

**SUSTAINABILITY AT THE
MAX PLANCK SOCIETY**

More Biodiversity at Max Planck Institutes

A Guide



CONTENTS

4	A personal foreword from the President
6	It's time for some Noah's Arks
8	INSTITUTES AND SPECIES DIVERSITY – THIS IS WHAT'S POSSIBLE!
10	MPI for Human Development, Berlin
12	MPI for the Study of Crime, Security and Law, Freiburg
14	MPI for Multidisciplinary Sciences, Göttingen
17	MPI for Plant Breeding Research, Cologne
20	Ernst Strüngmann Institute for Neuroscience, Frankfurt
22	CREATING HABITATS – HOW IT'S DONE!
24	Semi-natural plant beds
26	Flower meadows
28	Nesting aids for wild bees
30	Piles of stone, sand or wood
32	Bird protection
34	Green roofs
36	Green façades
38	Ponds
40	Habitats at Max Planck Institutes
42	Ten steps to increase biodiversity
44	Attracting wildlife with the help of plants
46	Biodiversity in villages and towns
48	FAQs
50	Legal



Dear Members of Staff,

We all recognise that climate change stands as one of the most significant challenges of our time. Comparatively less attention, however, has been given to the extinction of species due to human activity, a decline in biodiversity that poses a major threat. And this loss of species is not confined to remote locations; it is happening right here in Germany as well. Numerous studies have documented the decline of birds, amphibians, and insects in our country.

The Max Planck Society is actively engaged in research related to both climate change and biodiversity. The awarding of the 2021 Nobel Prize to Klaus Hasselmann is a testament to the crucial contribution we are making. His work has led to the fundamental understanding that climate change is a consequence of human actions. These research findings, among many others, emphasise the urgency of taking action. The Max Planck Society, too, wants to become more sustainable as a research organization. Many of you have already formed sustainability groups at your Institutes, focusing on initiatives such as reducing our carbon footprint and preserving biodiversity.

I have personally witnessed the positive impact of natural environments at my Göttingen Institute. In 2021, we inaugurated the BioDiversum, featuring flowering meadows, hedges, and nesting boxes. Within just a year, the number of breeding bird pairs has nearly doubled. Rare wild bee and dragonfly species have settled in the area around our pond. The biotopes have also proven to be highly beneficial for employees who work together to promote nature within our Institutes.

I was especially impressed that more than a third of our Institutes are already taking concrete steps to support biodiversity: they have created ponds, planted fruit trees and transformed green spaces into flowering meadows. My deepest thanks to you for these efforts! This brochure not only documents our various initiatives but, more importantly, aims to incentivise and help readers do more to combat species extinction. Is your Institute already involved? Get engaged! Every little effort helps – and also strengthens our sense of togetherness.

My very best wishes,
Patrick Cramer

It's time for some “Noah's Arks”

Worldwide, the pace of extinction has surged dramatically in recent decades. Since 1800, for example, we have witnessed the loss of approximately 80 per cent of all individual bird species in Germany – with 65 per cent of them vanishing in just the past 50 years. The remaining species are dwindling at an average rate of one percent per year. The “silent spring” predicted by Rachel Carson in her landmark book of 1962 might soon become a reality. Biodiversity loss has progressed from being a crisis to a catastrophe that also threatens our own survival. A once-flourishing biodiversity is giving way to biomonotony as a result of the most significant species extinction on our planet since the age of the dinosaurs.

Ecologists predict that within the next few decades, at least half of all animal and plant species will disappear solely due to climate change. However, we have already witnessed a substantial reduction in biodiversity, primarily attributed to industrial agriculture. In our monocultures, which are designed as much as possible to maximise profit, there is scarcely any space remaining for the once abundant secondary flora. Despite the growing calls for heightened ecological awareness in agriculture, progress remains elusive due to persistent factors such as unabated land use for settlements and transport infrastructure, food shortages, and the demand for land for bioenergy. These factors contribute to maintaining the utilisation of available land for agriculture at its maximum level.



Peter Berthold, emeritus Director at the MPI of Animal Behavior, Constance, and initiator of the biodiversity campaign “A biotope for every community” (“Jeder Gemeinde ihr Biotop”)

Does this mean the battle against extinction has already been lost?

Not necessarily: when we create new habitats in Germany – such as the Lake Constance biotope network run by the initiative “A biotope for every community” (“Jeder Gemeinde ihr Biotop”) – they are colonised by many species with surprising speed. This suggests that the remaining stocks of plants and animals in the country still possess an impressive regenerative capacity. We could preserve a substantial portion of our biodiversity for the future by establishing numerous such ‘Noah’s Arks’. Unfortunately, available spaces in Germany are scarce. We must evaluate the potential for natural oases in every conceivable open space, including cemeteries, city parks, schoolyards, and industrial wastelands. The areas around hospitals, universities, and research facilities like those of the Max Planck Society have received little attention so far.

Lighthouse projects at the MPI for Multidisciplinary Sciences in Göttingen (p. 14) and the MPI for Plant Breeding Research in Cologne (p. 17) have shown such promising results that the Max Planck Society decided to compile this guide. Its purpose is to assist anyone interested in taking action for biodiversity right outside their office or lab. I hope that the brochure contributes to flourishing life at our Institutes, bringing many of you an abundance of joyful nature experiences!

Peter Berthold



INSTITUTES AND SPECIES DIVERSITY – THIS IS WHAT'S POSSIBLE!

Many Max Planck Institutes have created habitats for animals and plants on their grounds: From small, semi-natural plant beds to large ponds, they've set up all sorts.

MPI for Human Development, Berlin



Meadow at the MPI for Human Development.

IDEA

- No use of artificial fertilizers or chemical pesticides
- Establishing the most native, bee-friendly plants possible
- Diversity of locations and plants
- Meadows instead of lawns
- Leave deadwood and undergrowth where it stands
- Supporting the lives of birds and small animals

MEASURES AND ACTIONS

- Meadows and alkali grassland (mown once or twice a year)
- Dry beds
- Carpet bedding
- Façade plants
- Herb spirals
- Fruit trees and shrubs
- Nesting aids for wild bees and birds
- Deadwood

LAUNCHED

- 1980, constantly revised and developed since then.

CONSULTING WITH THE AUTHORITIES

- When working on protected trees, the Urban Green Space Planning Authority [Grünflächenamt] has to be informed in advance.

CHALLENGES

- Time and patience are needed for beds to grow in and flourish.
- Nettles, barren ground and dead wood are also part of a natural garden; it does not always bloom everywhere.
- Because of the rising temperatures, it is especially important to use drought-resistant plants. Trees also require more frequent maintenance.



Plant bed at the MPI for Human Development.

FINANCING

- In-house budget funds from the Institute.

SPECIALIST SUPPORT FROM RESEARCHERS

- Use in research (“social learning in naturalistic contexts”)

MAINTENANCE

- External company (chosen by regular tender) and house gardeners from the Institute (seating areas, paths, winter maintenance)

SUCCESSSES

- Large diversity of animals (foxes/hares, bees, falcons, goshawks, etc.) and plants (approx. 400 species, including rare species like Polish quail wheat).

“People and animals alike should feel comfortable in our garden: birds feed from the feeders, and occasionally a falcon will breed in the Institute tower. The garden is an invitation for our staff to hold meetings or have lunch outside while they unwind and snack on one of the varieties of fruit.”

Erna Schiwietz, former Head of Central Services

MPI for the Study of Crime, Security and Law, Freiburg



Fire salamander on the grounds of the MPI for the Study of Crime, Security and Law.

MEASURES AND ACTIONS

Ecological upgrading of green roofs:

- Mowing is done with a bar mower instead of a mulcher. The cuttings are then removed.
- Mowing date: twice a year only, in autumn
- Particularly flower-rich areas are left as islands so that plants can fruit and produce seeds.
- Tall grass as structure for insects and birds
- Regional seed mixes
- Deadwood

Planned:

- Sand piles
- Nesting boxes for birds and bats
- Nesting aids for wild bees

CONSULTING WITH THE AUTHORITIES

- Advice from Freiburg Environmental Protection Agency
- Deadwood from the nearby forestry office

CHALLENGES

- Voluntary efforts by some employees

FINANCING

- No funding available
- The service specifications for the gardening company were adapted for the near-natural design of the roof.

SCIENTIFIC EVALUATION

- None

MAINTENANCE

- By the gardening company and building services



Green roof of the MPI for the Study of Crime, Security and Law, Freiburg

“Birds, insects and reptiles enjoy our green roof. It is a veritable living biotope and our contribution to Freiburg’s biodiversity.”

Anna Schaich, Press and Public Relations Officer

MPI for Multidisciplinary Sciences, Göttingen (BioDiversum)



Pond at the...

MEASURES AND ACTIONS

- Flowering meadows (regional seed mixtures), nutrient-poor sites with herbs and perennials (approx. 1.65 hectares)
- Pond (900 square metres, 1500 cubic metres)
- Orchard meadow
- Nest boxes (80) and year-round feeding station
- Flowering shrubs (approx. 200)

LAUNCHED

- April 2020, completion: November 2021

CONSULTING WITH THE AUTHORITIES

- Approval of the pond by the Lower Water Authority of the City of Göttingen
- Request submitted (including impact assessment) for some areas to be exempted from landscape protection area regulations
- Requests submitted regarding water rights

CHALLENGES

- Preparations for sowing the flowering meadows
- Local government regulations regarding construction of the pond, especially the sealing and sustainable filling of the pond, made the biotope project much more expensive than originally estimated: to sustainably fill the wetland biotope with surface water/rainwater, a replenishment reservoir, a filter system and a pump shaft had to be built.
- Establishing suitable barriers at the rear of the (open) Institute grounds to prevent children or adults from accessing the grounds unnoticed and falling into the water; cultivations or brushwood hedges are under consideration; signs have already been erected.
- Employees are not insured during work assignments. A non-profit association for the maintenance of the BioDiversum therefore is to be launched, and it should have association liability [Vereinshaftpflicht].
- Given all its planned measures and activities, the project could only be executed with the support of two external sponsors (AKB Foundation & Sparkasse Göttingen).



... MPI for Multidisciplinary Sciences.

“It’s fascinating how many employees are involved in the BioDiversum. Nature and species conservation has quickly become a key part of Institute identity.”

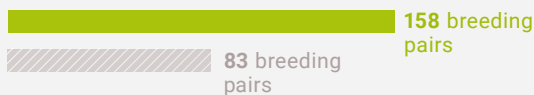
Carmen Rotte, Press Spokesperson and Head of the BioDiversum

Monitoring in the BioDiversum

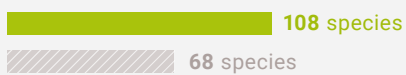
■ 2022

▨ 2019

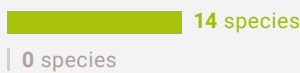
Birds



Wild bees



Dragonflies



Butterflies



Grasshoppers



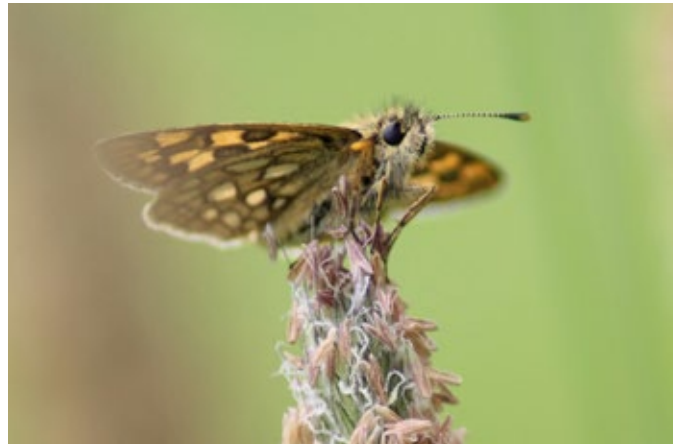
Bats



* Possible reason for stagnating species numbers: the grass content of the meadows is too high

-> Modifying the mowing plan: remove cuttings, staggered mowing with a bar mower

** Plus up to three species of the *Myotis* genus



Skipper butterfly species at the MPI for Multidisciplinary Sciences.

FINANCING

- Supported by the Max Planck Society, supplemented by donations (AKB Foundation, Sparkasse Göttingen).

SCIENTIFIC EVALUATION

- Yes, by external experts (flora, birds, wild bees, grasshoppers, butterflies & dragonflies, bats), with support from Institute staff for other species
- A survey of the status quo was carried out; monitoring will take place annually from the second year.

MAINTENANCE

- Institute gardeners
- Volunteer groups for nesting boxes and ponds, monitoring, and photos
- External company providing support for mowing the flower meadows (maintenance costs have to be paid by the Institute)

FURTHER PLANS

- Collaborations with schools
- Expanded networking with biotope projects in the region and with nature conservation associations
- Projects for the Institute's kindergartens

Further information:



➤ [BioDiversum](#)

MPI for Plant Breeding Research, Cologne

MEASURES AND ACTIONS AT THE INSTITUTE

- Flower meadows
- Ponds (1300 square metres)
- Green roofs
- Wood piles
- Orchard meadow/fruit trees (6000 square metres, 40 varieties)
- Stone piles, dry stone walls
- Hedges, old trees
- Nesting boxes for birds, bats and garden dormice, nesting aids for wild bees

MEASURES AND ACTIONS AT ESTATE VOGELSANG

- Extensive grassland use by year-round free-range cattle
- Perennial flower rows and areas with site-adapted regional seed mixtures, distributed across the entire farm area
- Five-crop rotation in the Institute's own fields
- Reducing the need for chemical plant protection by increasing biological plant protection with things like ferments and bacterial preparations.
- Organic fertilization of soils and crops with green-waste compost and fermentation substrate
- Three hectares of forest and one hectare of grassland with old trees as a "protected landscape area"

Pond at the MPI for Plant Breeding Research.





“The flower strips also benefit birds, as evidenced by the rises in populations of the goldfinch, skylark, corn bunting and grey partridge.”

Martin Krist, Administrator of Estate Vogelsang at the MPI for Plant Breeding Research

LAUNCHED

- 1990

CONSULTING WITH THE AUTHORITIES

- Lower Nature Conservation Authority, Urban Green Space Planning Authority, Chamber of Agriculture, Foundation for Rheinische Cultural Landscape

CHALLENGES

- Creation of ecologically high-value habitats in intensively used “Börde” landscape
- Coordination of construction activities/nature conservation
- Continuity of professional maintenance/support
- Energy issues on the Institute’s farm, where maize silage is grown for regenerative energy use (biogas) on about 20% of the land.

FINANCING

- Max Planck Society
- For agriculture: Estate Vogelsang

SCIENTIFIC EVALUATION

- For instance, in the framework of the Bonn project “Nature Conservation in Börde landscapes through Structure Elements Based on the Example of the Cologne Lowland”, January 2007.
- Annual monitoring of avifauna in Widdersdorf Süd via Cologne Office for Fauna on behalf of Amand GmbH
- Further studies planned with the city of Cologne, university institutes, environmental associations

MAINTENANCE

- By in-house “Green Group” (three gardeners) on the fenced-in Institute grounds and by the administrator of Estate Vogelsang for the outside area of the Institute.

SUCCESSSES

- Enrichment of biodiversity (plants/insects/birds/ small mammals)
- Development into a landscape park for the regional population
- Establishing an environmental education facility (science barn with educational garden)

GETTING EMPLOYEES INVOLVED

- Possible, such as when installing and checking nesting aids
- Evaluating flora and fauna
- Participation in science-related environmental education
- Establishment of an “Alumni Alley” (planting trees for new doctoral researchers)

Further information:



➤ *Nature conservation at the MPI for Plant Breeding Research*

Meadow at the MPI for Plant Breeding Research.

Ernst Strüngmann Institute for Neuroscience (ESI), Frankfurt



MEASURES AND ACTIONS

- Flower meadow (planned)
- Green roofs
- Plant beds with native plants
- Fruit trees
- Nest aids for wild bees (planned)

LAUNCHED

- 2013

CONSULTING WITH THE AUTHORITIES

- None (roof greening complies with the Energy Saving Ordinance for New Buildings requirement in effect at the beginning of construction and the additional Hesse requirement of falling below by 50%)

FINANCING

- In-house Institute funds

SCIENTIFIC EVALUATION

- No

MAINTENANCE

- Facility Management

ACTIONS

- A sustainability working group with the slogan "Greener ESI" has existed since the end of 2021 and includes personnel from research to facility management.



Bumblebee on a flowering wild rose at ESI.

“Fruit trees in the yard and a flower meadow – it’s just so much fun!”

Marieke Schölvinc, Research Group Leader



CREATING HABITATS – HOW IT'S DONE!

The majority of plant and animal species are in decline, primarily as a result of humans destroying their habitats. Naturally designed green spaces thus make an active contribution to increasing biodiversity.

The opportunities for establishing biotopes are every bit as diverse as the Max Planck Institutes' research topics: some Institutes are situated on the edge of a forest and have large green spaces, while others are in the middle of the city and only have a small green area or a few flower troughs that can be used as habitats. However, if they are designed to be naturalistic and filled with native species, even small areas can have a big impact on the environment.

If you want to get involved in increasing biodiversity at your Institute:

- ✚ Get in touch with the sustainability commission or group at your Institute.
- ✚ Present your project to the Board of Directors or the Managing Director and the Head of Administration.
- ✚ Speak with your Institute's external horticulture company or horticulturists.
- ✚ If you are planning a building project (roof, façade greening, large pond), speak with your local building coordinator and the Building Department of the Administrative Headquarters.
- ✚ Contact the local authority (Lower Nature Conservation Authority, the Water Management Office) in the event that extensive measures, such as the construction of a sizable pond, are required.

Semi-natural plant beds

The same lawns, ground covers or small, unused spaces filled with seasonal “throwaway” flowers from the DIY store, can be found in almost every Institute. Even though they are small, these plant beds and green areas can be very beneficial for many birds and insects if they are filled in a naturalistic way, with local perennials and woody plants.



*Hoverfly on chicory
at Campus Martinsried.*

TIPS

- The need to re-tender the contract for the upkeep of the outdoor facilities presents a great opportunity for a redesign. The services offered by the external horticultural company can then be modified as needed.
- In order to prevent quickly growing grasses, dandelions, nettles or clover from displacing wild herbs and perennials, the soil of naturalistic beds should be as devoid of nutrients as possible.
- In nutrient-rich areas, dig the soil 30 centimetres deep and replace it with a sand-gravel mixture with some compost. With unfertilized lawns, it may also be sufficient to remove the turf.
- For planting, please use only native species (even better: plants or seeds from the same region, i.e. “autochthonous” ones).
- During the first months after planting/sowing, the area should not be allowed to dry out. Later, watering is not necessary.

ADDED VALUE

- ✓ Flowers for bees, butterflies and other pollinators
- ✓ Open areas for wild bees nesting in the soil
- ✓ Seeds and insects serve as food for birds
- ✓ Flowering from spring to autumn without replanting
- ✓ Low maintenance: pruning only once or twice a year, no replacement of planting, no watering necessary
- ✓ Heat and drought resistant

EFFORT AND EXPENSE

- Implementation via in-house efforts may be possible, depending on the size of the areas. Specialized nurseries supply native plants.
- The removal of the old soil and the delivery of gravel and compost, for instance by a horticultural company, typically require outside assistance.
- Eliminate unwanted competitors like field thistle, clover and dandelion.
- After mowing, the cuttings must be removed and disposed of.



Semi-natural plant bed at the MPI for Multidisciplinary Sciences.

Flower meadows

English-style lawns provide habitats for only a few animals and plants. Additionally, it needs to be mowed frequently and might require artificial irrigation. Species-rich meadows are quite different: they house an abundance of plants and animals and are also easier to care for. There are commercially available seed mixtures with wild grasses and herbs for a variety of soil types and locations, including shady areas under trees. Larger areas can also be divided up into smaller meadows.



Blue butterfly species on sainfoin (Campus Martinsried).

TIPS

- The need to re-tender the contract for the upkeep of the outdoor facilities presents a great opportunity for establishing a meadow. The services offered by the external horticultural company can then be modified as needed.
- Normally, seeding into an existing lawn will not work. The turf must be removed or the area milled before sowing so that the seeds have space to germinate.
- Alternately, only sections of the lawn can be removed and reseeded. Over time, the meadow plants will gradually spread to the other areas.
- It's a good idea to mix the nutrient-rich substrate with sand to reduce nutrients.
- The ideal time for sowing is April or September.
- During the first months, the area should not be allowed to dry out. Later, watering is not necessary.
- After sowing, existing seeds in the soil frequently start to germinate and outgrow the delicate young meadow plants. In this case, the area needs to be mowed around four weeks after sowing. The process does not harm the meadow plants' leaf rosettes, which will only be a few centimetres high at that point.
- In subsequent years, mowing once or twice (for example, in June and September/October) is sufficient, preferably with a bar mower or a scythe, depending on the nutrient richness.
- It is essential to remove the plant material afterwards. If it's left lying around, it suffocates the growing plants while also adding nutrients to the soil as it decomposes.
- Please only sow mixtures of native species devoid of cultivated or foreign plants such as sunflowers (even better: use species and seeds from the region).



Marguerite daisies and meadow sage at the MPI for Plant Breeding Research.

ADDED VALUE

- ✓ Flowers for bees, butterflies and other pollinators
- ✓ Forage plants for caterpillars
- ✓ Seeds and insects serve as food for birds
- ✓ Flowering from March until October
- ✓ Low maintenance: mow only once or twice a year
- ✓ Heat and drought resistant

EFFORT AND EXPENSE

- The removal of the old soil and the milling of the turf typically require outside assistance, such as from a horticultural business.
- Seeds for native wild plants can only be obtained from specialist nurseries.
- Special equipment is required for mowing. The grass cuttings must be removed.
- Costs:
 - Example – MPI for Demographic Research:
Meadow: 4300 square metres: approx. €1000 with the same costs for maintenance

Further information:



➤ *Seed mixtures from Rieger-Hofmann*

Nesting aids for wild bees

There are around 550 bee species in Germany. The only bee that forms hives is the honey bee; all other bees lead more or less solitary lives. For their nurseries, the majority of species use underground breeding burrows that they have dug for themselves. Some also lay eggs in beetle tunnels in dead wood or other cavities. The houses – known as “insect hotels” – are intended for these species. But the name “nesting aid for wild bees” is more fitting, as these houses offer the wild relatives of our honey bee less a place to spend the night and rather more, a nursery.

Contrary to popular belief, the honey bee does not require any help beyond normal beekeeping. The species is a mostly domesticated farm animal that is intentionally bred in Germany. Despite the fact that honey bees are also harmed by the widespread use of pesticides and the scarcity of flowers, beekeepers make up for the bees lost through feeding and breeding. Beehives do not, strictly speaking, contribute to the preservation of biodiversity.





TIPS

- Wild bees do not form large colonies and are usually harmless.
- The majority of “insect hotels” that are sold commercially are completely inappropriate for wild bees and are not accepted by them.
- Home-made bee nesting aids can be constructed with some manual labour – and perhaps a little assistance from the Institute’s workshop. You can find instructions for this on the websites of environmental organizations and other informational websites.
- A sunny, wind-protected location facing south or southeast is best.
- Purist or artfully playful – the insects themselves don’t really care about design.
The casing itself is only used to protect against rain and to store the actual nesting sites.
- The tunnels that are drilled into bamboo or wood should be between 3 and 8 millimetres in diameter, at least 10 centimetres long (preferably longer), and closed at one end.
- Suitable nesting sites include:
 - hollowed-out bamboo pieces, blackberry or elder branches
 - special cardboard tubes (available online, see below)
 - tunnels drilled into wood blocks (important: only use untreated, well-dried wood from deciduous trees like ash. Spruce wood is not suitable! Also, drill into the long side, not the face of the block).
- The artificial breeding tubes must have smooth entrances and walls. Wild bees will not accept “frayed” boreholes, because they can injure their wings on the sharp wood shavings.
- Pine cones, moss, straw and brick are unsuitable – and even counterproductive.

ADDED VALUE

- ✓ A wide range of possibilities for observation

EFFORT AND EXPENSE

- Hardly any space required, easy to do yourself
- Check once a year, add new nest tubes if necessary

*Bee nesting aid
at the MPI for
Polymer Research.*

Piles of stones, sand or wood

Piles of stones, sand or wood can be habitats for many animals: they provide hiding places for lizards and amphibians made of stone, ground-nesting insect nesting sites made of sand, and beetle food sources made of wood. They thus perform vital ecological functions. They can also be built with relatively little effort and take up little space. Information boards can provide more detail on their intent and function.



TIPS

- Animals need a pile of stones, sand, or deadwood that extends at least 40 centimetres into the ground for them to hibernate with good protection from the frost. More important than the height (max. 1 metre) is the pile's surface area: between 2 and 10 square metres is ideal.
- Sand and stone piles should be placed in sunny areas; wood piles can also be in shade.
- Sand piles should ideally be made of unwashed sand that still contains some clay (no playground sand that has been cleaned!).
- For lizards to find suitable hiding places, stone piles should contain stones of various sizes (between 20 and 40 centimetres).
- It is also good to mix branches, logs and rootstocks into wood piles.
- Cats and dogs like to use sand piles to mark their territory. Loosely spread branches (e.g. blackberry vines) above the pile can prevent this.

*Deadwood at
Campus Martinsried.*



Wood pile at the MPI for Human Development.

ADDED VALUE

- ✓ Important habitat for reptiles, amphibians and insects

EFFORT AND EXPENSE

- Almost no space is needed, it's simple to implement yourself, and building material suppliers or municipal building yards can provide the materials.
- Hardly any maintenance required

Bird conservation: Glass façades, nesting boxes, year-round feeding

Three things should be included in your Institute's bird protection programme: preventing collisions with glass surfaces, offering nest boxes, and providing year-round feeding.

In Germany, approximately 100 million birds perish each year after colliding with windows and glass façades. The façades of many Max Planck Institutes also pose a danger to birds.

Nest boxes are an easy way to increase bird diversity at the Institute in areas where old trees are lacking and buildings also leave little room for bird nests. The boxes, which can be hung on trees near the Institute or directly on the building's exterior, should be designed to meet the needs of the various species (semi-cavity, cavity breeders).

Many people feed birds in their gardens in winter. However, experts now advise year-round feeding to prevent many young birds from starving to death because the birds can no longer find enough insects and seeds in the cleared landscapes found today.



*Great tit on the grounds
of the MPI for
Multidisciplinary
Sciences.*

TIPS

- Determine which glass surfaces at the Institute are especially hazardous for birds, or inquire with facility managers, gardeners, and colleagues to see if they are aware of any such areas. Keep a record of any dead birds you find. Statistics and images of the accident victims help to justify the generally high cost of protective measures.
- Stickers with a silhouette of a bird of prey are widely used to prevent bird collisions, but they are largely useless. Two-dimensional patterns, which can be glued on or applied to the panes at the factory, on the other hand, have a protective effect. To lessen the effects of transparency and reflection, this must be done from the outside. There are numerous designs and products available, all of varying degrees of effectiveness.
- In the interim until better solutions are found, temporary fixes like outside-mounted blinds, roller blinds, light-coloured curtains, coloured window decorations, drawings made with finger paint or window paint, nylon cords, or cotton threads can help.
- Nesting boxes made from wood concrete outperform wooden ones in terms of durability and are particularly well-suited for cavity-nesting birds. Outside of the breeding season, nest boxes should be checked once a year. Any outdated nesting materials should be removed.
- Do not feed birds food scraps or kitchen waste – only give them birdseed.
- Place the feeding station where the birds can see any prowling cats and are not in danger from the glass.
- Clean the feeding station regularly.



Young kestrels in a nest box at the MPI for Multidisciplinary Sciences.

ADDED VALUE

- ✓ A wide range of possibilities for observation

EFFORT AND EXPENSE

- In most cases, a specialist company must be hired to design a façade that is bird-friendly.
- Nesting containers and feeders are easy to set up and occupy very little space.
- Cleaning nesting boxes and feeding places.

Further information:



➤ [Bird protection with SEEN elements](#)

Green roofs

Unused flat roofs present an additional chance to promote biodiversity. It only takes a thin layer of nutrient-poor subsoil to support rare plants and animals. If a roof terrace is also feasible, it could also give staff a place to unwind.

A green roof is a building project and thus has to be reported to your local building coordinator or the Building Department of the Administrative Headquarters. They will then check the technical and financial feasibility. Planning should also take into account potential additional uses, such as the placement of cooling units or photovoltaic systems. For planning and implementation, it is crucial to hire a landscape architect.

TIPS

- The roof should ideally be simple to access so that future maintenance work can be completed quickly.
- Roofs should not be greened all the way to the edge. Additionally, the roof's waterproofing must be protected and its drainage may need to be adjusted.
- It must be ensured that even in high winds, soil and plants on the roof cannot be blown to the ground.
- Usually, additional safety precautions like fall protection are needed for green roofs.
- Always plant only native species; no exotic or domesticated plants.



Green roof of the MPI for Polymer Research.



Green roof of the MPI for the Structure and Dynamics of Matter.

ADDED VALUE

- ✓ Flowers for bees, butterflies and other pollinators
- ✓ Forage plants for caterpillars
- ✓ Flowering from March until October
- ✓ Easy maintenance
- ✓ Heat and drought resistant
- ✓ Because the green roof lessens the degree of sealing of the property and, consequently, the amount of rainwater discharged into the wastewater system, many municipalities grant a discount on the wastewater costs.

EFFORT AND EXPENSE

- Green roofs need to be carefully planned and are usually not cheap.
- Planning must be done by the central Building Department and the work must be done by a specialized company.
- Only one mowing per year necessary. Cuttings must be removed.
- Occasional weeding and removal of emerging bushes and trees.

Further information:



➤ "Green Roof of the Year 2021" Award for the MPI for the Structure and Dynamics of Matter

Green façades

Climbing plants are habitats for birds and insects. Even Institutes with very little or no land of their own can establish significant biotopes with green façades. However, ivy and the like do not have the best reputation. Some people fear damage to plaster and to roofs. Such damage can be prevented by the choice of plants and regular pruning. Not every façade is suitable for climbing plants.

TIPS

- Ask your Building Coordinator if your construction project needs to be reported to the Building Department at the Administrative Headquarters.
- Glass façades and façades consisting of individual elements are not suitable for greening.
- Ivy and Virginia creeper grow holdfasts that allow them to climb independently. The downside: the adhesive feet can only be removed from the plaster with difficulty.
- Up to 50 different bird species can find shelter and food in ivy, which is an evergreen climbing plant. Because it only blooms in the late autumn, it is a crucial source of pollen and nectar for butterflies and other insects.
- Because they lack holdfasts, other plants like the clematis, honeysuckle, or wisteria require wires or trellises as artificial climbing aids.
- Certain species, like ivy, can wreak havoc by growing in cracks and joints.





Virginia creeper at the MPI for Human Development.

ADDED VALUE

- ✓ Habitat for animals
- ✓ Food source for birds (ivy) and insects (ivy, hops, honeysuckle)
- ✓ Improves climate and air quality around the Institute
- ✓ Protects the façade from the weather and insulates

EFFORT AND EXPENSE

- Plants that do not form adhesive roots need a climbing aid. Typically, this needs to be installed by a specialized business (check with the local Building Coordinator!).
- Annual pruning may be necessary, for things like keeping windows clear. A specialist is usually required for this.

Ponds

Wetlands are the most species-rich habitats on earth. Even with a small pond, it's possible to create a home for an abundance of species. Size is less important than ensuring shallow, almost natural banks and a sunny location.

Larger ponds typically require the services of a specialized company, while smaller ones can typically be built via in-house efforts. In most federal states, you need a building permit to build a pond with a volume of 100 cubic metres or more or a depth of two metres.



*Grey heron at
Campus Martinsried.*

TIPS

- Select a non-sloped area that is as sunny as possible (ponds on slopes are more difficult).
- Frogs can be noisy. So you should keep the pond as far away from your guest house or residential buildings as you can. Additionally, avoid the vicinity of kindergartens, because even shallow waters can be dangerous for children. Put up signs so everyone knows that there is a body of water close by.
A fence is not always necessary because hedges and shrubs can serve as a natural barrier.
- To avoid obstructing any future new construction or building conversions at the Institute, ponds should only be placed in areas designated as "outdoor facilities" and not in the construction zone (remember to mind the development plan!).
- Plan your water body with shallow banks. Animals that have fallen into ponds with too steep or even vertical banks can no longer climb out and will drown. Moreover, steep banks are difficult to plant.
- For smaller ponds, a water depth of 30 to 40 centimetres is sufficient.
This minimizes work and guarantees that the banks won't get too steep.
It's not a problem if the water dries out during peak summer. Waters that regularly dry out are necessary for some species.
- A layer of sand, possibly a metal grid for rodent protection, a protective fleece and only then the actual pond liner are used to line the pit.
- The least harmful way to stop water from seeping out is with a thick layer of compacted clay. This is very complex and expensive, however. Even if done professionally, the clay layer might leak. Conversely, membrane ponds – which are best constructed of EPDM rather than hazardous PVC film – have proven successful.
- Pond substrate can be a low-nutrient sand-gravel or sand-loam mixture.
This will make sure that the pond doesn't quickly become overgrown.



Pond at Campus Martinsried.

- Make sure the pond edge is protected by a capillary barrier. This prevents the immediate environment from drawing all the water away.
- Avoid fountains and other water features.
- Avoid planting trees and bushes directly next to water bodies. These produce too much shade and, in the autumn, their leaves contaminate the water.
- Plant sparsely rather than abundantly. Open ground and water are essential for many animals. Sparse planting also reduces the amount of maintenance required. A water body can quickly become completely overgrown by the plants listed below: Reed, bulrush, iris, waterweed, large water lily species and pondweed.
- Fill your pond with rainwater.
- Do not insert fish in small ponds. The majority of fish, including the well-known goldfish, consume aquatic insect and amphibian larvae.

ADDED VALUE

- ✓ Water attracts people and animals.
- ✓ A pond is a vital habitat for many rare animals and plants.
- ✓ Water improves the surrounding climate.

EFFORT AND EXPENSE

- Small ponds are relatively simple and inexpensive to construct whereas larger bodies of water require a great deal more planning, money, and possibly even official permission.
- It can be costly to dispose of the excavated material.
- If at all, technical devices like pumps or filters are only required in ponds with fish.
- Low maintenance is required due to sparse planting and a nutrient-poor water bed.
- Larger ponds typically require planning and implementation by a specialized company, and maybe even official approval by the district administration.

Habitats at Max Planck Institutes

Native plants (flower meadow, flower beds, hedge)



Extraterrestrial Physics
 Astrophysics
 Multidisciplinary Sciences
 Campus Martinsried
 Biological Intelligence, Seewiesen site
 Study of Crime, Security and Law
 Human Development
 Dynamics of Complex Technical Systems
 Psycholinguistics
 Demographic Research
 Florida Institute
 Ernst Strüngmann Institute for Neuroscience
 Plasma Physics
 Chemistry
 Biology of Ageing
 Tübingen Campus
 Polymer Research
 Physics
 Chemical Ecology
 Molecular Plant Physiology
 Gravitational Physics
 Colloids and Interfaces
 Animal Behavior
 Biophysics
 Plant Breeding Research

Naturally designed plant beds

Multidisciplinary Sciences
 Florida Institute
 Tübingen Campus
 Dynamics and Self-Organization
 Chemical Ecology
 Plant Breeding Research



Fruit trees

Study of Crime, Security and Law
 Human Development
 Dynamics of Complex Technical Systems
 Ernst Strüngmann Institute for Neuroscience
 Chemistry
 History of Science
 Plant Breeding Research
 Dynamics and Self-Organization
 Animal Behavior, Radolfzell site
 Biology Tübingen

Year-round bird feeding



Multidisciplinary Sciences

Natural stone walls, piles (wood, stone, sand)

Biological Intelligence, Seewiesen site
 Study of Crime, Security and Law
 Chemistry
 Plant Breeding Research
 Psycholinguistics
 Polymer Research
 Chemical Ecology
 Astrophysics
 Campus Martinsried
 Human Development
 Plasma Physics
 Physics

Nesting boxes (birds, bats)



Multidisciplinary Sciences
 Biological Intelligence, Seewiesen site
 Human Development
 Art History Institute
 Psycholinguistics
 Chemistry
 Study of Crime, Security and Law
 Tübingen Campus
 Dynamics and Self-Organization
 Physics
 Chemical Ecology
 Molecular Plant Physiology
 Gravitational Physics
 Colloids and Interfaces
 Plant Breeding Research

Nesting aid for wild bees



Study of Crime, Security and Law
 Human Development
 Ernst Strüngmann Institute for Neuroscience
 Tübingen Campus
 Polymer Research
 Chemical Ecology
 Plant Breeding Research

Natural pond



Multidisciplinary Sciences
 Campus Martinsried
 Florida Institute
 Tübingen Campus
 Plant Breeding Research
 Dynamics and Self-Organization
 Physics
 Physics of Complex Systems
 Chemical Ecology

Greened building (roofs, façades)

Extraterrestrial Physics
 Campus Martinsried
 Biological Intelligence, Seewiesen site
 Study of Crime, Security and Law
 Human Development
 Psycholinguistics
 Ernst Strüngmann Institute for Neuroscience
 Plasma Physics
 Chemistry
 Biology of Ageing
 Structure and Dynamics of Matter
 Plant Breeding Research
 Polymer Research
 Comparative and International Private Law
 Chemical Ecology
 Florida Institute
 Physics

Kitchen garden (vegetables, herbs)

Florida Institute
 History of Science
 Tübingen Campus
 Dynamics of Complex Technical Systems
 Plant Breeding Research



Ten steps to increase biodiversity

- 1 Select a suitable site for the desired habitat type
- 2 Launch or contact a biodiversity working group or start a sustainability group at the Institute, and perhaps network and consult with regional nature conservation organisations.
- 3 Contact Managing Director and Head of Administration
- 4 Fundraising: The local Building Coordinator or the Head of Administration must report any construction projects (roof, façade greening, large pond) to the Building Department at the Administrative Headquarters. They will check the project for technical and financial feasibility and prepare a cost estimate.
- 5 Planning (if required, preparing expert reports and approval documents); if necessary, contacting authorities
- 6 Consider issuing tenders for external companies, e.g. for the creation of larger flowering meadows or a pond
- 7 Get employees and the public on board
- 8 Survey the status quo (species monitoring)
- 9 Carry out the project
- 10 Evaluate via regular monitoring



Attracting wildlife with the help of plants

During their evolution, some animal species have developed strong bonds with specific plant species. Many wild bees, for example, require a specific species or family of plants' pollen in order to feed their larvae, while birds have marked preferences for berries and fruits. With the aid of specific plants, such relationships can be used to entice animals to the bed or meadow.



Wild teasel – goldfinch

Goldfinches love seeds. With their pincer-like beaks, they can access their preferred food, such as the blossoms of wild teasel, from even difficult-to-reach crevices. You can be sure to see goldfinches scurrying around on the thorny seed heads and pecking seeds if you leave the plant outside over the winter. The wild teasel is humble – it can grow almost everywhere and is self-sowing. It forms a rosette of leaves on the ground the first year, then in the second year there are striking blossoms – which can grow to be over two metres tall. Their flowers attract bumblebees, bees, and butterflies.

Bishop's wort – European Wool Carder Bee

The purple flowers of bishop's wort are appreciated by wild bees and butterflies alike. But one wild bee species is especially fond of it: the European wool carder bee. The males even defend "their" flowers against intruders. They can drive other males and even butterflies away using the small spines on their abdomen. But for people, the animals are entirely harmless. And they settle quickly into nesting aids, too. They use plant hairs to line the cavities of their breeding tubes.



Soapwort – hummingbird hawk-moth

Hummingbird hawk-moths are diurnal. In the spring, the animals fly north from areas south of the Alps and reproduce in Central Europe, and some appear to overwinter here. If you plant bedstraw, you might be able to see their caterpillars, which are specialized on this plant. Hummingbird hawk-moths are often confused with actual hummingbirds because they, too, hover in the air in front of flowers and suck nectar. With its narrow calyxes, soapwort has the perfect flowers for the long proboscises of butterflies and moths. Other moths frequent its flowers because they are open until late at night. The perennial has no special requirements and is self-sowing.



Elder – blackbird

For insects and birds, the fast-growing shrub is a paradise. Bees, butterflies and flies pollinate its white, fragrant blossoms. Elderberries, in turn, provide food for over sixty bird species. Blackbirds are especially fond of the berries. Mountain ash berries are similarly popular among birds.

Ivy – ivy bee

Ivy doesn't start flowering until it's ten years old. The climbing plant's flowers do not appear until September, making it one of the year's last sources of nectar and pollen. The plant provides essential food for bees, butterflies and hoverflies to make it through the winter. One wild bee species even depends entirely on flowering ivy: the ivy bee. It feeds its larvae exclusively on ivy pollen. When the berries ripen in spring, blackbirds feast on them. Ivy is a favourite nesting site for robins, wrens, blackbirds, and tree sparrows.



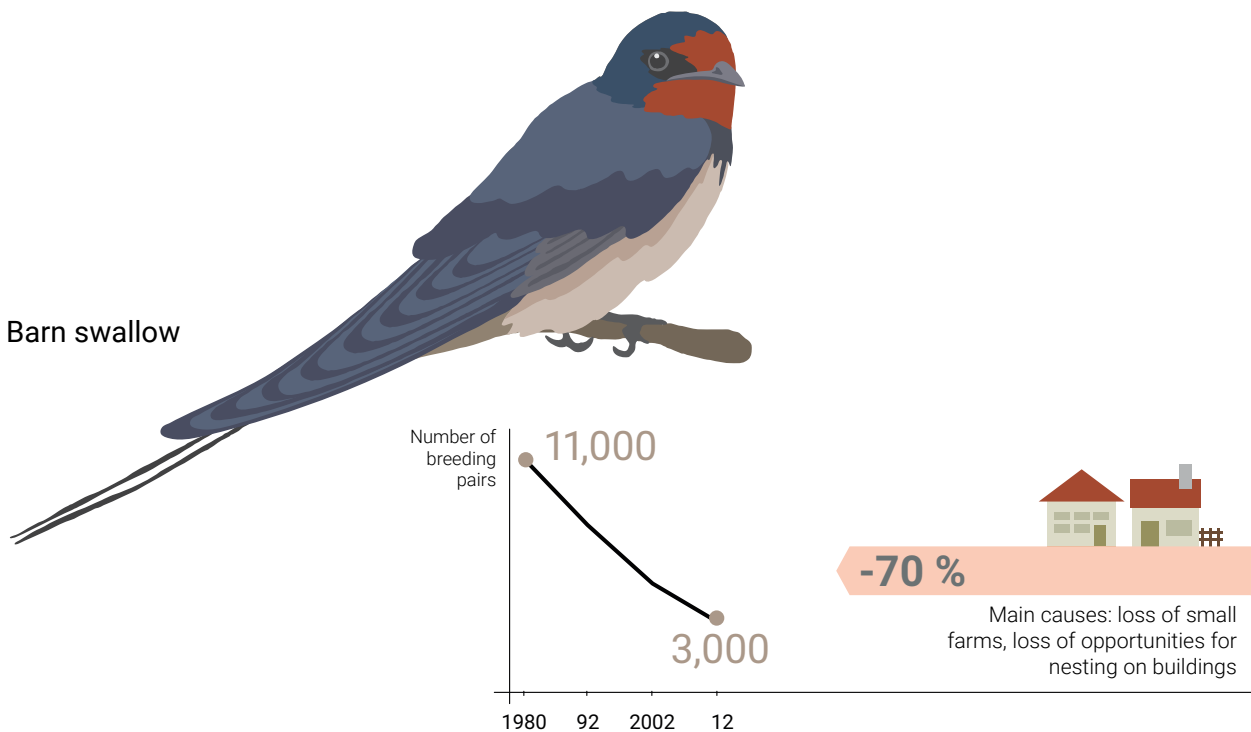
Hawthorn – flower chafer

These iridescent green beetles are one of our insect world's most striking phenomena. Flower chafers feed on flower pollen. The hawthorn's umbrella-like inflorescences are ideal for clumsy animals (and many other insects) to land on. The berries on the shrub, which can grow up to five metres tall, provide food for many birds in the autumn. Flower chafer larvae live in the soil from organic material. A small compost heap can serve as the ideal nursery for them.

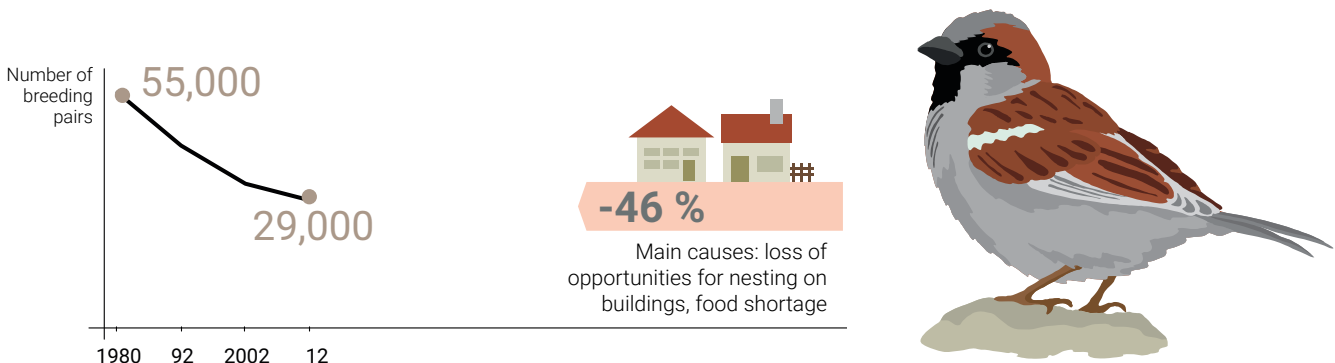
Biodiversity in villages and towns

Fewer and fewer birds

Most bird species living in settlements around Lake Constance declined between 1980 and 2012, according to a study conducted with the cooperation of the Max Planck Institute of Animal Behavior in Constance. The discovery is likely to apply to many other German villages and towns.

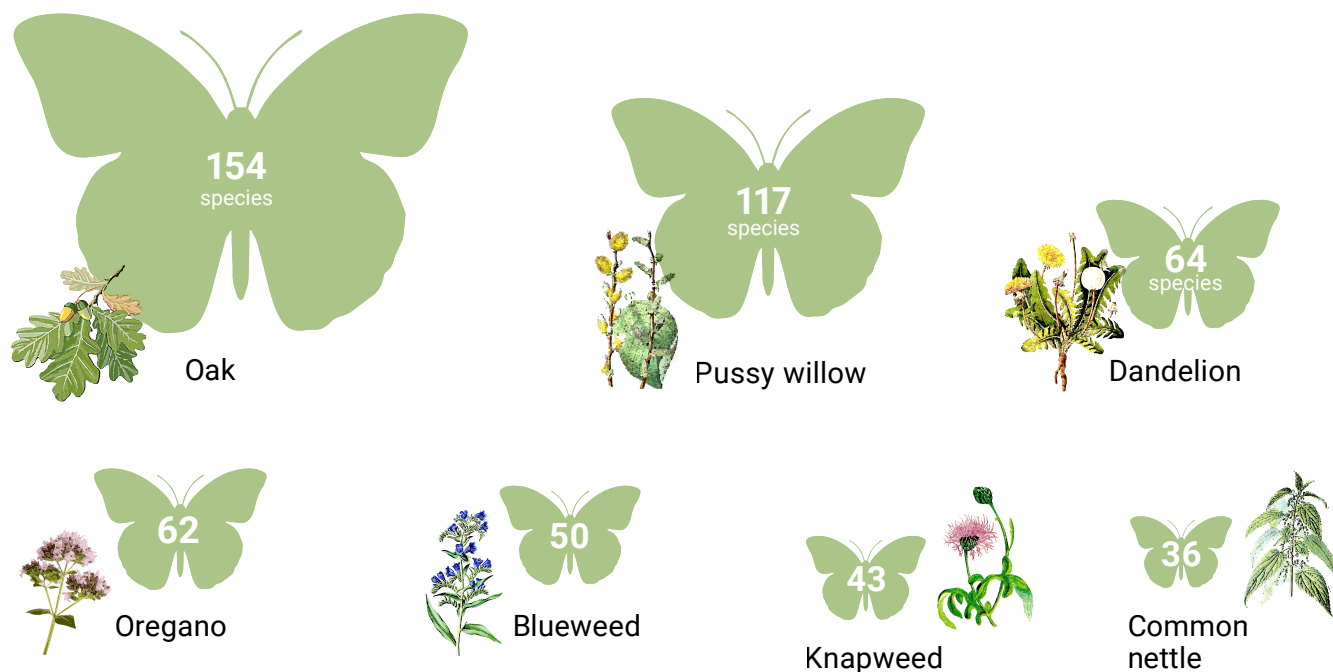


House sparrow



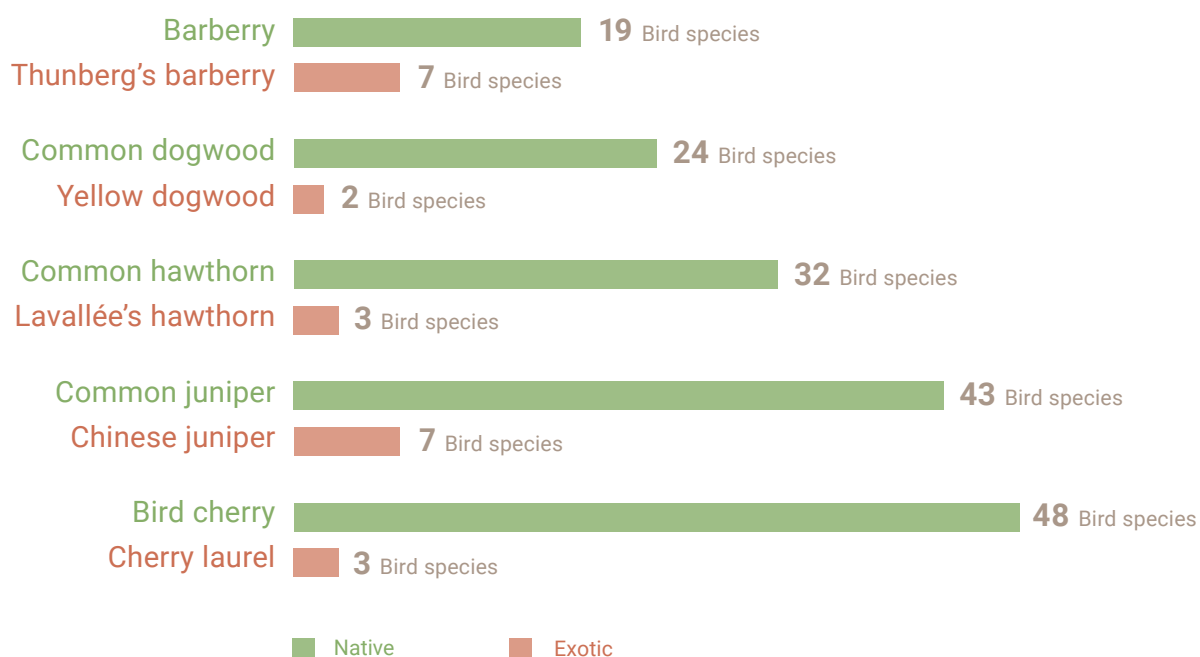
Native plants are a food source for many butterflies

Butterfly and moth species that feed on this plant, either as adults or as caterpillars:



Source: www.floraweb.de/xsql/schmetterlingspflanzen.xsql

For birds, native plants are better than exotic species



Source: *Ökologische Beziehungen der Vögel und Gehölze*, Dietmar Fennel (editor), Frantisek J. Turcek (author), Verlag Der Slowakischen Akademie Der Wissenschaften (publisher), Bratislava (1961)

FAQ

WHAT CAN I DO AT MY INSTITUTE TO PROMOTE BIODIVERSITY?

The first thing is to determine the space and funding that's available. Even those Institutes with limited space and funds can create diverse habitats by planting a bed with native wild plants (p. 24) or greening a façade (p. 36).

Essentially, biodiversity protection activities must also be consistent with the zoning of your Institute's land and cannot impede the Institute's construction or expansion plans. Likewise, there must not be any negative impact on the buildings' functionality for research. These requirements, however, do not prevent installations that can be reversed if necessary, such as meadows, nesting boxes, and smaller ponds.

WHO CAN HELP?

Things are easier when working together. Be on the lookout for like-minded people, the intranet or a notice board, for instance. Check with the press office at your Institute to see if there is already a sustainability group that can assist you. Others might have had a similar idea already.

WHO DO I NEED TO INVOLVE AT THE INSTITUTE?

You should get the following people on board:

- Directors
- Head of Administration
- Building Coordinator at the Institute (for construction projects, the Building Department at Administrative Headquarters, too)
- In-house or external gardeners

WHERE CAN I GET FUNDING FOR BIODIVERSITY PROJECTS?

The design and maintenance of the Institutes' open spaces is generally funded through budget funds managed by the Institutes. The federal and state governments are not currently providing additional central funding in this context. Small construction projects (under two million euros) can, in theory, be funded by the Administrative Headquarters. Ask your local Building Coordinator whether central funding is available for your project.

Sponsors might also help finance your projects. Speak with companies with which your Institute is affiliated to see if they would be interested in assisting you with the small sums required for most actions. Local businesses and institutions can also be enlisted to promote nature conservation and species protection, generating good publicity.

DO I HAVE TO INVOLVE THE ADMINISTRATIVE HEADQUARTERS?

Green space design is solely the responsibility of the Institutes. So you do not need to notify the Administrative Headquarters when you build beds, flower meadows or stone piles. Building modifications, such as green roofs or façades, necessitate careful professional planning and examination. When making changes to buildings, you should consult with your Building Coordinator or the Building Department at the Administrative Headquarters.

DO I NEED PERMISSION FROM THE AUTHORITIES?

Generally, the habitats listed here do not need official approval. But please note that a building permit is required in many federal states for the construction of a pond with a volume of one hundred cubic metres or a depth of more than two metres. Permission may also be required from the Urban Green Space Planning Authority [Grünflächenamt] for the maintenance or felling of old, possibly protected trees.

DO I NEED EXTERNAL SUPPORT FOR PLANNING AND IMPLEMENTATION?

This depends on your prior experience and the options available at your Institute. Smaller activities, such as building a bee nesting aid, planting a bed, or creating a flowering meadow, can also be planned and implemented yourself if you have the necessary prior knowledge. Larger projects, such as greening a roof or creating a pond, will almost always need the assistance of a horticulture or landscape planning specialist.

HOW CAN OUR BIOTOPE GET SCIENTIFIC MONITORING AND EVALUATION?

Of course, it is advantageous for a research institute if the success of its biodiversity conservation measures is scientifically supervised. Before construction begins, experts survey the populations of plants and/or individual animal groups. The success of the measures can then be documented through regular mapping of the species population after completion.

An evaluation could be carried out in collaboration with your city's university, for example as the subject of a Master's thesis. Inquire with local representatives of nature conservation organisations such as BUND and NABU (in Bavaria: BN, LBV) to see if they can get you in contact with suitable specialists. Mapping is also done by professional agencies.

HOW CAN EMPLOYEES GET INVOLVED?

One option is to launch a group that campaigns to establish a more sustainable working culture at the Institute. Informal working groups or project groups can also be formed to plan, construct and maintain naturalistic areas. Working groups can be tailored to individual staff interests, such as species monitoring, photography or maintenance.

FOR PONDS, WHAT DO I NEED TO CONSIDER IN TERMS OF SAFETY?

Even in shallow ponds, there is a risk of drowning. This is especially true if the water body is visible and easily accessible to the public, and if children spend time in the area on a regular basis. The pond should be secured with a fence and appropriate signage.

Legal

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Sustainability at the MPG:

➤ https://max.mpg.de/Sustainability/Pages/Sustainability-at-the-MPG_en.aspx



MAX Team Space for Biodiversity:

➤ https://extranet.mpg.de/teams/GV_biodiversitaet/Seiten/HomePage.aspx

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