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die Strategie

Mehr biologische Vielfalt

in Städten und Gemeinden

Eine Arbeitshilfe zur Erstellung kommunaler Biodiversitätsstrategien

English Short Version of the guideline for preparing municipal biodiversity strategies
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A joint project of

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Photos on title page: Top left: Rüdiger Becker, Heidelberg environment agency Top right, bottom left: Uwe Messer, Kommbio Bottom centre: Bielefeld environment department. Bottom right: Stefanie Herbst, Kommbio

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2. Steps in strategy development and implementation

When developing a biodiversity strategy, local conditions differ from municipality to municipality. Villages in northern Germany have a different range of species than cities in the south. Some of Germany's municipalities are large, while others are small. Some are growing, while others are shrinking, and some are prospering, while others are structurally weak. In some municipalities, the local administration cooperates constructively with relevant associations, while in others cooperation has yet to be established. These parameters affect both the goals and the content of a biodiversity strategy as well as how it is developed. But this is precisely why it is helpful to adopt a structured approach to the development of a municipal biodiversity strategy.

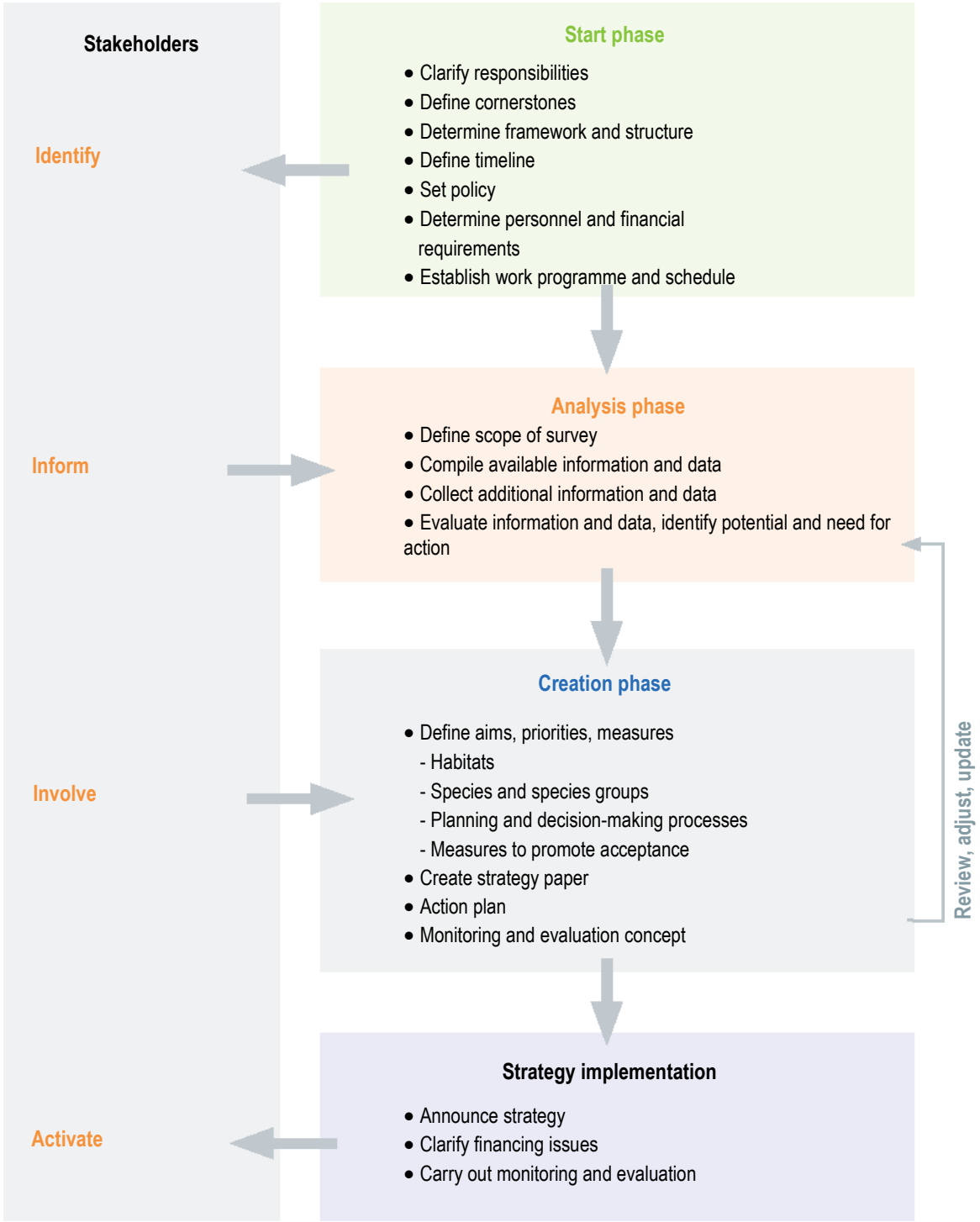
City stream restored to a natural state. Photo: Janos Wieland

Once a strategy has been created, the next step is implementation. This brochure also includes some relevant information about implementation (→Section on implementation).

The figure on page 13 provides a simplified overview of the phases of strategy development and serves as a guide for the following sections of this brochure. It should be noted that the phases involved cannot normally be clearly distinguished from one another in real-world situations. Often, they will overlap, take place in parallel or even be repeated.

Note: Efforts to involve various relevant stakeholders and to communicate effectively with the public play an important role in all phases of strategy development. Which stakeholders should be brought on board, at what point and how the overall process can best be supported by public outreach are cross-cutting questions that are relevant in all phases. Information is available at → Focus on: “Stakeholders, public participation, public outreach”.

Strategy development



Overview of the steps starting with the development of a biodiversity strategy through to its implementation (modified to align with the work of the GreenKeys Team) [17]

[17] *GreenKeys Team (2008) GreenKeys @ Your City – A Guide for Urban Green Quality. IOER Leibniz Institute of Ecological Urban and Regional Development, Dresden.*

The start phase – establishing the framework

Clarify responsibilities

Developing a biodiversity strategy is a multi-faceted task. It therefore makes sense to appoint one or more people who are responsible for the organisation and further development of the strategy on an ongoing basis. It is also a good idea to establish a "strategy team" to support the entire process. The members of this group, for example, could be staff of relevant administrative authorities, of employees of municipal companies that coordinate the maintenance and management of green spaces (→ Focus on: "Stakeholders, public participation, public outreach") and other local experts. A broad range of expertise flows into the formulation of goals, planning errors are prevented and new synergies are created.

Workshop on "Semi-natural maintenance of green spaces". Source: Bielefeld environment agency (Umweltamt)

Define cornerstones

Before developing detailed aims, stakeholders need to define the cornerstones of the strategy. What are the strategy's key overall aims? What is the strategy's target group? What is the focus of the content? For example, is the strategy designed to a) establish overarching specifications (valid across all relevant administrations) to protect and foster biodiversity and b) to implement relevant measures? Or, is it primarily aimed at informing the public about biodiversity and at raising awareness for the need to promote it? Ultimately, a biodiversity strategy's aims and its target group will shape the way the strategy is drawn up (→ Section on creation phase).

Determine framework and structure

Municipal biodiversity strategies can also differ significantly from one another in their level of detail. Existing strategies define regional goals and timelines, along with more general aims such as "improving ecological permeability". The Erfurt Strategy[18], for example, includes a specific aim calling for planting two kilometres of continuous field hedges along pathways within three years. The more concrete and detailed aims are, the better their success can be measured. In some cases, however, flexibility in content may be sacrificed.

[18] *Erfurt, Thuringia state capital – municipal admin. (Ed.) (2012): Erfurt's implementation plan for the declaration "Biodiversity in municipalities" (Umsetzungsplan der Stadt Erfurt zur Deklaration "Biologische Vielfalt in Kommunen"). Erfurt: 10.*

Define timeline

For a biodiversity strategy, a timeline of five to ten years – depending on the aims and scope – seems to be the most effective timeframe for achieving measurable success and providing sufficient latitude for municipal planning and decision-making. Strategy papers often contain aims reaching far into the future. The problem with such long-term aims is that they can lead participating stakeholders to delay concrete action and lose motivation. Contrary to this, short- and medium-term goals can facilitate success throughout the entire implementation process, thereby keeping the strategy in the public eye[19].

A municipal biodiversity strategy can also be seen as a continuing or recurring task. When this is the case, stakeholders can more easily highlight experience gained, adjust measures as necessary and respond to new requirements and parameters.

Newly created habitat structures in Heidelberg's Bahnstadt district. Source: Office of Environmental Protection, Trade Supervision and Energy

Adopt a resolution or an internal working paper

Municipal biodiversity strategies can also differ in the degree to which they are formally binding. A municipal biodiversity strategy achieves a particularly high level of political commitment when it is adopted by the city or municipal council and becomes binding for all offices of a local government. This makes it more likely that it will be taken into account in decisions about planning or that it will receive financial support. An internal paper that formulates guidelines for the responsible administration or even inter-agency guidelines as recommendations is considerably less binding. Ideally, a political agreement is reached that includes pledges of financial or personnel support.

If the development or establishment of a municipal biodiversity strategy is legitimised by a resolution of the municipality's local council at the beginning of the process, this will put the rest of the process on stronger footing. In efforts to convince the relevant municipal bodies of the importance of establishing a municipal biodiversity strategy, it can also be useful to focus on current political trends and publicly discussed issues.

Determine personnel and financial requirements

The personnel and financial requirements for the strategy's development and creation have to be determined. If it is not possible to finance the strategy with the current budget, additional funds can be raised. The "urban nature ("Stadtnatur") funding priority planned for 2020 within the Federal Programme for Biodiversity offers a good approach in this case, one that comprises projects for development and implementation of municipal concepts and strategies for enhancing biodiversity[20].

[19] *Grün Stadt Zürich (2006): Grünbuch der Stadt Zürich. Zürich.*

[20] *Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) (Ed.) (2019): Masterplan Stadtnatur – Maßnahmenprogramm der Bundesregierung für eine lebendige Stadt (Master Plan for Urban Nature – federal measures programme for a living city) Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. Berlin: 8-9. https://biologischevielfalt.bfn.de/bundesprogramm/bundesprogramm.html (last accessed: 6 March 2020).*

Establish work programme and schedule

As soon as the framework has been roughly defined, the next steps in strategy development need to be determined; how the relevant process is to be organised; what stakeholders should be brought on board and when and how this should take place; how the responsibilities should be assigned; and what communication channels should be used (→ Section 3). It is advisable to establish a work programme that takes account of all important processes and stakeholders, and that outlines the strategy's scope, tasks, requirements and timeframe. The schedule for creating the strategy should be realistic and feasible. Strategy development is usually expected to take about 18 to 24 months. The time needed depends not only on the available financial and human resources, but also on whether and in what quality necessary information and data are available.

Semi-natural greenery along roads and motorways. Source: Martin Rudolph

The analysis phase – collecting and evaluating data

The next step, once the work programme and the schedule are finished, is to determine and assess the current situation. What percentage of the municipality's land area is green space and how are these green spaces interconnected? Which species are in decline and which species are proliferating? What specific factors are driving these trends? What activities are underway in the municipality to benefit local biodiversity, and which people – both in local government as well as outside of government – are involved? The biodiversity strategy's specific goals and priorities cannot be defined until these and other questions have been answered.

A structured analysis is therefore carried out in defined steps:

1. Define scope of survey(s) (screening)
2. Compile available information and data
3. Collect additional information and data
4. Evaluate information and data, identify potential and need for action

What data is needed to develop a municipal biodiversity strategy?

- **Data on the overall city as a habitat and habitats in the city**
  To be able to describe the quality of the whole city as a potential habitat, data that reflects the condition and diversity of its individual habitats and biotope types is needed. Useful information includes the degree of greenery in the city, green and biotope network systems and the connectivity of habitats in built-up areas with the surrounding landscape. Of course, this also includes data on legally protected and valuable habitats.

- **Data on the occurrence and distribution of plant and animal species in the city**
  The plant and animal species that occur in the area and the trends in their populations provide clear indications of the condition of a municipality's biodiversity. Collection of data related to the occurrence and distribution of plants and animals therefore provides an important basis for a solid municipal biodiversity strategy.

- **The legal and planning framework: information about plans, programmes and concepts**
  Any plans, programmes and concepts that relate to "urban biodiversity" should be reviewed to ensure that all relevant existing bases for planning are being taken into account. This also makes it possible to highlight potential synergies in the municipal biodiversity strategy – as well as any conflicting goals with other planning processes and decisions.

- **Information about people and institutions actively involved in protecting and fostering biodiversity**
  In addition to administrative staff, external stakeholders often play an important role through efforts in nature conservation or environmental education that help to protect biodiversity. When creating and implementing a municipal biodiversity strategy, it is important to gain the best possible overview of the people, associations and institutions active in relevant areas.

- **Information, projects and activities aimed at protecting and fostering biodiversity**
  Many municipalities conduct many different types of practically oriented activities to protect and foster biodiversity, for environmental education and public outreach. A municipal biodiversity strategy should take account of these efforts. In order to determine in which form and for which specific issues cooperation is possible, it is necessary to determine which activities are carried out by associations, initiatives, educational institutions, private individuals and other stakeholders.

Detailed information about the analysis phase is available at: ***www.l.duh.de/urbannbs***

1. Define scope of survey(s) (screening)

Before starting the actual analysis, a screening is carried out. In the process, it must be clarified which data is required in detail, which people or institutions should be responsible for specific tasks and to what extent financial resources can be made available for collecting additional information.

2. Compile available data

While available data is normally compiled before the strategy itself is created, this step may be defined as a separate goal in in the strategy. Local administrations will usually already have significant quantities of relevant data that just needs to be collected and compiled. For example, municipal landscape plans, biotope-type maps and maps for certain species can serve as a basis for work. Other pieces of the puzzle can be gathered by consulting state offices, environmental associations or people involved in nature conservation as volunteers.

Number of species of the relevant taxonomic groups in Heidelberg and the surrounding area and in comparison to the federal state of Baden-Württemberg (BW)

	Species in Heidelberg	Species in BW
Plantae		
Vascular plants	984	2140
Mushrooms	391	2480
Fauna		
Vertebrates		
Bats	15	20
Birds	131	198
Amphibians	15	19
Reptiles	6	11
Selected invertebrates		
Butterflies	534	1170
Dragonflies	40	75
Spiders	413	772
Beetles	1481	4000
Hymenoptera	188	369

The more comprehensive and systematic the overview is in the end, the easier it is to identify the potential and shortcomings of a municipality's existing support for biodiversity, to identify current and future threats to local biodiversity, and to define possible needs for action for future work.

It is usually fairly easy to compile existing information on the condition and diversity of habitats as well as on overall planning and legal conditions and on activities and stakeholders. However, this may be different for data on plant and animal species: many municipalities have only a rough overview. Even cities that have relatively good knowledge of the occurrence of plant and animal species sometimes still find gaps in the data.

For this reason, as much information as possible about habitats, existing plant and animal species and relevant activities needs to be systematically compiled and evaluated. To be able to gather this information as easily and completely as possible, it is a good idea to enlist the help of people who have data and knowledge about biodiversity in a municipality in these surveys. The best way to do this is to facilitate communication between these individuals or institutions and organise a regular exchange of existing data, for example in a working group, advisory board or network.

3. Collect additional information and data

If gaps are still found when compiling existing information and data on the current situation of biodiversity, these can be remedied through targeted surveys. Missing data can either be collected independently (for example, data on the percentage of green cover within the municipal area, the percentage of green spaces being managed in accordance with ecological principles and the numbers and species of animals living in hollow trees) or can commission third parties to collect them, such as specialised consultants (for example, for mapping of bank/shoreline areas of water bodies or mapping of bat habitats) or nature conservation associations (for example, for gathering data on toad migrations). Cooperative efforts involving universities have also proven useful. Data can be gathered in the context of theses/final papers on relevant subjects. Also, comprehensive data collection can be defined as a separate component of a municipal biodiversity strategy. This is relevant especially in cases where biodiversity trends are to be monitored in future under a dedicated monitoring programme (→ Section on monitoring). In these cases, the necessary personnel and financial resources should be allocated to surveys on certain species groups, or to the required biotope mapping.

4. Evaluate information and data, identify potential and need for action

Once the necessary information has been compiled on the various habitats, plants and animals occurring in the area, on the relevant plans, concepts and programmes and on the relevant stakeholders and their activities, the information has to be properly evaluated. This evaluation should clearly highlight the biodiversity existing in the area, and it should make it possible to assess the current condition of the diversity of the area's habitats and species. Then, the potential gains and opportunities that can be achieved by promoting biodiversity need to be highlighted, and the potential measures and obstacles that could hamper biodiversity need to be identified, all with a view to developing and offering potential solutions and paving the way for targeted efforts.

- Assessments of the current local condition of the area's biodiversity should focus especially on habitats and species.

[Box]

Surveys carried out in Bielefeld and Heidelberg under the UrbanNBS project
As part of the UrbanNBS project, the current situations in Heidelberg and Bielefeld were comprehensively analysed. This analysis focused especially on the following areas:
- **The current state of biodiversity**
- **Existing planning approaches and instruments**
- **Relevant stakeholders in the area of nature conservation**
- **Nature conservation projects, including both current and completed projects**
- **Maintenance schemes for public green spaces**

The results were then used as a basis for developing initial recommendations for the cities' biodiversity strategies. Heidelberg, for example, urgently needs to carry out formal biotope network planning in order to enable mixing of wild plant and animal populations. To this end, it needs to concentrate especially on the areas in its city centre. It also needs to identify and promote biotope network structures and "stepping-stone biotopes" (such as tree-lined avenues and grass verges) within its municipal boundaries.

The creation phase – defining goals and measures

The content – priorities of municipal biodiversity strategies

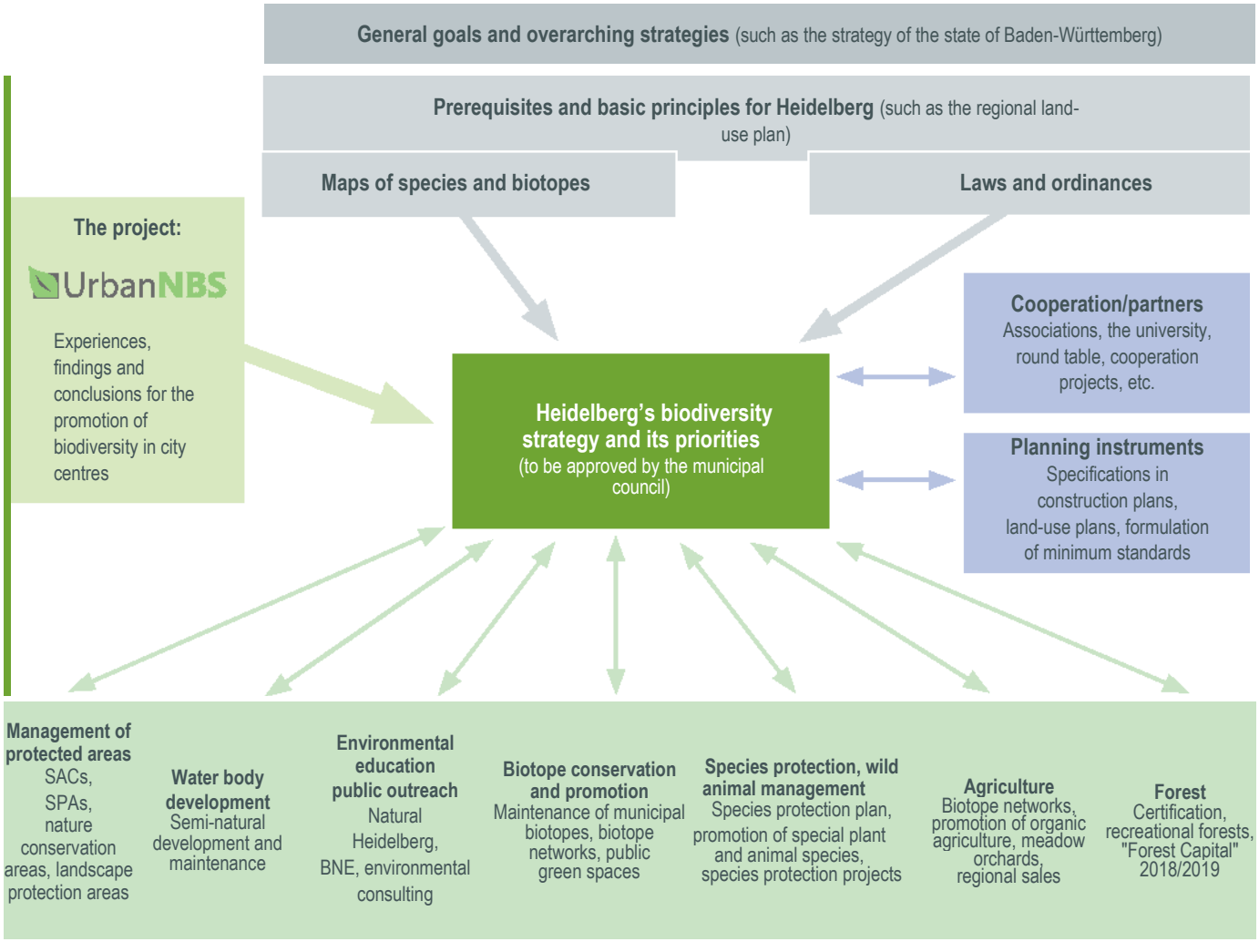
A municipal biodiversity strategy can define content priorities depending on the identified needs for action and potential for action (→ Section on analysis phase). Priorities can be oriented around spatial criteria, certain species, planning aspects or specific issues, or they can be geared towards environmental education.

Possible priorities:

- **Habitats**
- **Species and species groups**
- **Planning and decision-making processes**
- **Measures for environmental education and increasing acceptance**

As part of the UrbanNBS project, the city of Heidelberg has identified the cornerstones of its biodiversity strategy and defined various action areas within each category: protected area management, sustainable water body development, environmental education/public outreach, biotope conservation and promotion, species protection/wild animal management and agriculture and forests. In a next step, specific measures will be developed for these action areas.

Detailed information about selected action areas is available at **www.l.duh.de/urbannbs**.



Habitats

An important basis for biodiversity is the availability of sufficient areas where plants, animals and other organisms find habitats to meet their specific needs. In addition to the designation and management of protected areas and the preservation of valuable biotope types – e.g. dry, nutrient-poor sites or water ecosystems – it is particularly important to establish a high level of habitat diversity across the entire urban area. To this end, for example, the focus can be on typical urban habitats such as parks, cemeteries or green spaces along roads. These areas often hold great potential for the promotion of urban biodiversity without the need to use additional land. Another approach is to concentrate on certain urban structure types, i.e. areas characterised by typical building structures and open spaces. For example, industrial parks at the periphery of municipalities often offer large open areas with few or no conflicting uses. In addition, it can be useful to focus on open spaces in residential areas, including front and back yards and allotments (garden plots), since these areas often account for large portions of a municipality's green spaces. Furthermore, special attention should be given to areas that are rarely found in urban environments and have special characteristics – for example, semi-natural areas, succession areas or very large, interconnected areas. Of course, the focus can and must also be on areas used for agriculture and forestry.

[Box]

An example of habitat diversity promotion in Bielefeld
In Bielefeld's Grünzug Schloßhofbach area, measures were carried out in preparation for the development of a biodiversity strategy:
• For meadow areas, optimisation of wet or damp meadows (Frischwiesen) to improve living conditions for butterflies and grasshoppers has been defined as an objective. On various species-poor meadow areas, trials are underway with different mowing schedules and mowing regimes (mulching/mowing with removal of mowed material), along with sowing of four different regional seed mixtures.
• Achieving structural diversity in forest and forest-like areas is a special priority. To this end, old trees, hollow trees and dead wood are to be preserved and protected to the greatest possible extent. Special nesting boxes have been installed for bird species that nest in cavities – such as the Eurasian tawny owl (*Strix aluco*) and the common starling (*Sturnus vulgaris*) – and for bats. Along watercourses, special nesting boxes have been installed for the grey wagtail (*Motacilla cinerea*) and the white throated dipper (*Cinclus cinclus*).
• Hedges have been planted for birds that breed in hedges, and cairns and a nesting aid for insects have been put in place.
• A protection strategy for mushroom sites has been created.
• Along watercourses, suitable trees and shrubs have been planted and bank seams have been widened.

In city centres, management of green spaces has a special role to play in promoting biodiversity. An important starting point for green space management is to emphasise and highlight local differences. Currently, green space management often focuses on increasing biodiversity on individual sites. While this is a good approach, it can level out the diversity of the city as a whole. The next step is therefore to identify the local differences between individual areas and to highlight them by means of site-adapted maintenance.

The protection and improvement of existing areas generally offer many opportunities for promoting biodiversity. Scope for the development of new areas arises when changes in land use in residential areas are imminent that make proactive measures possible or even necessary. For example, in the context of conversion projects, redensification strategies, urban expansion projects or brownfield revitalisation, measures to protect biodiversity should be integrated into construction planning at an early stage.

It can also be feasible to formulate city-wide goals – for example, for the inclusion of animal-aided design (AAD) in the design of outdoor facilities and buildings in residential districts[21].

[21] *Apfelbeck B., Hauck T.E. et al. (2019): Animal-Aided Design im Wohnumfeld. Einbeziehung der Bedürfnisse von Tierarten in die Planung und Gestaltung städtischer Freiräume. Kassel, Munich.*

Species and species groups

Municipal biodiversity strategies normally include measures for the protection of certain species. These measures generally focus on improving the specific site and living conditions for the species in question, sometimes with a special emphasis on protected or endangered species (such as Red List species). In some cases, a municipality will have special responsibility for individual plant or animal species as a result of its good local conditions or its location within a regional centre of distribution of a particular species. For these species, protection programmes are often already in place that can be integrated into a biodiversity strategy.

Common wall lizard (Podarcis muralis) Photo: City of Heidelberg/R.Becker

"Flagship species", i.e. plants and animals that are very much in the public eye, either locally or regionally, are well suited for setting priorities for a biodiversity strategy. These species can help make communication of nature conservation goals more convincing and emotionally appealing, and thereby more able to mobilise support from local residents. Specifically highlighting these species and formulating measures for their protection and promotion can have the added benefit of indirectly promoting other species.

Preservation of genetic diversity should also play an important role in a municipal biodiversity strategy. Many plants and animals thrive and multiply in specific locations for many generations. Depending on the local climate, soil conditions and other factors, a species found in one area may differ in its typical regional genetic makeup from the same species found in a different area. This genetic variation within species is a component of biodiversity. It is important to take measures to preserve the specific adaptations to the local habitat and thus to preserve the regional gene pool. This involves the preservation of specific genetic variants of wild plants that are adapted to their region (protection through use of seeds and seedlings originating in the local area) and the protection of heirloom varieties of crops and old breeds of household pets.

Planning and decision-making processes

Various instruments of spatial planning and nature conservation provide the basis for integrating biodiversity into urban development. Which instruments are suitable for which purpose depends on many factors. For example, the scale level or the binding nature of the instrument play an important role.

The most important approaches for incorporating the main content of a municipal biodiversity strategy into urban development processes are to use spatial planning and nature conservation instruments, to link them to the strategy, and to set benchmarks and standards (→ Focus on: “Planning”).

Measures to promote acceptance

In addition to the implementation of specific measures, municipal biodiversity strategies also pursue measures that promote understanding, appreciation, acceptance, support and commitment for the protection of biodiversity in urban communities and encourage personal initiative among local residents (→ Focus on: “Stakeholders”). The range of possible approaches is broad, and a number of stakeholders can be considered or involved. For example, a strategy can focus strongly on promoting citizen science, on raising public awareness (→ Section “Public outreach”) or on encouraging private efforts and initiatives. These priorities can then be translated into different types of measures at different locations throughout the municipal area.

Sign on a biotope tree in Hildesheim. Source: Martin Rudolph/kommbio

Environmental education in particular plays an important role in municipal biodiversity strategies. Environmental education describes a broad spectrum of measures. These measures are designed to help children and young people, who often grow up far away from nature in the city, to appreciate urban nature and become involved in its conservation. But environmental education can also help adults (re-)discover a love of nature and give greater consideration to biodiversity criteria in designing and tending to their own gardens and other private outdoor spaces.

Possible measures should focus on the direct living environment of city residents, different cultural backgrounds and knowledge levels as well as possible barriers to access for different activities. Different population groups need to be specifically targeted and their different possibilities for participation in biodiversity projects taken into account. Generally speaking, measures are more likely to be successful if what is learned can be directly linked to people's own lives. Environmental education measures outlined in the strategy can range from information – for example through leaflets, descriptions on the municipality's website or signposting in the area – to excursions and nature discovery trails, "green classrooms", environmental education facilities or nature discovery spaces for children and young people. In this context, it is advantageous when these activities also reach people on an emotional level.

Nature discovery area at Berlin's Ostpark. Source: wikipedia.de, Lienhard Schulz, CC BY-SA 3.0

The strategy paper

A municipal biodiversity strategy reflects the specific conditions, priorities and intentions of a municipality. The development process, structure, scope and format of the strategy paper are usually different, as is the range of content.

There are generally two alternatives, although other solutions are also possible:

Biodiversity strategies with comprehensive content

Most of the existing biodiversity strategies cover all key issues in one fell swoop. In the process, measures are developed for all of the above-mentioned topics. The advantage of this approach is that it provides a comprehensive overview. Possible synergies and conflicting goals can also be better identified. However, the coordination processes also take longer and are more complicated. Updating and additions can require partial or complete revisions.

Modularly structured biodiversity strategies

The creation of a modularly structured biodiversity strategy begins with the development of a basic strategy that defines the framework for action. Then, strategies for individual areas that are especially important or that otherwise need to be given priority are developed – such as especially important biotope types or species or current priorities of the municipality's development. Additional topics are added step by step. The advantage of this modular form is that the strategy can be developed in a phased approach that is adapted to the available resources. Another advantage of the modular variant is that it can be flexibly updated. This allows current developments and discussions, which are also very present in politics and the public domain, to be taken up in the strategy.

[Box]

The structure and creation of the city of Bielefeld's biodiversity strategy

The initiative for the creation of a municipal biodiversity strategy in Bielefeld came from the environment agency (Umweltamt), which also assumed responsibility for its coordination. From the beginning, it seemed advisable to involve the agency in Bielefeld's environmental services enterprise that is responsible for the management and maintenance of the city's green spaces. This led to the establishment of an extended strategy team to which experts for green space management also contributed their ideas.

After many internal preliminary discussions, an externally facilitated workshop finally took place to determine the structure and content priorities of the biodiversity strategy. The discussion process resulted in a modular structure for the municipal biodiversity strategy in Bielefeld. Spatially, it covers the entire city and includes both open spaces as well as built-up areas. In addition to providing an overview of past and current activities as well as the current status of biodiversity in Bielefeld, the strategy will also define overarching goals and very specific measures.

The work plan comprises the following steps:

1. Workshop with local nature conservation stakeholders
2. Provisional definition and prioritisation of the planned modules
3. Development and approval of the planned modules in consultation with the affected stakeholders
4. Draft of a municipal biodiversity strategy for Bielefeld with a general section and initial modules
5. Political consultations
6. Public event for presentation of the biodiversity strategy

This initial process has led to the creation of an informational document for the city's environment and climate action committee (Ausschuss für Umwelt und Klimaschutz – AfUK). The document describes the planned biodiversity strategy's focus and structure, lists key stakeholders and outlines the steps to be taken in creating the strategy.

In some cases, it is advisable not to develop a municipal biodiversity strategy as an independent document, but to link strategic guidelines for protecting and fostering biodiversity to existing or newly developed municipal concepts (e.g. urban development concept, green space development concept) or to existing planning instruments (e.g. landscape plan). A disadvantage of this approach, however, is that it tends to have limited external visibility.

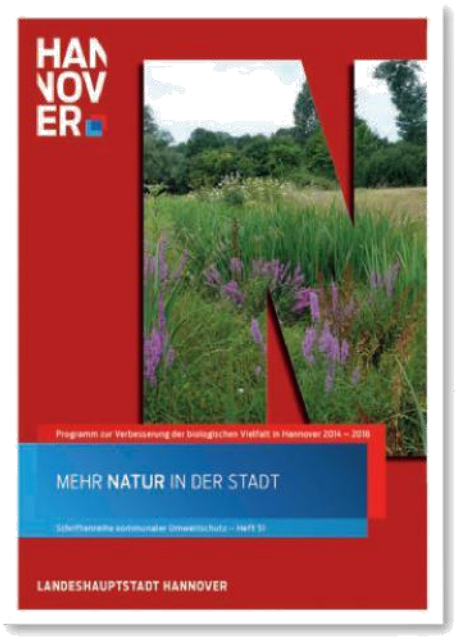
Action plan

The important components of a municipal biodiversity strategy include an action plan for the integration and implementation of the strategy. An action plan should include a schedule indicating when – and by whom – planned measures are to be implemented and how the measures are to be financed. This kind of action plan can either be 33part of the actual strategy paper itself or it can be introduced as an additional step in during implementation.

Monitoring and evaluation concept

A monitoring and evaluation concept for reviewing the formulated goals and measures can also be included in a municipal biodiversity strategy. In addition to reviewing the success of relevant efforts, monitoring provides a solid basis for any planned updates to the municipal biodiversity strategy (→ Monitoring and evaluation).

Depending on the goals to be achieved and the target groups to be addressed, there are different ways to draft and present a municipal biodiversity strategy. It is important to find the appropriate language and format. For example, an internal biodiversity strategy focuses on objective information, facts and the formulation of specific goals. A strategy that is aimed at a broader public and that focuses on informing and educating city residents about biodiversity should be clear and easy to understand, and should also appeal to the emotional level. Ideally, it has a clear, positive and catchy title like “More nature in our city”[22] or “Diversity connects – the local implementation strategy for the Vaterstetten model community”[23]. The strategy’s intended audience and its regional references should be clear in each case.



Cover pages of successful biodiversity strategies. Sources: Hanover (state capital), the City of Nuremberg

[22] *Landeshauptstadt Hannover (2015): Programm zur Verbesserung der biologischen Vielfalt in Hannover 2014–2018 (Programme to improve biodiversity in Hanover 2014-2018). Mehr Natur in der Stadt. Schriftenreihe kommunaler Umweltschutz 51.*

[23] *Gemeinde Vaterstetten (n.y.): Vielfalt verbindet – Modellgemeinde Vaterstetten Lokale Umsetzungsstrategie. (Local implementation strategy for the city of Vaterstetten)*

Implementing a municipal biodiversity strategy

Communicating the strategy – public outreach

Effective public outreach can play a key role in communicating a biodiversity strategy's goals, and thereby fostering acceptance and appreciation for its measures. Various channels can be used for this communication depending on the target groups and intended audience. In many cases, special informational events are held as a complement to media relations and online publicity. City festivals and town hall meetings can also serve as platforms for informing the public about a strategy. Other options for presenting information about biodiversity and a municipal biodiversity strategy include exhibitions, excursions, brochures, information boards and apps. Information can also be communicated through influencers (such as representatives of nature conservation associations, and teachers).

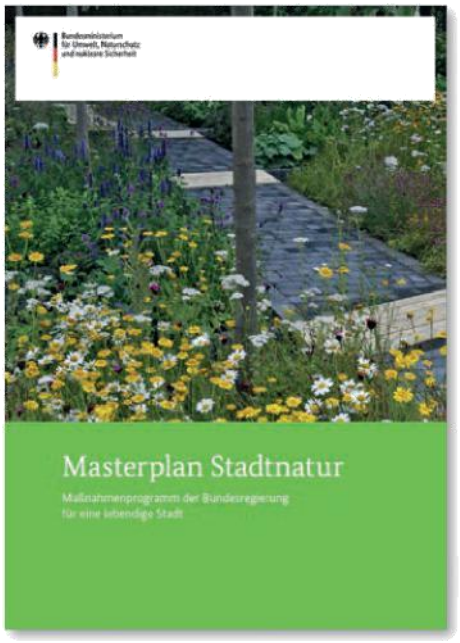
And the creation of a municipal biodiversity strategy offers many opportunities to make the subject more widely known. When a strategy is implemented, many opportunities will arise for sharing knowledge and cultivating a positive public image of biodiversity. These opportunities can present themselves, for example, when areas are being redesigned (→ Focus on: "Stakeholders, public participation, public outreach").

Financing measures

Many options are available for financing the implementation of specific measures. These options should be considered early on when a strategy is being defined and created.

First, the scope of the municipal budget must be used and the respective financing needs must be integrated into long-term planning. Furthermore, specific measures of a municipal biodiversity strategy in urban areas can also be financed with funds available from compensation for interventions in nature and landscapes (Eingriffs-Ausgleich-Regelung). Compensation measures can be implemented at an earlier stage and compensation funds can even be pooled. The prerequisite is that the areas are permanently secured, usually through municipal acquisition or contracts with private individuals.

Note: The German government's 2019 Master Plan for Urban Nature ("Stadtnatur") stipulated creation of a new "urban nature" funding priority in the Federal Biodiversity Programme. The new funding priority will be established sometime in 2021. The funding priority, which is geared towards municipalities (and others), covers projects for development and implementation of municipal concepts and strategies for biodiversity, and it includes funding for advisory services for staff on the implementation of municipal open-space and biodiversity concepts.



Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Ed.) (2019): Masterplan Stadtnatur – Maßnahmenprogramm der Bundesregierung für eine lebendige Stadt (Master Plan for Urban Nature – federal measures programme for a living city) Available online at https://www.bmu.de/publikati-on/masterplan-stadtnatur/ (last accessed: 25 June 2020)

Cover pages: "Projekte des Bundesprogramms biologische Vielfalt" (Federal Agency for Nature Conservation (Ed.) (2016) and Master Plan for Urban Nature (see above)

In addition to municipal budget funds, funding from the EU, the German government or the Länder (federal states) can be used. These are specific programmes or campaigns that focus on biodiversity, green space development and urban nature conservation. Funding from urban development programmes (Städtebauförderung) can also be used to finance measures that promote biodiversity[24].

How much does semi-natural meadow management cost?

Determining the costs under the UrbanNBS project in Bielefeld

The department for green space management and training (Abteilung Grünunterhaltung und Ausbildung), in the city of Bielefeld's environmental services enterprise (Umweltbetrieb Bielefeld) has politically approved management plans for all of the city's green spaces and outdoor facilities. For each of the relevant 2,000 spaces and facilities in Bielefeld – including green spaces, playgrounds, roadside greenery, sports fields and school grounds – the management plans specify the locations where maintenance is required (managed units such as lawns, meadows, paved areas) and the specific tasks that are to be carried out (such as mowing grass). In addition, for each individual task, the time required is specified in minutes per work unit and year, so that the sum of the individual task types results in the annual time spent on the management unit as a time value.

Before the project began, Bielefeld had no data about the time required for the semi-natural management of green spaces. For this reason, the aims of the UrbanNBS project included generating this data in order to provide a basis for calculating the costs of future adjustments in the management of outdoor spaces. The resulting calculations will provide a solid foundation for future policy decisions.

To provide a means of obtaining the required data, a detailed data collection system was introduced, and municipal staff were trained in its use. The new system recorded in detail the tasks carried out in each relevant area. The resulting detailed records, which covered a two-year period, then served as a basis for determining the required time investments. This detailed recording over two years then served as the basis for the calculation of the costs. This makes it possible to calculate the time required – for example, for the creation of a flowering meadow area and for mowing with removal (as the future regular maintenance of a [flowering] meadow area).

Prior to the change of management practices, management in the project area based on two different types of management units:

Management units OLD

Level	Management unit	Total time, in minutes/m²/a
L3Bi	1110 Functional turf/maintenance of short-mown turfgrass	0.63
L3Bi	1130 Meadow/mulch mowing	0.08

After switching to semi-natural area management, the units were reallocated and time values were determined:

Management units NEW

Level	Management unit	Total time, in minutes/m²/a
L3Bi	N 1131 Meadow/mowing with collection (2x/a)	0.25
L3Bi	N 1143 Flowering meadow, perennial/oligotrophic (1x/a)	0.20
L3Bi	N 1144 Flowering meadow, perennial/high	0.32
L3Bi	N 1141 Flowering meadow, annual/oligotrophic (1x/a)	0.38
L3Bi	N 1142 Flowering meadow, annual/high fertility	0.50

The data and calculations show that the total time required for a naturally managed area (0.20 – 0.50 min./m²/a) ranges between the time needed to manage a meadow with mulch mowing (0.08 min./m²/a) and the time required for maintaining a functional turf area with short-mown turfgrass (0.63 min./m²/a). In the future, the plan is to use this result to compensate for the costs of semi-natural meadow maintenance in the creation of a (flowering) meadow concept by converting intensively used lawns.

[24] *Rößler S., Böhme E. et al. (2018): Biologische Vielfalt und Naturschutz im Förderprogramm Stadtumbau. BfN-Skripten 493. https://www.bfn.de/fileadmin/BfN/service/Dokumente/skrip-ten/Skript493.pdf (last accessed: 6 March 2020).*

In addition, investments in green and open spaces and the protection of biodiversity have found their way into the annual administrative agreements on funding for urban development of the federal and state governments.[25]

For many municipalities, long-term maintenance of semi-natural areas poses a challenge. How maintenance and management are organised and financed plays a decisive role in the success of these management measures and must be considered from the outset, as funding from subsidies is usually not possible. This applies, for example, to measures in existing buildings, which may increase costs. In addition to requiring adequate financing, successful implementation depends on the availability of staff at the relevant offices and municipally owned companies. For this reason, it is important to convince associations, educational institutions and/or housing associations to support individual measures – either with funding or with personnel (→ Focus on: "Stakeholders, public participation, public outreach").

However, the commitment of private individuals or companies can also contribute to the implementation of individual measures for the promotion of urban biodiversity (→ Focus on: "Stakeholders, public participation, public outreach"). These collaborative efforts can lead to unconventional funding and financing opportunities.

Note: Detailed information about options for funding and financing is available at:
www.l.duh.de/urbannbs

Monitoring and evaluation – assessing progress and adapting measures

Monitoring and evaluation make it possible to continuously review whether the planned measures are being successfully implemented and whether the goals and priorities of the strategy are still on target. While overall goals usually remain the same, more detailed goals can be successfully completed. New conditions or needs may arise as the project progresses. Measures that do not bring the hoped-for success may require changes. To monitor success and assess the need for future action, it is helpful to have a practical monitoring and evaluation concept, which should ideally be an integral part of a municipal biodiversity strategy.

Definitions: "Monitoring of biodiversity" means systematically recording, measuring and observing biotope structures and populations of plants and animals. "Evaluation" refers to the assessment and review of this information; it serves as a means of determining the success of measures against the defined goals.

In the context of monitoring, changes are recorded and measured using criteria or indicators. Indicators that show changes as representatively as possible and that require little effort to record are well suited. This information is then assessed and evaluated. When monitoring and evaluating a biodiversity strategy, it is important to consider both the process and the impact level. The question is therefore which tangible impacts have been achieved, which measures have made a particularly effective contribution and which obstacles have arisen in the process. This exposes weaknesses, and measures can be readjusted accordingly. But the accomplishments also become visible and are now backed by facts and figures.

The following topics are recommended for a monitoring and evaluation concept, ideally with relevant information and data being collected, updated and evaluated on an ongoing basis: important biotope structures and habitats; species diversity based on selected indicator species; activities that foster biodiversity.

[25] *Federal Ministry of the Interior, Building and Community: federal and state funding for urban development. https://www.staedtebauf o-erderung.info/StBauF/ DE/Home/home_node. html (last accessed: 6 March 2020).*

Monitoring of important biotope structures and habitats

The indicators for important biotope structures that characterise a city and are of key importance for the promotion of biodiversity should be selected in such a way that they can be collected with reasonable effort and using relatively simple means. For example, aerial and satellite images can be used for analysis. Sometimes these can be analysed using inexpensive automated methods that are available to planning offices, for example.

Aerial photograph of the Bielefeld city centre. Source: Geobasis NRW – data licence "Deutschland – Zero" (https://www.govdata.de/dl-de/zero-2-0)

Monitoring of biodiversity on the basis of selected indicator species

While many types of data on biotope structures and habitats can be gathered using relatively simple methods, monitoring of plant and animal species tends to be more involved and time-consuming, and it not infrequently calls for special expertise. Since monitoring includes regular inventories to make it possible to observe current and continuing trends, it is necessary to carefully select which species are to be continuously recorded and how much effort is required. This depends on the goals of the municipal biodiversity strategy as well as on the local conditions and characteristics. To determine the impact of a municipal biodiversity strategy, not every single animal and plant in the relevant area needs to be counted. The aim is rather to compile a set of "observation species" that reflects in its composition the most diverse aspects and correlations of biodiversity development in the municipality. For example, sample plots representing different ecological conditions can also be defined over the entire urban area. On these areas, more extensive surveys are possible with reasonable effort. Support for mapping can be found from universities (theses), conservation organisations, and/or volunteers (citizen science), as appropriate. For some species groups, automated apps can also be used for identification.

Note: Explanations and an overview of the types of information/indicators and data that monitoring should cover are available at: **www.l.duh.de**.

Monitoring of activities that promote biodiversity

As part of the monitoring, for example, planning measures, specific species and nature conservation measures on the ground as well as management measures, public outreach, environmental biology, governance and participation, financing, data collection and research can all be recorded. In the best case, the success of the activities/measures can be indirectly represented by the indicators of the monitoring of structures and species. However, it is often also relevant to know how much effort is required. In addition, the development of habitats and plant and animal species populations cannot usually be specifically assigned to individual measures. Not all of these indicators need to be collected in every case. They should be selected based on the respective goals of the municipal biodiversity strategy and the local conditions in the municipality. To ensure effective implementation, the responsibilities for the individual tasks of monitoring should also be clearly defined. In the case of modular biodiversity strategies, it is recommended that the monitoring and evaluation concept be aligned with the modules.

Example of a monitoring concept: Gütersloh

To get a good overview even with limited staff capacities, the city of Gütersloh's biodiversity strategy[26] proposes the following plan for population surveys:

- **Year 1:** Small water bodies, amphibians and reptiles, meadow bird species: northern lapwing (*Vanellus vanellus*)
- **Year 2:** Trees with cavities and nest/aeries, forest birds (including the "responsibility species" Eurasian jackdaw (*Corvus monedula*), stock dove (*Columba oenas*), Eurasian tawny owl (*Strix aluco*)); meadow bird species: little owl (*Athene noctua*)
- **Year 3:** Epiphytic mosses and lichens, field birds (including the "responsibility species" grey partridge (*Perdix perdix*), meadow bird species: Eurasian curlew (*Numenius arquata*)
- **Year 4:** Aquatic birds; meadow bird species: northern lapwing (*Vanellus vanellus*)
- **Year 5:** Bat roosts and bird species that nest on buildings west of the railway line (including the "responsibility species" Eurasian swift (*Apus apus*), common barn owl (*Tyto alba*); meadow bird species: little owl (*Athene noctua*)
- **Year 6:** Bird species that nest on buildings east of the railway line (including the "responsibility species" Eurasian swift (*Apus apus*), common barn own (Tyto alba), meadow bird species: Eurasian curlew (*Numenius arquata*)
- **Year 7:** Biotopes (legally protected biotopes, and others); meadow bird species: northern lapwing (*Vanellus vanellus*)
- **Year 8:** Village flora; meadow bird species: little owl (*Athene noctua*)
- **Year 9:** Field flora, flora and fauna (birds, dragonflies, butterflies, grasshoppers) of the riparian strips and field margins, meadow bird species: Eurasian curlew (*Numenius arquata*)
- **Year 10:** Flora and fauna (birds, dragonflies, butterflies, grasshoppers) of parks and green spaces, meadow bird species: northern lapwing (Vanellus vanellus)

The remaining indicators for biodiversity are to be updated at the following intervals:

- **Land use: 5-year intervals**
- **Areas of intervention: 2-year intervals**
- **Protected areas: 5-year intervals**
- **Groundwater protection: annually**
- **Riparian strips: 5-year intervals**
- **Ecological quality of water bodies: 6-year intervals**
- **Local unfragmented areas with little traffic: 5-year intervals (or when changes occur)**

[26] *City of Gütersloh – Environmental Protection Department (2015): Lebendiges Gütersloh: Pflanzen, Tiere, Biotope – Das Programm zur Bewahrung der Biologischen Vielfalt in der Stadt Gütersloh (Bio-diversitätsprogramm Gütersloh). Gütersloh. 82.*

Interview with Rüdiger Becker, from the city of Heidelberg's Office of Environmental Protection, Trade Supervision and Energy (Amt für Umweltschutz, Gewerbeaufsicht und Energie)

Mr Becker, in your former role as head of the nature and landscape conservation department, which is part of the Office of Environmental Protection, Trade Supervision and Energy, you were responsible for Heidelberg's UrbanNBS project*. What led you to want a biodiversity strategy for Heidelberg, and how did you think the city would benefit from this strategy?

Heidelberg is still at a very early phase in its efforts to draw up a biodiversity strategy. So far, we have defined the strategy's cornerstones, meaning we have identified the areas that the strategy should focus on. In July 2019, we held an event with the aim of identifying the initial details of these cornerstones. This event also kicked off subsequent working group meetings held between August and the end of October 2019. Participants at these events included representatives of various bodies, including municipal offices, the University of Heidelberg, the local University of Education, churches and nature conservation associations, and various farmers and nature conservation officers. In a total of five meetings, goals, measures and target species were jointly defined for the cornerstones.

We have been motivated to develop a strategy for quite some time. The UrbanNBS project has once again made it clear how useful a biodiversity strategy can be. We hope that the biodiversity strategy will be binding for all projects within the administration. This would mean that the nature conservation administration would not have to repeatedly discuss the appropriateness of nature conservation or species protection measures, and how and to what extent they should be carried out. The aim instead is to ensure that the interests of nature conservation and species protection are taken into account by all stakeholders early on in the planning phase in order to preserve our local biodiversity. Experience shows that as planning progresses, or even during its implementation, it becomes increasingly difficult to implement meaningful and effective biodiversity measures. For this reason, we consider the biodiversity strategy to be the right way to counteract the loss of species more effectively.

In addition, we want to create more public awareness for biodiversity through targeted public outreach, for example, by presenting the measures we are implementing as part of the biodiversity strategy in the press or on information boards. This is also intended to motivate the public to implement measures on their own in their own gardens or on their balconies.

What advice would you give to other cities seeking to put a municipal biodiversity strategy in place? What are the biggest obstacles involved?

My advice would be to get in touch with key stakeholders – such as nature conservation associations – as early as possible when development of the relevant cornerstones begins. And I would announce internally that a strategy is planned and the relevant offices will soon be contacted to coordinate goals and measures.

While it is not realistic to expect all concerned parties to welcome these kinds of projects unconditionally, acceptance can be encouraged by providing information early on in the process. In addition, it certainly makes sense for this information to be communicated to the heads of the administrations. In ideal cases, administrative heads can be enlisted to communicate the information to their staffs.

... and how have local policymakers reacted?

Experience has shown that the issue of sustainability and the related goals and measures have been positively received here in Heidelberg. I am therefore optimistic that a strategy created in agreement with all stakeholders will meet with approval, especially since issues such as land consumption, green spaces and insect decline play a major role in many projects.

Has the strategy development process raised awareness of biodiversity among policymakers, administrations and local residents? Has the response been positive?

It's still too early to tell. We won't know until the strategy has been agreed and then approved by our municipal council. That said, in earlier projects for biodiversity, such as the UrbanNBS project, I found that participating stakeholders –schools, allotment gardeners' associations, sports clubs, government offices, private individuals and others – were generally mostly in favour of the project even if it was ultimately not possible to implement all the measures..

The word "biodiversity" is used more and more often in cooperation with public authorities and in current planning, and efforts can be seen that give hope for more cooperation in the future.

Mr Becker, thank you for this interview!

***** In the meantime, the Biodiversity Strategy Heidelberg - Cornerstones - Goals – Measures is finished and was adopted in March 2021.

3. Focus on: “Stakeholders, public participation, public outreach”

If a municipal biodiversity strategy is to be successfully implemented, it has to meet with the acceptance and approval of the local government and the local residents. Stakeholders should therefore be informed well in advance that a municipal biodiversity strategy will be developed, also with a view to the subsequent implementation of the strategy. This will enable them to be involved in the development of the strategy early on. In addition, the issues of biodiversity appreciation and acceptance can also be independent goals or priorities of a municipal biodiversity strategy.

Important stakeholders

Municipalities normally have a wide range of stakeholders who can participate in both the development and implementation of a municipal biodiversity strategy. As the numbers of qualified individuals and groups who can be included in the project grows, so does the breadth of expertise that can flow into the effort. For this reason, it is a good idea to bring key stakeholders on board as soon as strategy development gets underway. It is particularly important to involve those who are to perform tasks in the implementation of the biodiversity strategy. The overall aim should be to enable relevant individuals and groups who are already playing an active role in the municipality to take part in the effort. The people and groups to consider include personnel in various administrative units and other municipal institutions, civil society actors, such as associations and clubs, as well as companies and/or private individuals. In some cases, it may be advisable to involve additional experts.

To determine whether this is necessary, the following questions are relevant: Does the project call for experts with special types of knowledge? Should existing round table groups or other, similar existing platforms for discussion be incorporated for the duration of the strategy development period? Should associations and clubs be encouraged to participate in implementation later on? The participating individuals and groups should be kept regularly informed, even if they are only actively involved over a period of time.

Cooperation with farmers, like here in Bielefeld, often benefits all sides. Source: Bielefeld environmental agency

Municipal administrations and municipal enterprises

Administrations for municipal properties, cemeteries, forests and schools are important especially in terms of the availability of and responsibility for land. Cooperation with the local parks department and the various municipal enterprises is also a crucial success factor, especially when it comes to the management of city-owned green spaces. Along with parks and green corridors, this usually includes roadside trees, areas of greenery lining roads, as well as herbaceous borders and other planted vegetation. This offers considerable potential for the promotion of biodiversity, for example by selecting suitable plants or adapting maintenance practices. This means that municipal enterprises are important partners when specific measures are implemented because small changes in management can make a big difference, especially if it is possible to convince the staff responsible for implementation of the added value of the changed approach. In addition, the local offices for municipal planning and construction should also be brought on board and made aware of the value of a biodiversity strategy. This helps ensure that biodiversity criteria are taken into account when creating integrated urban development concepts, land-use plans, zoning plans and urban renewal concepts.

Changes in tree management regimens can allow old trees to be preserved as a habitat for many years to come. Source: Martin Rudolph, Kommbio

Municipal institutions – educational facilities, housing associations

Municipal institutions play an important role in two respects: first, they often own properties. For example, municipal housing associations can contribute to fostering biodiversity through the design and management of their grounds or by installing nesting aids for building-breeding animals (e.g. swifts or bats). Second, public institutions are often important influencers: schools and kindergartens can be approached when it comes to measures for discovering nature and environmental education, but also for the formation of small biotopes on their properties. Universities can be involved in data collection. Surveys and mapping, for example as part of field work or final year projects, can provide the basis for the development of a municipal biodiversity strategy and, in particular, for subsequent monitoring.

Civil society – clubs and associations, private individuals

In addition to full-time nature conservation staff, many municipalities have clubs, associations and/or private individuals who voluntarily – and often, over long periods – help protect and maintain biotopes, plants and animals. It is important to identify these stakeholders, to learn about their skills, knowledge and interests and, where possible or necessary, to engage them in creating and implementing the strategy. Local nature conservation associations generally prove to be highly motivated partners with high levels of expertise in the protection of special species, the maintenance and management of special biotopes and efforts to raise public awareness

through events such as excursions or guided tours. Cooperative efforts in which the municipality partners with clubs or associations are also an option. For example, it is possible for associations to assume responsibility for specific tasks in the protection of valuable habitats through maintenance agreements, with the municipality providing for the removal of the mown material in return.

But each individual has an important role to play in the implementation of a biodiversity strategy. Knowledge and understanding are important prerequisites for long-term acceptance and, at best, active support of individual measures to promote urban biodiversity. Private individuals are also important stakeholders when it comes to implementing specific measures on their own. Private gardens often represent a large part of the green and open spaces in a community. Unfortunately, there are no exact figures for Germany, but it has been calculated for British cities that private gardens account for 19 to 27 percent of the total urban area[27]. In quantitative terms, these areas also offer great potential for implementing measures to foster biodiversity.

Urban garden with rich structures and high biodiversity. Photo: Janos Wieland

[27] *Smith R.M., Warren P.H. et al. (2006): Urban domestic gardens (VI): Environmental correlates of invertebrate species richness. Biodiversity and Conservation 15: 2415-2438.*

[28] *Bavarian Academy for Nature Conservation and Landscape Management (Ed.) (2018): Unternehmen Natur. Naturnahe Gestaltung von Firmenflächen – Worin liegt der Mehrwert für Natur und Wirtschaft? Von der Idee bis zur Umsetzung. Laufen. https://www.anl.bayern.de/projekte/unternehmen_natur/doc/leitfaden_unternehmen_natur_v05_web_endkorr_gepr. pdf (last accessed: 11 March 2020).*

The private sector

Commercial and industrial enterprises also often have large areas of land, especially on the edges of urban areas where they transition to open countryside. Car parks, clearance zones, storage areas, areas for expansion, but also the sometimes large surfaces of buildings offer great potential for implementing measures to foster biodiversity. At the same time, the locations become more attractive for employees and visitors. Furthermore, companies can also be actively enlisted to finance specific measures and activities[28].

Agriculture and forestry

Similarly, agriculture, horticulture and forestry are important partners in the context of a municipal biodiversity strategy, as they manage large areas of land. More and more municipal forests are being certified and contain natural forest cells. The city of Frankfurt has included a biodiversity clause[29] in lease agreements with farmers. The city of Hanover has launched its own urban agriculture programme[30].

Public participation in strategy development

Whether, when, to what extent and in what form the city's inhabitants are involved in the strategy development process depends on a city's particular goals and context. Participatory processes with the public can be carried out as part of strategy development. Participation processes have high added value (e.g. with regard to the acceptance of measures) if the goals, framework and methods are clearly defined in advance, and if sufficient technical and financial resources are available to organise the processes professionally well ahead of time. Poorly managed participation, on the other hand, leads to frustration on all sides and complicates the processes. This must be avoided at all costs.

Forms of participation for the creation of municipal biodiversity strategies

- **Workshops to inform local residents and enable them to contribute their own ideas to the municipal biodiversity strategy**
- **Round table formats to which selected groups (e.g. experts in specific fields) are regularly invited to discuss certain issues.**
- **Online platforms where information is provided and opinions expressed**
- **Online, household and park visitor surveys, etc.**

Information on organising participatory processes, including opportunities and risks, can be found, for example, in the "Handbuch Bürgerbeteiligung" [31] (Public participation manual) issued by the Federal Agency for Civic Education (Bundeszentrale für politische Bildung) and in the brochure "Umweltgerechtigkeit durch Partizipation auf Augenhöhe"[32] (Environmental justice through equal participation) published by Deutsche Umwelthilfe.

Some ideas for improving the way participation processes are handled internally and externally can be found at: http://urban-nbs.de/veranstaltungen/berichte/2-fachtagung-mehr-natur-in-der-stadt-neue-ziele-neue-wege/labor-3-beteiligen

Public outreach

Public outreach plays a key role in fostering public acceptance and support for the promotion of biodiversity, and in keeping the topics and visions associated with a biodiversity strategy in the public eye. The factors that determine the success of a biodiversity strategy include strong, active, ongoing communication. There is no universal answer to the question of which channels and formats are suitable for which situation or target group. A steady stream of information can be provided by press releases, short communications in the local official journal and posts to social media. Park festivals, district festivals and outdoor markets can all serve as venues for providing information and practical tips about biodiversity, at stands/tables or through special promotions. Advisory services available from allotment gardeners associations, publicly available lists of recommended trees and shrubs, distribution of special, regionally adapted seed mixtures and plants at cost and excursions and exhibitions are often enthusiastically received by local residents.

Measures such as planting wildflower meadows and flower strips is also a great way to create a positive image. In addition, having associations and private individuals "adopt" (sponsor) trees and green spaces is also an excellent way to keep "biodiversity in the city" in the public eye. Finally, in efforts to convince the public of the importance of a municipal biodiversity strategy, it can be useful to focus on current political trends and issues in the public debate – such as the decline of insect populations and the best way to deal with the pesticide glyphosate ("Pesticide-free municipality").

[29] *City of Frankfurt – environment agency; 2014: Biodiversitätsklausel im Pachtvertrag der Stadt Frankfurt am Main – ein Beispiel zur kommunalen Biodiversitätssicherung (biodiversity clause in the leasing agreement of the city Frankfurt am Main – an example of a municipal effort to protect biodiversity). Lecture by Peter Dommermuth, head of Frankfurt's environment agency, at the expert conference "Natur in der Stadt – Stand und Perspektiven zur ökologischen Funktion des kommunalen Grüns" ("Nature in the city – status and perspectives relative to the ecological function of municipal greenery"). June 26, 2014. Heilbronn. https://www.bbn-on-lie.de/fileadmin/Service/8_2%20Veroeffentlichungen/Natur_in_der_Stadt_2014/8_0_Biodiversitaetsklausel_Frankfurt_a_M_Dommermuth.pdf (last accessed:11 March 2020).*

[30] *Regional capital Hanover (Ed.) (2017): Agrikulturprogramm 2017 für Hannover (2017 agriculture programme for Hannover). https://www.hannover.de/Leben-in-der-Region-Hannover/Umwelt-Nachhaltigkeit/Naturschutz/Aufgaben-Projekte/Das-Agrikulturprogramm-f%C3%BCr-Hannover (last accessed: 6 March 2020)*

[31] *Nanz P., Fritsche M. (2012): Handbuch Bürgerbeteiligung. Verfahren und Akteure, Chancen und Grenzen. Bundeszentrale für politische Bildung. Bonn. https://www.bpb.de/system/files/dokument_pdf/Handbuch_Buergerbeteiligung.pdf (last accessed: 7 April 2020).*

[32] *Partzsch K., Wissel J.,*