URBAN BIODIVERSITY PROTECTION IN THE CITY OF BERLIN, GERMANY

Text by Trudy Maria Tertilt, Researcher (Centre for Urban Greenery & Ecology, Research)
Images courtesy of Senat for Urban Development, Department for Nature Conservation, Landscape Planning & Forestry, Berlin

COUNTRY	GERMANY
city	891.82km² (344.3sq. mi.)
elevation	34 – 115m (-343ft)
population city	3,431,700
population density	3,848/km² (9,966.2/sq. mi.)
population urban	3,700,000
population metro	5,000,000
GDP/Nominal	81.7 billion euros (2007)

COUNTRY	SINGAPORE
total area	710.2km² (187th), 274.2sq. mi.
total water (%)	1.444
population (2009 estimate)	4,987,600 (115th)
population (2000 census)	6,814/km², 3rd (17,275.7/sq. mi.)
population density	3,700,000
GDP/Nominal total	$181.989 billion
GDP/ per capita	$38,972 (22nd)

ABOVE Fig. 1: Berlin is the most populous city in Germany and the 8th populous city in Europe. The metropolitan area is serving about 5 million people from over 190 nations. (Photo: I. Kovarik)
OPPOSITE, LEFT Fig. 2: Summary of Biodiversity Inventory, Berlin 2005.
OPPOSITE, TOP RIGHT Fig. 3: An example of habitat mapping for a local orchid (Epipactis helleborine) and its distribution over the city area of Berlin.
OPPOSITE, BOTTOM RIGHT Fig. 4: Schoeneberger Suedgelande—an 18ha railtrack abandoned for 50 years has been turned into a Nature Reserve.

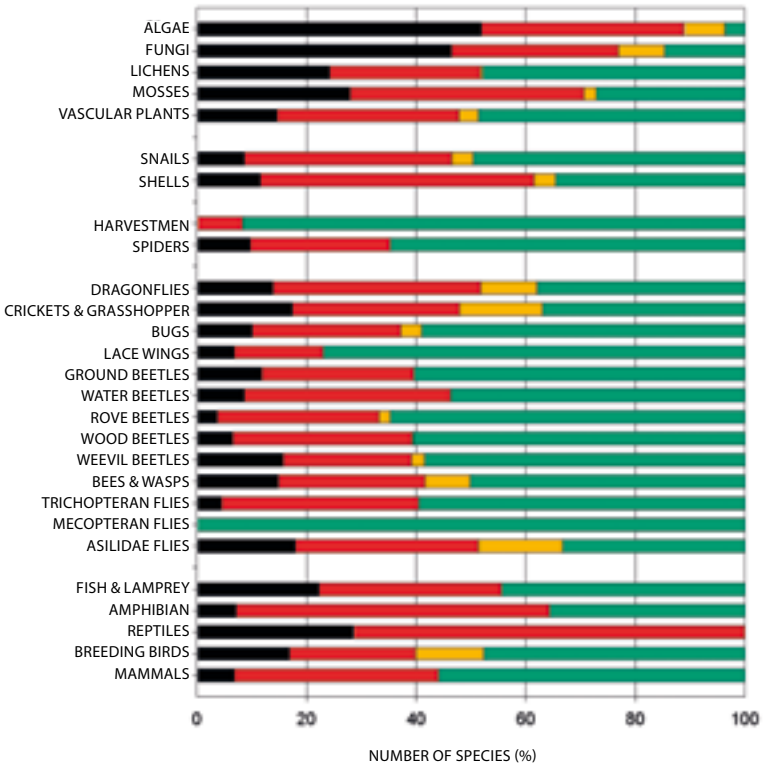
ABSTRACT

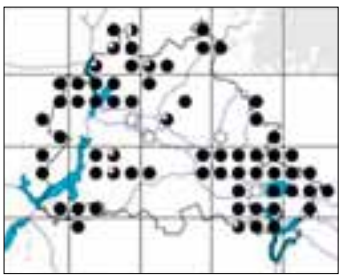
This article provides an overview of Berlin's approach in urban biodiversity. Berlin became the front-runner in urban biodiversity protection because its botanists have been focusing on exciting wild life and plants within the city boundaries since 1970s. In those days, many other cities were still trying to beautify their cityscape with designed and horticultural modified greenery. Although the metropolitan areas of Berlin serves a population of about five million inhabitants, the city is able to maintain a very high biological diversity compared to other cities in temperate climate zones. The main reason for this successful programme is a detailed and regular updated database containing local information of natural resources including flora and fauna inventories of the whole territory; this provides the necessary knowledge for ecologically balanced decision making. Another important reason is the culture of data sharing among different departments within the administration and with the public. Also, a compulsory methodology for any planning and design processes with early public involvement creates the base for ownership and understanding by all citizens. This leads to localised and customised solutions also in green space development. Last but not least, Berliners are proud of their individuality, and therefore they do not need to chase after or copy the latest "international designer fashion" in greening.

BERLIN—THE STARTING POINT OF URBAN BIODIVERSITY

Berlin is the most populous city in Germany and the eighth most populous city in Europe. The Berlin-Brandenburg metropolitan area is home to about five million people, out of which 14 percent come from over 190 nations (Fig. 1). The Berlin open space system has its own characteristic features rooted in history. Important for urban biodiversity was the isolation of the city for several decades, where researchers and the administration started to focus on their existing nature within the city boundaries. Initial studies found a unique and diverse vegetation cover in abandoned places such as disused transportation lines and former industrial sites. Although the reconstruction after World War II started quickly, Berlin kept many abandoned patches all over the city until the seventies when botanists turned their focus to spontaneous wild urban vegetation and could testify its value for biodiversity.

Berlin was the first city in Germany, as well as in Europe, to view the existing wildlife within its city boundaries as an asset of its natural resources. The city became the frontrunner in urban biodiversity protection and started systematic research on urban "weed"/ wild plant communities. For centuries, cities only paid attention to manicured parks or gardens and neglected the wild and spontaneous vegetation cover that established without human





assistance, or better still, despite human intervention. During reconstruction in the 1950s and 1960s, the city followed the general understanding in beautifying the city landscape by planted and horticultural modified greenery. Intensive maintenance and the use of weed killer in the name of "cleanliness" and "safety" against all unwanted plants was the dominant task of the garden department. "Weed" communities that settle on any open and accessible soil were renamed as "spontaneous vegetation". This is to firstly, distinguish them from planted horticultural and agricultural vegetation, and secondly, to demonstrate their value and importance. The botanists and administration concluded that apart from natural and semi-natural areas, urban areas also had the potential for nature conservation.

The studies from the 1970s onwards testifying to the diverse and interesting plant compositions in Berlin's abandoned sites and built-up areas led to the first cornerstone: the publication of the "Red Data List" of endangered species in 1982. This was followed by biodiversity action plans, which were endorsed in 1984. In 1986, a series of legally protected nature reserves on derelict areas with "weed" communities within the city of Berlin were established. Urban industrial sites were regarded as a new type of environment with species compositions and habitats peculiar to these areas and new terms like *Stadtnatur* (urban nature) or *Industrienatur* (industry nature) were established among professionals.

FLORA & FAUNA INVENTORIES

Berlin biodiversity inventories of today show a higher number of flora and fauna species compared to the rural surroundings, which are often shaped by intensive agricultural use. These abandoned industrial sites, brown fields and waste lands create very specific environments, which cannot be found elsewhere in surrounding rural areas and therefore contain a high biodiversity with many new species. The flora and fauna inventory of 2005 listed and mapped out about 7,087 species (Fig. 2), out of which 2,179 are flowering plants. Overall, estimations go up to 30,000 species, of which 17,000 are insect species in the city area of Berlin. The inventory also describes the conservation status of the species population and distribution in written text and on maps (Fig. 3). Compared to other cities within the temperate climate zone, Berlin harbours quite a high number of biodiversity. For example, Berlin has the highest number of breeding birds within the city boundary and hosts more than 17 different species of bats.

More than 50 specialists and numerous NGOs, universities and volunteers are continuously working on the flora and fauna inventory of the city. Besides producing lists, maps play an important role to define the exact locations of species and make the information usable for planners and architects. Details of the location are considered very important; otherwise there is no case for protecting a particular small plot against development or other human impact. Building and recreational concepts have to be adjusted to the protection requirements. The highest biodiversity was found in transition zones in the city outskirts where urban structures are closely interlinked with larger open spaces and waste or derelict lands (Fig. 4). Besides the mosaic of land use patterns, the number of species also reflects the historical land use and gardening tradition over the last 70 to 100 years.

HABITAT MAPPING PROGRAMME

The protection and sustainable use of municipal nature and landscape can only be successful with adequate knowledge of the local conditions. Besides inventories and mapping programmes of single species, Berlin pays special attention to habitats or biotopes. (The term "biotope" is used more often and widely in Germany.) Habitats or biotopes are descriptions of locations inhabited by a particular animal or plant species to form a long-term association. Its composition depends primarily on the site conditions necessary for the existence and flourishing of certain organisms. By the virtue of its typical site and structural features, each location has distinct physical parameters, which are influenced and utilised

LEFT Fig. 5: Habitat mapping on an industrial plot in the city centre.
BOTTOM Fig. 6: Breakdown of biotope classifications in Berlin (2009).
OPPOSITE Fig. 7: This Berlin land use map shows the distribution of green spaces. Details can be viewed online at *www.stadtentwicklung.berlin.de*

by a specific species population. The term "biotope" or "habitat" always refers to a certain space; while "habitat type" or "biotope type" refers to a community with same characteristics. A diversity of habitats provides homes for a wide range of biodiversity. In reverse, a less complex or monotonously structured landscape with large areas of the same physical factors or settings can only harbour a very low biodiversity. Berlin realised this interrelation very early and included a territory-wide biotope mapping together with the species-based mapping programmes from the beginning. Berlin listed more than 500 habitat types and visualised about 37 in the maps "Arten & Biotopschutz" first issued in 1986 in the Environmental Atlas of Berlin[1](Fig. 5).

Conditions for plants and animals have been continuously changed by destruction, impermeable coverage of the soil, extensive drops in the groundwater table, fertilizer and pollutant input, and last but not least, recreational use. Complex food chains and communities were developed by nature that lasted for millennia. It is estimated that the loss of a single plant species is the loss of basic conditions of life for about 10 to 20 species of animals. While previously only those rare and strongly specialised species were affected, Berlin today increasingly sees a deterioration process which is endangering species which were still very common during the 1950s. The pressure of construction has increased tremendously after Berlin resumed its capital status in 1990; this frenetic redevelopment is further aided by new urban planning tools which literally leaves no stone unturned. Architects and designers also have an impact on the plots in the name of "fashion" and "international good taste".

An assessment of the *Red List of Endangered Biotopes Types* in Berlin shows that biotopes connected to the local water regime and nutrient-low and sandy soils have become rare in urban settings (Fig. 6). In Berlin, 18 biotopes have been identified as particularly valuable for biodiversity protection: fenlands, swamps, marsh land, reed beds, areas with sedges and bulrushes, springs, natural creek and river banks, silting up areas of lakes, alluvial forests, lowland riparian forests, xeric grasslands, wet meadows and sand and gravel pits. All endangered biotopes have been placed under legal protection. This legal protection status requires no further formal procedure, as is the case of the certification of protected areas. Legal protection is designed to preserve these biotopes completely, to keep them intact, and to protect them from adverse changes. All actions and measures, which can cause considerable or permanent damage, are strictly forbidden and punishable by law. This instant protection law for enhancing biodiversity was endorsed since 2008 by the newly updated federal law for nature conservation. Past experiences show that the bureaucratic certification system was too slow when urban development pressure exists. Citizens of Berlin are aware of this important tool and it is to be believed than none of these protected biotopes can disappear into the unknown anymore because of the widespread public awareness.

The knowledge about the composition and spatial distribution of the culturally shaped near-nature biotopes in Berlin is an essential basis for urban and regional planning, landscape design, and the conservation-appropriate developments of spatial utilisation. A current and full-coverage database is also essential for environmental analysis and ecological assessments like the Environmental Impact Assessments (EIA), the Strategic Environmental Assessment (SEA) and mandatory reports. Berlin, Munich, Augsburg, Warsaw and London are among the first cities to follow Berlin and carry out urban ecological investigations.

BIOTOPE TYPE CLASSES	Area in hectares	Proportion of the total area of Berlin
Flowing waters	970.75	1.1%
Standing waters (including shore area, cane brakes etc.)	4,521.86	5.1%
Anthropogenic regosol sites and ruderal fields	1,882.16	2.1%
Bogs and marshes	210.35	0.2%
Green spaces, herb fringe fields and grassland communities	4,355.12	4.9%
Dwarf shrub heaths	12.32	0.0%
Bushes, tree rows and groves	1,550	1.8%
Forest	16,481.38	18.7%
Fields	2,054	2.3%
Green and open spaces	8,201.96	9.3%
Special biotopes	612.42	0.7%
Built-up areas, traffic facilities and special areas	47,572.34	53.8%
BERLIN	88,353.01	100%

PROTECTION AND CONSERVATION

It is common sense that biodiversity protections need foremost a spatial protection scheme to mitigate the main threats. Habitat protection is the basic requirement for biodiversity conservation and protection in Germany. Besides this instant protection of habitats/ biotopes just mentioned, Berlin is using a "five-tier" nature protection system as it was targeted by the Federal Law of Germany. The protection categories are:

1 National Parks. (The Priority lies more on biodiversity protection than public education). Not (!) important under this agenda are recreational activities and tourism, although some controlled activities—with nature guides—are possible. Usually, activities are only allowed in the surrounding areas of National Parks; even outside the buffer zone. National Parks should also develop wilderness zones, which mean a transformation of formerly used landscapes to meet IUCN requirements.

2 Nature Reserves. (The Priority is firstly, on biodiversity protection and secondly, on public education, but these areas are much smaller than National Parks).

3 Landscape Protected Zones (*Landschaftsschutzgebiete*) are areas where selected human activities are allowed. The type of activity, the frequency—including the quantity of people allowed to do these activities—are regulated in the park's plan.

4 Nature parks (*Naturparke*) and Biosphere Reserves (*Biosphaerenservate*) are priority areas for recreational activities in nature (eco tourism). Biosphere Reserves are much larger areas and are declared model areas for a balanced harmony between human activities and nature requirements. Industrial agriculture and forestry is discouraged and eco-friendly (often traditional) forms of cultivation are supported by monetary compensation payments for farmers and eco-friendly companies.

5 Natural Monuments (Under this category we can find single trees, alleys or a cliff formations or special glacial erratic block and rockeries).

Besides the Instant Protected Habitats and the classic conservation areas like those listed above, there are the protection zones installed by the EU under the programme "Natura 2000" from 1992. Every municipality in Germany, whether urban or rural, has to develop 10 percent of their land territory according to this protection programme for biodiversity. These "Flora & Fauna Habitat" protection zones (FFH), in addition to the "Special Protected Areas" (SPA) for birds from 1979, should become the backbone of a European-wide habitat network. Interlinking isolated natural areas and protected zones are considered the most important task nowadays in nature and biodiversity conservation facing climate change. We need to give plants and animals the possibility to migrate and find suitable new habitats within the totally segregated landscape, which is the result of more than 80 years of car-friendly planning approach. In addition, other departments like the water, climate, soil and forest departments also have their designated protected areas. The EU introduced a European-wide classification, evaluation and monitoring system for protected areas which follows German practice a great deal[2].

All protected areas or protected zones have to be integrated into the local land use plan, and have to have a proper concept and development plan (master plan) in written and visualised forms (Fig. 7). Besides the land use issue, main threats to biodiversity are: segregation of land and urban space by urbanisation; sealing of soil by built structures such as paved areas; the disruption of the nutrient cycles, and the input of chemicals into these cycles; mass tourism; and pollution. All green space management and all development plans have to include tools and approaches where measurements are taken to protect or to enhance biodiversity. The "List of Possible Threats to Biodiversity" and the "List of Development Measurements for Biodiversity Conservation" give an overview of potential problems the park management may face. Both can be downloaded from the internet[3].

In Berlin, the first Nature Reserve, which is the strictest category of protection, was established in 1941 (Pfaueninsel). Since the seventies, a more systematic approach has been taken in nature protection. The nature conservation departments want to protect or redevelop nature reserves to showcase all recent and all original natural habitats within Berlin. To cover the whole range of possible habitats, the administration is guided by the main natural biophysical environment: habitats of the glacial valley, the Barnim Plateau and the Teltow Plateau. In 2008, Berlin listed 39 certified Nature Reserves with a total area of 1,990 hectares. These areas with the tightest protection measures account for about 2.2 percent of Berlin's territory. In addition, currently 13 percent of Berlin's territory is under the "landscape protected zones" scheme, which aims to cover 20 percent of the area within the next 10 years. Also, more than 620 "Natural Monuments" around the city area have been declared.

MANAGEMENT AND MAINTENANCE TO PROTECTED AREAS

Different to protection zones in large nature areas, protected areas in the cities need constant management according to the protection goals. Although physical changes are no longer allowed under the protection law, pollution and recreational pressure pose a continuous threat onto these sites. In many cases, natural succession will eventually wipe out endangered species. Without the annual trimming of vegetation, a Xeric grassland might change into a woodland. As there are many different habitats, each habitat has its own goals and requirements. All taken measures need to be customised to the defined development goal.

In general, the selection of tools and methods are modified based on the constant monitoring of the targeted species population; decreasing numbers indicate mistakes and would need further evaluation. Management is usually carried out only by manual labour as big machinery can cause too much damage to the habitat by compressing the soil and causing air and noise pollution (Fig. 8). Also, heavy machinery needs proper access, which will further damage the protected area. Manpower is expensive nowadays and nature conservation requires a lot of help from volunteers and NGOs. Sensitive management often requires special skills like working with horses in forests or with sheep on grasslands and heather or fenlands (Fig. 9). They serve as environmentally friendly tall-grass mowers. NGOs or nature academies offer such practical training classes.

Choosing the right timeslot for implementation of certain management measures is also very crucial for habitat development. For example, species are very sensitive to disturbance during breeding times. Another important rule is to work on a small scale. Mowing the whole flower meadow at one go prevents the species from finding refuge. It is thus better to set up a mowing schedule for different patches. The same applies for management work along rivers and lake banks.

"WEEDS" AND "INVASIVE SPECIES"

Berlin's urban planning fabric consists of a mosaic of diverse habitats. These habitats are more diverse than the surrounding agricultural landscape. Many new plant species which have been introduced deliberately or unintentionally attribute to this diversity. Therefore, the wild-growing ruderal vegetation on derelict areas or wastelands is considered very valuable for urban biodiversity in contrast to horticultural modified plants. The word "weeds" simply describe the relation to humans for a certain time period for unwanted and nuisance plant species. It has been substituted by the term "wild plant" or "spontaneous vegetation" when referring to communities, or "ruderal vegetation" when referring to a larger area. Horticulturally modified and infertile plants are now nuisances to ecologically oriented citizens and they may now be called "weeds".

These so-called newly arrived plant species (neophytes) are closely monitored but are not considered as threats to the environment. Nor are they classified as "unwanted" plants in general. From 1,492 registered neophytes, only 271 could establish a stable population in Berlin. And only a few of them are considered a threat and classified as "invasive" like the Asian ladybug, raccoon or the plant, *Ambrosia artemisiifolia*. Neophytes are viewed as nature's response to human travel activities and changes of the local environment. Under the threat of climate change, the natural migration of plants and wildlife is considered a necessity now. Therefore, all new biodiversity policies work on the development of local, regional and international ecological corridors to ease migration.

ABOVE, RIGHT Fig. 7: Management of protected areas are done by humans. Old skills such as that of using the scythe are in high demand.
ABOVE, LEFT Fig. 8: Management of protected areas by sheep: an environmentally and tourist-friendly grass mower.

> BERLIN WAS THE FIRST CITY IN GERMANY, AS WELL AS IN EUROPE, TO VIEW THE EXISTING WILDLIFE WITHIN ITS CITY BOUNDARIES AS AN ASSET OF ITS NATURAL RESOURCES.

STAKEHOLDERS IN BERLIN'S URBAN BIODIVERSITY

TThe main stakeholders in urban biodiversity protection are the Department of Nature Conservation, the Department of Urban Green Space, and the Department of Urban & Landscape Planning. Other departments in charge of forest, water and agricultural issues also contribute significantly to the success. Last but not least, the departments concerning statistics, public environmental education and internet presentation are also important. All programmes for urban nature conservation have to find the support of the public. By encouraging public involvement from land use decision-making processes to implementation, the administration can help local citizens gain ownership in these issues.

Laws and guidelines are available on information policies and public data sharing, particularly on formal public involvement for development projects by public agencies. In Germany every citizen has the right to obtain any information from the public administration. In return, nature conservationists depend on the input of NGOs, universities and volunteers to update biodiversity data due to the chronic lack of manpower and money.

The design for urban, rural and all types of natural spaces is in the hands of landscape architects and landscape ecologist who often share the same academic training programme. Landscape architects are required to understand and differentiate horticultural and native, as well as wild plants. In this academic training programme, basic soil sciences, botany, forestry, zoology, limnology, metrological knowledge and water management is required. Landscape architecture is a multidisciplinary field that needs to communicate with many specialised academia and engineers.

INTEGRATION OF BIODIVERSITY CONSERVATION INTO URBAN GREEN SPACE SYSTEMS

The Berlin urban green space system deals with all types of greenery within its boundaries. This includes the planted areas, as well as the wild and spontaneous vegetation cover. Inventories of areas with wild and spontaneous growing plants demonstrate the high value of un-designed urban green spaces for biodiversity, as well as for people's appreciation. Indeed, many species from surrounding and far-flung rural areas now find refuge within the city green spaces. One explanation for the relatively high biodiversity might be found in a high diversity of landscape features and green space types, the connectivity to surrounding rural areas, and simply the amount of green space in the city of Berlin. 56.2 percent of the total area of the German capital is classified as "built-up and transportation area". This means Berlin has more than 40 percent of public green spaces where parks are only one category (Fig. 10); others include the private gardens and the attached greenery to buildings under the classification "built-up" or residential areas.

In Germany, privately owned forests and agricultural areas have to be made accessible to the public by law. Therefore the green administration has and can also integrate these private areas into the public recreational walking and cycling networks throughout the city. Berlin has developed new categories for connectional urban public green space planning:

1 REMAINS OF ORIGINAL NATURAL LANDSCAPES: forests, moors, swamps, rivers, creeks, wetlands
2 CULTURAL LANDSCAPES: meadows, fields, pasture, hedges, heath
3 HORTICULTURAL LANDSCAPES: garden and parks, allotment gardens, sport fields, street trees
4 NEW URBAN NATURE: spontaneous vegetation, unmanaged brown fields, old quarries and other wasteland patches

Most of the contributions to the biodiversity in Berlin come from the remains of the original landscapes and ecosystem and from the un-designed and abandoned industrial sites. Land in agricultural and horticultural use should also not be underestimated for biodiversity purposes. Vegetable gardens and fruit trees feed a lot of wildlife, from insects to wild boars (Fig. 11). Many private garden owners also install natural ponds and hang up nesting boxes for birds and wasps. Old cemeteries are quiet places and usually covered by many old trees that serve as refuge for many birds. Old tombstones harbour a lot of mosses and other shade-loving plants. The value of public parks for local wildlife is very different, depending on their design and management (Fig. 12).

Historical parks and court gardens are often very well manicured and can contain up to 30 percent of foreign species. Therefore these segments of parks are less interesting for local biodiversity programmes. However, Berlin has a long tradition of cultivating naturalistic landscape parks, which are managed in an ecological way for a long time. Modern time greenery guidelines further support this ecological approach. Just because of this, the patchwork of small but diverse private and public green plots interwoven into the city fabric is the reason to Berlin's biological diversity. These "green islands" or "stepping stones" are linked by 428,444 street trees (about 81 trees per kilometre of roadway), half of them which are more than 40 years old. Although World War II took a high toll on Berlin's trees, one can still visit *Dicke Marie* (Big Marie), the oldest tree in Berlin, at Tegel castle. This oak has been growing there since around 1192 and is actually older than Berlin itself.

The people of Berlin also appreciate wild and un-designed greenery and like to take walks or a bike tours near to nature areas. Even tourists from other parts of the country enjoy exploring the city via the well-developed cycle trails or boat trips. Another favourite recreational activity of Berliners is having picnics in parks. School classes visit their "outdoor classroom" on a regular basis. Many Berliners like to do gardening in their little *Schrebergarden* which is also called allotment or community garden. These forms of "semi-public" garden areas were invented in 1864 in Germany. The trend of commercialising public green space has not yet reached Berlin but most people are quite happy with enjoying nature without artificial entertainment.

SUMMARY AND CONCLUSION

The city of Berlin tries to maintain the diversity of its natural, cultivated and urban nature and landscape features by a number of legal instruments and planning policies in nature conservation and Public Park system planning. In summary, the main factors for a successful urban biodiversity programme are:

1 City-wide inventories on species and habitat level
2 Data sharing and easy data access among public authorities and with the general public
3 Early integration of all scientific data about natural recourse; already on the land use planning level
4 Soil and water space protection programmes as the "mother" of all life
5 Compulsory procedure for the involvement of NGOs and the general public
6 Ecological oriented design and management programmes
7 Administrative access to all green plots within the city, even those in private ownership
8 A set of laws, directives and guidelines for spatial conservation (EU-level,Federal Level, Province Level)
9 Environmental awareness and appreciation for natural green spaces
10 Compulsory consultation and ecological assessments for any government action

Other factors like the biodiversity index and tax incentives play a secondary role. Berlin is unique because its 40 years of isolation had slowed down industrial development. Other cities and even villages which have taken a more radical approach to "sweep out" the old and the "untidy" areas in the 1950s and 1960s are now struggling to win back their natural and biological diversity. The tools and instruments Berlin is using for the protection of its biodiversity are more or less the same as other cities in Germany. The Federal Government and the EU law set out the framework for the municipalities in both rural and urban areas. In general, soil and microclimatic conditions differ between urban and surrounding agricultural or natural areas. However, cities in temperate climate zones can still provide a home for many native plants and animals. The difference between cities and the surrounding countryside microclimate seems to be larger only within tropical areas.

Public Green Spaces in the City (as of Dec. 31, 2008)

	ha	% of city area
Public parks 1)	6,389	7.2%
Allotment gardens 2)	3,064	3.4%
Cemeteries 3)	1,145	1.3%
Sport facilities, bathing areas	942	1.0%
Green spaces on roadway land	1,252	1.4%
Total of public green spaces	12,792	14.3%
Forest areas	16,223	18.2%
Water areas	5,947	6.7%
Agricultural areas	4,127	4.6%
Residential and Transportation areas	50,065	56.2%
Total area of Berlin	89,154	100%

1. including playgrounds and special green spaces
2. including surrounding green space
3.both state-owned and denominational

ABOVE, TOP Fig. 11: Industrialised agriculture practices drives wildlife, such as wild boars onto Berlin's roads. (Photo: Florian Mueller)
ABOVE, BOTTOM Fig. 10: Breakdown of land use in Berlin (2008).
OPPOSITE Fig. 12: Foxes and rabbits are common wildlife in city parks. (Photo: Florian Mueller)

[1] *http://www.stadtentwicklung.berlin.de/umwelt/umweltatlas/edua_index.shtml*
[2] *http://bfn.de/0316_bewertungsschemata.html*
[3] *http://bfn.de/fileadmin/MDB/documents/030306_refgefaehrd.pdf* and *http://bfn.de/0316_bewertungsschemata.html*

> “THE HIGHEST BIODIVERSITY WAS FOUND IN TRANSITION ZONES IN THE CITY OUTSKIRTS WHERE URBAN STRUCTURES ARE CLOSELY INTERLINKED WITH LARGER OPEN SPACES AND WASTE OR DERELICT LANDS.”