensable links in any wetland foodchain.

Habitat: It prefers habitats with extensive belts of reeds, bulrush, sedges or water soldier. It reproduces at standing or along slow-flowing waters including canals, marshes, ponds and lakes.

Shelter: the presence of a well-developed aquatic vegetation provides shelter for the larvae. It prefers sunny habitats offering some shelter from winds.

Food habits:. they feed on insects such as mosquitoes, midges, moths, flies and even other dragonflies.

Predators: any kind of bird such as swallows, raptors, dragonflies, spiders, bats, foxes, domestic cats.

Curiosities: they serve as an effective population control of mos insects since they eat their larvae before development.

Species portraits: amphibians

Grass frog

Rana temporaria

ASP

Description: native and widely spread around Europe, it is a semi-aquatic amphibian that can reach up to 10 cm of body lenght.

Habitat: they use to live in damp places near ponds or marshes or in long grass.

Shelter: They breed in well-developed acquatic vegetation. The females lay between 1000-2000 eggs wich float in clusters near the surface of water.

Food habits: tadpoles are herbivorous but at maturity they eat insects, their larvae, spiders, nails and worms.

Predators: many species of fishes, beetles, dragonflies, birds such as herons and ducks. Domestic cats are a threat.

Curiosities: when temperatures drop, some frogs dig burrows underground or in the mud at the bottom of ponds. They hibernate in these burrows until spring, completely still and scarcely breathing.

Smooth newt

Lissotriton vulgaris

Description: native to Europe, this small amphibian can adapt to a wide range of semi-natural environments. The juveniles are terrestrial but then switch to the aquatic phase.

Habitat: mainly lowland species, they show a wide habitat breadth (terrestrial and aquatic ecosystems). It occurs in wooded areas but also in more open areas such as damp meadows, parks and gardens. They breed in the water.

Shelter: ideal freshwater breeding sites are sun-exposed, stagnant and have shallow areas with abundant vegetation. They need winter shelters to hibernate such as under logs.

Food habits: they feed on invertebrates, small plankton and rarely they can prey on eggs of its own species.

Predators: waterbirds, snakes, frogs but also larger newts.

Curiosities: they reach maturity in two or three years and they can live up to 14 years.

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