AAD

ANIMAL AIDED DESIGN

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THOMAS E. HAUCK & WOLFGANGW.WEISSER

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Prof. Dr WolfgangW. Weisser, Chair for Terrestrial Ecology,
Technical University of Munich
Dr.-Ing.Thomas E. Hauck, Chair of Landscape Architecture and
public space, Technical University of Munich (until March 2014) Department
of Open Space Planning, University of Kassel (since April 2014)
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Short student drafts: Oliver Ferger, Julius Peisl, Benedikt Radlmeier, ElisabethThiel, as part of a short draft at the Chair of Landscape Architecture and Public Space under the supervision of Thomas E. Hauck, WolfgangW. Weisser
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Anja Hoehl, Martin von Roeder, AgnesWagner
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Dr. Norbert Schäffer, Royal Society for the Protection of Birds, UK
SylviaWeber, State Association for Bird Protection in Bavaria
Dr. Sophie Engel, State Association for Bird Protection in Bavaria
Dr. Andreas Zahn, Coordination Office for Bat Protection in Southern Bavaria PD
Dr WolfgangVölkl
Dr. Gabriela Jofré, Amphibian and Reptile Ecologist

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Dr. Cordelia Polinna, Polinna Hauck Landscape + Urbanism
Tobias Goevert, Greater London Authority
R +,) * #,
Stefan Feller, Project Manager Special Projects and GIS, GEWOFAG Holding GmbH, Hechenbichler Architects
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Barbara Markstein, Ecology & Planning, Landscape Architect and Landscape Planner,
Dipl.-Geogr. Benjamin Büttner, Department of Settlement Structure and Traffic Planning, TUM
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Prof. Dr Tanja Gschlößl
N! RIJI4G1NGI: E% N & _IZFH7JK
Brigitte Grimm, TUM
Katharina Fuchs, StMUV

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ANIMAL-AIDED DESIGN

The core idea of Animal Aided Design (AAD for short) is to plan the occurrence of animals integratively as part of the design of an open space. When animals become part of the design, they can inspire the design and enable better design. AAD requires a reorientation of the planning process. Animals are no longer drawn in at the end, when the planning has actually already been completed, but animals and their occurrence are an integral part of the design planning. At the beginning of the draft planning there is the question, which animals should appear in the open space? The occurrence of animals is therefore on an equal footing with all other necessary planning decisions such as whether a public place should offer a playground,

For the designer, Animal Aided Design is not a restriction of his planning options, but an extension. With the help of Animal Aided Design, the planner deals with the demands of an animal species and ensures that the intended species can actually occur in the specific case, instead of leaving the occurrence of animals to chance as usual. The needs of the animals serve as inspiration and not as a limitation of the design. How this can work is shown in this publication.

Animal Aided Design is particularly suitable for urban areas and can be used in a variety of planning fields: from climatic building renovation to the small-scale redesign of an inner courtyard to the planning of spacious parks. Animal Aided Design can also help bring nature conservation and urban planning closer together when implementing compensatory measures. Animal Aided Design is attractive from a nature conservation point of view, as it allows new habitats to be created for animals where otherwise there might not be any. Animal AidedDesign makes it possible to create or improve habitats for animals in the city. Animal AidedDesign can be used for redesigning a neighborhood, for implementing a city's biodiversity strategy or for other large-scale planning, as well as for carrying out nature conservation measures. Animal AidedDesign improves people's living environment as it helps to create an attractive green infrastructure for people.

URBAN NATURE AND CLIMATE CHANGE

Many animals live in our cities. Around 40 of the 90 species of mammals living in Switzerland have been recorded for the city of Zurich, i.e. almost half of all species whose activity is documented with the help of citizens. [1] In addition to mammals, many other animal species also find suitable living conditions in the city, such as birds and wild bee species. In almost every animal group there are species that can also live in the city. [2] The diversity of animal species can even exceed the diversity of the surrounding landscape if it is used heavily for agriculture. [3] By their increasing
Cities are also important places of retreat for many animal species an increasing importance for the protection of these species. Since climate change is threatening many animal species, the function of cities will become even more important as a retreat in the future.

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However, the current green planning is not geared towards systematically determining the occurrence of animals in cities enable. On the contrary, due to the current challenges to urban development, the animal species in the city are coming under increasing pressure as there is less and less unused space in the city. In order to allow animals to survive in the city, it will no longer be sufficient in the future to just hope that animals will be found in green spaces that have been planned without taking animals into account. Today it is z. For example, so that birds can often only roast in residential complexes or in a park because there are suitable areas nearby where they can look for food, while the residential complex or park itself does not deliver enough. If these other areas are gone, however, then the animal's food sources are lacking and even hanging up nesting boxes cannot prevent the animals from roasting. Animal Aided Design is a method which was developed in order to be able to include the basic needs of animals in the planning. The aim of Animal Aided Design is to create living space for a viable population in an open space.

MODERN URBAN DEVELOPMENT

Our cities are facing major challenges not only because of climate change. Globally, the growth of the human population will lead to a sharp increase in the number of urban dwellers. While around 234 million people lived in cities in 1950, there were already a billion people in 1990, and 3.25 billion cities are forecast for 2025. 4th

Only a slight increase in urban population is to be expected for Europe; it rises from 920 million in 2010 to around 1.1 billion people in 2030. Nonetheless, our European cities are also changing. Demographic change requires the infrastructure to be adapted to the increasingly aging population. In Germany, for example, many of today's rental apartments date from the 1950s to 1970s and are built in the so-called post-war modern style. These dwellings, which are now getting on in years, are increasingly lacking in quality of living, so that an energetic refurbishment as well as a basic structural refurbishment of the building is necessary. In general, the increase in general prosperity leads to higher demands of the residents on their built environment; for example, the living space per person is steadily increasing. 5 Since the cities want to minimize the growth in the area or have to avoid it where the city limits have already been reached, it is their strategy that

To compact living space. Vertical densification, such as adding one or two floors to the existing structure, is property legally difficult and associated with enormous costs. A horizontal densification, on the other hand, is often at the expense of existing open spaces such as district parks or borders. The Free spaces are created by the increased car parking space requirement new residents additionally cropped.

The increasing need for space for apartments and parking spaces is undermining the performance of spaces. Urban open spaces and urban green spaces are playing an increasingly important role in the adaptation of the city to the changed climate. The man-made climate change intensifies So-called thermal island effect, which states that cities are warmer than their surrounding areas due to their thicker sealing and heat-storing building masses. Extreme values will continue to increase; the characteristics are longer periods of heat, greater drought, but also heavier rainfall. These forecasts require a climate strategy on the part of urban planners in order to make cities climate-safe.

Future urban planning is faced with the difficult task of designing climate adaptation strategies that include urban open spaces, on the one hand, and improving existing living space and designating new areas for development on the other. One approach to mastering this balancing act is that of Animal Aided Design. Because, as we will show, Animal Aided Design can make it easier for open spaces to adapt to climate change.

GREEN INFRASTRUCTURE

Over the past few years, research, planning and research continued Politics is an understanding of nature that shows the functional role of nature and the multitude of services it provides for people achieves, moves into focus. So far, we have taken these services for granted because they are made available to people free of charge. 6th They include, for example, the cleaning of our wastewater and the formation of new groundwater. Without ecosystems like forests, in which rainwater is filtered, or without organisms in the soil and in rivers, the substances convert and break down pollutants, it would not be, for example possible to get very good tap or mineral water at a very affordable price. Waterworks and mineral wells only have to pay for the costs that are necessary to convey and fill the water. The water itself was previously treated by nature free of charge. How laborious it is and what it costs, custom or even drinking water from Wastewater extraction can be seen in Israel or Singapore, for example.

4th - Cities: the century of the city, Nature, 2010, Vol. 467: 900-901.

5 - While in Germany it was 39 square meters per person in 1998, the per capita living space reached in 2013 with 45 square meters a new high. Source: Federal Institute for Population Research: http://www.bib-demografie.de/ DE / Aktuell / Grafik_des_Monats / Archiv / 2013 / 2013_07_wohnflaeche_pro_kopf.html.

6th - MILLENNIUM ECOSYSTEM ASSESSMENT 2005.

6.1 Aerial photo of the Jena experiment. The more than 450 large and small trial plots are clearly recognizable.

Many other processes that take place in nature are also very useful for humans, such as protection against erosion on the slopes, protection against flooding on the Rivers, but also maintaining the fertility of soil. The beauty of the landscape is also decisive due to the ecosystems found there. Another service provided by nature is the control of pests: snails, amphibians and predatory insects eat mosquito larvae. The blue tit gathers caterpillars and other herbivorous insects from the leaves of the trees. These services of nature for humans are summarized today as so-called ecosystem services. 7th Because these services are so important to people, they have to be careful to encourage them.

In the city, too, people bene fi t from ecosystem services. Trees provide the necessary shade in strong sunshine. The microclimate in the squares, in the inner courtyards, but also in the apartments, depends on the plants. Leaves filter fine dust out of the air. Human wellbeing is also in fl uenced by the surrounding nature. There are increasing numbers of studies that show a positive in fl uence of nature experiences on human health. This is not just restricted to plants: the song of the blackbird In the morning or in the evening, the lively puffing around by sparrows or the frolic of squirrels increase the well-being of many city dwellers.

At the level of the European Union, the need to integrate ecosystem services into planning is described as creating a green infrastructure. 8th The same importance is attached to the maintenance and re-planning of the ecosystem services as the creation of traffic infrastructure or the planning of power lines: both prerequisites for functioning cities and villages. The expansion of green infrastructure is particularly necessary for large cities with their low green share compared to the surrounding area in order to provide the locally required ecosystem services. The upcoming urban redevelopment due to the climate and demographic change offers the great opportunity to realize more green infrastructures. Animal Aided Design is a method that helps develop such a green infrastructure.

! "# $% & '(% $ &) * (%! +, &) *%!" # $

Scientific studies show that the processes taking place in cosystems, on which the ecosystem services are based, depend on the diversity of organisms in the ecosystems

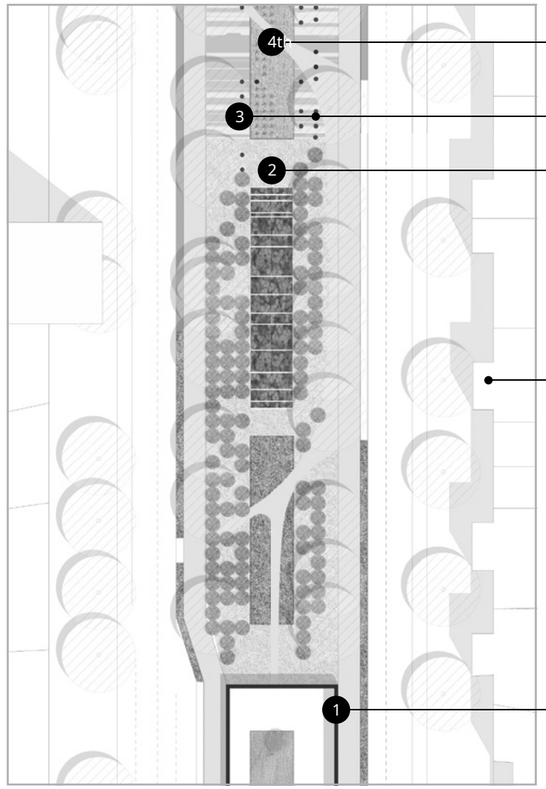
7th - Ibid.

8th - Building a green infrastructure for Europe. Luxembourg: Publications Office of the European Union, 2013.

87.1 SPECIFIC DESIGN BLOCKS DWARF BAT

The central reservation of the green belt offers long, linear hunting structures over bodies of water and light sources for the pipistrelle bats. You will find quarters at the head ends in the masonry of the rest room and in the deadwood steles.

CRITICAL LOCATION FACTORS



Hunting nocturnal insects (mosquitoes, lacewings and moths), especially above the retention basin and at light sources on the deadwood steles

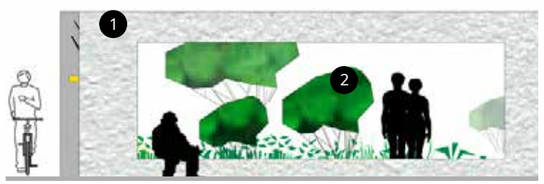
Quarters for daytime rest and mating in the notches in the deadwood steles; Width of entry hole 1- 2cm

Linear hunting structures in the middle of the green belt, bordered by the wooded border. Wall elements at the head ends limit the hunting lane and serve as a "bat jump" over the crossing areas

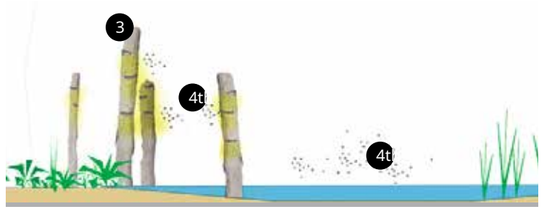
Winter quarters possible at a distance of up to 50km. Draft-free and frost-proof. 3 ° -9 ° C with high humidity. In buildings, basements, caves

Maternity room for the rearing of the young in the wood-clad wall crevices of the resting room, space for 10-50 individuals, width of the entrance hole 1- 2cm

Section of the site plan



Detail of bat room

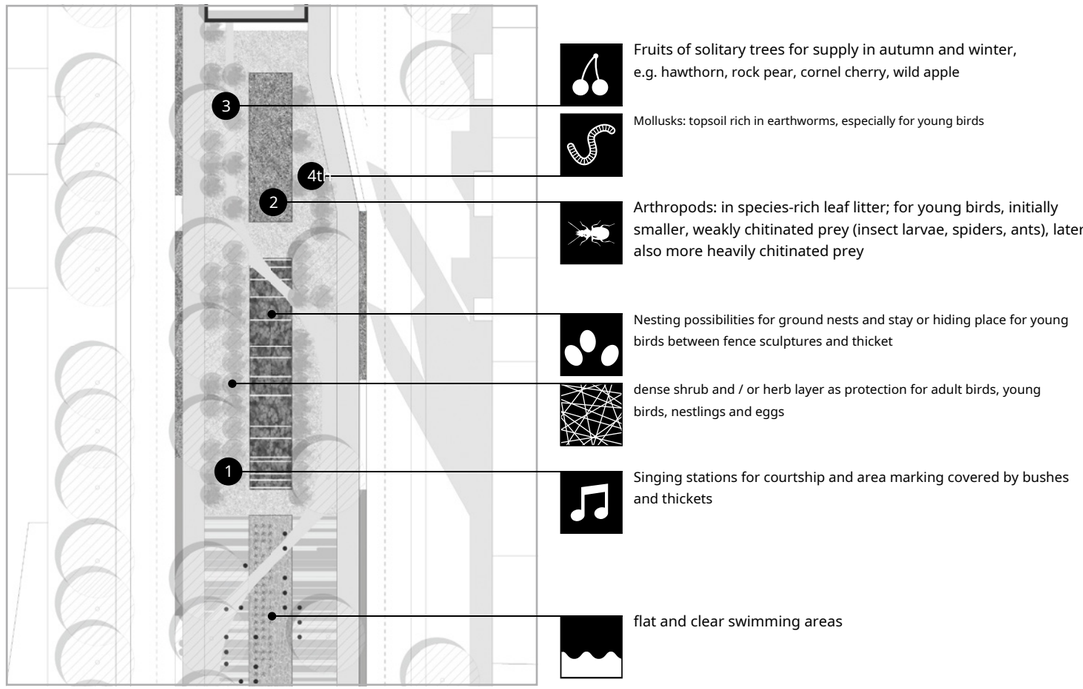


Section of the hunting room

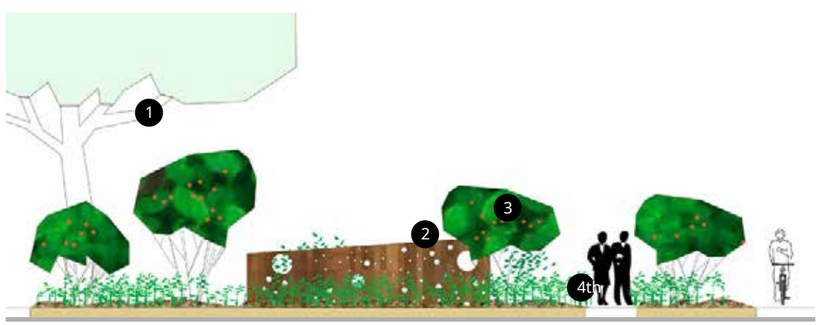
86.1 SPECIFIC DESIGN BLOCKS
NIGHTINGALE

The nightingale prefers sunny and dry areas with isolated trees. In the clear area of the eastern section, it finds food in the nutrient store and the dense herbaceous layer and breeds in the protected area of the breeding site.

CRITICAL LOCATION FACTORS



Section of the site plan



Detail of nutrient store

depend. [9] This was found out in so-called biodiversity experiments in which the number of species is manipulated as an independent, that is, given variable. All other parameters, such as the type of soil, are kept constant during the investigations. One such biodiversity experiment is the so-called Jena Experiment.

A species-rich fresh meadow serves as a model co-system Fig 6.1. From a total of 60 plant species, plant communities consisting of one, two, four, eight, 16 and 60 species were selected. These plant tests can be used as a basis can be used for comparative measurements of ecological processes in the various diverse meadows. Since all other factors except for the number of species are kept constant, one can investigate whether the number of species (or biodiversity) in fl uences the ecosystem functions. In the Jena experiment, a large number of ecological processes are investigated, which are the basis for many ecosystem services. This is how water, for example, becomes nitrogen! and phosphorus cycle examined, as well as carbon storage. In addition, the researchers are analyzing how a different number of plant species in fl uences the number of animals and other insects, and they are testing the reaction of many animal species to changes in biodiversity. Several thousand variables have been measured in the trial plots since the start of the experiment in 2002. The main result of the studies is that the number of plant species plays an important role in almost half of the processes examined. The plant biomass and the amount of carbon! in the soil increase with the number of plant species. The nitrate content in the soil leachate and other components of the nitrogen cycle are also in fl uenced by the number of plant species. The number and activity of the organisms living in the soil are also positively in fl uenced by increased biodiversity. The results clearly show that species diversity can be very positive for humans, since the processes in a complex ecosystem are different than in a simple one with only a few species.

Sometimes species diversity has a positive effect on an ecosystem service even if the underlying process is apparently only determined by one or a few species. This is the case when these species vary from year to year, for example when different temperatures or precipitation conditions prevail in different years and, depending on these conditions, other species determine the ecological process. In the Jena experiment, for example, it was found that the long-term hay yield is positively dependent on species diversity. [10] One also speaks of a portfolio ect, since this knowledge corresponds to the results of investigations on the market. With a diversified share portfolio with shares

The average yield is better from very different companies, because in some years some companies and in other years other companies deliver a good result.

This means two things for planning. Plants should be selected in such a way that they fulfill certain ecosystem functions particularly well. In order to benefit from the advantages of diversity, not only ume or other plants of one species but of different species should be planted. Which species and combinations of species are particularly well suited for a particular ecosystem service still needs to be investigated in detail. Basically, however, it is not a good idea to put everything on one card than to plant only one type of plant, such as the vine and hope that it serves all purposes throughout.

So far, ecosystem services have rarely been included in the planning included in parks and other open spaces. This is especially true Special for ecosystem services provided by animals: these occur in cities, but which species occur in which place is unplanned. So people enjoy the song of the song thrush or the sight of a robin. However, whether these species are found in a residential complex or in a park is coincidental at the moment. Animals are simply there or not when they lack the necessary livelihoods. In order to enable the occurrence of certain animals in the wild, Animal Aided Design intends to replace chance with systematic planning.

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Human population growth and increasing land use by humans have become a strong one
Decline in biodiversity. Over 100 bird and mammal species have become extinct in the last hundred years through human intervention. [11] Biodiversity is also falling sharply in Germany. Many plants and animal species are on the red list because the number of members of the species is getting smaller and smaller. Biodiversity is also decreasing in the city. For example, the population of the house sparrow, which until recently was a frequent inhabitant of public places, is currently declining sharply. In the course of the densification of the city quarters, there is less and less space available for plants and animals. Urban planning must therefore not rely on the fact that animals and plants will in future be there when they are needed, but must actively promote the occurrence of animals and plant species. With the help of targeted planning steps, Animal Aided Design not only helps to preserve biological diversity, but also actively
to promote.

9 - CARDINALE ETAL. 2012: 59-67.
WEISSER 2012: 99-109.
10 - ALLAN ETAL. 2011: 17034-17039.

11 - MILLENNIUM ECOSYSTEM ASSESSMENT 2005.

URBAN PLANNINGVS. NATURAL RESERVE

Sustainable urban planning endeavors to create a green infrastructure and tries to use the ecosystem services of a diverse nature. There are many reasons why there are still conflicts between urban planning and nature conservation, and the conflicts are mostly unnecessary. Legally, nature conservation is on weak legs. Only species that are directly protected by EU law, our breeding bird species and some other FFH species [12th], enjoy direct protection. Since there is a ban on killing the FFH species, a great deal of effort is sometimes made to relocate animals. In total there are around 64,000 different species in Germany, around 48,000 of which are animal species. [13th] The approximately 260 breeding bird species protected by EU law as well as fewer than 200 other FFH species therefore only make up around 0.7 percent of the species occurring in Germany. Other species are only indirectly protected, if at all, for example through the biotope in which they occur. In general, according to the intervention regulation, an intervention in nature and landscape always requires a balance, so if one forest is cleared, another forest has to be created anew. However, it can hardly be checked whether the same animal and plant species occur there. Biodiversity cannot be preserved through legal regulations alone. Despite the rather low legal status, nature conservation is often in the pillory as a brake on urban development. Species protection is often instrumentalized, because it offers a handle against generally unpopular building measures. So the occurrence of the Juchtenk fers or Ermit (*Osmoderma eremita)* as an argument against the unintended planning of the Stuttgart 21 train station for other reasons, and the bat species Little Horseshoe Bat (*Rhinolophus hipposideros)*
should help to prevent the Dresden Elbe Bridge, which was also unwanted for completely different reasons. Thus, both of these FFH species became, unjustifiably, a symbol for the prevention of nature conservation. An important approach to solving conflicts between planning and nature conservation would be to include the biological diversity of the area in question and its ecosystem services in the planning from the outset. This consideration enabled better and more sustainable planning.

In order to create a network of green infrastructures, classic nature conservation measures, such as the protection of existing habitats of plants and animals, are not sufficient. It is essential to create green infrastructure in places where it is not or no longer available. As we are referring to in this brochure

Three examples will show that Animal Aided Design as a method can combine good planning for people with the protection of biodiversity. There is a special focus on the use of animals.

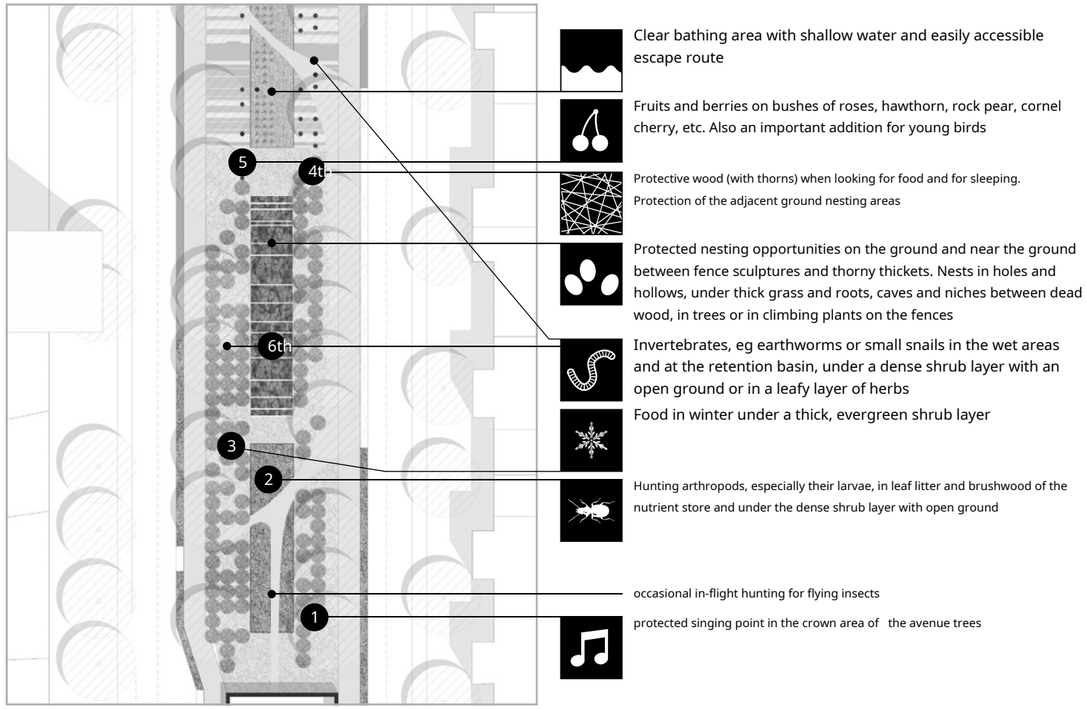
12th - FFH stands for the Fauna-Flora-Habitat Directive of the European Union from 1992, which has only been consistently implemented in Germany since 2010 after the amendment to the Federal Nature Conservation Act and relevant court rulings.

13th - VÖLKL, WEISSER & HOTES 2010.

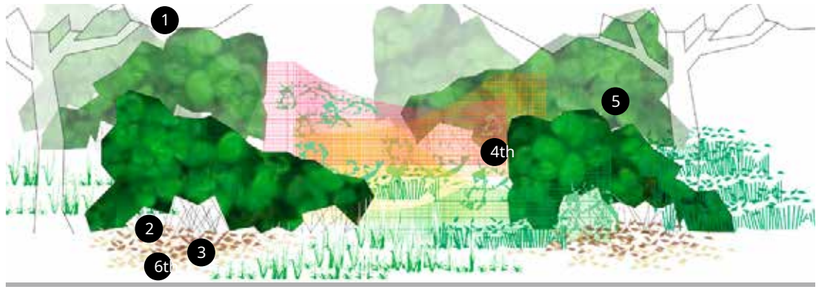
85.1 SPECIFIC DESIGN BLOCKS DEATH

The robin prefers the damp areas in the undergrowth that are shaded by the dense avenue. It looks for food in the brushwood of the nutrient store, on the dead wood of the hunting room or under the thorny thicket of the breeding ground. It also breeds there between the fences on the ground. It can also bathe in the retention basin.

CRITICAL LOCATION FACTORS



Section of the site plan



Section of the hotbed

Protection and serves as a breeding ground for insects and their larvae, especially caterpillars. The corten steel containers are surrounded by bushes. The robin prefers a dense, evergreen layer of bushes under which it can fi nd an open ground for hunting ground animals, even in winter. A dense planting of hawthorn, mahonia and privet forms a closed canopy for this. The nightingale, on the other hand, is primarily dependent on a dense and species-rich layer of herbs, which is interspersed with solitary shrubs as a place of retreat and singing observatory. Attractive solitary shrubs such as rock pear or cornel cherry can be used here. All of the shrub species mentioned have both a protective function and, through their berries, a function as a food supplier.

The nutrients are expanded to include areas of lying and standing deadwood, which are arranged around the retention basin. Deadwood is very rare in public spaces, but very important for a variety of insects and other limbs, the one Large numbers of birds serve as food. Arranged lying or standing in formation, the dead tree trunks create an attractive picture that changes over time and will soon be covered by ferns and mosses - for the nightingale and especially the robin As well as other bird species such as woodpeckers and tree creepers, this creates excellent hunting areas.

Nesting facilities for robins and nightingales that breed on the ground and at low heights are offered in a separate section specially designed for this purpose. As a soil broiler, the birds are particularly susceptible to predators and to human disturbance. The route prevents humans and dogs from being too close to the nesting facilities. Dense, thorny bushes of roses, barberries and sloes form an impenetrable border for cats and dogs. In the middle there are rows of columns in different colors and shapes. They too keep out unwanted intruders, but they also have a design aspect: if the strollers look at the colored, sculptural fence elements in passing, they overlap like a membrane to create an ever-changing play of colors. A dense layer of herbs grows between the fences, and blackberries and bindweed grow on the fences. Here the birds can fi nd nesting opportunities on the ground and material for their nest. In order to prevent the fence sculptures and the all-important herbaceous layer from being overgrown by overgrown plant species, these areas must be cleared of all vegetation once a year.

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Animals have of course already played a role in the design of open spaces. There is a long tradition of artistic use of animals in gardening, especially in connection with the design of parks. In both landscape architecture and nature conservation, certain animal species are understood as an indispensable component of desirable, mostly scenic, natural images. Only through the occurrence of these animals does the harmonic relationship between man and nature, expressed in the image of nature, become perfect. For example, it is the stork and its nests that make the Spree forest a beautiful landscape with great ecological value.

One goal of nature conservation planning practice is to protect these natural images and to maintain their function as habitats for certain animal and plant species. In the design practice of landscape architecture, on the other hand, an attempt is made to recreate an image of nature, whereby this is usually equated with the habitat of the animals associated with it. The targeted animal species have a cultural value, either based on cultural landscape images of nature [1] related to the conception of nature as wilderness. In both cases the animals are part of an image that humans make of nature.

The specific needs and demands that an animal has are often not taken into account at all or only as a general rule in the planning and construction of images of nature. This harbors the great danger of the dysfunctionality of the built images for the target species. Whether the desired species settles in the project area is more or less left to chance.

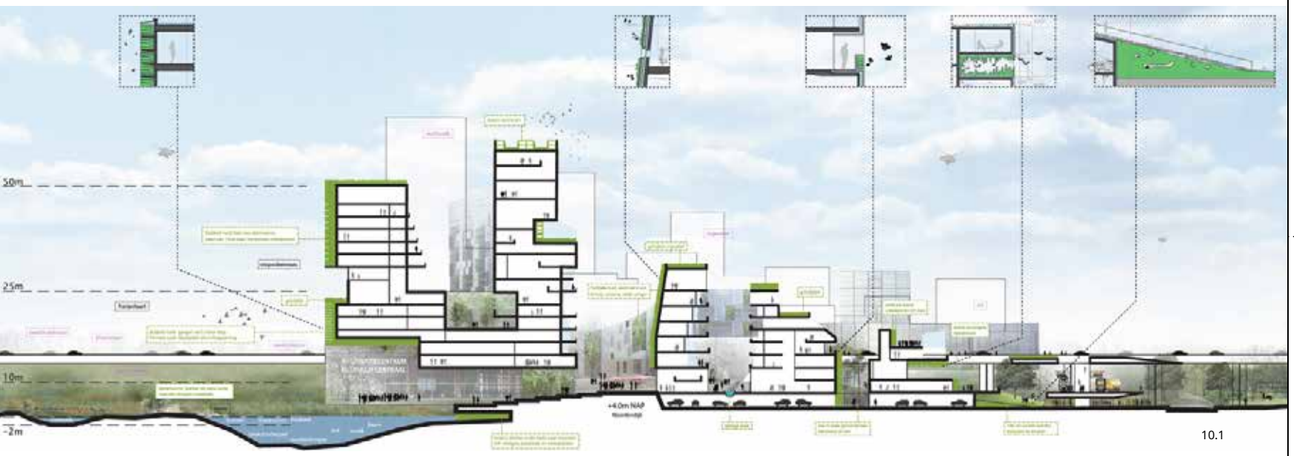
In the course of the scientification of design practice, the ecologically-shaped term is often used for the desired images of nature! Biotope [2] used. A biotope, however, is not understood as a space of factors that meet the needs of a specific species, but as a spatial, geographical unit. [3]

Therefore, a biotope does not necessarily meet all the needs of the animals that occur in it. By mapping the occurrence of animal species in biotopes, evidence is largely provided that these locations fulfill functions for the respective species. But it is not certain whether all the requirements within the biotope will be met. The construction of biotopes is therefore only suitable to a limited extent as a method for establishing target species as part of the creation of open spaces. An additional limitation is the pictoriality of biotopes. So if a negatively populated type of biotope (for example nettle fl ows) is not desired in a project in terms of aesthetics, the planner may also exclude the animal species that appear to be associated with the natural picture. And that, although there is no causal connection at all,

The design with animals as part of landscape architecture has been experiencing a new upswing for several years, especially in the planning of urban open spaces and the design of landscape [4th] at the regional level. One reason for this is the landscape urbanism design philosophy developed in the USA [5] and Ecological Urbanism [6th]. Biotopes as images of nature and the corresponding inventory of animal species play a large role

1 - Here farm animals, especially old and rare breeds that are linked to historical uses of the landscape, play a major role, such as the white horned heather.

2 - See JAX 2002.
3 - Cf.TREPL 2005: 106f.
4th - See PROMINSKI 2004.
5 - See WALDHEIM 2006.
6th - See MOSTAFAVI 2010.



10.1

Role if mostly photo-realistic images are drawn to communicate the plans. The iconic design for the revival of wild animals as a design element in landscape architecture is the Fresh Kills Lifescape design by New York landscape architect ros Field Operations under the direction of James Corner. The design envisages transforming New York's F resh Kills landfill, allegedly one of the largest in the world, into a modern Arcadian landscape. The covered mill mountains become the bearer of a multitude of new, dynamically developing biotopes with a diverse inventory of species.

Other international landscape architecture projects, with their biotope-based and animal species-rich approaches, are certainly shaping a new global design style in landscape architecture due to the attractive images. Examples are numerous projects by the Boston office Fig 11.1, the draft of Governors Island of the Rotterdam office West 8 Fig 11.2 or the concept for the multimodal transport hub Biesbosch Central from VenheovenCS Fig 10.1.

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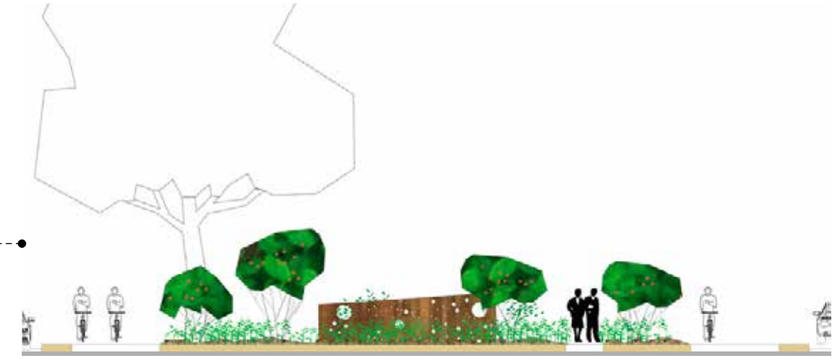
In landscape architecture and in large parts of nature conservation, animal species are assigned to certain images of nature and are actually kept in these images. The cause can be seen well by looking back at the historical relationship between humans and animals and the social relationships with nature in Europe. In the European understanding of nature, a distinction is made between farm animals and wild animals, each of which has its own assigned place in the world.

Farm animals are seen as part of the social household, as they are seen as the result of artificial selection and breeding, and thus as artefacts as something made by man. They were given a place appropriate to their function (e.g. in farms with intensive animal husbandry or in the living room), that they traditionally share with other practical things. It was not until the 19th century that the use and breeding of animals for recreational purposes developed into a feeling of love for animals and thus an understanding of farm animals, which before that only had its place in a religious context. 7th The animal, which is closely related to humans, is understood as a household member and part of an emotional family. The transition between the love of animals and the use of animals is fl owing here, since many a pet is more of a fun thing with a cuddle function than

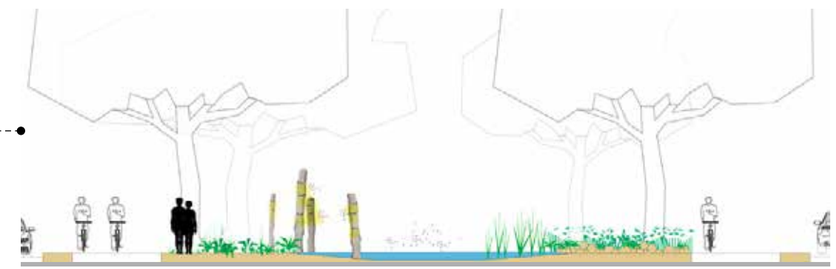
is understood as a companion with their own interests. As a result Farm animals are still understood today as objects of household and as part of the inner nature of a society, which like arable land, gardens, parks, but also like buildings, furniture or machines, have to be cared for and managed. The possessive attitude towards farm animals is expressed also in the design of the images of nature with which they are associated. A popular motif here is the increase in agricultural production processes. The cattle are part of the design material for creating an aesthetically and symbolically effective agricultural production site. This was for example in the

The 18th century was the case with the so-called ferme orn e or ornamented farm. The aesthetic idea of the ferme orn e was to combine beauty and utility in agriculture. This approach is experiencing a new upswing thanks to social goals such as sustainability and is formulated differently depending on the political worldview. So sets

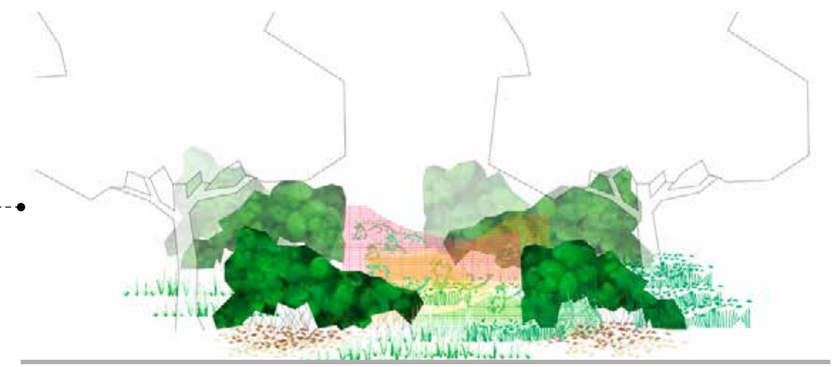
7th - A close relationship between humans and animals, which were not primarily characterized by their usefulness as food, suppliers of raw materials, labor, means of transport and their military use, has probably existed since the domestication of the wolf since the Upper Paleolithic. (Benecke 1994, 68ff.) It is even speculated that the domestication of the wolf started for emotional reasons - by taming puppies as playmates. (Ibid. 76.)



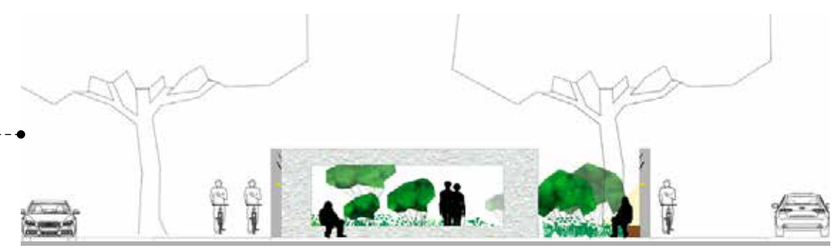
Cut nutrient store
Fruit-bearing solitary shrubs
(Rock pear, cornel cherry, crab apple) and perforated corten steel containers as nutrient stores. In between nutritional rich herb layer (especially stinging nettle).



Section hunting room
Retention basin with moist vegetation and insect diversity. Dead wood lying next to it with vegetation of ferns and mosses. Standing dead wood as a vertical element with integrated lighting and bat roosts.

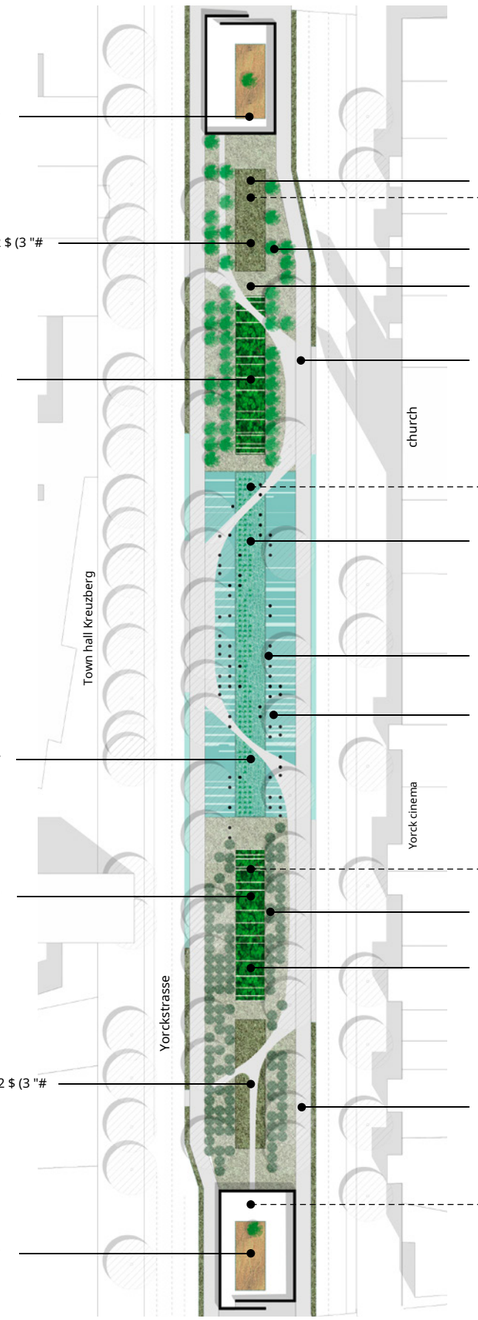


Cut hotbed
Dense, evergreen and partly thorny bushes (dog rose, barberry, Holly, hawthorn, privet) and Overlapping fence sculptures made of steel mesh (different in shape and color) protect floor standing places of nightingale and robin.



Section rest room
Wall element made of stamped concrete as a resting room at crossings with a view of the green strip. Bat quarters and seating are in the wall and lighting elements integrated.

82.1 DESIGNED BY YORCKSTRASSE BERLIN



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Corten steel container as a nutrient store

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Solitary shrubs (rock pear, ornamental apple, cornel cherry, etc.)

Nitrate-rich tall herbaceous vegetation with nettle and earthworm-rich topsoil

Clearance of the avenue stock

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Retention basin with aquatic and marsh plants

Deadwood steles with integrated lighting and columns for piped bats

lying dead wood, overgrown with ferns and mosses

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dense, sometimes evergreen shrub plantations made of barberry, hawthorn, dog rose, privet, oregon grape as space creator (also in winter)

Area with open vegetation, which is structured by fence sculptures in different colors and shapes

& / * # 0 + 122 $ (3 "#

Compaction of the avenue stock

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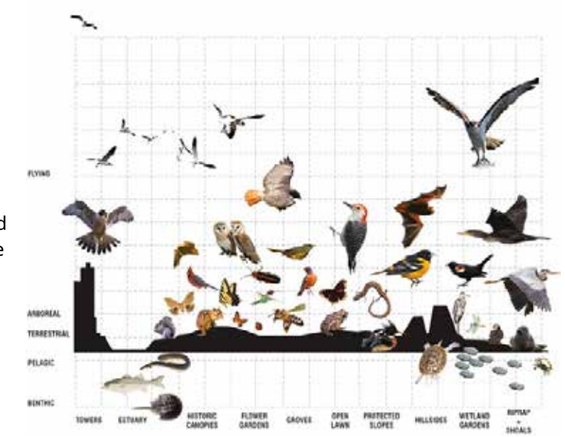
11.1

the architectural idea of so-called vertical farming 8th the pig city high-rise buildings are an example of better control of nature through new, sophisticated (bio) technology Fig 12.1 by architects ros MVRDV from Rotterdam. The Arcadian counterpart to this is provided by organic farms in which livestock are kept in a species-appropriate manner. There the animal may even be valued as an individual, for example when its picture and name are printed on its products.

Even wild animals are assigned a place according to their social function, but this is not in society but outside in nature. 9 This nature can be concretely experienced and felt, which man can experience as independent and self-sufficient. The relationship between humans and nature was reflected in images, texts and words, and thus also shaped. It is the idea of nature as Aristotle understood it: for him, nature is that which itself takes shape and changes by itself. 10 The independence and idiosyncrasy of nature described by Aristotle was felt in Europe both as a threat from which one had to protect oneself and as a place of longing that offered the opportunity to escape the social order in order to be free to be or to meet God. The dividing line between the inner nature of a society and its outer nature would, however, rarely have to be determined geographically. Rather, the dividing line shifted depending on what was understood as inside and outside, as controlled nature and independent nature. Classic examples of this are the Italian Renaissance

8th - See DESPOMMIER 2010.
9 - Even if the outside nature is spatially "in" society, for example as urban nature, it still remains as an independently living nature "outside".
10 - TREPL 2012: 14.

10.1 Cut from the concept for the Biesbosch Central Station in Dordrecht by VenheovenCS architecture + urbanism and DS landschapsarchitecten with integrated habitats
11.1 View from the "Laaglandpark" competition design by Stoss Landscape Urbanism
11.2 Diagram of the planned occurrence of species from the design for the redesign of Governors Island in New York by West 8 urban design and landscape architecture



11.2

12.1 Draft of a "Pig City" of the Architects' offices MVRDV

garden and the French baroque garden, which contrasted wild nature with a rational and godly form of mastery of nature.

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What is remarkable about the demarcation between inside and outside nature in Europe is that it was not just about removing the self-sufficient nature and its dangers (especially for agricultural production, such as wolves, which threatened livestock) The dominated and cultivated nature of society must be kept and excluded, but that people in the early Middle Ages were concerned about it
tried to contain nature in order to protect it. The early form of nature conservation served the hunting passion of the aristocracy, who saw the wild nature, in this case above all the forests with their wildlife, threatened by other uses, such as forest grazing. The forests were protected through various types of containment and through restriction of use. Certain huntable wild animals such as deer, which were seen as living symbols of the creative power of nature, were at the center of efforts to contain them.

In the context of hunting, animals were initially a resource for obtaining food and raw materials (fur, bones, etc.), but they were also a danger to life and limb as well as pests for agriculture. For these reasons the hunter hunted animals, which earned him a prestigious role as a provider and protector. The existential importance of hunting in hunter-gathering societies and also in some settled societies with a harvest economy explains the symbolic importance that certain wild animals and their hunt have. Even when hunting was no longer necessary to feed and protect societies, its significance as a symbol of control of nature was retained. In Europe, aristocrats underpinned with the hunt their right to rule, which they also reflected outwardly in the form of hunting rituals and traditions as well as hunting trophies. The claim to delimit hunting as a special activity of the rulers was enforced through various hunting privileges for court and aristocracy against the ruled in Europe during the Merovingian period (from the early 5th to the middle of the 8th century AD) through information [11]
and Wildbann. Based on the royal houses, even those that were not in their own possession were declared royal forests and given the so-called wild ban. As a result, the king claimed an exclusive hunting right, which he also granted to important personalities in the empire from the 10th century. [12th] Thus, more and more forest areas were virtually fenced off by the game ban [13th] and thus withdrawn from the farmers' hunting use. Through the consolidation of the feudal order, the peasant hunting rights were increasingly restricted, for example to hunt small game, or even completely eliminated. [14th] This process increased the power of the dynasts and sovereigns. [15th] In the High Middle Ages, the hunt became a sporting event and an important part of the knightly fine culture. The hunters refined their riding skills as well as their fighting skills and were taught strategies in warfare. From the claim that the hunt served the character formation, the rules of the grasshopper hunt developed. Endurance, speed, strength, vigilance, patience and foresight are just as much a part of the characteristics and traits of a hunter,

11 - Designates the establishment of royal or ban forests.
12th - RÖSENER 1997: 128f.
13th - ZOTZ 1997: 103.
14th - RÖSENER 1997: 129.
15th - See RÖSENER 2004: 90.

The quality of a bike path in the green creates a bu! Er for motorized traffic, which brings strollers and animals on the central strip more calm.

The main focus of the design is on the central strip of the main thoroughfare. This is not very attractive today and is mainly used as a parking lot or by dogs and their owners. As a result of the traffic-related restructuring and the redesigning measures, the median is being upgraded as a public space and green infrastructure. In addition to the spatial conditions, the design results from the needs of the targeted animal species. The central stripe is divided into different sections, each of which has a different function for the species. For the robin [Fig 85.1] and the nightingale [Fig 86.1] There is a hatchery, a nutrient and a bathing area. For the bat [Fig 87.1] a resting room and a hunting room. The design concept provides for each of these functional elements to be offered design equivalents, which on the one hand follow a natural and on the other hand an artificial aesthetic.

The different sections are connected by a different path. Here the movement of the pedestrians slows down. Cross-references to important public buildings such as the church, town hall, supermarket and cinema are established. You can also experience the animal species in the Gr nzug.

At the head ends of the central strip, the highly frequented intersection areas, quiet spaces are created as a contrast to the noise of the street. They are surrounded by walls that block out the noise and traffic. These quiet rooms are designed as contemplative places in the midst of the hustle and bustle of the big city. Large recesses, like a window, allow a view of the green area, which is traversed by a curved path. The rest rooms are planted with summer lilac (Buddleija) in the middle, which attracts butterflies, their caterpillars as a source of food
serve for birds. Seating and lighting are integrated in the walls. The rest rooms are also a central place for the pygmy bat. Deep gaps are set in the concrete walls and the inside is clad with wood. They can be used by the pygmy bat as roosts and living quarters. At the same time, the walls separate the bats from traffic.

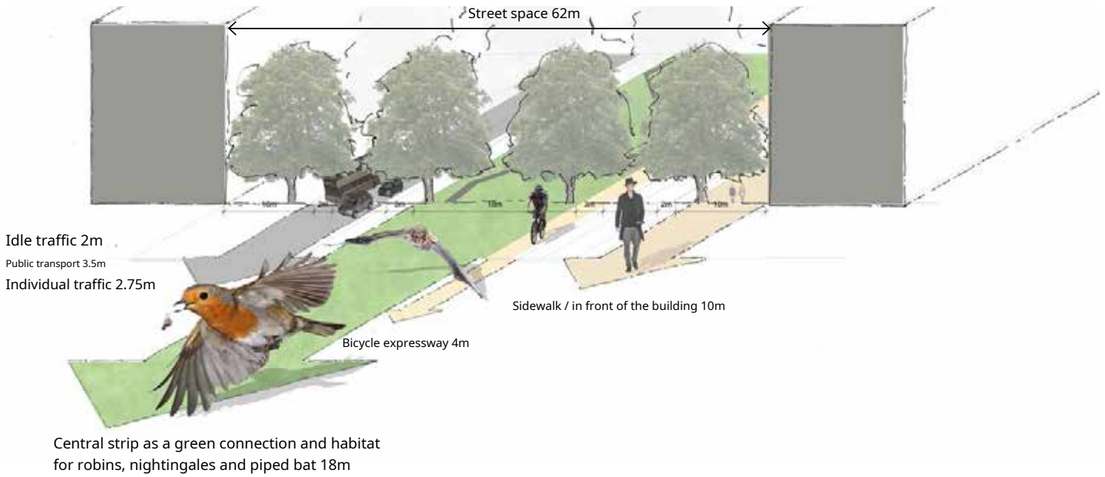
The axial green space between the crossing areas forms a hunting path for the bats. Pygmy bat hunt primarily along linear structures. This is ensured by the tree and bush-free central axis of the green space in the design location. The linearity is reinforced by the wooded border and by a rainwater-fed water area in the center of the strip. The latter is a climate adaptation measure to accommodate heavy rain events, and it serves as a development site for insects that are hunted by bats. Artificial light sources that attract insects are also installed within the hunting corridor and thus also the hunting bats. They illuminate the way and make the nocturnal animals come alive for humans. In the standing deadwood trunks next to the retention area, slots are made that bats can use as roosts. At night, the room is transformed into a bizarre backdrop with hunting bats through its staging with water, dead wood sculptures and lighting, and instead of the roaring traffic noise, the chirping of birds from the nightingale and the robin, animated by the lighting to sing at night.

The nightingale and robin have similar demands on their environment. Both roast on the ground and look for their food there too. For breeding and hunting, they therefore need well-protected areas, and for bathing they also need well-manageable water points. However, they seem to be fundamentally different when it comes to the requirements for temperature, incidence of light and humidity. The robin is more likely to be observed in shady, cool and damp areas in the undergrowth. The nightingale, on the other hand, prefers open areas with a dense herbaceous layer and high shrub coverage. By clearing or densifying the avenue of trees on the central strip, the different living spaces are shown in the design
di! erentiated. The functional areas for brood, young However, rearing, foraging, and bathing are very similar. It could also happen that a robin looks for food in the sunny open areas or finds its breeding place, or, conversely, the nightingale satisfies its needs in the shady undergrowth.

The basis for a stable population is sufficient food from insects, other arthropods, snails or earthworms. Urban floors are poor in such animals living in the ground due to the high level of use, care and dense vegetation cover (ground cover). In contrast, nutrient-rich soils with active soil life and a rich layer of shrubbery are in short supply in urban areas. So special food production facilities, so-called nutrients, had to be created for robins and nightingales

Containers made of Corten steel serve as urban compost heap. The containers, which have a capacity of several cubic meters, are filled with leaves and clippings from the regular care measures. This organic material serves as the basis for a whole food web of soil organisms such as earthworms, millipede, snails and a multitude of other things
Insect species that break down the material and for robins and nightingales serve as food. The Corten steel container protects the birds from unwanted intruders while they are looking for food. In the tangle of dry leaves and brushwood, it is also entirely possible that urban compost will be accepted as a breeding ground.

Once the material has broken down into compost by the soil organisms, it is spread over the surrounding areas as mulch in order to promote a nutrient-rich herb layer with nettles and other perennials. This in turn offers



80.1 System cross-section through the street space

By reducing the traffic areas for IV and public transport to a minimum, the bicycle expressway can be expanded to a width of four meters in each direction and relocated to the median. The relocation of the

The cycle path on the median is not only useful in terms of traffic, but also represents a kind of buffer zone for the noisy traffic in the green belt and increases its quality for cyclists, pedestrians and animals.

have a positive effect because predators like house cats are prevented from reaching the room.

Among the bird species found in the area, the nightingale (*Luscinia megarhynchos)* a special position: Berlin was called the capital of the nightingale. 2 The settlement densities here are particularly high in relation to other large cities, but also to rural areas. Several breeding pairs were found at the Gleisdreieck, in the immediate vicinity of the design area.

The nightingale sings at night. This species-specific phenomenon serves as a central starting point for the development of the design concept, which deals with the Berlin nightlife in a slightly different way Fig 80.1. The idea is to transform the street space with the help of certain animal species into a special, neat adventure space that is also attractive during the day. In addition to the nightingale, the robin (*Erithacus rubecula)* included in the design: it has similar claims to the nightingale (see species portraits) and sings in large cities because of its strong power Artificial lighting also at night. Finally, in order to expand the nightlife, the third species is the pygmy bat (*Pipistrellus pipistrellus)* selected, a typical and common type of urban space. Their social sounds are audible and the hunting of the animals in the evening can be easily observed.

2 - MÖLLERS & REICHHOLF 2010.

The establishment of these three types is intended to create an acoustic and optical experience space in the middle of Berlin. At night, when the traffic is back on the main road, the songs of the nightingale and the robin can be heard there; Bats chirp and buzz around lanterns on the hunt for insects.

An elementary component of the design is a modified traffic concept Fig 82.1. The change from the car-friendly city to an urban mobility behavior in which local public transport, cycling and walking play a larger role
play also affects the cross-section of the street. The Roadways are narrowed as much as possible for cars and for local public transport further expanded.
Parking spaces are still necessary, especially in central locations for car sharing, but no longer everywhere and everywhere. The bicycle is becoming more and more important as a fl exible, climate-friendly means of transport. Cycle paths with a central connection function in Copenhagen and Amsterdam already developed into so-called bicycle highways. Separated from the areas of movement for pedestrians and cars, the speed and efficiency of bicycle traffic can be increased. Such a bicycle expressway can thus be an alternative to the further developed street and could serve as a model project at this central point in the city. For this central connection, the bicycle, which is now just one meter wide, will be relocated from the edge of the road to the center next to the green central reservation and expanded to four meters wide. In addition to the

like dealing with hunting dogs and horses, as well as social responsibility towards fellow human beings. In addition, deer justice was demanded, i.e. fair behavior towards the animal. 16

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Since hunting was regarded as a representative leisure activity of the ruling class, there were mostly hunting areas close to the residences. Sometimes forest-like parks were (re) designed for this purpose, sometimes the hunting grounds were first on site and only then did the castle follow. The latter was the case with Versailles: Louis VIII (Louis le Lion, King of France) went hunting with his father in the damp Versailles valley, 22 kilometers west of Paris, and spent the night in the village until he finally settled in 1623 built a simple hunting pavilion. The country estate was gradually expanded and it was only the so-called Sun King Louis XIV who was to make Versailles the important and now world-famous palace and park complex.

Animal gardens in particular provided comfortable hunting grounds, as keeping and rearing the animals made it possible to have a large number of wild animals. Different departments could be created for the different species of game and the whole complex equipped with avenues and hunting trails. A corresponding part of the forest was demarcated by gates or gates. Wild meadows, feeding places and salt licks were created. 17th Such animal gardens were often combined with agricultural land and pheasantries. Hunting forests designed in this way were highly valued in Germany and in some cases were traded more expensive than arable land. 18th

A famous example of a wildlife park is in Berlin too to fi nd: the Berlin zoo. In the 15th century, this was a high forest with sprinkled fields, meadows and alluvial forest on the river, ditches, quarry forest, ponds and oxbow lakes of the Spree and further to S den Heide 19th all requirements for a game fence. Since the Berlin Palace was built in 1443, it was used as a zoo. However, a fence around the site is not mentioned until the end of the 16th century. The enclosure deteriorated in the Thirty Years' War and was not restored until the 1650s by the great Elector Friedrich Wilhelm von Brandenburg (1620 1688). He had fences renewed, animals brought in from other hunting grounds and said that farm animals would graze there from then on. The area was enlarged on two sides of the Spree and finally completely surrounded. Even barriers in the river prevented the game from migrating. Its use as a hunting area in the 17th century still shapes the basic structure of the Berlin zoo. The plan from 1698 already shows the Great Star and the avenues. The successors of the

16 - See RÖSENER 2004: 264-266.
17th - LASS 2006: 41.
18th - See LASS 2006: 40f.
19th - WENDLAND, WÖRNER 1986: 5.

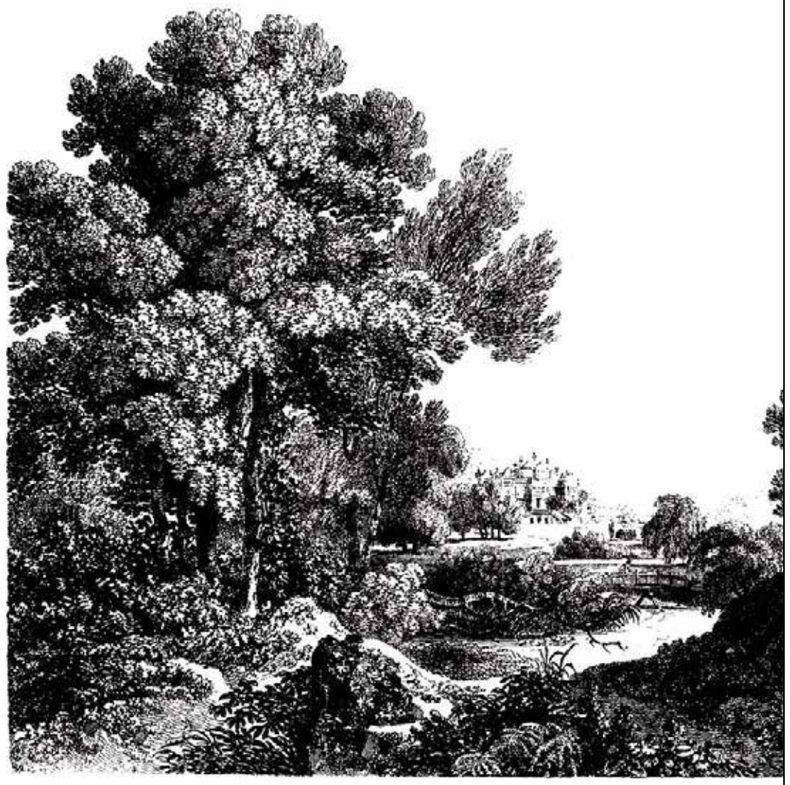
The great Kurfsts envisaged other uses for the hunting area and continued to build the fence back. A park-like forest was created. In 1832 Berlin had to struggle with the consequences of cholera, the personal physician spoke to himself royal family for the positive medical and hygienic effects that a creatively improved zoo would have for the population. This gave the impetus to commission the horticultural artist and landscape architect Peter Joseph Lenn (1789 1866) to design a park that provided sunny corridors and light spaces. Lenn had the wood thinned out and new, curved paths laid out. 20th But even after many phases of changed use and redesign, the Berlin zoo retained its basic landscape. This basic structure can still be seen today that it was shaped by the pleasures with animals but also by the animals themselves.

In England in particular, the establishment of so-called deer parks (game parks) gave rise to an understanding of cherished nature, which still shapes our social relationship with nature, especially with regard to wild animals Franconian hunting traditions introduced in England and the royal house reserved royal forests for exclusive hunting use. 21 The
As a result, the proportion of land used by the royal hunting grounds in England rose sharply in 1187, around a third of the kingdom of England belonged to the royal forest. 22nd About the Etablie
In addition to the virtual boundaries of the royal forests, hunting grounds were also kept as parks in England Fig 14.1, be it through dense vegetation or through earth dams. 23 Through the enclosure and the leaps 24 it should be ensured that the game entered the enclosed areas but could not migrate again. The oldest known deer park dates back to 1045. The deer park movement finally reached its peak in the 14th century when there were 800 such game reserves across England. The holly hedges, which are widespread in England, were used to feed the animals in winter and are today legible evidence of the hunting culture in the landscape. Generally speaking, the parks are smaller, enclosed areas within the landscape; the royal forests mentioned above are larger territories that also integrate agricultural areas. The designation royal forest only means that there is game here and the king has control of use. 25th

As early as the early Middle Ages, collectively farmed land (commons), including fields, pastures and forests, was converted into private property through enclosures. With the establishment of deer parks, the

20th - See ENGEL 2009: 253-255.
21 - Cf. MILESON 2009: 121.
22nd - See RÖSENER 2004: 166.
23 - The exact origin of this practice in England is not known. Mileson 2009: 7.
24 - Cf. MILESON 2009: 33.
25th - See SIMMONS 2001: 109-112, 141-143.

14.1



14.1 Illustration on the cover of the book “Some Account of English Deer Parks ”from 1867

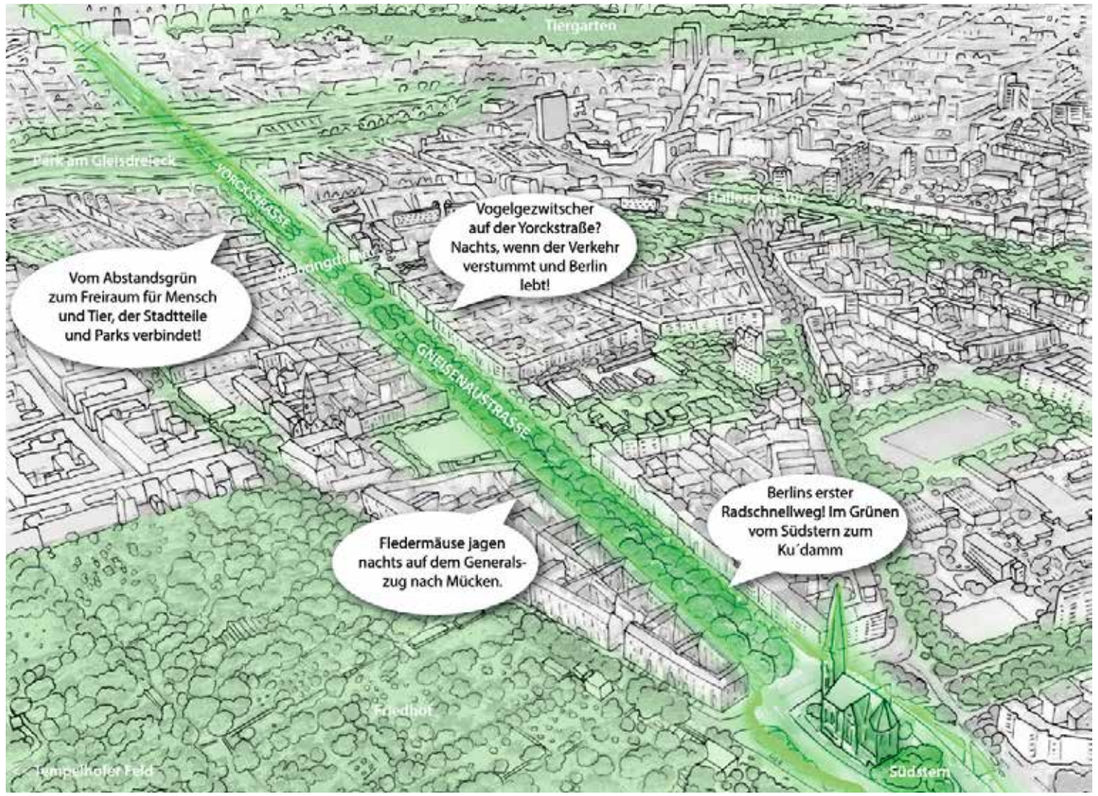
15.1 Examples of landscaped gardens in the picturesquen and smooth style from the book "The Landscape, a Didactic Poem" from 1794

Exclusion of the general public in favor of the undisturbed hunting activity of the nobility further radicalized. The widespread use of land enclosures with the primary purpose of keeping deer hunting for was an expression of the competing claims for land use between grazing, arable farming and hunting in England in the 12th century. 26th Because forests were heavily used as forest pastures and for logging and were hunted by all strata of the population, the wilderness was declining. In order to be able to pursue the aristocratic hunting passion, the deer parks have restricted the hunting possibilities to the owners, guests and keepers of the parks. 27 The protection and care of the game involved a high level of personnel and material expenditure. The parks had to be fenced in, animals fed and the park guarded. In addition, for the creation of parks, profitable pasture and arable land were often used converted into a use that could, in the best case, be operated cost-neutrally. Therefore, the establishment and maintenance of deer parks was mostly only possible for the English aristocracy. The hunt in one's own deer park with entourage and guests was a social event that allowed people to freely dispose of high Financial and temporal resources showed and supported the authority of the owner.

As a rule, the parks were laid out near aristocratic residences, but it was not until the 15th century that it became common to establish aristocratic residences within parks. That by hunting in the deer parks to the Au! The natural relationship brought about by the nobility became a fi xed symbolic component of the structural ensembles of the upper class through the merging of living and hunting grounds. On the basis of their rural property with a park, aristocrats were able to clearly formulate their God-given claim to rule over man and nature.

From the end of the 17th century, this rural order with its aristocratic residences, the peasants who were dependent on the rulership, the aristocratic hunting societies and their deer parks was disrupted. Representatives of the economically emerging and

26th - Cf. MILESON 2009: 28 and 135.
27 - Cf. MILESON 2009: 28 and 135.



79.1 Location of the design site in Berlin with key ideas

BERLIN AT NIGHT

Example 3

THE GENERAL TRAIN CONNECTS THE SOUTH STAR WITH THE MEMORIAL CHURCH TO A LENGTH OF 3.5KM. WITH AN 18M WIDE GREEN STRIPE AND THE FOUR-ROWS OF TREE AVENUE, THE STREET, IN ADDITION TO A NEW BICYCLE SPEED, CAN ALSO HAVE IMPORTANT FUNCTIONS FOR THE URBAN CLIMATE OR ALSO HABITAT FOR ROBIN, NIGHTEDALL AND DWARF. WITH THESE SPECIES, BERLIN BECOMES ONE FACET RICHER AT NIGHT.

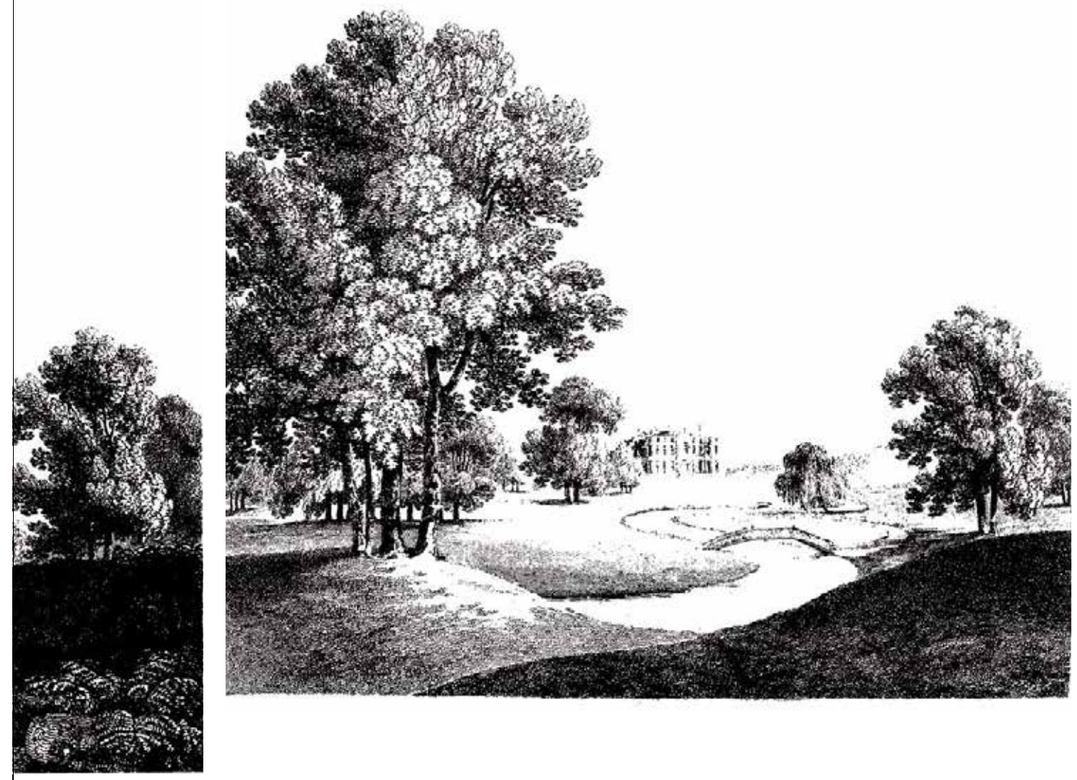
The general train planned by Peter Joseph Lenn was chosen as the location for the test draft in Berlin (Gneisenaustra fl e, Kleist stra fl e, B lowstra fl e, Tauentzien stra fl e). The 60! Meter wide street train is one of the largest main thoroughfares in Berlin. Located between S dstern and the Kaiser Wilhelm Ged chtniskirche, it represents an important east-west connection in the center of Berlin Fig 79.1. The street area is planted as a wide avenue with four rows of trees. A generous median strip 18 meters wide divides the space into separate lanes with two lanes each and a park or turning lane for motorized traffic. Sidewalks ten meters wide give the buildings a generous front area.

The general train, especially the part between S dstern and Gleisdreieck (Gneisenaustra fl e, Yorckstra fl e), was chosen as the design space for several reasons. The street space in Berlin is a defining part of the public space, especially the spacious main thoroughfares. In addition, the traffic areas serve as projection surfaces for current social issues. In addition, there are questions about alternatives to the currently prevailing motorized individual traffic in Big cities, and questions about the meaning of streets as green spaces in a green infrastructure. Given that it is predestined: the existing trees can serve as a singing station for the climate changes forecast for Berlin, in particular can be used and the barrier effect of the roadways Those with a tendency towards a hotter and drier climate, green streets are important for regulating the urban climate.

The two main themes of private transport and urban climate awareness are the thematic extension of the design. This is then processed based on the requirements of selected animal species. The first criteria for the selection of the animal species were: (a) the presence of the species in the vicinity of the design space; and (b) the potential suitability of the main road as a habitat for the species.

In the middle, the general train is interrupted by the so-called Gleisdreieck. This is essentially a wasteland converted into a park, which has an extremely diverse mosaic of different biotopes with a high biodiversity. Among other things, 65 species of wild bees, 28 species of wild beetle, 11 species of locusts and 18 species of birds were detected there. [1] The detected insects were excluded as design species because the main road is not suitable for the warm-loving species such as wild bees and grasshoppers due to the shading by trees and buildings, while the barrier effect of the carriageways is suitable for the bugs that predominate on the ground offers unfavorable conditions. For certain bird species, however, the space appears to be almost

1 - Expert opinion on the development plan 7-21 in the Tempelhof-Schöneberg district of Berlin, client Tempelhof-Schöneberg district office of Berlin, construction department, 2007.

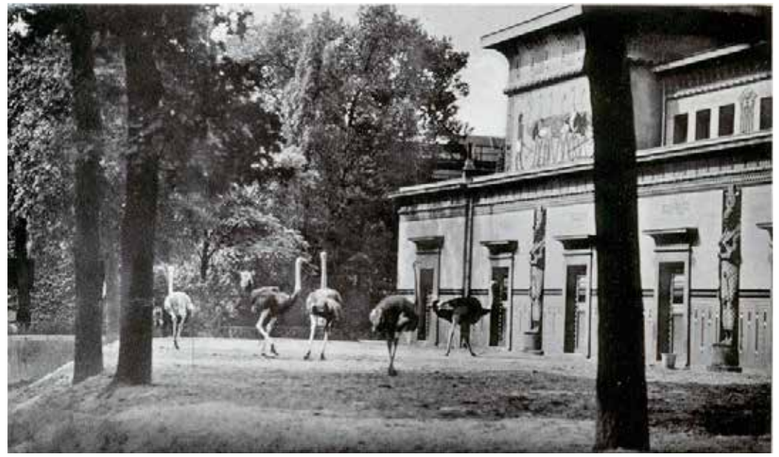


15.1

politically liberal trading class traders, brewery owners, B rocrats, but also climbers from the aristocracy, acquired land on which they designed parks that were intended to symbolize an enlightened, liberal attitude. For this, the existing structure often had to be radically rebuilt, as the aim was to represent an enlightened relationship to nature. Your country estate, developed as a well-run rural property, should show that you can reasonably manage and control nature with rational means. [28] The resulting benefit for the people was well illustrated by going back to the ancient motif of Arcadia's sheep and man in a gentle pasture landscape. This landscape motif showed something that was particularly important to the new landowners, namely that the pursuit of profit and liberalism is life would improve in all areas, including agriculture and rural economics, which were politically packaged in the style of the English landscape garden

The message was an attack and provocation for the old, conservative feudal lords. These had already lost political power through the dissolution of the feudal order and the rise of the same liberals. Well, startled by the new neighbors, the landed gentry also used their parking spaces as a means of expression. In the style of a natural design of the manor house and park, they represented their insistence on traditional values and the old natural order. In terms of design, this was reflected in the consideration of the genius loci, i.e. when relics of historical uses, old trees and, in some cases, wilderness were valued. These aesthetic qualities were then summarized at the end of the 18th century under the beauty-theoretical term "des p icturesque (picturesque), Fig 15.1. The old feudal lords intended to reproduce their harmonious relationship to nature, which supposedly had grown over centuries and which also included the relationship between landlords and peasants as a quasi natural one.

28 - See SIEGMUND 2011: 169ff.



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The landscape garden showed great differences in the worldview of its creators and clients. This was also reflected in the role that various animals played in the artistic conceptions of landscape gardens. If animals had any meaning in the liberal landscape garden, then it was farm animals, especially sheep, but also cows, that were included in the design were involved. They contributed to the representation of a rational and progressive use of nature for the benefit of mankind, and the landscape garden could thus function as a model for modernized agriculture. The gardens should be both beautiful and practical. To demonstrate this, particularly advanced farming methods were used on model farms. A great deal of care was expected when laying out pastures and meadows through selected grasses, herbs and flowers, through the regulation of the water levels in the meadows, through balanced grazing and finally through careful haymaking. After all, the quality of the grazing cattle also plays a central role. It depends on the external beauty and productivity of the animals, on their good wool quality, the milk content of the cows, the meat quality of the beef cattle and the so-called noble blood and the elegance of movement of the horses, especially the English thoroughbreds. After all, the quality of the grazing cattle also plays a central role. It depends on the external beauty and productivity of the animals, on their good wool quality, the milk content of the cows, the meat quality of the beef cattle and the so-called noble blood and the elegance of movement of the horses, especially the English thoroughbreds. After all, the quality of the grazing cattle also plays a central role. It depends on the external beauty and productivity of the animals, on their good wool quality, the milk content of the cows, the meat quality of the beef cattle and the so-called noble blood and the elegance of movement of the horses, especially the English thoroughbreds.[29]

In the picturequen landscape gardens of the conservative landed nobility, however, the wild, rough and even poor were emphasized as part of desirable and authentic images of nature. The country nobleman Uvedale Price wrote in his weighty essay on the Picturesque, As Compared with the Sublime and The Beautiful from 1794: No animal is so often in the Landscaping uses like the sheep, although, as mentioned above, it has no particular picturequeness; (÷). The opposite is true for deer; Their effect in the group is comparatively meager and only punctual, but their wild appearance and liveliness, their sudden jumps and the delicacy of their branched horns are characteristics that are extremely picturesque.[30th] Therefore, not optimized fat grazing cattle gave the impression of Picturesquen, but wild animals and farm animals that characterize the genius loci, such as shaggy goats (shaggy goats)[31]. The theorists of the picturesquen landscape garden therefore also vehemently criticize the smooth and placeless style of the landscape gardens, such as the star of English garden art, Lancelot Brown, designed in the 1750s to 1770s.[32]

Whatever the style, in the English landscape garden animal species (cows, sheep, horses, deer, roe deer) and their special character (wild, shaggy and so on) were associated with a differentiated typology of pictorial spaces. The idea of keeping animals is expanded beyond the practical purpose of keeping animals in animal gardens, deer parks or fenced in under pastures by assigning the animals to landscapes with different characters. After this
Certain animals are only suitable pictorial elements in certain landscape pictures and only there contribute to the beauty and coherence of the picture as a whole.

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29 - PRUNS in Heckmann 1994: 114.

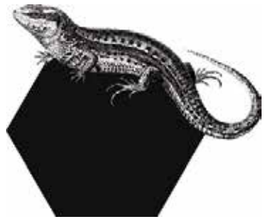
30th - PRICE 1842: 85f (translation by T. Hauck).
31 - Ibid. 85.
32 - See e.g. PRICE 1842: 181-188 and 213-226. KNIGHT 1794: 17f.

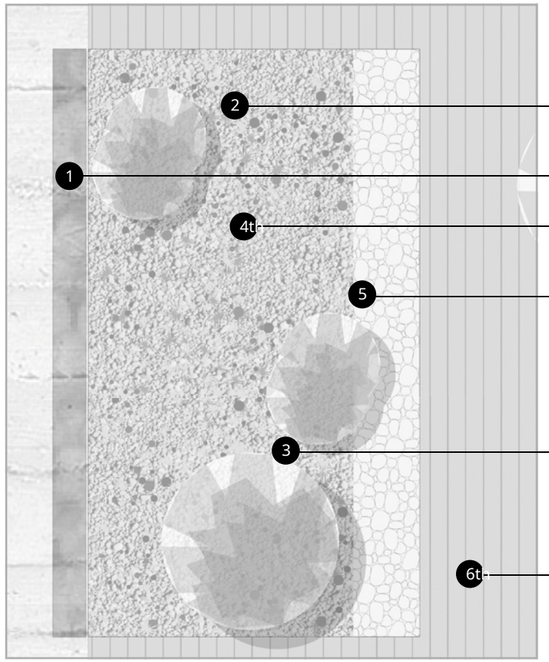
77.1 SPECIFIC DESIGN BLOCKS

SAND LIZARD

The sand lizard finds a thermally favorable habitat in the lizard gardens on the south facade of the college. The site mosaic of wooden deck, natural stone, sandy soil and sometimes dense vegetation is ideal for thermal regulation. The dry, deep sandy soil is suitable for laying eggs and wintering. As a poor location, it is ideal for easy-care and flower-rich perennials, with a variety of insects and arthropods as a source of food. The gardens are interconnected and have a connection to the railway embankment.

CRITICAL LOCATION FACTORS





Insects and arthropods on a sunny, dry sandy soil, with a mosaic of different degrees of coverage by grasses, herbs, perennials and areas free of vegetation

Refuge and escape hiding place, retreat for the night under a wooden deck, in cracks in walls (gabions), caves or under thick vegetation

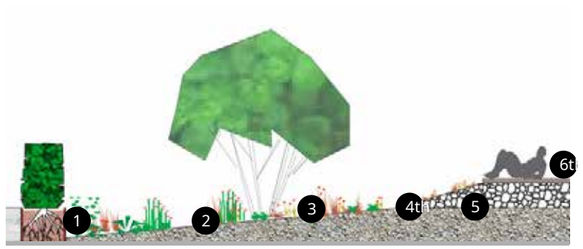
Place to lay eggs in areas free of vegetation with deep, south-exposed sandy soil, depth:> 30cm

Winter quarters in stone crevices in front of / under wooden deck. Dry, insulated, frost-free and sunlit

Site mosaic for thermal regulation from shady places (under dense vegetation, wooden deck or in cracks in stones) and sunny spots with different exposures (on wooden deck or stones)

Special sun spots on the wooden deck and dead wood for thermoregulation in the morning with the option of escape

Section of the site plan



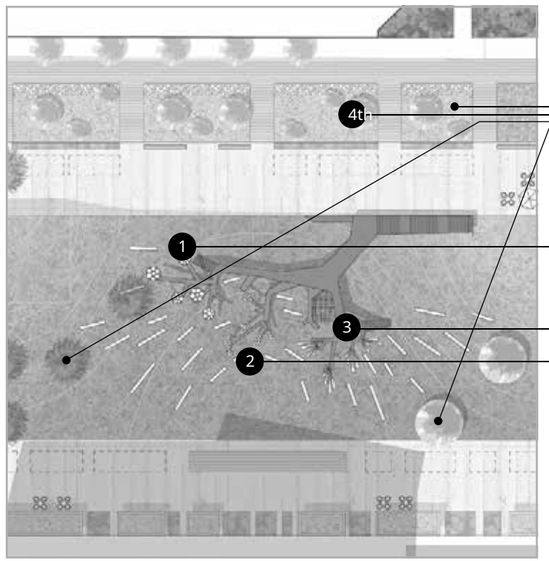
Detail "Lizard Garden"

76.1 SPECIFIC DESIGN BLOCKS

GREAT SPOTTED WOODPECKER

The Fairtree stages the woodpecker as an “urban performer” and offers him opportunities to build caves, foraging in dead wood and hammering on percussion elements. In the immediate vicinity, black pines, mountain ash and hazelnuts with their cones, fruits and nuts complement the food supply.

CRITICAL LOCATION FACTORS



Section of the site plan

High-fat seeds and nuts of black pine and hazelnut in the lizard gardens

Fruits on bushes in lizard gardens and on mountain ash

Arthropods and their forms of development in dead wood on woodpecker tray (attached to a steel plate with steel straps) later, also on the trees that have been planted.

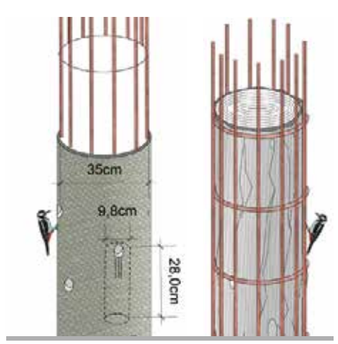
Sound box made of wood and metal as a woodpecker percussion element on the Fairtree for marking the territory and courtship

Possibility to build breeding caves 3 - 8m above the ground.
Version 1:
Cylinder made of plastic d = 35cm with internal steel construction, woodpecker cave in hard foam core, cave entrance punched in roughened plastic d = 5cm
Variant 2:
Tree trunk d = 35cm in steel cage, woodpecker cave in dead wood

1

Detail "woodpecker tray"

2 version 1 Variant 2



Detail "Woodpecker Cave"

3

Excerpt "woodpecker percussion"

17.1

16.1 Classification of animals in natural habitats: Postcard of the ostrich
Outdoor area in the Berlin Zoological Garden from 1943

17.1 Enclosure of animals in nature pictures: Cover picture of the series “Nature Conservation
Library ”published by Walter Schoenichen

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The landscapes in painting and in landscaped gardens were ideal pictorial worlds until they were increasingly understood as real spaces at the end of the 18th century. The formal design principles of landscape paintings and landscape gardens, such as naturalness and diversity, became real properties of these physical spaces. [33] For animals this meant that the landscape images to which they previously fit best became landscapes into which they belong, in which they have their ancestral place. One understood the tops of the earth
as a mosaic of landscapes that show different fauna and flora due to the differences in the climate. These mosaics also shape the people who live there. At the same time, the cultivation of natural landscapes creates speci
fi c cultural landscapes as an expression of the respective functional human and natural relationship on site. If this relationship is harmonious, whether this is the case is shown by the beauty of a landscape, then all parts of the whole (including the people) are in their right place. From the middle of the 19th century, this idea that individual landscapes are part of a functional whole shaped the way animals were treated in various forms in industrialized nations. This becomes clear when one considers how different the important zoological gardens of the later days were
19th century, like London and Berlin Fig.16.1, and most of them Princely managements practiced dealing with animals, especially in the 18th century. In the menagerie, the animals collected were classified on the basis of various (mostly morphological) characteristics and sorted into the geometry of the menagerie according to the system. The modern zoological Largest, on the other hand, followed a geographical order that reproduced the habitats of the respective animals and presented the animal to the visitor in the landscape from which it came. [34]

This association of animals with certain landscapes but not only in zoological gardens
or in the Natural History Museum [35] instead, but also in the citizen movement of nature and homeland protection. Certain animal species, wild animals that have become rare or local farm animal breeds
were identified as typical of certain landscapes and therefore as worthwhile. The initially culturally justified enclosure of animals in typical landscapes was reinforced by the fact that landscapes (i.e. certain images of nature) with equated with the habitat of animals.

This understanding still applies today when open spaces are created in connection with animals: One designs certain images of nature that are not landscapes today, but, in their dimensions somewhat more modest, are called biotopes and so hope that those chosen with the chosen one To preserve or settle animal species associated with the image of nature in an open space. This thinking is based on the idea of enclosing animals in images of nature and not on their needs Fig.17.1. The design of images of nature is therefore not a design method with which it is possible with a certain statistical probability to settle animals in the open space. The aim of Animal Aided Design is to provide the enclosure idea with a method that takes the needs of animals better into account and makes it possible to use these needs as a creative building block of
Understand design.

33 - See, for example, HAUCK 2014.

34 - See WESSELY 2008: 93ff.

35 - Here, for example, there was a change from the presentation of animals in showcases and showcases, arranged according to their place in a taxonomic order, to dioramas showing groups of animals in their natural geographical environment.

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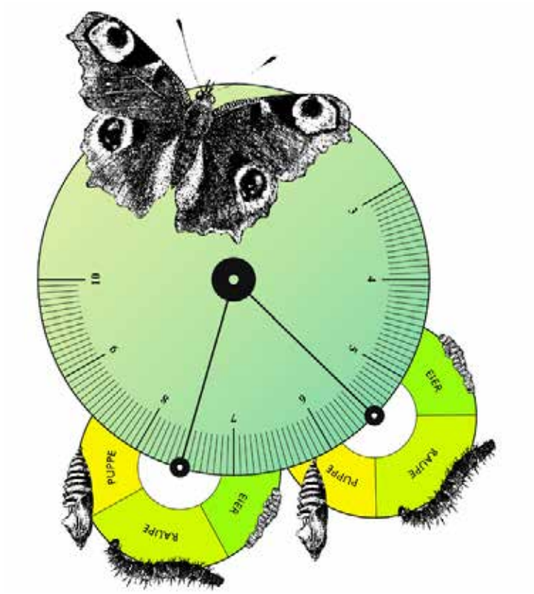


18.1

CRITICAL LIFE CYCLE

The planner's knowledge of the life cycle of a species, from birth to production of the next generation, and
The needs of the animal in these phases of life are the key to successful design with animals. It can only occur at the planning site if the speci fi c needs of the animal are met. The aim of Animal Aided Design is to enable stable populations of one or more species to exist. The needs of the animals can change depending on their phase of life, but they mostly follow the same basic principles. Every animal needs a place for the young to raise, such as a nest and suitable food for the young to be raised. In addition, it needs food for the adults as well as mating places and, in addition, adequate protection from predators.

Illustration 18.1 shows the life cycle of a butterfly. Butterflies are insects that go through a complete development, that is, they transform from the larva into a pupa. The adult moth, the butterfly, then hatches from the pupa. As larvae, many butterfly species specialize in a single plant species. If this is missing, butterflies cannot reproduce. Pupation requires suitable structures; some moths do not pupate on the host plant. In contrast to the larvae, the adult butterfly does not eat any leaves, but mostly sucks the nectar of certain plants. The peacock butterfly (*Aglais io)* For example, as a larva only feeds on the nettle, but the adult butterfly visits a number of different plants in the course of the summer.

The adult butterfly needs a protected space for wintering. The peacock butterfly winters in places with a certain humidity so as not to dry up; this can be in natural caves, but also in basements, garages, sheds, sewers or attics. When the butterflies wake up from wintering, again suitable plants with pollen and nectar must be available; the

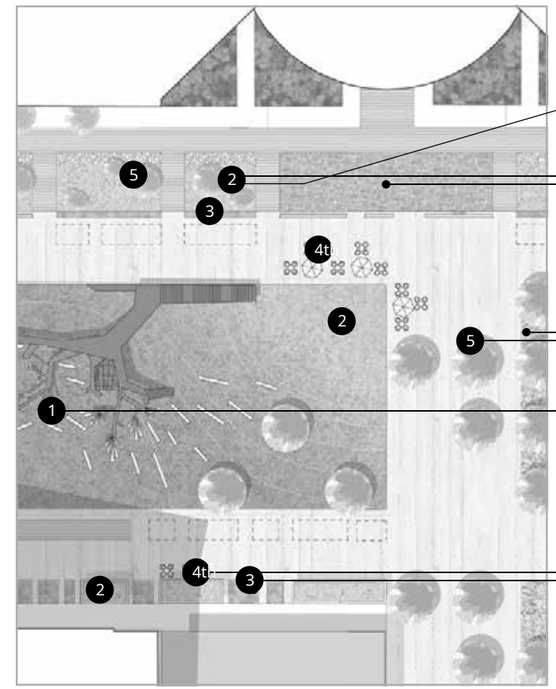
Peacock butterfly, for example, needs pasture. The example
The peacock peacock shows how exactly the planner must be familiar with the life cycle of a species in order to be able to meet all of the animal's needs at the planning site. However, if the planner knows about the speci fi c requirements, then it is possible to design a habitat for the species.

Illustration 19.1 shows the life cycle of a bird. A suitable place for the nest, the right food for the young birds as well as for the adult animals is also a prerequisite for birds so that they can occur in one place. Many species of birds eat both plants and animals, and the need for food changes over the course of the year, so there must be forage plants and forage insects. At the robin (*Erithacus rubecula)* the hatched young birds are mainly fed with insects. These have to be soft at first so that the little birds can eat them. The parents therefore initially feed mainly with caterpillars and other soft larvae, and only later also with adult insects, which have a harder (more strongly chitinized) skin. Later broods in the year are also fed with fruits that are early in the first broods
Year not yet available. In late summer and autumn the adult robins eat different fruits

75.1 SPECIFIC DESIGN BLOCKS
HOUSE PEARLING

The sociable house sparrow feels at home in lively, urban open spaces, provided it finds all critical location factors. The design of the Fairfield Gardens offers nesting opportunities in the Fairtree, hedges as protective trees, areas for dust and water baths as well as diverse sources of food. The best conditions for the formation of a new colony.

CRITICAL LOCATION FACTORS



Section of the site plan

Arthropods and their larvae in the open ground and on the plants of extensive green roofs, dry lawns and perennials
especially important for young animals

Grass seeds, seeds from perennials on a central green area, extensive green roofs and lizard gardens

Water bath on a film of water in front of college in a sunny location, maximum depth 5cm

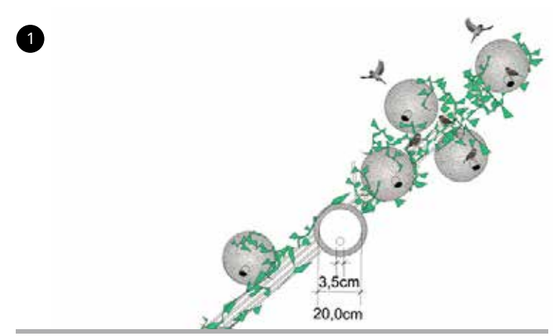
Dust bath for parasite control in areas of the water-bound ceiling

Fruits on bushes in lizard gardens and on mountain ash

Nesting opportunities in ball made of fiber concrete d = 20cm
opening protruding d = 3.2cm, interior for nesting box
h160 x w105 x d150mm, attachment to tree sculpture with structural steel (clad). Distance to other nests (courtship!) 50 - 75cm

Leftovers (crumbs) on the floor, especially in front of the outside areas of the bars

dense, sometimes evergreen hedges at the edges of the square as shelter, sleeping and resting places



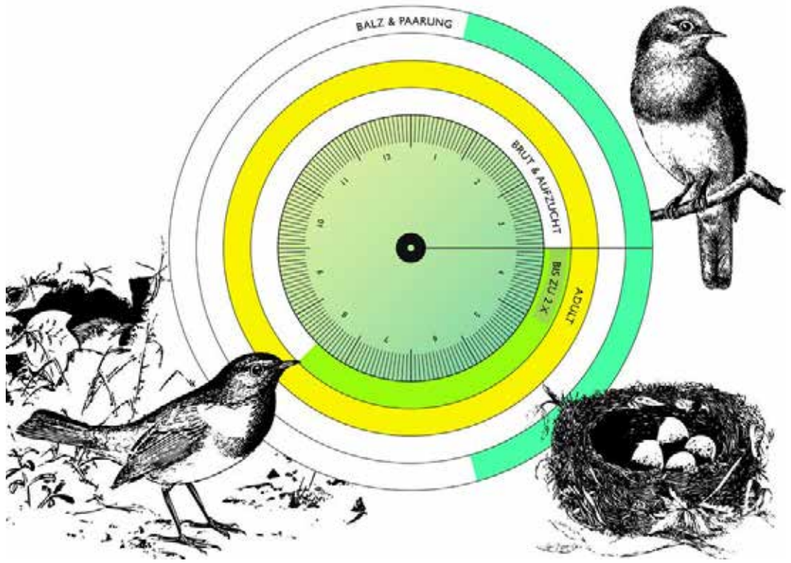
Detail "Sparrow Battery"

for the lizards. The deep sandy soil (50-70cm) is very suitable as an egg-laying area. Open, sunlit ground promotes the occurrence of running kernels, spiders and ants. 8th

The care of the gardens is low due to the low-nutrient soil. When pruning the perennials every year, care must be taken to ensure that the proportion of open soil is retained. The gardens under the decks are connected to one another and thus form a cohesive habitat that creates a connection to the railway area to the south, which can then also be populated by sand lizards.

In order to allow the visitors to the Fair fi eld to take part in the life of the animals, cameras are installed that broadcast the life of the birds (breeding, rearing, foraging) and the fence lizard (sunbathing, hunting) in large format on the theater facade. The woodpecker becomes a musician and the sparrow becomes a performer. The urban animal life itself is increased to the central media event in a certain way typical of London.

8th - "Sandy soil promotes insect life best. The radiated heat is released into the layers close to the ground at night. The drier and warmer the biotope, the higher the number of ants will be. "FESSLER 1988: 133.



19.1

18.1 Life cycle of the peacock butterfly
19.1 Life cycle of the robin

and berries, which must also be present in the open space. Which insects and plants are preferred differs from bird species to bird species. The decisive factor is where and how the types of feed occur. Robins either hunt hopping on the ground or catch their prey from so-called huntings at a height of 1 6m. However, they do not search small branches for insects, such as the blue tits, and neither poke the ground for food like blackbirds.

The example of the robin illustrates how the settlement of one species also serves other species at the same time. Plants and insect species that the robin eats are just as critical location factors as a suitable nesting site. In terms of Animal Aided Design, the species that form the basis for the existence of the desired species must therefore also be included. The plants that are eaten lose some fruit and the insects that serve as food kill many members of the population, but Animal Aided Design ensures that the types of food also build up their populations in the open. From a nature conservation point of view, the target species of Animal AidedDesign (such as the robin) is therefore a so-called umbrella species under the umbrella of the selected species, other species find their livelihood.

Animal Aided Design ensures that the target species' food is available at a distance that is acceptable for that species. Sparrows (*Passer domesticus),* Also called house sparrows, have a small radius of action and rarely move more than 500 meters from their nest. Your food sources must therefore be available in the immediate vicinity of the nest.

The robin example illustrates another important need of many bird species: protection from predators.

Both the eggs and newly hatched young in the nest as well as the fl young birds who have grown up and who cannot yet fl y properly, are endangered by overtops. Securing the nests against predators such as cats or martens plays a crucial role in the successful rearing of young of many species. Thorny trees help to make nests as cat-proof as possible. For reasons of protection, adult robins also need dense bushes to rest and sleep. Young birds that have flown out and are not yet able to fly so well are mostly on the ground or close to the ground. Since they are such easy prey, protective trees like the lower ones are helpful. Since the robin likes to bathe, it needs a fl at, wide and easily accessible bathing area. This should be far enough away from bushes so that the robins can see overhead jumping out of their hiding place in good time. On the other hand, it should always be possible to reach so that the bird can attack in the event of an attack! can fl ow there. Protecting animals adequately from predators is one of the greatest challenges for Animal Aided Design. For birds, but also lizards, frogs, toads and other species, the food supply is often not the limiting factor for their occurrence
in a place in the city, but rather protection from predators.

SHAPING WITH THE LIFE CYCLE

Animal Aided Design should help designers not to lock animals in certain pictures, but rather to focus on the needs of the planning project

Animal species to meet. The two main goals are:
a. to achieve greater freedom of design in connection with animals in the planning of open spaces.
b. to meet the needs of animals in open space planning in such a way that a population of the target species can be built up at the desired location.

As already explained above, the LIFE CYCLE of the respective target species is the basis for the application of Animal Aided Design in the design of open spaces. In order to permanently settle a population of the desired animal species with a high probability, the designer must know about the needs of the animal in all of its LIFE PHASES and then incorporate this knowledge into his planning. Here is that The de fi cit of many previous measures for the settlement of animals, such as hanging up nesting boxes or setting up bee hotels: only part of the animal's needs is met in these two examples: the breeding site. Other essential needs, such as the availability of food or the need of some young birds for close cover and close coverage, are not taken into account and left to chance. If these requirements are not accidentally met anyway, the desired species will not be established in the planning area. It should be noted here that, for spatial reasons, not all needs can be met locally for some animals, such as migratory birds that winter in North Africa.

The aim of the Animal Aided Design research project is to make knowledge about the life cycle of animals with the respective essential needs applicable to the designer. For this purpose, CRITICAL LOCATION FACTORS are described for the individual phases of life.

a. These critical location factors include specific ones Environmental factors such as the climate or the occurrence of certain types of plants that a population needs in order to survive. It is used to first describe the minimal environment of an animal or a species of animal in order to be able to construct it. [1]

The environmental factors for an animal are described as either minimum and maximum values, for example the temperatures at which an animal can exist. Or else, the environmental factors are called qualitative, such as the existence of a certain plant that the animal needs in order to survive. The detailed descriptions of the critical location factors provide pointers for a possible animal-friendly planning, on the basis of which the specific environment for the animal in the respective planning area can be derived.

b. In addition, describe the critical location factors also things, complexes of things and concrete characteristics of things. These enable the designer to meet the needs of certain animals, because in his draft he works with specific design elements such as plants, building materials, and seating. This planning aid saves the planner the big one Effort to determine the things necessary for the fulfillment of these factors yourself, for example to calculate which combination of plants can meet the nutritional needs of a certain animal. The N hrsto! Information is based on empirical values and is, for example, given in lists of plants which indicate a number of possible food plants or protective trees against predators for an animal species.

The designer can now integrate knowledge about the LIFE CYCLE and the CRITICAL LOCATION FACTORS of a desired type into the planning. As with every design, the designer compares the functional requirements, which in our case now also include the needs of the target species, in an iterative design process with his subjective creative and aesthetic ideas and combines them in the design. In order to successfully integrate the needs of a target species into the designs, the following conditions must be met:

a. IMPLEMENTATION OF ALL CRITICAL LOCATION FACTORS IN THE DESIGN
Animal Aided Design lists the critical location factors (as far as they are known) that must be met in the design to successfully establish a target species. This list, made by the designer has to be processed, but is only an aid for the design. The creative challenge for the designer is to find meaningful and innovative design solutions for all critical location factors within the framework of the overall design.

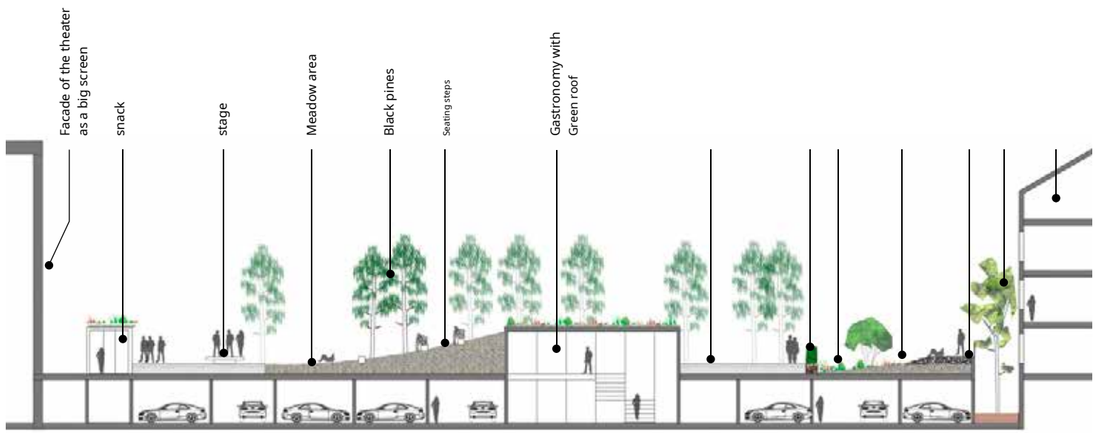
b. LOCATION OF THE LIFE CYCLE OF THE TARGET TYPE IN THE DESIGN PLAN
After the design process, it must be possible for the planner to draw those places and things in the design plan at and with which the critical location factors of the respective life phases of the target species are met. Thus the FULL LIFE CYCLE AMPLAN becomes visible. Requirements that can only be met outside of the planning area should also be presented and their reachability for the target species should be demonstrated.

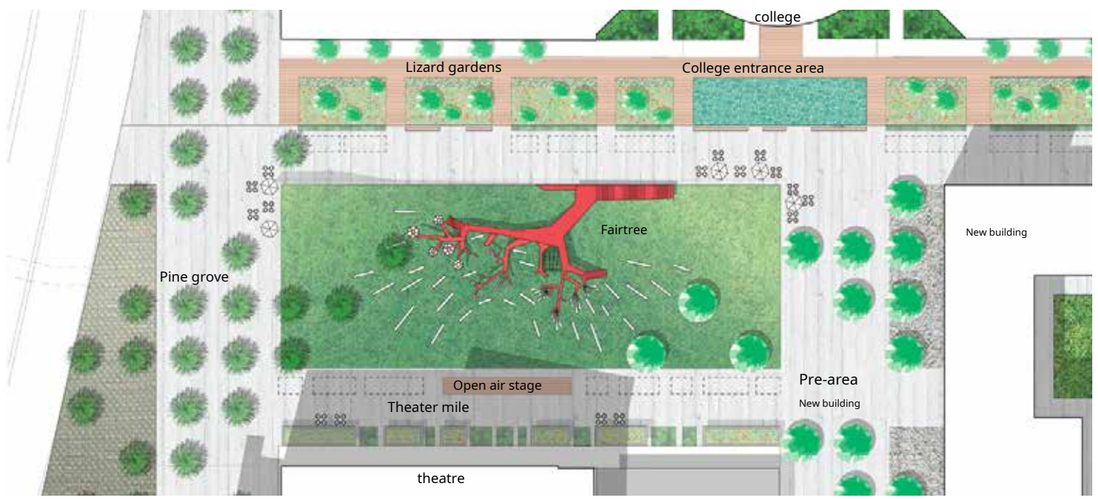
1 - see TREPL 2005: 108ff.

Axonometry Fairfield Gardens
The Fairtree as the central sculpture gives the place an extraordinary identity. Restaurants with a green roof form the spatial interface between Underground parking and College Green and enliven the public space.

Axonometry Fairtree
The Fairtree has different functions: projector, sound and lighting system can be used for events. Climbing frame, slide and Viewing platforms offer an experience for children and adults. The branches of the Fairtree take on specific functions for house sparrows and great spotted woodpeckers.

72.1 DESIGNED FAIRFIELD LONDON





, # &! & $ * - "# * made of black pines with a long ramp to create a connection to the underpass to Queens Gardens.

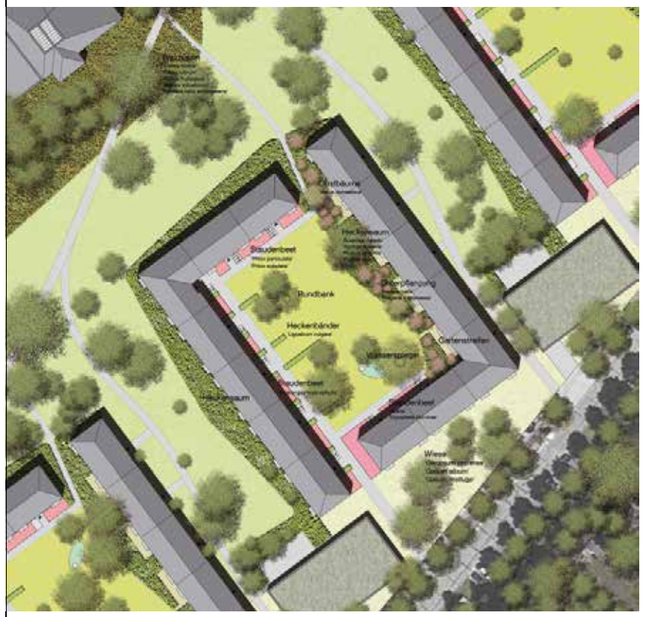
& # + & .- / & * 01 $% & * from wooden deck framed, gardens with solitary shrubs (hazel, cornel, rock pear) and species-rich perennial planting on deep sandy substrate. Delimitation to central area with benches and hedge elements. Before that optional Installation areas for market stalls.

% - & "% & $ 6 & # (& with optional set-up areas for market stalls, with mini-architecture in front of the theater facade in the north Green roof for public uses such as snack bars, youth clubs, student cafés, radio stations, studios and workshops. In between there are evergreen hedge packages from privet.

) 5 & * '"# $' /%" 0 & with Fairtree as Multimedia element (projector, sound and lighting), modeled lawn with seating elements as a grandstand, wooden deck as a stage and action platform in the north and theater facade as a projection surface for open-air cinema.

& # * 0 "* 0/2 & $ & # .- '.) ((& 0 & With central water surface and seating heiten.Area area with gastronomy and outside seating. Access via a wooden walkway. Greening in front of the facade with evergreen hedge packages Privet and trees planted in the underground car park (hornbeam, birch).

3) $ 2 & $ & # .- '* & 42 "4 of water-bound path cover with mountain ash survived. Ground floors with public use (shops, bars, studios, etc.)



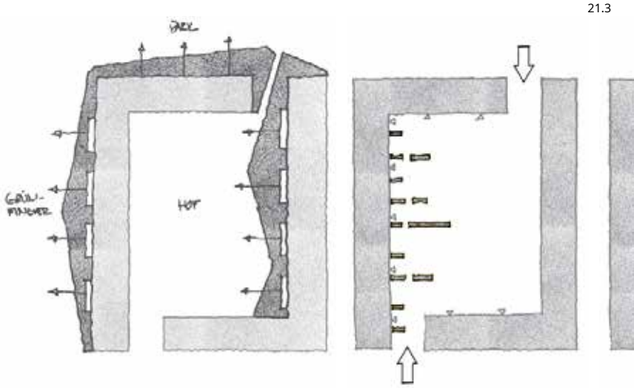
21.1

21.2

STUDENT SHORT DESIGNS

As part of the research project, it was first tried out whether designing with the inclusion of animal needs can lead to structurally interesting and functional design solutions. Students at the Technical University of Munich at the Chair for Landscape Architecture and Public Space tested the method on the basis of so-called short drafts, which they had two weeks to develop. All students were given the same residential complex in Munich as an exercise facility, in which the inner courtyard was to be redesigned to enable better use by the tenants. The students should choose one or more animal species that they want to settle in or near the residential complex based on purely aesthetic qualities and design their design based on the life cycles of the animals. The student contributions helped

21.3



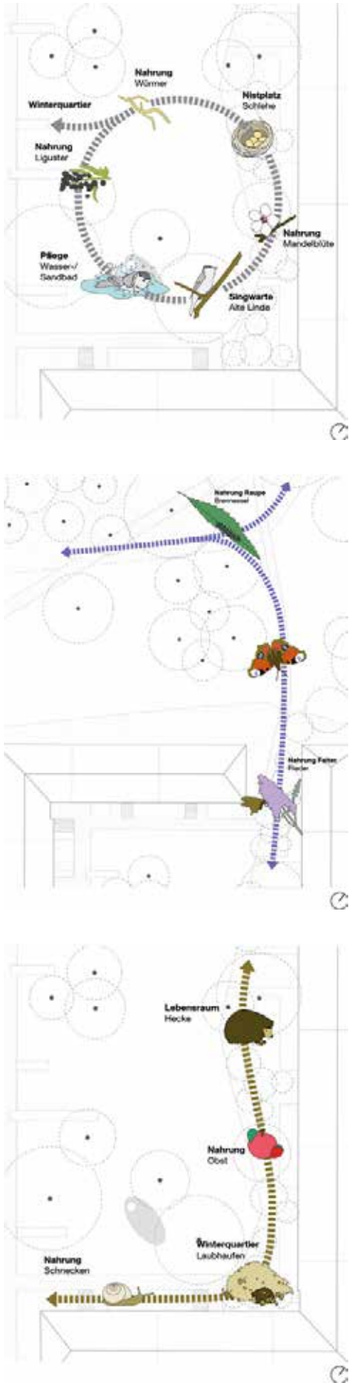
Draft for a residential complex on Züricher Straße in Munich by Julius Peisl for the target species blackcap, peacock butterfly and brown-breasted hedgehog

21.1 Detail of the floor plan

21.2 Overall design

21.3 Concept diagrams of the short draft by Julius Peisl; Concept hedge border, Concept of cut hedges, concept of equipment (from left to right)

22.1 Location of the life cycles of the target species in the design plan (next page)



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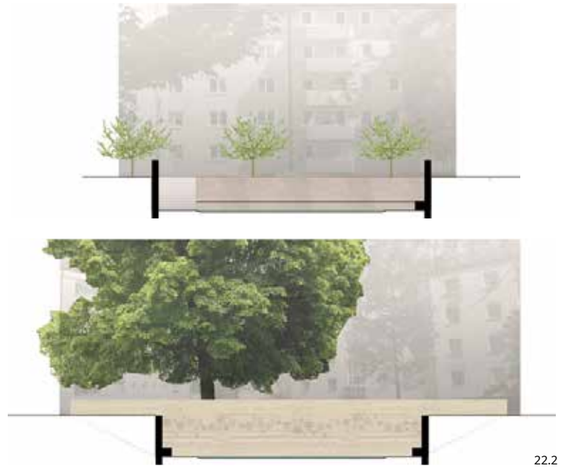

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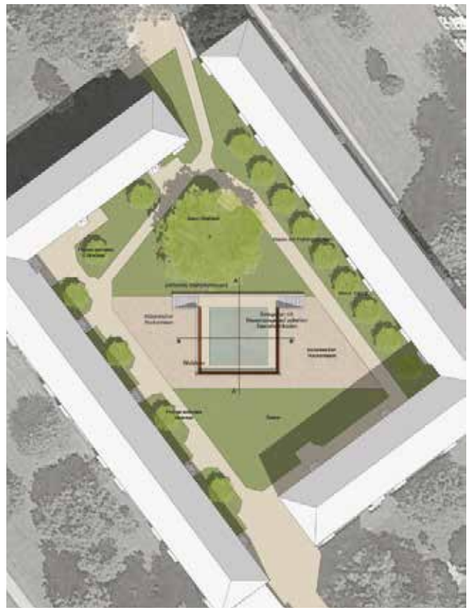


22.3

22.4

habitats, e.g. in hedges or on railway lines. 6th It is likely that the sand lizard was still living in London in the last century. A settlement in London seems possible in any case. 7th In contrast to the other designs, the London design provides for the reintroduction of an endangered species in the viewing area. The species could at least in principle occur on the sun-exposed slopes of the existing railway embankment.

Part of the concept is therefore to expand and network the habitats of the selected species or to create new habitats (for the sand lizard) as a possible source for further colonization. The approach pursues the central thesis that this creates synergy effects for animals and humans. The fact that heavily frequented public spaces with a high quality of stay and a wide range of uses cannot exclude the occurrence of these species, but can even prevent them. Vice versa, according to the thesis, the presence of these animal species also enriches the space for humans.

The draft envisages reactivating the fairfield through various uses. A distinction is made between two zones: room-encompassing, functional edge areas and a central multifunctional event arena with the sculpture of the Fairtree as the most important element in its center Fig 72.1.

Gastronomy and temporary market stalls represent an expanded space program for public use and are intended to additionally liven up the space. Your waste, such as cakes and breadcrumbs, are supplementary sources of food for the house sparrow. The nearby hedge elements offer the sparrow the necessary retreat. Individual fruit-bearing shrubs serve the house sparrow as an autumn source of food. Seeds, insects and other invertebrates for rearing young
You can fi nd nesting opportunities for the sparrow on the central square, in the fair tree, on the roofs of the catering buildings, the extensive dry grass in the event arena and in the plants in the lizard gardens (see below) Fig 75.1.

The great spotted woodpecker uses the fruits and nuts of the individually planted shrubs as a source of food. Black pines on the western edge of the square and oaks on the eastern edge of the square complete the food supply for the woodpecker. In his forge, he works the cones and acorns to get the fatty seeds. In addition, the large spaces frame the square and de fi ne spatial hillsides to the buildings in the east and the street to the west. The great spotted woodpecker will find nesting places, opportunities to hog as well as other sources of food in dead wood in the event arena Fig 76.1.

The centrally located green area, modeled on an amphitheater, forms the grandstand of the event arena. To the south, in front of the theater facade, a large wooden deck is planned. It can be used as a stage for concerts or open air theater

6th - JOFRÉ & READING2 2012.

7th - JOFRÉ, personal communication, May 27, 2014

the facade itself as a projection surface for an open-air cinema. At the two northern corners, dug under the event area, there are restaurants. They are designed as a split level between Fairfield and the underground car park. The gastronomy enlivens the above-ground public space and the underground car park. The existing street underpass to the neighboring The Queens Garden will also be generously widened and the two green areas will be networked with one another. The focal point of the event arena is formed by an utterly au! Fairtree sculpture. It is a multifunctional element for humans and animals. The roots of the underground car park lead to the surface, right in the middle of the event arena. The trunk is designed in such a way that it functions as a grandstand, offers a viewing platform and a playground with a climbing frame and slide.

The branches, on the other hand, offer the animals, especially the birds, additional habitat. There the sparrows find nesting opportunities and the great spotted woodpecker can find ducts filled with rigid foam into which they can carve out caves. A tray made of dead wood offers the woodpecker wood-dwelling insects as food. Strong resonance sound elements made of different materials (Wood, metals) serve as a percussion to mark the territory. The Fairtree is equipped with a projector and lighting and sound system and enables events such as theaters ouch! events, concerts or open air cinema. It also has an educational purpose, namely life
to make the animals accessible to a broader public. The drumming of the woodpecker fills the square and the closer Environment with strange sounds. The knocking noises like also the noise of the people and the Au! On the contrary, the sparrows are not bothered by any alarms, they are very well protected from predators in the sculpture.

In front of the facade of the college up to the railway embankment in the east, south-exposed and slightly inclined lizard gardens are laid out Fig 77.1. Wooden decks frame these gardens and offer visitors a quiet place to stay with a view of what is going on in the event arena. The wooden decks are also important sunny spots for sand lizards, especially in the morning hours. In the spaces between the wooden planks, you will fi nd opportunities to retreat. The substructure of the decks made of coarse gravel and sand offers the lizard night and winter quarters. Towards the south, a dry stone wall clad the substructure for the sand lizard
Offers retreats and also winter quarters. The gardens not only meet the needs of the sand lizard. They are also designed from a aesthetic point of view with attractive perennials and solitary shrubs. The
abundant flowering of the perennials, the characteristic habit of Larger and the fruits and seeds in autumn contribute to the quality of the public space. In addition, they create a mosaic of open, sandy beaches and dense vegetation, which the sand lizard prefers. In the loose plants with a cover of approx. 75% she will find good conditions. The grasses and perennials also offer retreats

70.1 Existing planning to which AAD is linked: Further development of the quarter tiers to become an educational, cultural and service center. Excerpt from the Fairfield master plan Fig.2

Adjacent public buildings have no relation to open space. The multi-lane carriageways in the west and the railway line in the east represent great barriers.

Behr in London drew up a master plan for the site. [1] It provides for the expansion of the adjoining college to the north and the renovation of the theater to the south. In the east of the area, new residential buildings with public and commercial ground floor uses are to be built. The redesign will turn the centrally located open space into a new green and social center Fig 70.1.

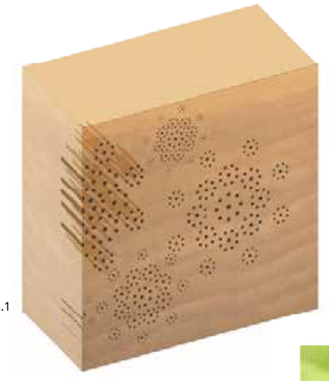
The Animal Aided Design concept is based on this master plan and adds another design component. So the design not only solves the spatial problems and develops programs to revitalize the place. It also shows how the needs of three selected animal species can be incorporated into the design of public, highly frequented places. The background to this is that, due to scarce green and open spaces and the economic exploitation of niche and fallow areas, life

Areas of many animal species in London are gradually disappearing. As a consequence, the current distribution of many species in Greater London is very spotty. [2]

The population of supposedly ubiquitous species has also been falling for years, such as the house sparrow (*Passer domesticus).* [3] This decline in stocks should be taken up by the draft. In addition to the house sparrow, the great spotted woodpecker (*Dendrocopos major)* and the fence lizard (*Lacerta agilis)* chosen. The great spotted woodpecker is a species that could also be found in the adjacent areas of Park Hill. The sand lizard also lives in cities, often on railways
d mmen and fallow. Most populations are found in the south of England, but there have been reports of isolated populations further north, for example on the coast of Merseyside. A limiting factor for the egg-laying species seems to be the solar radiation in May, whose eggs (and young animals) develop depending on temperature. [4th] Southern England has the most northerly populations a little south of London, but older reports indicate occurrence at the same level or even north of London. The number of sand lizard populations has been declining for at least 50 years, if not for about 200 years, [5] due to the decline of the original open habitats, such as heaths or sand dunes, in the course of industrialization and land use change. In southern England, as in Germany, the sand lizard comes in man-made seconds

1 - See Croydon Council: The Fairfield Masterplan, 2012. http://www.croydon.gov.uk/planningandregeneration/ framework / localplan / masterplans / fairfield-mplan (accessed May 02, 2014).
2 - London's Amphibian & Reptile Environments (CLARE) Project, London Record Center website, overview maps of amphibians and reptiles in London
http://www.gigl.org.uk/atlas/amphibians-reptiles-atlas/ (accessed May 16, 2014).
3 - WEBER 2010: The Sparrow Primer. State Association for Bird Protection, Munich.
4th - JACKSON 1978.
5 - HOUSE & SPELLERBERG 1983; SPELLENBERG 1975 ..

23.1



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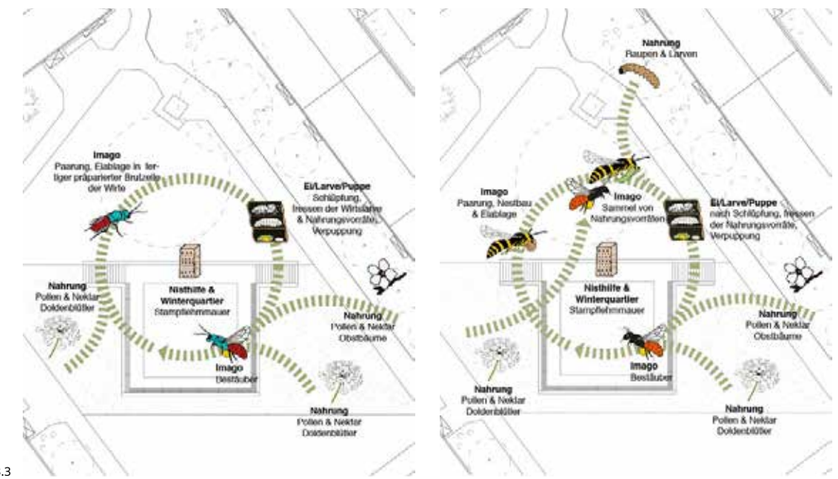


Draft for one of the inner courtyards of the residential complex on Züricher Straße by Oliver Ferger for the target species gold wasp

22.2 Longitudinal and cross-section through the sunken garden

22.3 Layout

22.4 View of the cave garden with a perforated rammed earth wall as a breeding habitat for Golden wasps and their hosts, various wild bees and wasp species

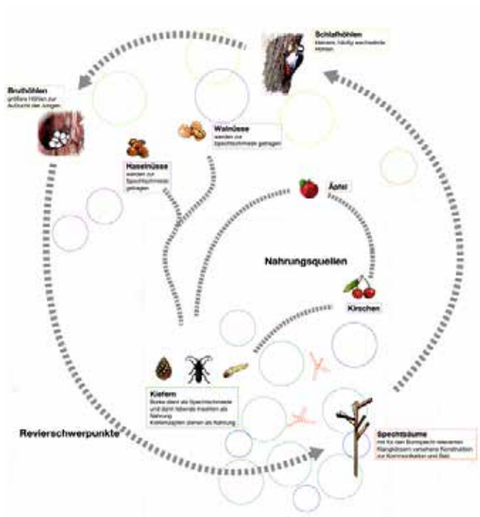
23.1 Detail of the perforated rammed earth wall

23.2 Derivation of the design for the perforation of the rammed earth wall from the Blossom of the wild carrot, an important fodder plant for the host of the golden wasp: Common golden wasp (! "# $% &% '& () & * +), Wild carrot (, + -.-%'. + # / * + '% - *0% 12 '* . + # / * +), Principle of flower structure Wild carrot, perforation pattern rammed earth wall. (from left to right)

23.3 Location of the life cycles of the target species in the design plan

24.1

24.2



24.4

24.3

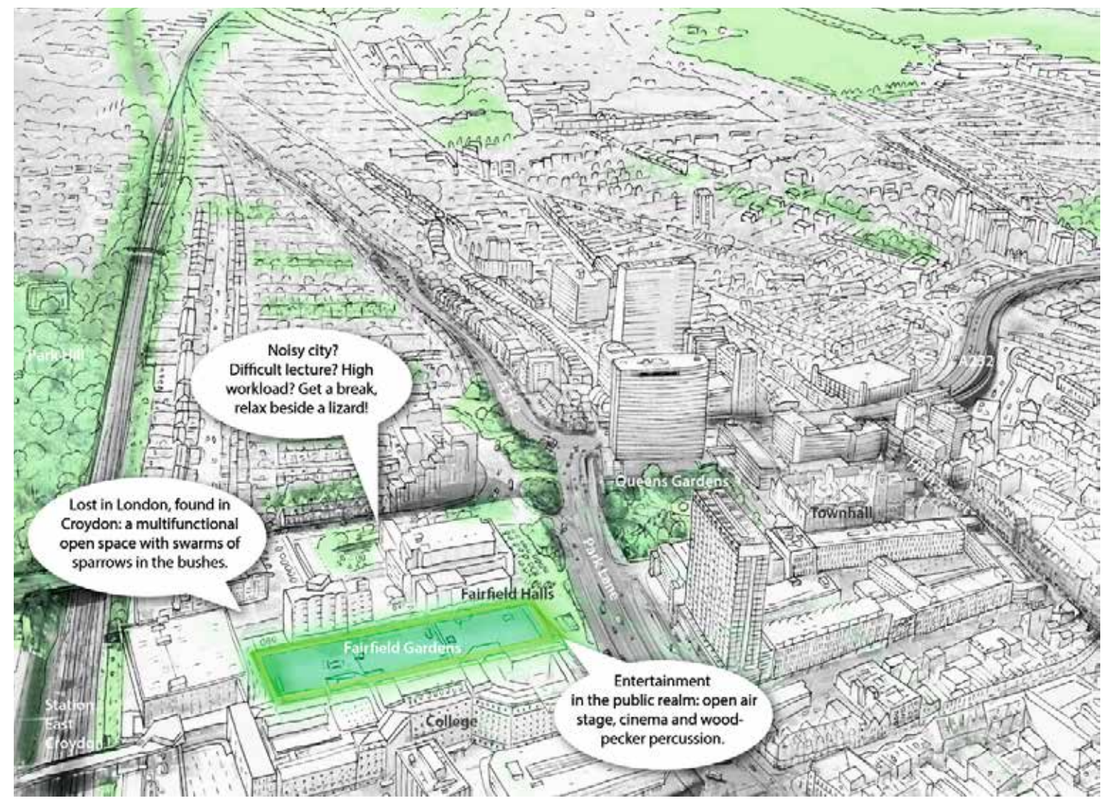
"Urban Percussion" design for one of the inner courtyards of the residential complex on Züricher Straße by Benedikt Radlmaier for the target species great spotted woodpecker

24.1 Section through an inner courtyard

24.2 Layout

24.3 View of the redesigned inner courtyard with “woodpecker trees” that provide various sound bodies as courtship and communication instruments

24.4 Location of the life cycle of the target species in the design plan



69.1 Location of the design site in Croydon with key ideas

FAIRTREE LONDON

Example 2

IN THE MIDDLE OF THE CENTER OF CROYDON, CHARACTERIZED BY HIGH-RISES FROM THE 1960s, IS FAIRFIELD GARDEN. THE CENTRAL SPACE FORMS THE SPATIAL AND SOCIAL ANCHOR POINT FOR THE DEVELOPMENT OF THE QUARTER. Woodpecker, house sparrow and sand lizard additionally enliven the place and give it ecological value. THE NETWORKING WITH SURROUNDING GREEN AREAS (PARKHILL PARK, QUEENS GARDENS) AND THE ADDITIONAL RAILWAY DAM CREATE WIDE-ROOM HABITAT.

In the era of the conservative government under Thatcher and Major (1979 1997), the London city government, the Greater London Authority, was abolished and public investments in urban development projects were reduced to a minimum. Hardly any new public green or open spaces were created. Larger investments were only made privately, as in the Broadgate office, or to make service quarters competitive, as in Canary Wharf. This policy only changed with the change of government in 1997, when the urban renaissance became a central political issue in Great Britain. Since then, pedestrian-friendly open spaces in the city center, such as Trafalgar Square, have been an important contribution to increasing the competitiveness of companies, Tourists and wealthy residents. In addition, the city's population growth and the resulting densification should be cushioned by high-quality parks and squares. A considerable number of new squares, redesigned streets and new parks were created in the first decade, primarily in the inner city and in the urban redevelopment projects in East London. The highlight of this development was the Queen Elisabeth Park, which was completed for the 2012 Olympic Games, and the open space projects planned in the Olympic Fringe, such as the Greenway, Fat Walk, Three Mills Green, etc. A considerable number of new squares, redesigned streets and new parks were created in the first decade, primarily in the inner city and in the urban redevelopment projects in East London. The highlight of this development was the Queen Elisabeth Park, which was completed for the 2012 Olympic Games, and the open space projects planned in the Olympic Fringe, such as the Greenway, Fat Walk, Three Mills Green, etc. A considerable number of new squares, redesigned streets and new parks were created in the first decade, primarily in the inner city and in the urban redevelopment projects in East London. The highlight of this development was the Queen Elisabeth Park, which was completed for the 2012 Olympic Games, and the open space projects planned in the Olympic Fringe, such as the Greenway, Fat Walk, Three Mills Green, etc.

However, large areas of Outer London could not benefit from these investments. This only changed after the election of the Conservative Party Mayor Boris Johnson in 2008. Through the Outer London Fund, he launched a number of projects in the public space of the outer boroughs, especially in boroughs in which Conservative Party voters have settled. However, London shows a social polarization that is above average for European standards. In the less favored areas of the outer city in particular, there was hardly any major investment. Housing estates shape the neighborhoods there, ie social housing projects from the 1960s and 1970s with their traffic planning in the style of modernism and modernist district centers. This dense juxtaposition of rich and poor resulted, among other things, in social tensions, which erupted in the so-called London Riots in 2011 and made the outskirts of the city the focus of politics and urban development. One of the core areas of the riots was Croydon.

Urban development investments, among other things for strengthening of the public space, are now supposed to help the social span to defuse and strengthen the desolate structures. An example of such an urban development project is the Fairfield in the middle of Croydon, the viewing area for the design Fig 69.1. The former fairground area, Fairfield, is largely sealed or covered with shear lawn and low hedges. There is an underground car park underneath. The place

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BASIS OF SPECIES PORTRAITS

AAD provides the planner with knowledge about the needs of animals through so-called SPECIES PORTRAITS. These consist of the following parts:

SPECIES PORTRAIT
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THE GENERAL CHARACTERISTICS Fig 26.1 shows and describes the APPEARANCE of the animal species, its current DISTRIBUTION, the SPACE REQUIREMENTS regardless of the life phases as well as important BEHAVIOR AND ENEMIES.

THE IMPORTANCE FOR HUMANS Fig 26.1 describes the ATTRACTIVENESS of the animal species, for example the song and whether an interesting behavior can be observed. In addition, the usefulness of the species is explained in this section, for example as a pest-devourer; but also whether there are possible USE CONFLICTS between animals and humans. Conflicts can originate from the animal, for example loud shouting at night, or from humans, for example through disturbances in the nest and the keeping of domestic cats. Finally, the DANGER and LEGAL STATUS of the species are explained.

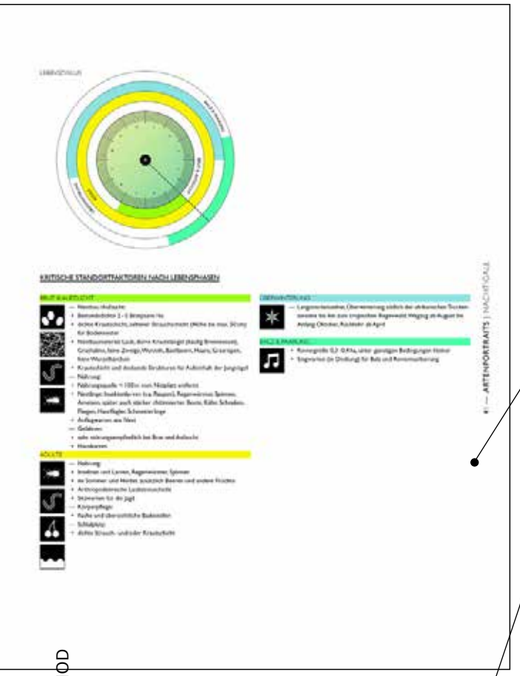
THE LIFE CYCLE Fig 26.1, 26.3 the animal species is divided into different LIFE PHASES, which are shown in a graphic. For all animal species, the graph starts with the breeding or reproductive phase. The duration of the individual phases can be read on a monthly scale, and the phases of life are described in detail Fig 26.2. The textual information is structured according to the needs of the species in each phase of life.

The CRITICAL LOCATION FACTORS are derived from the needs of the species described Fig 26.1, 27.1 listed for each phase of life. The list now contains the information relevant to planning, with which means the animal needs are to be met. It should be completely incorporated into the design by the designer Fig 27.2. Only when all critical location factors have been met through appropriate measures in the draft is there a high probability that it will

Desired animal species can survive as a population in the project area.

As a PLANNING AID Fig 26.2 Information on certain critical location factors, such as food for young birds or plants for nest building, is expanded with lists that provide information on suitable animals and plant species.

26.1



26.2

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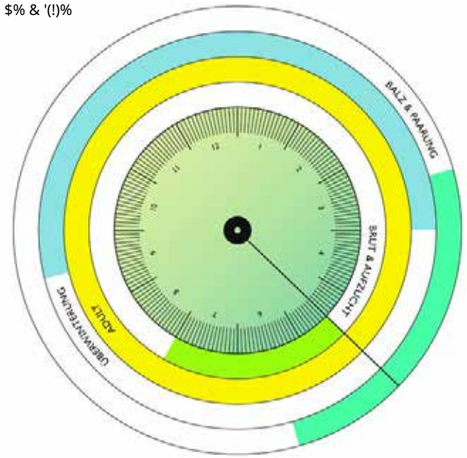


The circle diagram shows the life cycle of an animal species over the course of a year (this can be different for animal species with longer or shorter life cycles)

** Breeding & rearing: The innermost circle shows the period within a life cycle in which animals of the respective species are born or eggs are laid and, if necessary, rearing of the young takes place. The hand of the "clock" marks the approximate beginning of this first phase in the life cycle of a species. Adults: The second circle

** shows the period in which the respective species goes through the respective life cycle as an adult animal. In the case of species that go through several life cycles, the circle is therefore closed.

** Wintering: The outermost circle shows the period within a life cycle in which the respective species changes its behavior in order to survive the winter. This can be, for example, hibernation or calm, or the train to warmer regions.

** Courtship & mating: The third circle shows the period of partner search and mating of the respective species.

Illustration of how the information from the species portraits is incorporated into the design, using the nightingale as an example (see the species portrait in the next but one chapter)

26.2 Further planning aids: plant lists and a more detailed description of the life cycle

26.3 Excerpt from the species portrait: Life cycle of the species as a pie chart

27.1 Excerpt from life phase-related critical location factors as a planning tool

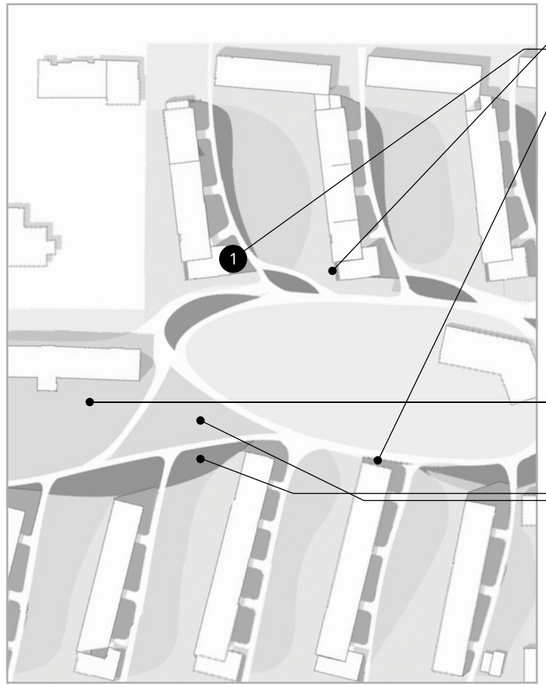
27.2 Example for the location of the location factors in the design

67.1 SPECIFIC DESIGN BLOCKS

DWARF BAT

The spacious interior of the settlement offers long, linear hunting structures for the pipistrelle bats. Hunting insects is particularly lucrative over retention areas and extensive meadows. Since the pipistrelle bat is a typical building bat, it is offered quarters in the energetically refurbished facades with different orientations (west, east, north).

CRITICAL LOCATION FACTORS



Section of the site plan

Day quarters, nursery or winter quarters as a facade component with a drip tray integrated in the insulation layer of the facade

Entry slot as a design element in the facade 2 cm high, up to a meter long

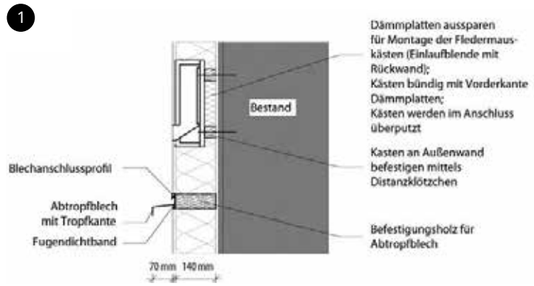
Quarters on the west, east and north facade allow variable exposures, depending on the individual space requirements (humidity, temperature, etc.)

Daily roost for daytime rest and mating, especially for individual males, nursery for rearing the young with space for 10-50 individuals. Winter roosts draft-free and frost-proof, 3 ° C- 9 ° C with high humidity, with space for approx. 10 individuals

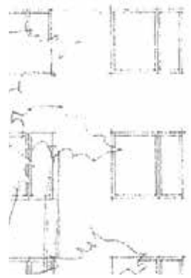
linear hunting structures along the buildings, woody structures and retention areas

nocturnal insects (especially mosquitoes, small flies and lacewings) over wet areas of the retention areas and extensive fatty meadows

1



Section of the facade quarter. Source: Hechenbichler Architects' Office, Munich



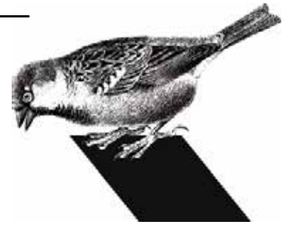
Detail of the design of the south-west facade

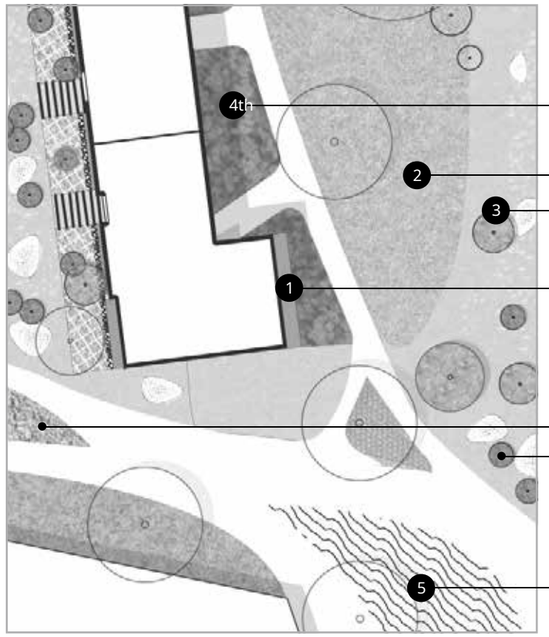
66.1 SPECIFIC DESIGN BLOCKS

HOUSE PEARLING

The house sparrow lives in colonies and, as a typical building breeder, is very local. Nesting facilities are offered in the east facades at the head ends of the northern row buildings. All necessary needs (food supply, protective trees, bathing areas, dust baths) are offered within a radius of approx. 50m.

CRITICAL LOCATION FACTORS





Section of the site plan

Protection, sleeping and resting places in hedges on the east side of the building with thorns and dense branches (hawthorn, privet, hornbeam)

Ears of grass and other seeds of the species-rich fat meadows and dry grass in the extensive courtyard areas

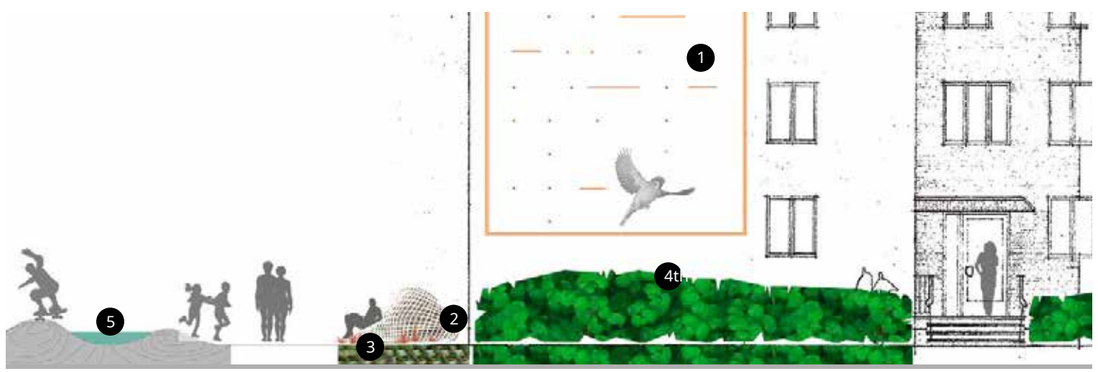
Arthropods and their larvae in open ground and plants. Especially in areas of the sun-exposed dry grassland with areas free of vegetation. especially important for the supply of the young animals

Nesting place in the east facades, integrated as a nesting block in the facade insulation, height 3 -10 m, openings 35 mm and 45 mm, minimum distance to neighboring nests at least 50 cm

Dust bath for combating parasites in sandy and dusty areas free of vegetation, in sand play areas and boules pitch

Fruits of solitary trees for supply in autumn and winter. Species: hawthorn, rock pear, cornel, wild apple, wild rose

Water bath in puddles, artificially created in the depressions of the asphalt hills



Detail section "Facade installation Spatz"

27.1 CRITICAL LOCATION FACTORS AFTER LIFE PHASES

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- Nest building / rearing:
  - Stand density 2 - 5 breeding pairs / ha
  - dense herbaceous layer, rarely shrub layer (height up to max. 50cm) for ground nests
  - Nest building material: leaves, dry herb stalks (often nettles), blades of grass, fine twigs, roots, bast fibers, hair, grass panicles, fine root hairs
  - Herb layer and covering structures for the young birds to stay for
- food:
  - Food source <150m from the nesting site
  - Nestlings: insect larvae (especially caterpillars), earthworms, spiders, ants, later also more heavily chitinized prey, beetles, flies, flies, hymenoptera, butterflies
  - Approach waiting at the nest
- Hazards:
  - very sensitive to disturbances in breeding and rearing
  - domestic cats

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- Food:
  - Insects and larvae, earthworms, spiders
  - Berries and other fruits in summer and autumn
  - Arthropod-rich leaf litter
  - Seat attendants for the hunt
- Personal hygiene:
  - Flat and clear swimming areas
- Sleeping place:
  - dense shrub and / or herb layer

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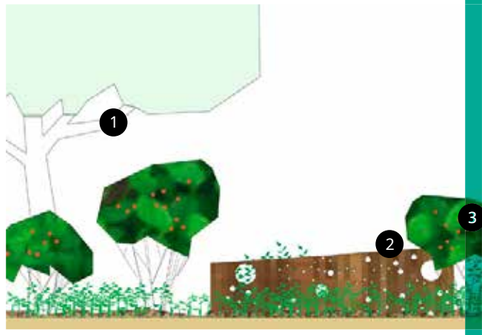
- Long-distance migrants, overwintering south of the African dry savannah to the tropical rainforest, moving from August to the beginning of October, returning from April

'"43-2-6" "* + &, -

- Territory size 0.3-0.4 ha, smaller under favorable conditions
- Singwarten (under cover) for courtship and area marking

27.2



Detail of nutrient store

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The aim of Animal Aided Design is to create living spaces for animals and thereby improve the design of open spaces for people. The planned living spaces are usually rebuilt as part of the planning. The use of Animal Aided Design helps ensure that the species that are in demand become more abundant. If an endangered or particularly protected species is selected as the target species, then Animal Aided Design can make a positive contribution to the conservation of this species. Animal Aided Design is not a classic nature conservation - there are no protected areas, nor are the animals in the foreground, but it supports classic nature conservation, because more habitats are created for species. Animal Aided Design also helps to increase the acceptance of coexistence between humans and animals. People bene fi t from a good design that gives them access to more co-system services. This makes it clear that the protection of species and the human use of public or private spaces do not have to be in contradiction.

Despite the many possible uses of Animal Aided Design, it will of course not be able to replace traditional nature conservation. Species that colonize very large areas or are potentially dangerous to humans, such as the brown bear or the wolf, cannot be established in urban open spaces. Extremely threatened species or very sensitive species with very special life cycles
must continue to be protected to the exclusion of humans. And of course Animal Aided Design is not the solution to global problems such as the deforestation of the tropical rainforest. Animal aided design is strongest where humans and animals have common interests or needs, that is, in green areas where ecosystems services are to be funded. Animal Aided Design supports classic nature conservation with concepts on how the settlement of a species can succeed. Animal Aided Design can therefore be applied to traditional nature conservation measures, such as compensatory measures.

We, the authors of this brochure, see great potential in Animal Aided Design to supply our cities and communities with a functioning green infrastructure that makes them more climate-proof and enables the people who live there to enjoy a higher quality of life.

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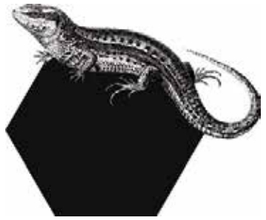
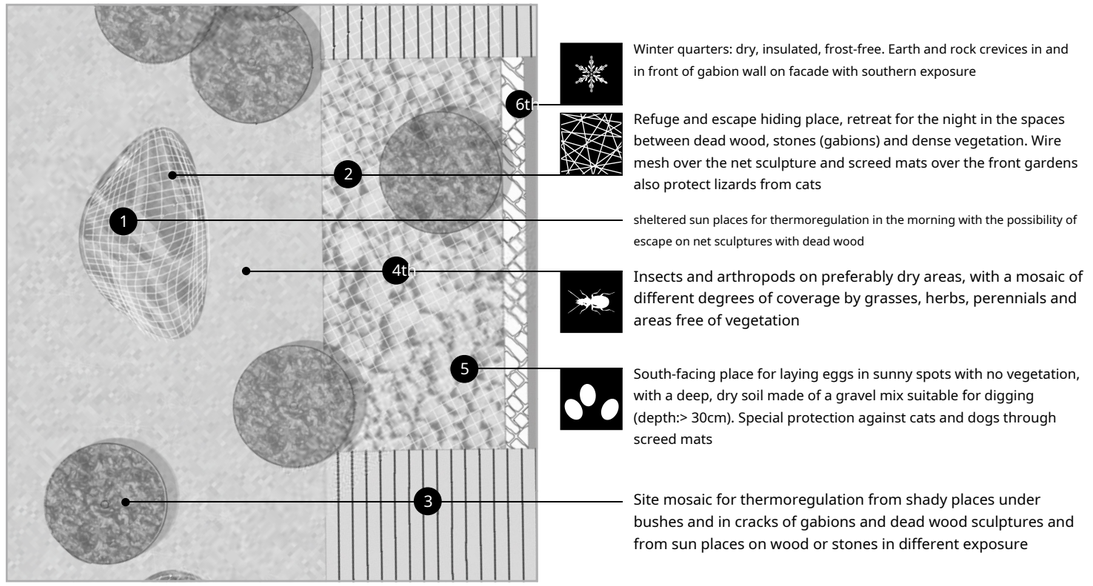
Successful design with animals requires precise knowledge of the life cycles of the selected species. In the course of research for our presented projects, it turned out that this knowledge is often not available in detail. It is well known how to make a place or a garden bird-friendly in general. However, to ensure that for a certain species all critical factors
are met so that a population of the species can establish itself, the knowledge is not detailed enough. Animal Aided Design would like to close this gap. In order to work out which of the factors are really critical and which factors are perhaps not so important after all, experiments are necessary in which the importance of the factors is tested. Most studies of our native species are descriptive, that is, the bird or lizard is observed in their natural habitat. By comparing it with similar Habi
actions in which the species does not occur can be tried to identify the critical factors. Habitats, however, have many idiosyncrasies, all of which can be potentially important to a species. Such a descriptive comparison can therefore only provide indications as to whether the differences found really are

65.1 SPECIFIC DESIGN BLOCKS
SAND LIZARD

Lizards prefer sunny locations in a south-facing location. The base areas of the south-west facades of the residential buildings are particularly suitable as a lizard habitat. Excessive trees are thinned out. Base areas made of natural stone (gabions), open, sandy soil, solitary trees and net sculptures made of dead wood represent an attractive living space on and in front of the facades. Particular care is required with cats, which are to be kept away with wire mesh.

CRITICAL LOCATION FACTORS





Section of the site plan

Detail "lizard terraces"

The pygmy bat is the most mobile of the three design species and can lie greater distances between sleeping quarters and feeding habitats. Insects multiply in the wet areas in particular and are then hunted in the air. Elongated retention areas offer linear, structured hunting areas along the buildings and wooded fringes. At night they go hunting along surfaces of water, high meadows, paths, building facades, solitary trees and lanterns Fig 67.1.

The meadow and retention areas also play an important role in climate adaptation. Compared to the current structures, they are likely to have a significant cooling effect on the local climate within the settlement.

the reason for this is that the species occurs in one habitat and not in the other. Ultimate certainty that this is actually the case can only be achieved by changing (manipulating) the supposedly critical factor. If the presence of a species can be brought about by changing certain levers, i.e. a habitat becomes habitable for a species, if one introduces a factor, then this factor is indeed critical.

To illustrate the prerequisites for a successful animal-aided design, a comparison with successful gardening helps. A gardener can only plant a plant promisingly in a certain location if he knows whether the location offers sufficient light or, if necessary, sufficient shade, whether the plant will survive the winter temperatures at the location, and whether and how often it is watered or must be fertilized. However, knowledge about these critical factors in plants comes only to a very small extent from studies of species in their natural habitats. What we know today about the horticultural demands of our ornamental and useful plants is the result of countless experiments in which plants were planted under different conditions and with different care. These were not necessarily scientific experiments, but more or less systematic trying out, as every gardener does in his garden. In the case of many types of plants, we have a tradition, often centuries old, of determining the critical factors. In the case of animals, this knowledge is limited to our classic farm animals, such as chickens, cows, horses, goats, sheep or even cats and dogs. But even about these very familiar species, we still don't know everything today, as the discussion about good and animal-worthy keeping conditions shows. The history of the keeping of plants and livestock is a story of trial and error in which more and more knowledge has been accumulated over time. It is therefore illusory to believe that there are "specialists"

So we can't expect every design with animals to work right away. Good animal-aided design uses the existing knowledge about the species, but also creates something new through design. How well the designed design elements are accepted can only be seen after implementation. The designs presented in this brochure are examples based on what we know about the species that occur. The species portraits and critical factors were worked out through a study of the literature and discussions with many specialist colleagues. Nonetheless, our designs are still designs. Only when the various elements have been tried out in practice can you be sure that they will work.

So that Animal-Aided Design can prevail, we need two things: firstly, research that determines the critical habitat factors through targeted experiments, and two-

At least courageous local authorities and property owners who implement Animal Aided Design projects to test and demonstrate the practicality of the designs.

5 - SPECIES-PORTRAITS

In the 20mm wide slots in the bat roosts, the circular openings for building nesters create a new facade image. Pygmy bats react sensitively to the conditions in the roost (temperature, humidity, etc.) and change roosts depending on requirements. This is why the slots in the district building blocks are also made on the south-west and north-west side of the facades. They can be used as summer and winter quarters, but also as living quarters. The base area of the facade is also included in the design. Dense hedges are provided in front of the east facades, which the house sparrow, especially the young birds, can use as a retreat and relaxation area.

The sand lizard, like other lizards, is quite capable of living in cities; however, all lizards suffer very badly from predators, especially cats, which are a major reason why lizards are not very common in urban settings. The draft tries to find solutions for how sand lizards can occur in spite of the presence of cats Fig 65.1. In front of the west or south-facing facades, gabions filled with coarse natural stone quarry cover the base area. Instead of the balconies on the mezzanine floor, wooden decks are created as terraces for the respective apartments. The gabions stand on a 50cm deep gravel-sand mixture. This is a predestined hiding place for the sand lizard, especially for wintering, as the room is close to the facade and is in fl uenced by the waste heat from the building, so it remains frost-free.

The sandy substrate is also spread between the terraces. The nutrient-poor, loose soil is only sparsely populated by plants and thus leaves the opportunity for areas free of vegetation. They are strongly heated by the sun and are ideal for laying eggs. Ground beetles, spiders and ants also prefer warm, dry soils. Their abundant occurrence forms the lizards' food source. In combination with solitary perennials, grasses and shrubs, a diverse structural mosaic is created. Cats are a major problem for the sand lizard in urban areas. Especially early in the morning, the cold-blooded sand lizards are still very sluggish and are easy prey for cats, which, like humans, are homeothermic and therefore do not have to warm up to go hunting. Protecting lizards from cats is very difficult, especially because cats are very adaptive and quick and skilled at hunting. The draft tries to protect lizards from cats using three approaches. The egg-laying and wintering areas on the south-west facades are covered with filigree steel mats (eg screed mats) between the terraces and gabions. With a distance from the floor of 15-30cm and a mesh size of 5cm, they reliably protect against cats, as cats are reluctant to walk over the narrow bridges, are quite slow there, have trouble getting to the lizards and can be seen by the lizards in time. The lizards' hunting ground is extended by a dry grassland, which together with especially because cats are very adaptive and quick and skilled at hunting. The draft tries to protect lizards from cats using three approaches. The egg-laying and wintering areas on the south-west facades are covered with filigree steel mats (eg screed mats) between the terraces and gabions. With a distance from the floor of 15-30cm and a mesh size of 5cm, they reliably protect against cats, as cats are reluctant to walk over the narrow bridges, are quite slow there, have trouble getting to the lizards and can be seen by the lizards in time. The lizards' hunting ground is extended by a dry grassland, which together with especially because cats are very adaptive and quick and skilled at hunting. The draft tries to protect lizards from cats using three approaches. The egg-laying and wintering areas on the south-west facades are covered with filigree steel mats (eg screed mats) between the terraces and gabions. With a distance from the ground of 15-30cm and a mesh size of 5cm, they reliably protect against cats, as cats are reluctant to walk over the narrow bridges, are quite slow there, have trouble getting to the lizards and can be seen by the lizards in time.

Solitary shrubs and sculptures made from deadwood Lizards preferred mosaic of sunlit open areas for hunting and warming up, as well as of overgrown, shady retreats and night quarters. The sculptures are elliptical formations made of stone and deadwood, which are interwoven with a wire mesh. They offer night quarters in connection with morning sun spots, which are also in front of Cats are protected and have a more casual and informal style of the free spaces continue.

While the solutions found appear practicable, only the practical test will show whether the sand lizard will be able to survive in a large number of cats in the roost. Further structural measures would be sprinklers, which are triggered by the cats via motion detectors and would scare cats off. Of course, it would also be possible for the house community to keep the cats in the apartments in order to maintain the sand lizard population.

In the middle of the housing estate, a central lounge area is being created which, in addition to the existing playground, is being expanded to include additional elements that, in addition to new uses for people, take on other functions necessary for the three species. Some of the net sculptures for lizards can also be covered with a climbing frame or equipped with seating. In addition to the function for humans, the network sculptures distributed over the residential complex achieve the networking of the lizard territories. The house sparrow particularly bene fi ts from the recreational opportunities created for children and adults Main ways. Sandpits and boules courts in water-bound Construction can be used as a sand bath. Areas with asphalt hills invite you to run around and skate. In the valleys the formation of puddles is deliberately encouraged serve baths for sparrows Fig 66.1.

In the courtyards to the north of the residential complex, too, the green areas are being expanded, ie the mowing frequency will be increased once weekly reduced to once or twice a year. this has not only results in a reduction in care and maintenance costs. The less frequent mowing turns the monotonous spacing areas into species-rich meadows, as many plants and insects can now develop there and set seeds or lay eggs. The area in the courtyards is raised in the east to the terraces on the mezzanine floor and slopes down to the west to the retention areas for surface water. The result is a gradient from dry and sunny areas with a brisk meadow character in front of the west facades, over areas with a smooth oat meadow character to more humid meadow areas in the retention areas. In addition to the aesthetic enhancement of the monotonous outdoor areas, the meadows become a variety of sources of food.

from about 50m around the nest. Species-rich meadows are also home to a large number of insects that are hunted by bats.

62.1 With the loose development of this type of settlement, it would be possible to build large areas

Extensive shear lawns to species-rich meadows. A system of footpaths, retention basins and lounges could form the functional backbone of the open spaces in the residential complex, into which old trees, play areas and special areas, e.g. for kindergartens, could be integrated.

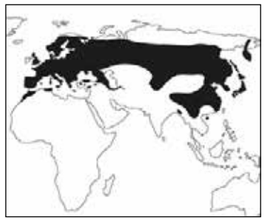
up to the eaves. The pipistrelle looks for its quarters in crevices in the facade or roof structure.

In front of and in the 15 cm thick layer, space is created for suitable niches for the three types. Nesting stones be created. The nesting sites or quarters have different shapes such as circles and slits and thus offer the possibility of enhancing the façade in terms of aesthetics. The house sparrow that breeds in colonies prefers the weather-protected east side. Holes of 35 45mm diameter are arranged at different heights up to below the eaves. The nesting site can certainly also be attractive for other people in the building such as the starling, titmouse or common swift. This fact is regarded as quality, but its needs outside of the nesting area are not discussed further. Along with

GREAT SPOTTED WOODPECKER

Dendrocopos major

SHORT CHARACTERISTICS



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Woodpeckers (! "#" $% &)

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the great spotted woodpecker is clearly identified by its black, white and red plumage exercise to recognize. The back of the abdomen and the underside of the tail are red The shoulders are spotted white. The male also has a black crown, a red patch on the neck and a continuous black rein from the neck to the beak. Females do not have a red patch on their necks. Young birds have a completely red crown and a light pink lower abdomen.

Loud drumming

in late winter and spring, often also when building caves and looking for food, shouts "kix" (also described as "tschick"), when excited, "kixkixkix" are lined up closer together

; ',!,' 6 $ "#.

in the coniferous and deciduous forest belt of Eurasia

Longitude: SW Europe (10 ° W) to Japan and SE Asia (140 ° E)

Latitude: 50 ° N (in SE Asia (China) from approx. 25 ° N) to approx. 65 ° N

Height: from low areas (0m above sea level) to the forest border (Central Alps approx. 2200m above sea level)

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- Mandatory linkage to trees, ie forests (of any kind) or forest islands as well as parks or gardens. Old trees and dead wood (dead trees) are essential
- Territory size: mostly 4 - 20ha per pair, but at least 1ha. Area size depends on the conditions The better the conditions, the smaller the area can be
- Settlement density: mostly 2-8 breeding pairs per 10ha; Deciduous forests are usually more densely populated than coniferous forests; the smallest possible distance between neighboring breeding caves is about 40m

; ',) + 5 $' #

- Birds usually stay in the breeding area all year round

- diurnal

4'6 # 8'0

- Sparrowhawks, martens, foxes and others

SIGNIFICANCE FOR HUMANS

* +), # ') - "#.

- different drum tone

Territory marking, cave construction, Foraging

- shouts
- courtship
- climbing the tree
- "Woodpecker forges", where the great spotted woodpecker pinches cones of conifers in order to pick out seeds

"$ / '# 01023 # 4562 $'

- Creation of caves in undesired places (in thermal insulation mung, wood cladding)
- Noise pollution from strong Drums nearby
- Loss of nest holes when old trees are felled
- Windows are a danger to birds, as are busy roads

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- like all birds in Europe, protected according to the European Birds Directive

- basically stable stocks

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Section through the extensive courtyard area

Courtyard design through extensification the lawns to species-rich meadows and the maintenance or replanting of solitary trees. By lowering and elevation of the terrain creates moist retention areas in the east and dry grassland in the west. In addition the ground floor apartments will have access to the garden via wooden terraces The intermediate areas are designed as rock gardens. The sunny access areas of the northeast facade are spatially framed with hedges in front.

View from the courtyard to the north-east facade

Facade design of the northeast facade with round openings for the house sparrow and elongated crevice quarters for the pipistrelle. Frame the plinth areas

Hedge bodies. Towards the central area, deadwood sculptures offer seating opportunities and asphalt hills space to play.

View from the courtyard to the south-west facade

Facade design of the southwest facade with elongated crevice quarters for the bat. Gabions filled with stones and wooden terraces are in front of the base areas. Towards the central area, deadwood sculptures are offered as seating and a boules pitch.

60.1 LOCATION PLAN CENTRAL AREA

% 2 (% & #) 3)% * (% - 14!% with old tree duration. Extensification of lawns to species-rich meadows with gradients from wet meadows in retention areas to dry lawns on the fire brigade driveways. Garden access to the ground floor apartments via terraces and rock gardens on the southwest side. East-side development areas with upstream Hedge bodies.

5% & (* "6% * - # 7)% 68 - + & $ - "+!% & (1" 6 (# '% *%) 01 downtown the facility with a playground, playground and a building with public use (e.g. kindergarten or café).

! "##" $% & '% ()% * + &, - as part of the energetic facade renovation on windowless building heads. Design of selected southwest, North-east and north facades with openings for nesting and quarters for house sparrows and piped bat.

5% & (* "6% # - 9%,% #: # (% .- With Furnishing from lighting and seating. Combined with Retention areas for seepage and areas with special use such as boules pitch, sand play area, Asphalt play hill, it forms the central open space infrastructure of the residential area.

% 2 (% & #) 3)% * (% - 9)% #% & '% *%) 01% - as two-tier, species-rich smooth oat meadows with old trees.

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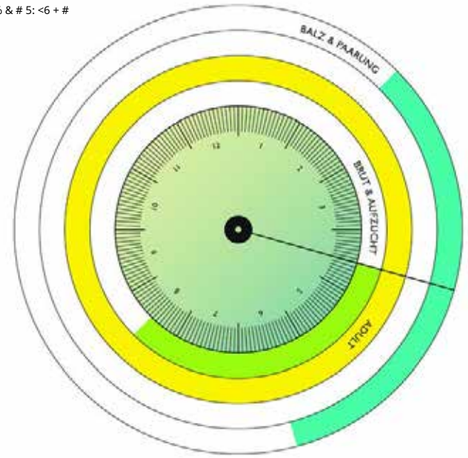

CRITICAL LOCATION FACTORS AFTER LIFE PHASES

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- breeding cave:
  - 3-8m above the ground. Trunk diameter> 30cm. Dimensions: depth approx 40cm; Inner diameter: approx. 14cm; Opening 5cm. Chips serve as nesting material (approx. 8cm high in the cave)
  - either in trunk caves, often newly built, or in branch caves of mostly diseased trees. With softwood also in healthy trees. Deciduous trees are preferred over conifers (spruce and pine). In deciduous forests especially in oak and beech. Very rare in nesting aids
  - alternative to trees: wooden poles (e.g. power poles). Heavily resinous trees are avoided
- Food for young birds:
  - initially small insects, e.g. aphids, later increasing numbers of larger insects and other invertebrates. Also nestlings of other birds

"$ + 6 (- - - -

- Food:
  - very variable, vegetable or animal food
  - (high-fat) seeds of, for example, pine, spruce, beech, oak. "Woodpecker forges" for cones, bleeding sap from the ringing of trees in spring, berries and nuts in autumn
  - wood-dwelling beetles, caterpillars, ants in rotten wood; Eggs and juveniles from mostly cave-breeding smaller bird species
- Sleeping place in woodpecker holes (rarely in nesting boxes)

/ '% * 9) & (% * + &, -

- Sleeping place in woodpecker holes
- Food:
  - alternatively, occasionally visiting bird feeders

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- Sound box for drumming: natural or artificial (tree, tin roof, antennae, etc.)

PLANT LIST

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German name	Scientific name
European beech	*! "# $% &% '()" * +, "*
English oak	*- $. /, $% & / 01 $ /*
Apple	*2 "($% &, 033 $ 4 +%*
aspen	*$ 506 ($% & * /. $ 3 ($%*
Spruce	*5 + ,. "&" 1 +.%*
birch	*7. * $ ("& 6.48 $ ("
Bird cherry	*5 / $ 4 $% & ") + $ 3*
pasture	*9 "(+: &% 6.,;*
Sycamore maple	*<. / & 6%. $ 806 ("*" 4 $%*
jaw	*5 + 4 $% &% + ().% * / +%*
poplar	*$ 506 ($% &% 6.,;*
Hornbeam	*= "/ 6 + 4 $% & 1. * $ ($%*

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food	Plant species
Fruits and berries	Blueberries, cranberries, currants, Gooseberries, grapes, sea buckthorn, elderberry Berries, cherries, plums, sloes, mulberries, raspberries, berries of mountain ash, apples, pears
Tree seeds	from the cones of forest pine, black pine, spruce, larch; with hazel, walnut, hornbeam; No Douglas fir
Tree sap	Birch, ash, hornbeam or maple

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German name	Scientific name
Longhorn beetle	*=. / "31 ', + 8".*
Jewel beetle	*7 $ 6 /.%*+ 8 ".*
Bark beetle	*9.0 ("* + 8 ".*
Wood drill	*= 0 %% + 8 ".*
Glass winged	*9.% ++ 8 ".*
Wood wasps	*9 + / +, + 8 ".*
Gnaws	*>* 6 $ (+ 8*
Oak curlers	*>*@/ * / +: &) + / + 8*

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German name	Scientific name
Ground beetle	*= "/" 1 + 8 ".*
Ants	*! 0/3 +, "& $ 48 &?"% + $%*
Butterflies	*?. 6 + 806 *. / "*
Sawfly larvae	*>. 4*@/.8+4+8 ".*
Aphids	*< 6 @ + 8 + 4 "*
Eggs and fledglings	

PORTRAIT

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Bruth cave: Great spotted woodpeckers are hummers. The breeding caves are usually built by the house in the spring, ie February / March. Existing caves or nesting aids are used less often. Mainly diseased trees are used as hollow trees, in the case of softwood species also healthy ones with a trunk diameter of at least 30 cm. The hollows are usually in the trunk area of the trees, but sometimes also in the largest ones. A layer of chips several centimeters high is used as nesting material, which accrues when the cave is created. It takes about 3 weeks to create a new nest box. In some cases, sleeping caves (see below) are converted into nesting caves. Artificial caves are being tested.

Brood: Courtship and mating generally begins in mid-March and continues until May, in some cases even in December. /Jan.

The female lays four to seven pure white eggs from mid-April, which are incubated by both partners for 10 to 13 days. After hatching, begging calls such as loud chirping can be heard outside the cave after just a few days. The young are fed by both parents for about three weeks. Then they fl y out.

Life phases: Laying begins in mid-April to June; Incubation period (10 13 days), hatching early May to June; Fledgling period: 20 23 days

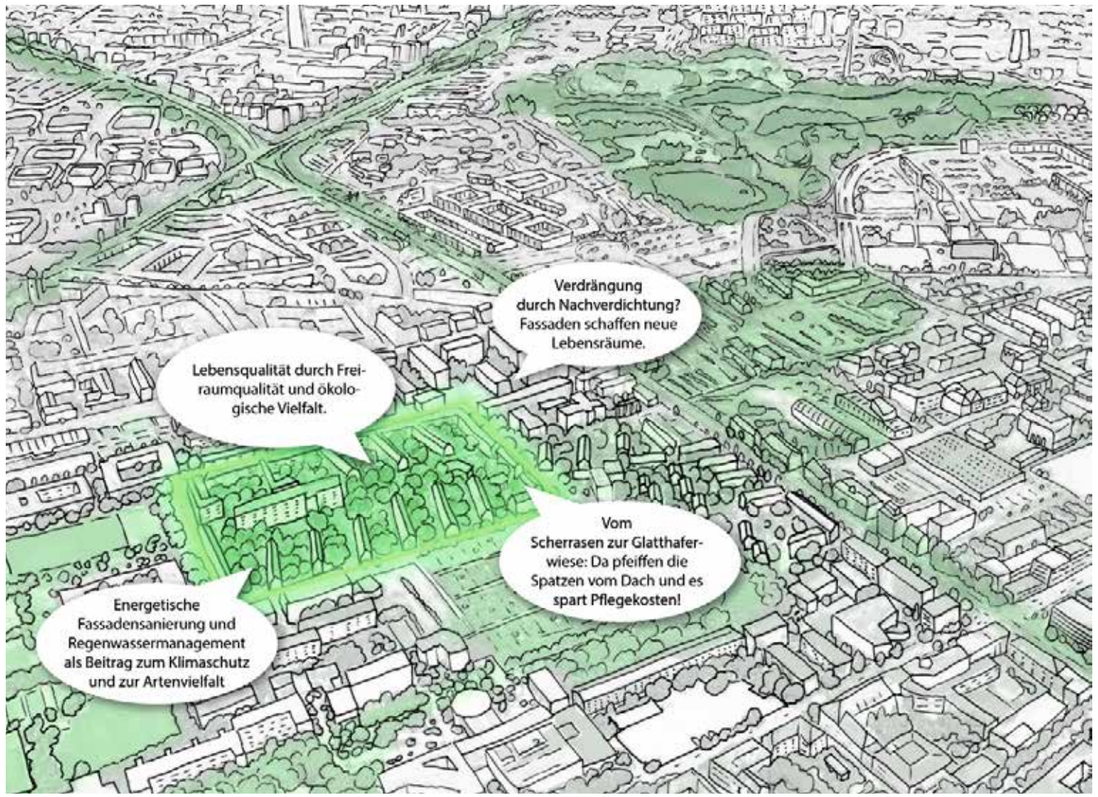
Food: The young birds are provided with animal food, which is usually sought within a 50-100m radius around the brood cave. In the first few days, smaller insects are fed (especially aphids), later larger prey, in whole or in part.

0 "1 '# 23'

After fl ying out, the boys go in search of food independently, but stay together in the family. The most critical phase in the life cycle has just fl owed young birds. The nestlings are well protected in their nest from attackers such as martens. As soon as the young birds leave the nest, however, they can easily become the prey of sparrows, ravens or foxes. The youngsters are usually not very skilled at climbing or fl ying; they only perfect these skills over time. Often so-called nests (the last egg) become victims of the prey animals. Cars and window panes also pose further threats. The young birds that survive this first dangerous phase usually grow up and are sexually mature in the following year.

-, '3 $'

Food: The food spectrum of adult great spotted woodpeckers is very broad and consists of both animal and vegetable components. The animal part consists primarily of wood-dwelling insects and their forms of development (eggs and larvae). These include beefs (eg Bock, Pracht and Borkenkenkfer), butterflies (eg wood burs) and cuticle fl ug (eg wood wasps). In addition, insects are picked up on leaves, twigs and bark, e.g. common beef,



59.1 Location of the design site in Munich with key ideas

FACADE ADMINISTRATION
MUNICH

example 1

IN THE HETEROGENIC URBAN STRUCTURE IS THE MONO-FUNCTIONAL ISLAND FROM THE 1960s. IN ADDITION TO THE ENERGETIC RENOVATION AND DENSIFICATION OF THE BUILDING STOCK, IMPROVING THE QUALITY OF LIFE ALSO DEPENDS ON THE NEW DESIGN OF THE SPACES IN THE ESTATE. HERE IS THE OPPORTUNITY TO CREATE NEW LIVING SPACES FOR THE SAND LIZARD, HOUSE PEARLING AND DWARF BAT.

Redensification and energetic renovations are central urban planning issues in Munich. As a consequence of the densification, the pressure to use the remaining open spaces, which are important habitats and living space for humans and animals, increases dramatically. Remaining areas are sealed or built on and thus contribute to a warmer urban climate. Even compensation areas are becoming scarce, which leads to previously unknown building law problems. Energetic renovations such as external insulation of facades prove to be extremely ambivalent from an ecological point of view. Although they can reduce the energy consumption of buildings and improve the energy balance, on the other hand, in the course of the renovation, habitats of animal species living on and in buildings such as house and tree sparrows, swifts, black redstart, house martin, Barn owl, various bat species, etc. destroyed. The fact that this is significant and problematic in terms of nature conservation law is one thing, but the associated loss of aesthetic qualities conveyed by animals, which are particularly important for urban space, appears much more serious. Using the example of the draft, we would like to show options for an alternative way of dealing with these problems.

The draft shows how an inner-city residential complex can be qualitatively upgraded in such a way that an improvement in the living environment, an ecological area upgrade and climate adaptation measures can be implemented without major investments in production and subsequent maintenance.

A housing estate built in the 1960s in Munich was chosen as an example of the design location. It is centrally located within the middle ring. The buildings are around 30m long and 10m wide, four to five-storey, north-south or east-west-oriented apartment blocks with a mezzanine floor without garden access Fig 59.1.

The design concept provides for energetic renovation measures of the facades as an opportunity for the establishment of To understand species that normally suffer from such measures Fig 60.1. As part of a facade renovation, all potential niches for animals are usually eliminated due to e! Cient insulation systems. However, with little intervention, nesting spaces can be created for a number of species. Analogous to the well-known "facade greening", a "facade installation" is tested here. The house sparrow (sparrow, *Passer domesticus),* the pygmy bat typical of urban areas (*Pipistrellus pipistrellus),*

as well as the rather atypical sand lizard (*Lacerta agilis)* selected. Like the other two species, this is an “FFH species” (according to the “Fauna-Flora-Habitat” directive of the European Union, which contains a list of protected species) and is directly protected by the Federal Nature Conservation Act. All of these species can use the facade as a nesting place
or use quarters at different heights. The sand lizard uses the sunlit base area, the sparrow
colonies the facade from a height of 3 meters

Ants, butterflies, sawfly or aphids. Bird eggs and nestlings of other bird species are rarely used as food. The vegetable part of the diet consists of (high-fat) seeds (e.g. pine, spruce, beech, oak) and nuts (e.g. hazel, walnut) as well as fruits and berries (e.g. whelk, cranberry, currant, prickly, vine and red elderberries, cherries, plums, sloes, mulberries, raspberries, berries of mountain ash, apples, pears). In spring, the bleeding sap is consumed by trees (birch, ash, hornbeam or maple). Great spotted woodpeckers drink water from hollows in trees (e.g. forks of branches) or on the ground, as well as dew from the vegetation.

Foraging: Bay woodpeckers look for animal food mainly by "hoeing" mostly dead or. rotten wood, whereby wood-dwelling insects, especially larvae, are exposed. The great spotted woodpecker's beak serves as a “tweezer” and “gripper” and the barbed sticky tongue, which can be stretched out up to 4cm, serves as a “probe” and “harpoon” with which it explores cavities deeper in the wood and, if necessary, impales soft-skinned prey . To get seeds from cones or to open nuts, the great spotted woodpecker clamps them in a suitable place in cracks in bark or forks that serve as a holder. These “woodpecker smiths” are sought out again and again. Their location is on the frayed, empty cones to recognize at the foot of the "blacksmith trees".

The great spotted woodpeckers can grow six to max. Feed exclusively on seeds from conifers for nine months. The cracking of nuts is not innate in animals, they have to learn to do it. A young great spotted woodpecker needs around 20 minutes for a nut, while an adult animal only needs around five minutes.

Rest / sleeping places: During the day, great spotted woodpeckers rest sitting on the trunk of trees. At night they look for sleeping caves (rarely nesting boxes or the like). The sleeping caves are smaller than the nesting caves and can be created within a few days. They are mainly built in autumn. Often there are several sleeping caves in one area.

Body care: Great spotted woodpeckers clean themselves extensively in the mornings near their sleeping caves.

WINTERING

In Central Europe, great spotted woodpeckers are resident birds, i.e. the birds remain in the breeding area. In winter, great spotted woodpeckers can often be found at feeding places.

REVERSE OCCUPATION, PAIRING AND BALZ

Great spotted woodpeckers are territorial and defend their territories. The main areas of interest are the breeding caves, the sleeping caves and the drum trees. During the breeding season, only a narrow area around the nest box is vehemently defended. In females or in male territories outside of the breeding season, the so-called feeding grounds in autumn and winter, however, there can also be overlaps or the territories are not always clearly delineated. Territories are marked by drumming instead of singing. The size of the area is heavily dependent on the quality of the habitats, sizes from only one to 60 hectares have been described, mostly 3-20 ha.

The courtship begins in February with “drum rolls” by males and females and so-called “flutter fl ights”. These are flights with a noticeable wing noise, during which the red of the under-tail-coverts is particularly evident. Great spotted woodpeckers also behave very similarly towards rivals. Mating takes place at the time of cave construction.

The first brood occurs in the year after hatching. Great spotted woodpecker pairs find each other anew every year, but the pair ties can also last for several years, with males and females being able to mate with other partners in between.

A new territory owner usually takes over the caves of the previous owner.

DRUMS

Great spotted woodpeckers drum for both territory marking and courtship. For this they are dependent on a resonance body. Natural structures such as trees or individual (hollow) branches can be used for this, but also artificial ones such as tin roofs, antennas or gutters; The resonance properties of the structures seem to be decisive.

Shorter drum rolls of only 10 to 15 beats can be heard by males all year round. The woodpecker brain is well protected when drumming by a thicker bone covering on the skull. The strong beak is sprung towards the skull like a shock absorber, so that shocks are attenuated. The eyes are separated by a bony septum and the optic nerves are protected with cartilage. Fine feathers over the nostrils prevent wood dust from entering.

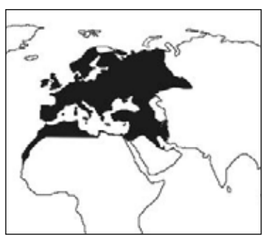
INTERACTIONS WITH OTHER SPECIES

Abandoned and begun but not completed great spotted woodpecker caves are used by numerous other animal species such as titmouse, pygmy owl, dormouse, wood mouse, bats and invertebrates such as bees and wasps.

ROBIN

Erithacus rubecula

SHORT CHARACTERISTICS



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Flycatcher relatives

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unmistakably small (14cm length) songbird with a rounded shape; olive brown on top, light underneath, rust-red breast, pointed insectivore beak, males and females

looking alike; Young birds: light brown, spotted, initially without red. Relatively large eyes, active in the twilight and during the day. Very loud, conspicuous singing with alternating pearly elements and trills in different pitches, ends with

deeper fading tones

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the focus of dissemination is in Europe (approx. 75% of the stock). The distribution area includes the boreal, temperate and Mediterranean zone of the Western Palearctic in the following limits:

Longitude: from islands of the East Atlantic (approx. 20 ° W) to Western Siberia (approx. 85 ° E)

Latitude: North of the Arctic Circle (approx. 65 ° N; in northern Scandinavia also up to> 69 ° N) to Mediterranean countries (approx. 35 ° N) ° N)

Altitude: from the coast (0m above sea level) to the tree line (2200m above sea level)

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- Binding to the forest or the edge of the forest

structures with a humid microclimate

- Breeding success strongly dependent on the structure of the ground vegetation: on the one hand, protected nesting opportunities are included

dense ground vegetation necessary, on the other hand, areas for foraging with open ground

- preferably near water (if Breeding areas are dry) and moist habitats
- in anthropogenic areas (parks, cemeteries, etc.) generally less dense occurrences than in natural habitats. Outside the breeding season

also in less dense vegetation structures. More often in gardens and parks in winter

*%! & + '#%)

- active during the day, at dusk and at night

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- Migratory bird in northern and high-lying areas, which winters in Western Europe, the Mediterranean area, or

spends in northern Africa. In Germany partial migrants, ie only part of the population migrates to southern and southwestern areas, mostly females and young birds

2% /) 3% 4

- Cats, martens and others, as nest robbers also hedgehogs, rats etc.

SIGNIFICANCE FOR HUMANS

. + &!)% & 50) 1

singing

- especially shortly before and after sunset, during the day when defending the territory. Observation at night under moonlight and bright lighting

- courtship
- Hunt
- Bath in the water / in the sun
- Winter feeding feeding station

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- remove layers of leaves and herbs (no food sources

due to lack of humus formation)

- domestic cats
- disturbance in breeding and rearing

1% 28 &! 30) 1474!% (& # '94: # + # 0:

- like all birds in Europe, protected according to the European Birds Directive

- largely stable stocks

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AADTEST DRAFT

In the imStudio AAD [1] developed test designs and in two workshops with experts from the fields of biology, nature conservation, architecture, open space planning and real estate management [2] Another important aspect for the application of Animal Aided Design became visible: AAD is relevant for urban open space development if it is possible to dock on current planning topics. That is, when spatial changes that are necessary anyway are accompanied by Animal AidedDesign and thus, in addition to other planning goals, a focus is on the fulfillment of animal needs. With the three test designs presented here, the AAD design studio has three current planning topics in three cities
Munich, Berlin and London and the ADD methodology integrated into the designs. In Munich we chose a design site that included the topic of redensification through existing building, modernization of housing estates from the 1950s / 60s / 70s and energy-efficient building renovation. It is a residential complex in a central Munich location from the 1960s owned by a large housing construction company, where these issues are currently being planned.

In Berlin, the AAD studio developed a design for the so-called general train, an important thoroughfare in the Berlin transport network. The subject of the planning was the redevelopment of the autogeous right-wing city [3] In the course of a new mobility behavior, away from the car, towards a modal split (traffic sharing) with more Bicycle and public transport. As part of this complex topic, we worked out a design for a bicycle expressway along the general train. With this proposal we activate the relatively wide space between the carriageways for humans and animals.

In London, the test draft was based on the planning topic of urban regeneration (urban renewal). The Urban renewal through the qualification of public spaces is paying close attention to London's politics and city council, especially since the 2011 London Riots. [4th] Studio AAD saddled the fair on one of these regeneration projects fi eldMasterplan on. We worked out an alternative design for the open spaces in the center of Croydon, which is located in south London, and integrated AAD into the existing plans.

The three test designs show that Animal Aided Design is very well suited to methodologically expanding open space planning. From a fi nancial perspective, too, it can be attractive to integrate Animal Aided Design as a complementary method in upcoming projects. Animal Aided Design offers a special incentive when it is included as a planning method for compensatory measures. Because the compensatory measures can be planned and carried out by AAD directly on the spot and would not have to be outsourced to other locations. This planning potential needs to be checked in the future with further test designs, especially in the course of the implementation of Animal Aided Design projects.

1 - In Studio AAD, under the leadership of the landscape architect Rupert Schelle, in close cooperation with the biologist Georg Hausladen, the test designs for Berlin, London and Munich presented in this brochure were developed.
2 - The workshops were carried out as part of the research project carried out by the Bavarian State Ministry for the Environment and Consumer Protection, among others with partners from the Bavarian Climate Alliance.
3 - See e.g. BODENSCHATZ, HOFMANN AND POLINNA 2013.

4th - See: Stadtbauwelt 194: London 2012, June 2012.

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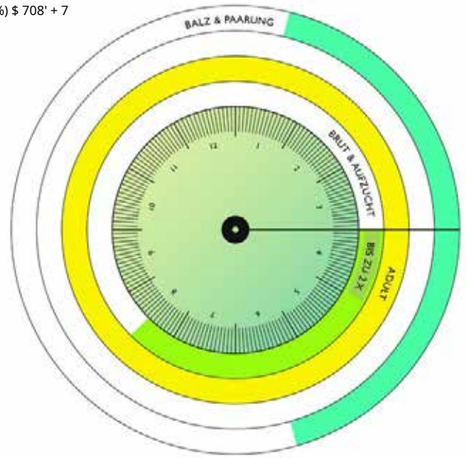

CRITICAL LOCATION FACTORS AFTER LIFE PHASES

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- Nests:
  - (1) Ground nests: in holes and hollows; under grass and roots; in embankments and demolitions

    (2) higher nests: close to the ground; in tree caves, wall niches, climbing plants, low-hanging half-cave boxes (no closed nesting boxes)
    (3) special nests: in overturned flower pots, letter boxes, rubber boots, etc.
  - Nesting material: moss, dry stems and leaves, stems and roots, feathers and hairs
- Nestling food:
  - little chitinized invertebrates, often only
- caterpillars.
  - Nest robbery by predators (especially house cats in gardens), other disturbances

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- Sleeping place in thick bushes
- Food:
  - Shrubs bearing fruit and berries
  - Arthropods and their larvae in a leaf-rich herb layer
  - Matting floor coverings (especially due to grass) have a disadvantageous effect
  - dense shrub layer as cover when foraging
- Hazards:
  - Nest robbers, other predators, other disturbances
- Personal hygiene:
  - Flat, wide bathing area, not next to cover for robbers, with an easily accessible escape route. In the vicinity waiting areas for drying

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- Sleeping place:
  - Protected areas in thick bushes or on and in buildings
- Food:
  - Feeding places: artificial or natural (snow and frost-free areas with open ground)

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- protected singing point (at> 4m height)
- Territory size: 0.2 to 1 ha (depending on the food supply)

PLANT LIST

German name	Scientific name
Wild berry	*! "# $ #"% # & '() * #*
Blueberry	*+ #!"*-*%, % -. &. / "0%*
daphne	*2 # 34, (&. (5 ("(-.*
Grape collunder	*6 # .7 - * -) & "# * (. 8) #*
Black elderberry	*6 # .7 - * -) &,% $ "#*
Buckthorn	*94 # ..-) &: "# $ - 1 #*
Pfaffenhütchen	*; '8, / .-) & (- "83 # (-)*
Bird cherry	*<", -) & 3 # = -)*
Red currant berries	*9% 7 () & "- 7" -.*
Alpine currant	*9% 7%) & # 13%, -.*
Blackcurrant	*9% 7%) &,% $ "-.*
raspberry	*9-7 -) &% = # (-)*
blackberry	*9-7 -) &: "- 0% * 8) -)*
ivy	*> (= ("# & 4 (1%?*
Wild rowanberry	*@ -,% 3 ("-) & * 8 ..-,%)*
yew	*A #? -) & 7 # ** # 0 #*
Grape	*+(6"0%) & '%,%*
Spindle bush	*; '8, / .-) & 1 # 0%,: 81% #*
Buckthorn	*9 # 4,, - = & * # 04 # "0% * #*
Red dogwood	*B8 ", -) &) #, $ -%, (#*
juniper	*@ -,% 3 ("-) & * 8 ..-,%)*
Sea buckthorn	*>% 33834 # (& "4 #., 8% = ()*
Snowball	*+% 7 - ", -. & 83-1-)*
Stone laurel	*+% 7 - ", -. & 0%, -)*
Holm oak	*C - ("* -) &% 1 (?*
Bird cherry	*<# = -) & # '%, -.*
liguster	*D% $ -) 0 "-. & '- 1 $ #" (*
Wild Wine	*<# "04 (, 8 *%)) -) & 0"% * -) 3% = # 0 #*
Snowberry	*6 / .348 "% * #" 38) & "% '- 1 #"%)*
Loquat	*B8 "08, (#) 0 (" &%, 0 ($ ("%" .-)*
Velcro madder / wild madder	*9-7% # & 3 ("($"%, #*
Firethorn	*</ "# * #, 04 # & * 8 **%, (#*
mastic	*<%) 0 # *% # & 1 (, 0%) * -)*

PORTRAIT

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Nests: Robins are considered to be ground roasters, but they are relatively fl exible in their choice of nesting location. They use soil nests, e.g. in pits and hollows, under tufts of grass, between roots and under brushwood, on level ground as well as in cracks and breaks. They also nest close to the ground, e.g. in tree hollows, wall niches, climbing plants and low-hanging nest boxes. In addition, they use unusual structures as nesting sites, e.g. various garden utensils such as overturned flower boxes, letter boxes, rubber boots, however also empty tin cans. The nests are nodular, have high walls and sometimes even a roof. Dry moss and leaves, fine blades of grass and roots as well as hair and feathers serve as nesting material.

Brood: From April 4 to 7 yellowish, reddish brown spotted eggs are laid. These are buried by the female alone for 14 days. The male lures the female from the nest with special calls for short breaks to feed her. The newly hatched young are cared for by the female alone for the first few days, then the male also takes part in raising the young. The young fl y out about 2 weeks after hatching. There are usually two broods per year. Occasionally, nest broods occur, ie broods of the same pair that overlap in time, in which the male takes care of the older offspring while the female broods the other clutch.

Food: The young birds are mainly fed with insects, initially mainly with caterpillars and other (soft) larvae, later also with more strongly chitinized prey.

Problems: Disturbances at the time of nest building, brood and young rearing can lead to the abandonment of the nests or broods. The brood is endangered by nests such as hedgehogs and rats.

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After the youngsters have left the nest, they will be looked after by their parents for another three weeks. Young birds that have flown out mostly stay on the ground or close to the ground. In this development phase they are very susceptible to predators such as cats and martens in particular.

PORTRAIT

BIRTH AND RAISING

In May, female pygmy bats can be found in maternity rooms, which can contain an average of 10 to 50 individuals (sometimes up to 100 animals). The nesting roosts of the pygmy bat are mostly located next to buildings and are more spacious than individual roosts. Studies in Bavaria found 89% of the nurseries in residential buildings, of which 60% were behind external cladding, mostly wooden cladding. In June / July, the females give birth to one or two cubs each, which are fed exclusively with milk for three to four weeks. The young stay behind in the nursery and warm each other when the females fl y out looking for food. The females come back several times a night to warm and nurse the young. They recognize their own young by the smell and through individual contact calls. After about 4 weeks the pups can fl y, at 6 weeks they go in search of food independently. Pygmy bats are very sensitive to disturbances (noise, light, dust, vibrations) during rearing. In the event of danger or disturbance, the animals may change roosts.

JUVENILE

Some of the young stay in the nursery a little longer than the mother animals. When looking for new quarters, they sometimes get lost in apartments.

ADULTS

Quarters: The pygmy bat is a typical building or settlement bat and can therefore be described as a cultural follower. Their quarters are almost exclusively found in buildings. It colonizes crevices of all kinds (rock crevices, tree hollows, wall cladding, wall cracks). A width of 1 - 2 cm of the entry hole is sufficient. Both males and solitary females of the pygmy bat can be found in summer roosts (individual roosts). Here, too, a large part of the quarters are buildings. In addition, nest boxes, rarely tree hollows, are also populated. Studies in Bavaria found that the pygmy bat was most common when 40-80% of the area was covered by trees.

Hunting and Food: Pygmy bats are air hunters. They begin their hunting fl ights approx. 20 minutes after sunset and prefer to hunt along linear structures (forest edges, streets, rivers), over water (approx. 60% of the observed hunting activity) and around street lamps. They hunt at different heights between 2 and 12m. The range of action of your hunt fl ights is between 50m and 2.5km. It mainly kills nocturnal insects such as mosquitoes, small flies and lacewings, but also others such as small moths and small beetles. The food intake is high, up to 3,000 insects per pygmy bat per night. Pygmy bats go hunting for a short time, even in wet and cold weather.

HIKE

Pygmy bats migrate up to 50km between summer and winter quarters.

WINTERING

Pygmy bats hibernate (from late October to late March). The winter quarters are not identical to the summer quarters. For the most part, buildings are used, to a lesser extent cellars and caves. It is crucial for their suitability that the quarters are free from drafts, have high humidity (85-100%) and constantly cool temperatures (between 3 ° C and 9 ° C). The animals should not be disturbed during hibernation, as waking up is associated with considerable energy consumption. If they are woken up repeatedly, this can lead to the death of the animals.

PAIRING

From mid-July to the end of August, after the young have fl owed, courtship and mating take place, usually in the summer roosts of the males. Although the females are mated during this period, the gestation period does not begin until the following spring, ie fertilization does not take place until after hibernation and the sperm are stored in the uterus of the female.

ADULTS

Rest / sleeping places: Adult robins need dense bushes for resting and sleeping.

Body care: Robins like to bathe. Bathing areas should be fl at, wide, easily accessible, but not too close to cover for predators to hide in, but close enough so that the birds can quickly fi nd cover for themselves. There should be waiting areas for drying and sunbathing near the bathing area.

Food: The main food of adult robins are invertebrates living on and in the soil. In this respect, robins are dependent on soils rich in foliage or on soil conditions in which intensive humus formation leads to the production of a rich invertebrate fauna. In contrast to the nesting area, the ground should therefore not be covered by felted grass or the like, but should have open areas as far as possible that can be easily hunted, e.g. B. under evergreen bushes. Surrounding, dense bushes serve the birds as cover from predators such as cats and martens and as camouflage. In addition to those living on the ground, fl ying insects are also captured. Fruits and berries are also eaten in late summer and autumn.

Hunt: The prey is hunted either directly (hopping) on the ground or from hunting grounds (1-6 m high). Robins are not very shy when hunting, as they like to hunt invertebrates that are startled (e.g. by humans) and exposed (e.g. by soil work). They therefore appear extremely trusting.

WINTERING

Robins are predominantly resident birds in Germany. Due to high losses due to lack of food, snow and frost-free areas that can also be used for foraging in winter are important for resident birds. These include piles of dead wood, brushwood or compost. Robins are often found at artificial feeding places in winter.

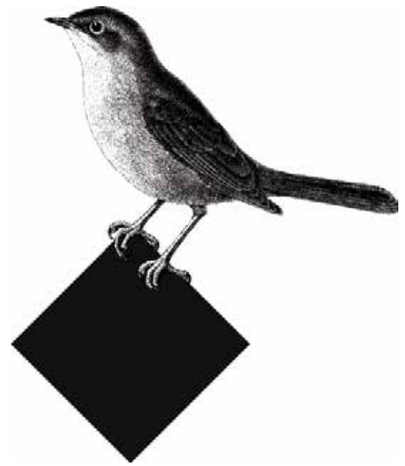
BALZ AND PAIRING

Territory occupation: Robins that do not migrate already begin to mark territories by singing in late summer and to defend feeding grounds for the winter. The animals are there relatively true to territory, males more than females. Already in In winter, females are attracted by singing. A female entering the territory is first chased away by the male several times, but then accepted as a potential partner. The actual courtship begins in February / March, depending on the weather. It essentially consists of ritualized singing by the male in front of the female and the female “hunting” the male. Through his behavior (posture, soft singing) the female asks the male to mate, showing a behavior similar to that of begging young birds.

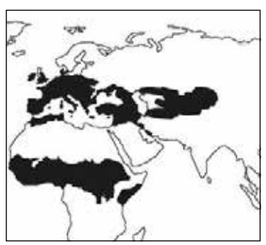
To mark their territory and courtship, the animals need a cheap singing tower, which is usually high, often in the crown area of Trees. Robins sing even at night when the moon is bright but also with artificial lighting, especially in big cities.

NIGHTINGALE

Luscinia megarhynchos



SHORT CHARACTERISTICS



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Flycatcher (! "# $% $ & '% (&))

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the nightingale is a small songbird with a height of 16-17cm. It is brown on top, beige on the underside, with a rust-brown tail. The sexes are equally colored and very inconspicuous in appearance, so the strong, loud singing of the males is the best identification mark

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North Africa, Western and Central Europe,

Southern England and Denmark. East and north of the distribution

The twin type sprout occurs (* "# $% +% &, -" # $% +% &). In Germany it is widespread, in places with mild spring and summer temperatures

frequent breeding bird

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- undergrowth-rich vegetation, cover Shrub layer> 40%
- dense herbaceous layer even without trees
- warm in summer
- low precipitation
- Soil can be damp and dry

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- migratory bird
- day and night active

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- Predators (cats, martens)
- nest robbers (rats, hedgehogs, Squirrel)

SIGNIFICANCE FOR HUMANS

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singing

- (1) before sunrise until the early hours of the morning
- (2) dusk
- (3) At night (from 10 p.m.; especially solitary males)

Versatile loud whistling, sobbing whistling tones with increasing volume and deep beats. 260 different types of stanzas are known, which usually start very quietly and get louder and louder. The typical wistful sobbing can be heard especially at night

observation

- Arrival in spring
- Move out in late summer
- courtship
- Raising boys

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- remove layers of leaves and dense herbaceous layers (e.g. nettles), heavy hedge trimming
- use of pesticides
- Disturbances in the nest
- domestic cats

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- like all birds in Europe, protected according to the European Birds Directive
- Stocks are considered stable. Overall not endangered in their existence in Germany. Regionally, however, there are declines in stocks and negative

Record trends due to habitat loss

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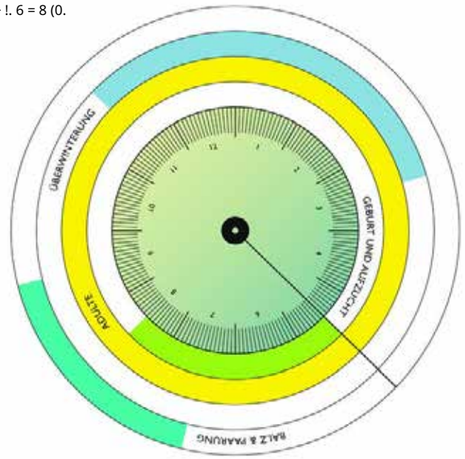

CRITICAL LOCATION FACTORS AFTER LIFE PHASES

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- Maternity rooms:
  - Rearing of the young animals in so-called weekly rooms, which offer space for 10 - 50 females and their offspring. Mostly wooden cladding, cracks in walls, etc. on buildings

"40 (% +,,,,

- Quarters:
  - Summer roosts as sleeping quarters for individual individuals (mostly males). Small gaps or cracks on buildings, including nesting boxes, rarely tree hollows
  - sensitive if light conditions or the temperature are not constant, this leads to a change of quarters. This also applies to disturbances in the neighborhood
- Food:
  - nocturnal insects such as mosquitoes, small flies and lacewings, but also others such as small moths or small
  - beetles. B. stagnant water, compost heaps, orchards
  - linear structures for hunting (e.g. forest edges, lines of buildings, river banks, rows of trees)
  - Light sources for hunting. The maximum hunting activity takes place at "medium" illuminance

3 - + / 5 &!% + / 0! ',

- Quarters:
  - Winter roosts differ from summer roosts and maternity roosts: draft-free and frost-proof. Ideally 3 ° C- 9 ° C with high humidity (85-100%) with room for approx. 10 individuals, eg in buildings, less often in basements or caves

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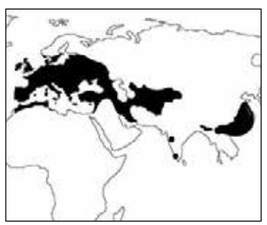
- Quarters:
  - Mating in summer roosts, the sleeping quarters of individual males that defend them. Mostly cracks or cracks in buildings, less often tree hollows or nesting boxes

DWARF BAT

Pipistrellus pipistrellus

SHORT CHARACTERISTICS



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Smooth noses (! "# $"% & '(') * '+, ")

Order: bats (-. '%) $ & "%,)

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one of the smallest and most common in Germany

Bat species only 3.5 - 5 cm in size and 3.5 - 8 g in weight, wingspan 18 - 24 cm. Fur on top red-brown to dark brown, underneath yellow-brown to gray-brown; The muzzle, ears and membranes are black-brown. Tail, legs and ears short, ears also broad, triangular and rounded at the tip.

Nocturnal, like all bats use echo sounders to locate prey and obstacles,

Sound waves at 45 kHz for humans not audible, but easily detectable with an ultrasonic detector. Frequently very high-pitched sounds such as "zrrp, zrrp" can be heard in flight, which help the animals to understand each other (social sounds) and children and adults with good hearing are noticed

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all of Europe up to 63 ° N. Also in parts of Asia, the exact distribution is not yet known.

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- typical building or settlement bat (culture follower)
- colonized crevices of all kinds (rock crevices, tree hollows, wall cladding

cracks in the wall, etc.). Different quarters in summer and winter

- Action radius: 50m to 2.5km

9 # $ 5 * '. # -

- Air fighters
- Nocturnal: hunting flights from approx. 20 minutes after sunset
- Hike between summer and winter quarters
- hibernation

& # 3 - (# /

- Domestic cats, owls, owls, martens

SIGNIFICANCE FOR HUMANS

PERCEPTION

- Hunting flights around lanterns
- "chirping" (social sounds)
- +. ! # - / 0/12 - & '31. #
- Excrement under sleeping places (insignificant, as it is very small and blown by the wind or disintegrates quickly)

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- Protected by the Fauna-Flora Habitat Directive of the European Union (Annex IV)
- Relatively stable stocks
- sensitive to interference during Rearing (noise, light, dust, vibrations)

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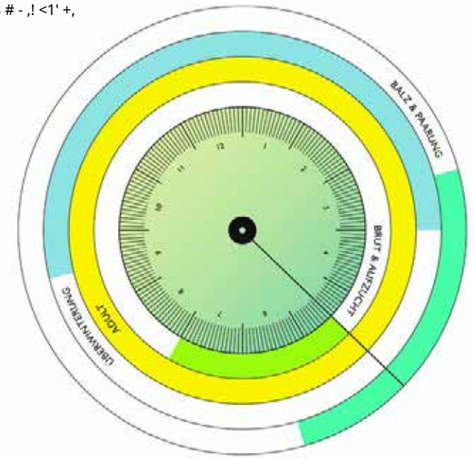

CRITICAL LOCATION FACTORS AFTER LIFE PHASES

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- Nest building / rearing:
  - Stand density 2 - 5 breeding pairs / ha
  - dense herbaceous layer, rarely shrub layer (height up to max. 50cm) for ground nests
  - Nest building material: leaves, dry herb stalks (often nettles), blades of grass, fine twigs, roots, bast fibers, hair, grass panicles, fine root hairs
  - Herb layer and covering structures for the young birds to stay for
- food:
  - Food source <150m from the nesting site
  - Nestlings: insect larvae (especially caterpillars), earthworms, spiders, ants, later also more heavily chitinized prey, beetles, flies, flies, hymenoptera, butterflies
  - Approach waiting at the nest
- Hazards:
  - very sensitive to disturbances in breeding and rearing
  - domestic cats

* (+ '. # / / / /

- Food:
  - Insects and larvae, earthworms, spiders
  - Berries and other fruits in summer and autumn
  - Arthropod-rich leaf litter
  - Seat attendants for the hunt
- Personal hygiene:
  - Flat and clear swimming areas
- Sleeping place:
  - dense shrub and / or herb layer

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- Long-distance migrants, overwintering south of the African dry savannah to the tropical rainforest, moving from August to the beginning of October, returning from April

8 * '! / 0 /: ** $ + -% /

- Territory size 0.3-0.4 ha, smaller under favorable conditions
- Singwarten (under cover) for courtship and area marking

PLANT LIST

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German name	Scientific name
Big nettle	*! "# $% & '($) $% &*
Small nettle	*! "# $% & '*" +, -*
hop	*. *-/ * 0 * - '0 * 1 * 0 **
blackberry	*2 * 3 * -:- +% # $), '2 * 3 * -*
raspberry	*2 * 3 * - '$ (& + * -*
ivy	*. +5(+ '& '4 + 0 $*
reed	*64 '& 7 / $ # + - '%) // *, $ -*
and other grasses	

&& 3,4. ("! / (& # $ 2,!" $ * +! '67 + 2 ((2!

German name	Scientific name
Black elder	*8 & / 3 *% * - ', $ 7 "&*
Grape elderberry	*8 & / 3 *% * - '"&% + /) - &*
Currants	*2 $ 3 + - '"* 3" * / 9'2 $ 3 + -', $ 7 "* /*
Buckthorn	*: "&, 7 * 0 & '& 0, * -*
Dogwood	*;) ", * - '& 03 &*
Rock pear	*<=> = ? / + 0 &,% 4 $ + "' 0 & / &"% @ $$*

PORTRAIT

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Nests: As nesting material, dry leaves, leafy stalks (often nettle), blades of grass, fine twigs, roots, bast fibers, hair, grass panicles, fibers of old nettle stems and fine root horns should be available. Moss and fine reed leaves are used less frequently. The hollow of the nest is padded with skeletonized leaves, hair, grass panicles, fibers of old nettle stems and fine root ears. In 3 5 days only the female builds a deep, loose bowl. The nest is mostly very hidden in the penumbra in a dense herbaceous layer directly on the ground or in the vegetation up to a maximum of. 50cm high (mostly less than 30cm), always close to branches of trees or young trees as approach waiting areas. Nest locations are often near streams and rivers, in the herb and shrub layers of mixed forests in hedges and bushes of cultivated land,

Brood: From May, as soon as the nest is ready, the female begins to lay one of 4-6 olive-gray or brown eggs every day. Only the female cooks the eggs for about two weeks and warms the young, while the male brings him food. The female passes on part of the feed to the young. After a few days, both parents feed. The young stay in the nest for about 11 days, if there is a problem they leave it earlier. One brood per year is the norm.

Food: Newly hatched young birds are more likely to be fed with softer, older young then increasingly with more heavily chitinized prey, which mainly consists of birds, gnats and flies. Skin fl yers, butterflies and small earthworms are also fed. If present, other small invertebrates will also be eaten. Food for rearing young is usually sought within 150 meters of the nest.

Problems: Nightingales are very susceptible to failure. In the first days of brooding, the female very secretly leaves the nest for a short time in the event of a malfunction. From around the 9th day of incubation, the female is very difficult to drive away from the clutch. Males sing loudly when they are disturbed; During the nestling period, couples try to drive away peace by loud whistling at a distance of several meters from the nest, possibly together with their neighbors. You only return to the nest when it is completely calm. Often the old birds walk the last meters back to the nest covered by the herb layer.

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Only at the age of 16 can the cubs fl y, freshly fl ight cubs hide in the herbaceous layer under covering structures, Eg roots, whereby distances of up to 100m from the nest can be covered. The parents lure them out with "errrp" calls. Hungry boys reveal their location by shouting. After a few days, the parents lead the young up to 150 m away from the nest, about 2 weeks after fl ying out, the young are self-sufficient. Food like that of nestlings.

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Territory occupation: From March the sand lizards come out of their winter quarters. After the first herding, the territories are (re) occupied, with no marked borders, and defended against conspecifics. Sand lizards are very faithful to their location. Young animals look for their own territories after their first wintering. The routes covered mostly run through suitable living spaces, unsuitable areas are rarely crossed. Completely isolated occurrences can easily extinguish. Sand lizards are sexually mature after the second winter.

Mating takes place between mid-April and mid-May (June). When looking for a partner, male sand lizards are often less attentive and careless and therefore easier to observe. Females choose the males, with larger males appearing to be preferred. During courtship, the male pursues a female and bites her in the tail, whereupon both of them run side by side (mating march) until the female is ready to mate. After mating, the male stays close to the female and tries to drive away other males.

Pregnant females sunbathe particularly often. Male sand lizards are relatively aggressive during the mating season, but later in the year the animals are more sociable.

PORTRAIT

EGG SHELF AND SLIP

Sand lizards do not care for their brood. The microclimatic conditions, especially the warmth and humidity, are therefore decisive for breeding success. The eggs are laid by the female between May and July in mostly self-dug tubes at a depth of 10 to 20 cm. Existing structures such as abandoned small mammal structures and other cavities are also used to lay eggs. The entrances are mostly under stones, boards, metal sheets, etc. Suitable egg-laying places are occasionally used by several females. Sunlit, more or less vegetation-free, south to south-west exposed areas with loose, well-drained, ventilated and digable substrate (especially sand, but also sand-gravel mix, gravel from lava rock etc.), which have a depth of min. 30cm, better: 50-70cm and a soil moisture of approx.

The areas for laying eggs should have an area of approx. 1 -2m! per breeding site. The eggs can survive periods of drought, which then increases the development time. Persistent dryness or wetness are lethal. As a rule, females lay eggs twice a year, the first time in May and the second time in June / July. Clutches consist of 4 to 15 eggs each. Depending on the microclimatic conditions and the weather, the young hatch after 7 to 10 weeks. The hatching process takes a few hours to over a day, depending on the temperature and weather.

ADULTS

Sand lizards need a small-scale mosaic with diverse transition areas from vegetation-free, herbaceous and grassy areas, shrubs, trees, dead wood, stones, etc. The structures must offer opportunities for thermoregulation, escape and protection from enemies as well as good wind protection. Sand lizards occur in very different habitats, from heathland to dunes, sunny slopes with bushes, road embankments, abandoned gravel pits, vineyards, railway embankments, roadsides and roadsides, forest edges, fallow land, wet meadows, parks, gardens and cemeteries.

The structural "diversity" is a decisive factor in relation to certain degrees of vegetation cover, slope inclination, exposure, etc. Contrary to general information, not only southern slopes but also northern slopes and flat areas are populated, provided that all structures necessary for existence are present there.

Thermoregulation and retreat areas: Sand lizards are cold-blooded animals. On the one hand, they need warmth (places in the sun) in order to be able to be active, but on the other hand they also need places of retreat (coolness) that they can seek out when temperatures are too high. For thermoregulation, microclimatically variable structures with the highest possible temperature gradients in a small space are advantageous. The optimal body temperature of the animals is about 38 ° C; They avoid an air temperature> 35 ° C in the shade. Stones, dead wood, fence posts, dry vegetation (e.g. leaves or old grass), tree trunks, walls and other structures serve as sun spots, whereby wood is preferred. The thermal properties of the structures are essential. They should warm up quickly and dry quickly and be insulated from cold surfaces, store heat and can have different exposures (east, south, west). As a retreat when temperatures are too high but also to protect against enemies, z. B. Earth and rock crevices, small mammals, dead wood crevices, leaf litter, etc. and generally areas with a vegetation cover of about 75%. The escape route (distance between hunting areas / sun spots and hiding places) should be a maximum of 75-100cm.

Food: Sand lizards feed almost exclusively on arthropods (beetles and their larvae, grasshoppers, spiders and butterfly larvae), and they also eat earthworms and small snails. The composition of the food varies depending on spatial and temporal availability. Hunting areas are relatively dry and also have a mosaic of different degrees of coverage by grasses, herbs as well as perennials and areas free of vegetation. Water is absorbed through food, dew or rain.

However, the occurrence of the sand lizard does not only depend on the availability of structures, but also on opponents such as cats and magpies.

WINTERING

Sand lizards retreat to hibernation in Central Europe (depending on the weather) from mid / late September to mid March / early April. The males withdraw 2-3 weeks earlier than the females, but also reappear 2-3 weeks earlier. Young animals do not begin to hibernate until mid-October. Self-dug or existing (artificial and natural) cavities serve as wintering quarters. These must be well insulated and frost-free. They are often located on slopes with southern exposure.

ADULTS

Food: During the day, nightingales are mostly busy looking for food, especially at the beginning of the breeding season and before they leave in autumn. The search for food usually takes place hopping on the ground, with prey being taken up by the ground or the vegetation. Occasionally the foray also starts from waiting or takes place in a jump or in flight. We like to eat insects and their larvae (especially caterpillars), earthworms, spiders and ants, depending on what is on offer. In summer and autumn the feed also consists of berries and fruits.

Rest / sleeping places: lie hidden in thick bushes or bushes. Nightingales like to bathe in the water for body care. Bathing areas should be shallow, wide, easily accessible, not too close to cover where predators can hide, but close enough so that the birds themselves can quickly fi nd cover. Most birds do not completely submerge, but wet their feathers with water in order to then clean and organize the feathers with their beak. In the vicinity of the bathing area there should be waiting areas for drying and sunbathing, which is also used for personal hygiene.

WINTERING

Nightingales migrate long distances, they overwinter south of the African dry savannah to the tropical rainforest. The migration begins from mid-August to the beginning of October, the return to the breeding areas in Germany takes place from the beginning of April. Nightingales migrate at night and also sing during the procession.

AREA OCCUPATION

Territory sizes of the nightingales are between 0.3 and 0.4 ha; under very favorable conditions, smaller nest spacings were measured. The actual size of the area depends on its nature (supply of food, cover and nesting possibilities), whereby the proportion of the herbaceous layer or shrub layer seems to determine the foraging: the higher the proportion of herbaceous layer or shrub layer, the smaller it can be The male nightingale first arriving in the breeding area initially occupy so-called pre-territories, which are reduced by further arrivals and their settlement. Neighbors are warned at the borders by whistling sounds as well as "karr" and "tak" sounds it to chase flights.

Territory sizes and the occupation of territories often change until a nest is built. After that, only if the nest or clutch is lost is relocated. Territory boundaries often appear to have existing structures such as open spaces / clearings, wide paths and the like. to go along. After the breeding season, the territories shrink, as young birds now also defend feeding grounds.

BALZ AND PAIRING

From March, but mostly in the middle / end of April, the males come back from the winter roosts to the breeding areas and occupy an area that is marked by singing. Nocturnal singing is likely to attract females who arrive in the breeding area a few days after the males. Males appear to return to the areas where they were born. Females are less localized.

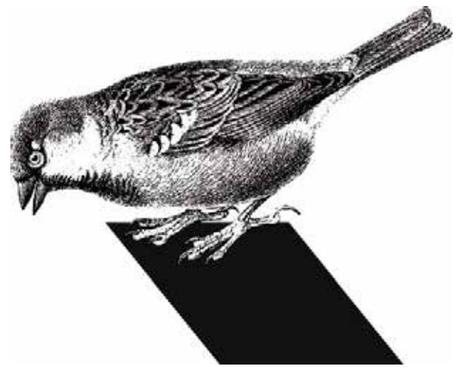
Nightingales are sexually mature at the end of their first year of life and around half of the nightingales from the previous year then start breeding. If a female appears in the precinct, the male begins with the courtship. While singing softly, it stays close to the potential partner and in between fl ows over the branches, where it shows an imposing behavior with slow movements. This is characterized by the raising of the wings and the lowering of the head, as well as a tail that is alternately fanned, folded, raised and lowered. On the ground the male circles the female and jumps towards it in an arc. If the female flies away, it will be pursued by the male. Through the ball, the aggressiveness between the partners is increasingly reduced and the courtship song is then replaced by soft contact calls. The pairing is usually over short, Chase flights ending on the ground initiated. The courtship lasts up to a few days after the start of the brood, then the male repeats more territorial song.

After the pairing, the female chooses a nesting location, which is shown to him by the male, in which the male cuddles on the ground and flaps his wings. Usually the construction of the nest begins immediately.

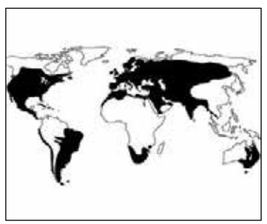
Nightingales marry a monogamous seasonal marriage, rarely does a male have several females.

HOUSE PEARLING

Passer domesticus



SHORT CHARACTERISTICS



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Sparrows (! "## $% & '" $)

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Males gray underneath, predominantly brown above, black throat, gray crown, brown eye band, gray-white cheeks; females and

Young birds are rather inconspicuous, lightly unpatterned underneath, gray-beige-brown patterned on the upper side

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distributed almost worldwide, at altitudes up to approx. 2000m

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- originally inhabitants of dry tree savannahs and steppes
- lives today where there is enough food, niches / caves or trees / bushes
- Cultural followers in cities and villages (formerly due to cattle breeding

  and grain store)
- lives in colonies of 5-10 and also more breeding pairs
- Building breeder (cave breeder) behavior
- Resident bird, i.e. stays in the area all year round, extremely local, nests are reused.

  radius during the breeding season about 50m, outside the breeding season usually not more than 500m
- diurnal
- Foraging in the troop

Enemies

- domestic cat, barn owl, sparrowhawk, Carrion crow, magpie, in cities also kestrel, sometimes martens and squirrels

SIGNIFICANCE FOR HUMANS

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- roost communities / breeding colonies
- Singing, courtship and mating
- Territorial defense
- Entry of nesting material
- begging young birds
- The boys fled
- sand bathing
- Bathing in water
- Foraging for food
- Swarms in winter

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- Disturbance during the breeding season due to building renovations
- falling nesting material (rubbish)
- Pollution from feces
- Noise pollution from sparrows
- Harassment by "cheeky" sparrows looking for food in the vicinity of people, for example in cafes, on benches, near rubbish bins

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- like all birds in Europe, protected according to the European Birds Directive
- on the warning list of endangered species since 2008
- Population collapse in the last decades (approx. 1/3 in the last 50 years) due to: Loss of food sources: seeds

  (Abandonment of horse and small animal husbandry; intensification of

  Keeping livestock in stables; Optimization of the grain harvest; Intensification

  the maintenance of green spaces, gardens, etc.)
- Lack of food, especially in winter
- Loss of breeding grounds (renovation of old buildings; energetic density

  New buildings)

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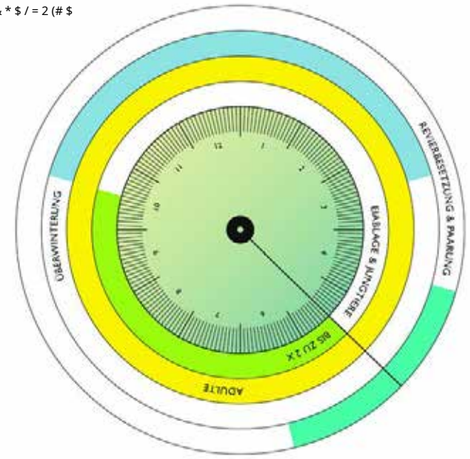

CRITICAL LOCATION FACTORS AFTER LIFE PHASES

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- Egg laying:
  - suitable substrates for oviposition. +/- vegetation-free, loose, well-drained, ventilated and digible. Sand is often well accepted, but also sand-gravel mixtures, gravel from lava rock and other substrates. The preferred substrate seems to differ regionally
  - Egg-laying area approx. 1 - 2m² per hatching place, depth:> 30cm, better 50 - 70cm, soil moisture approx. 5%, exposure to the south to south-west

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- Quarters:
  - Mosaic of structures for thermoregulation: sun and shade; Highest possible temperature gradients in a small space generally sufficient coverage, e.g. herb layer: 30 - 50%; Shrub layer 20-30%; Shading by woody plants <40% (mosaic of different degrees of coverage by grasses, herbs, perennials and areas free of vegetation)
  - Special places in the sun: dead wood, stones, fence posts, dry vegetation (leaves, old grass, etc.). Thermal properties: rapid warming, quick drying, insulated from cold subsoil, heat-storing. Wood better than dry vegetation, better than stones; Different expositions (east, west and south) Refuge for the night:
  - underground structures in crevices and rock crevices, small mammal structures, crevices in dead wood, under leaves, etc., in the settlement area dry walls
  - Escape hiding place to protect against predators: preferred vegetation with approx. 75% ground cover such as bushes, grasses, leaves etc .; but also stones, dead wood etc .; Escape distance: max. 70-100cm
- Food:
  - almost exclusively insects and other arthropods, e.g. beetles and their larvae, grasshoppers, spiders and butterfly larvae. Choice of food variable and flexible
  - Foraging in relatively open areas with patchy or short-grass vegetation

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- Winter quarters:
  - Earth and rock crevices, small mammal burrows, self-dug tubes (only in loose soil); must be well drained (dry), insulated, frost-free, mostly sloping areas with southern exposure

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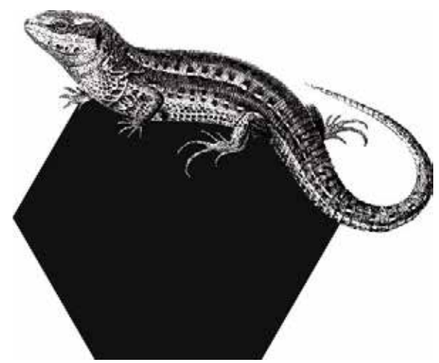
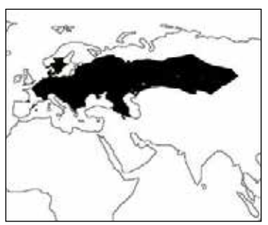
- Living space extension approx. 100m!

SAND LIZARD

Lacerta agilis



SHORT CHARACTERISTICS



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! "# $% & '(" $, Systematic position:

Reptiles (reptiles), Squamata (Scale creepers)

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medium-sized lizard, body length up to 11cm, tail length up to one and a half times as long as body length; appears short-tailed and stocky, with a relatively blunt snout

Males: flanks and throat green (for

Mating season very intense, outside of this rather faded to brown-green), back brown or black-brown, mostly with eye spots (= light spots with black border); regularly with a single-colored red-brown back ("erythronotus" variant);

greenish underneath

Females: gray to brown, with dark Back band and mostly dark side stripes, each with dark and white spots (often as eye spots) and light stripes in between; yellowish underneath

Subadults (not yet grown up):

similar to the females, basic color brown, with dark areas and very noticeable eye spots, belly

yellowish to greenish

Juvenile (newly hatched): basic color brown, with dark areas (often dark stripes on the back), black spots and eye spots

The eye spots serve at Females, subadults and juveniles to distinguish them from adult forest lizards

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from W-France, S-England (approx. 0 °) to Lake Baikal (approx. 105 ° E) and from southern central Europe and southern Siberia (approx. 47 ° N) to southern Scandinavia and central Siberia (approx. 60 ° N; east approx. 55 ° N), in Germany from the lowlands to in the Alps

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- originally resident of semi-open habitats; today outside the Alps largely restricted to anthropogenic habitats
- colonized dune areas, heaths, Semi-dry and dry grassland, sun-exposed embankments of all

Type (roadsides, railway embankments, Embankments, vineyards, etc.), mining pits, house gardens, urban and industrial wastelands, river gravel heath, alpine habitats up to over 1400m

- requires a small-scale mosaic of bushes and open areas with border structures (between

vegetation-free, herbaceous and shrubby areas, for thermoregulation, retreat and hunting)

- structural "diversity" is more decisive as z. B. certain degrees of cover of the vegetation, slope, Exposure etc.

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- winter dormant
- diurnal

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- Eggs: ground beetles, mole crickets, etc., cannibalism
- Young lizards: birds, mice, Toads; cannibalism
- adult lizards: smooth snake

("Reptile diet" of young animals), Adder, various mammals and birds, e.g. house cats (often a limiting factor in settlement areas), martens, foxes, birds of prey (especially kestrel), magpie, crows, etc.

SIGNIFICANCE FOR HUMANS

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- sunbathing
- Males in splendid dress

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- potential oviposition sites can also be used by cats as a pass and are then unusable
- Domestic cats prey on sand lizards
- Sand lizards are generally not so susceptible to faults

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- sharp decline
- extremely high loss of boundary lines in the cultural landscape
- Type of warning list (Red List Germany)
- Listed in Annex IV of the Habitats Directive of the European Union (ie "particularly protected" in Germany). Due to climate change, the warmer summers could in the long term lead to an expansion of the sand lizard's area into areas that have hitherto been climatically less favorable

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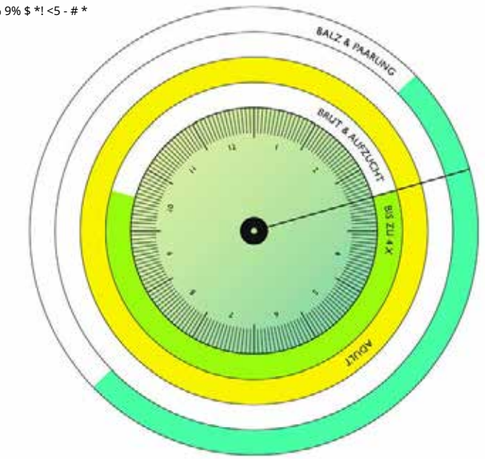

CRITICAL LOCATION FACTORS AFTER LIFE PHASES

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- Nests:
  - Colonies with 5 to 10 nesting sites at a distance of at least 50 cm from each other
  - At a height of 3 -10 m in caves, especially crevices and niches on buildings, rarely also tree hollows and nesting boxes; Breeding success in building cavities greater. Shape: spherical in the cavities. Rarely free-breeding (in trees, bushes or climbing plants), recently also found in steel structures and advertising signs, entrance opening nesting place approx. 35mm (with larger opening competition from other building breeders), also
  - cross-oval 35x60mm or continuous slot 35mm high
  - Base area of the nest about 20x20cm to 15x40cm with an inner height of 15 to 20cm
  - Nesting material: hay, plant fibers, hair, moss, feathers (also twine, plastic: danger for young birds!); partly leaves with essential oils to protect against parasites (e.g. lavender, rosemary)
- Food:
  - initially ") ** # +, '$ -,' # + animal food, especially insects, later the vegetarian portion rises to fledgling
  - The source of food must be in the immediate vicinity of the breeding site (<50 m)
- Hazards:
  - Very high mortality in young animals (on average only approx. 20% chance of survival), therefore protection of nests and fledgling young birds from predators is very important for successful population development

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- Sleeping place:
  - Shelter, sleeping and resting places in the immediate vicinity of the breeding site, in dense bushes (hedges, climbing plants, etc.) Food:
-
  - Seeds from many plants (grasses, cereals),
  - fruits and berries
  - small invertebrates, especially insects on the ground and on plants, animal food makes up a maximum of 30% of the total diet
  - Also uses waste and crumbs
- personal care:
  - Dust bath for parasite control in vegetation-free sand and dust areas (roadsides, water-bound ceilings, sandboxes) sunny bathing
  - areas with shallow water (puddles, overflows from wells, etc.)

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- Sleeping place:
  - Protected areas on and in buildings (possibly communal sleeping areas)
- Food:
  - Seeds from perennials, berries, civilization waste
  - artificial feeding places

PLANT LIST

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German name	Scientific name
Trees	
Rowan / mountain ash	*8% 5,) 2 +,) 3) &, 5 (,*
Bird cherry	*/ 5) $) 2 + &, ') 2*
Silver birch	*= # 0) -, + & # $ ') -,*
Quaking aspen	*/% &) -) 2 + 05 # *) -,*
Common willow	*8, - (D + 3, & 5 #,*
Bushes	
Dog rose	*A% 2, + 3, $ ($,*
sloe	*/ 5) $) 2 + 2 & ($% 2,*
Hawthorn	*! 5,0, # 1) 2 + *% $% 16 $,*
Black elderberry	*8, *,) 3) 2 + $ (15,*
Rock pear	*9 * # -, $ 3 "(# 5 + 2 & <*
liguster	*B (1) 205) * + 7) -1.5 #*
Cornelian cherry	*!% 5 $) 2 + *, 2*
Garden perennials	
Sun hat	*A) '. # 3F (, + 2 & <*
Globe thistle / noble thistle	*@ 3 "($% & 2 + 2 & < G + @ 56 $ 1 () * + 2 & <*
Sunflower	*C # - (, $ 0 ") 2 +, $$)) 2*
Mullein	*H # 5,, 23) * + 2 & <*
Knapweed	*! # $ 0,) 5 #, + 2 & <*
Poppy	*/, &, 7 # 5 + 2 & <*
Evening primrose	*: # $% 0 "# 5, + 2 & <*
Spring bloomer	
crocus	*! 5% 3) 2 + 2 & <*
primrose	*/ 5 (*) -, + 7) -1.5 (2*
Squill	*83 (-, + 2 & <*
Lungwort	*/) - *% $, 5 (, +, $ 1) 20 (E% - (,*
Larkspur	*!% 56 ', - (2 + 3.7,*
Wild herbs and grasses	
White goosefoot	*! "# $% &% '() * +, -.) ***
Bird and flea knotweed	*/% - 61% $) * +, 7 (3) -, 5 # +) $ '+ & # 52 (3,5 (,*
Chickweed	*80 # -, 5 (, + I # '(,*
dandelion	*Taraxacum officinale*
Large and small stinging nettle	*450 (3, + '(% (3, +) $' +) 5 # $ 2*
Large meadow button	*Sanguisorba officinalis*
Meadow sage	*8, -7 (, + & 5.0 # $ 2 (2*
different grasses	*>/%,(0.5 (,? + 8 # 0.5 (, ? + @ 3 "(*$% 3" -%,? +*

German name	Scientific name
More plants	
White goosefoot	*! "# $% &% '() * +, -.) ***
Plantain species	*/ -, $ 0.1% + 2 & # 3*
Large and small nettle	*450 (3, + '(% (3, +) $' +) 5 # $ 2*
knotweed	*/% - 61% $) * +, 7 (3) -, 5 #*
Flea knotweed	*/% - 61% $) * + & # 52 (3.5 (,*
Chickweed	*80 # -, 5 (, + * # '(,*
amaranth	*Amaranthus retroflexus and blitoides 950*
mugwort	*# * (2 (, + 7) -1.5 (2*
Common evening primrose	*: # $% 0 "# 5, +, (# $$ (2*
dandelion	*Taraxacum officinale*
different types of grasses	*; <= <+> (1 (0.5 (,? + 8 # 0.5 (, ? + @ 3 "(*$% 3" -%, +) $ '+ /%, + 2 & # 3*
different types of grain (wheat, Oats, barley, rye, corn, millet, rice)	

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German name	Scientific name
Bushes	
Dog rose	*A% 2, + 3, $ ($,*
Gray loquat	*!% 0% $ #, 20 # 5 + '(# - 2 (, $) 2*
sloe	*/ 5) $) 2 + 2 & ($% 2,*
Hawthorn	*! 5,0, # 1) 2 + *% $% 16 $,*
Common barberry	*= # 5, # 5 (2 + 7) -1.5 (2*
Cut hedges	
liguster	*B (1) 205) * + 7) -1.5 #*
Hornbeam	*!, 5 & ($) 2 +. # 0) -) 2*
Cornelian cherry	*!% 5 $) 2 + *, 2*
Field maple	*93 # 5 + 3, * & # 205 #*
Façade green - always when knotweed has	
grown densely	*/% - 61% $) * +,), # 50 (*
Common wood vine	*! - # *, 0 (2 + 7 (0, -.,*
Winter jasmine	*Jasminum nudiflorum*
Evergreen climbing blackberry	*C # '# 5, + "# - (D*
ivy	*C # '# 5, + "# - (D*
Real honeysuckle	*B% $ (3 # 5, + 3, & 5 (E% - () ***

PORTRAIT

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Nests: House sparrows are holy men. They burrow mainly in crevices and niches in buildings, less often in tree hollows and nest boxes or freely in trees, bushes or climbing plants at a height of 3 10 m. Breeding in building caves is more successful because of the more protected location. The nests are spherical and consist of hay, plant fibers, hair, moss, feathers, leaves, etc. The nest is often padded with feathers. However, artificial elements such as ties and plastic parts are also used. Plastic parts can pose a danger to the nestlings if they strangle themselves (ties) or if fungal infestation occurs due to a lack of air circulation (plastic). Sometimes leaves from plants that contain essential oils (lavender, rosemary, etc.) are used. This is used to ward off parasites.

House sparrows broke into colonies. Therefore, there should be at least 5 10 nesting places at a distance of approx. 50 cm.

Brood: From March (a little later in Germany) the female lays 36 white to bluish, brown-spotted eggs, which are incubated by both partners for 11 to 14 days. After hatching, the young remain in the nest for about 12-18 days. They are given a week by their parents with their wings / belly feathers before the weather Rivers protected (huddled) and fed in the nest for a total of about three weeks. After flying out, the young are cared for outside the nest for about 14 days and are then independent, usually around the beginning of June. The female starts the next brood at the same time. Depending on the weather and food availability, house sparrows roast 14 times between March and August. During the breeding season the range of action of house sparrows is only 50m (in cities) or 400m (in the countryside).

Food: The nestlings are initially supplied almost exclusively with animal food such as insect larvae, aphids, spiders or other insects; later, when the young birds grow up, the proportion of vegetable food increases, but remains below 50%.

Problems: During breeding and rearing, house sparrows are very sensitive to damage (e.g. from renovating facades and other work on the building).

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About 14 days after the young have left the nest, they are independent, but, like the adults, very local. The dismigration distance (propagation distance) is usually less than 10 km.

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Food: Adult house sparrows feed mainly on semen. Grains (oats, wheat, rye, etc.), but also seeds of other s fl grass species (e.g. *Poa, Echinochloa, Digitaria)* and ruderal species (e.g. gnefu fl fl ow, birdcake, large and small nettle, chickweed, amaranth, mugwort, common evening primrose) serve as food. In addition, adult house sparrows eat fruits, invertebrates and waste. The proportion of animal food, however, is a maximum of 30%. The food sources should be a maximum of 50m away from the breeding site.

Foraging: House sparrows look for food in troops. Their radius of action (outside the breeding season) is approx. 200m (in cities) to 600m (in the country). They search for seeds on the ground. When it comes to food sources, they depend on protective structures (protective trees, dense hedges and bushes) that allow them to quickly find cover in the event of danger.

Rest / sleeping places: House sparrows need protection, sleep and resting places in dense bushes, hedges, and climbing plants.

Personal care: House sparrows like to bathe, both in water and, above all, in sand or dust. The presence of Sand or dust appears (compared to water pools) to be of paramount importance. They should be dry or quick-drying and free of vegetation. In urban areas, these can include footpaths and utility roads in water-bound construction, riding arenas or sand bars in sunny locations. The edge of mulched areas, where the bark mulch dries out quickly, is also suitable. The water bathing areas should be fl at, wide, and easily accessible and not too close to cover where predators can hide, but close enough for the birds to take cover quickly to find. In the vicinity of the bathing area there should be waiting areas for drying and sunbathing.

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House sparrows are stationary birds. In exceptional cases, they migrate to swarms of medium-sized stretches (up to several hundred kilometers).

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House sparrows are very sociable birds and only defend the immediate vicinity of their respective breeding grounds. The black one

The throat of the male plays an important role in the defense of the territory and courtship as a sign of dominance. Once a male has found a suitable nesting site, it begins to bring in nesting material. At the same time it mates (by singing) for a bitch. Once a couple has come together, both partners continue to build the nest. The couples usually stay together for life.