Norbert Müller, David Knight & Peter Werner (Eds.)

Book of Abstracts

Third Conference of the COmpetence NeTwork URban ECology

Urban Biodiversity & Design

Implementing the Convention on Biological Diversity in towns and cities

Federal Agency for Nature Conservation

BfN-Skripten 229-1

2008

FACHHOCHSCHULE ERFURT UNIVERSITY OF APPLIED SCIENCES

Urban Biodiversity & Design

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Third Conference of the COmpetence NeTwork URban ECology

Erfurt, 21.-24. May 2008

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Cover photos: Norbert Müller, Horst Schumacher and Jan-Tobias Welzel.

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The International Conference "Urban Biodiversity and Design" is organised within a research project at the University of Applied Sciences Erfurt.
Supported by the Federal Agency for Nature Conservation with funding from the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.
UFOPLAN 2006; Duration 2006-2009; FKZ 806 80 220

This publication is included in the literature database "*DNL-online*" (www.dnl-online.de)

BfN-Skripten are not available in book trade but can be downloaded in a pdf version from the internet at:. http://www.bfn.de/0502_skripten.html

Publisher: Bundesamt für Naturschutz (BfN)
Federal Agency for Nature Conservation
Konstantinstrasse 110
53179 Bonn, Germany
URL: http://www.bfn.de

Printed by the printing office of the Federal Ministry of Environment, Nature Conservation and Nuclear Safety

Printed on 100% recycled paper

Bonn, Germany 2008

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Preface from the conference organisers

NORBERT MÜLLER , DAVID KNIGHT & PETER WERNER

This “Book of Abstracts” contains all the presentations that have been accepted as talks or posters for the third conference of the COmpetence NeTwork URban ECology “Urban Biodiversity and Design – Implementing the Convention on Biological Diversity in Towns and Cities”. The conference uniquely brings together scientists, planners and other practitioners from around the world to present and discuss the current state of knowledge and practice concerning biological diversity in urban areas and sustainable urban design. The overwhelming response reveals that it was time to organise such a conference. About 300 proposals for presentations were submitted presenting nearly every working group and many persons world-wide (see Figure 1) dealing with the topics of the conference.

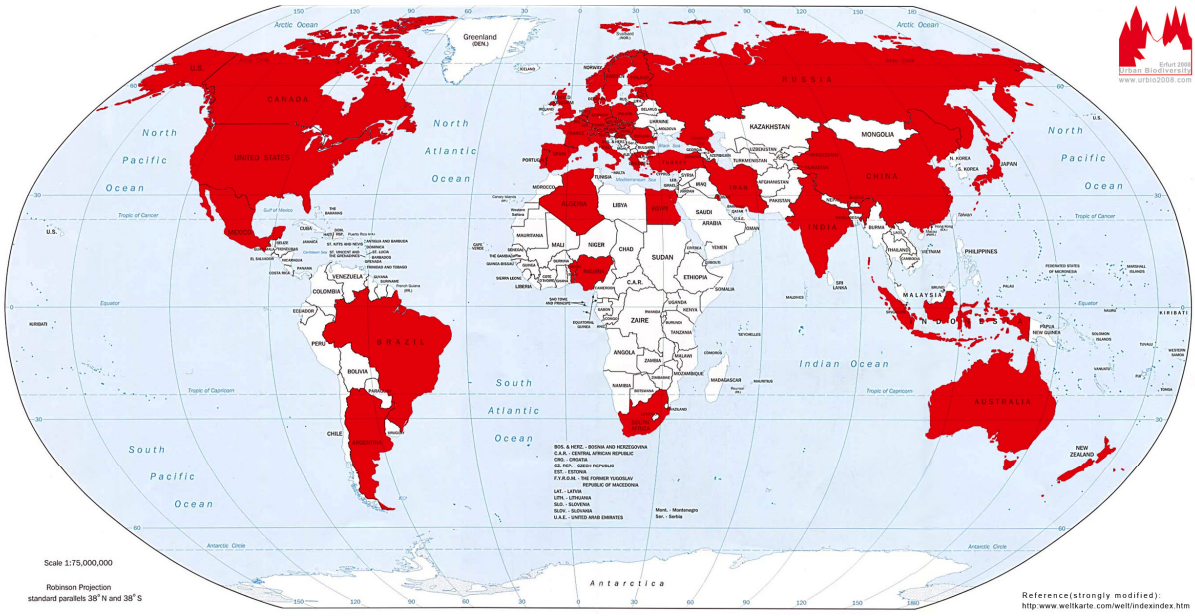

Figure 1: Origin of contributors for the conference “Urban biodiversity & Design” according countries

All the accepted oral and poster presentations (more than 250 in total) are published here. They appear in alphabetical order according to the presenting author. Additionally the keynote presentations are included chronologically. At the end of the book all authors – first and co-authors – are listed in the index. This collection was compiled some 3 months before the conference and reflects the expectations of the organisers at the time of going to press.

Table 1: Topics, keynotes, parallel sessions and chairs of the conference "Urban Biodiversity & Design"

Topics , keynotes and parallel sessions		Chairs
Introduction:	**Cities and the Convention on Biological Diversity – from Rio via Curitiba to Erfurt - facing the main challenges of this century for life on earth**	
Keynote	Norbert Müller, Germany, David Knight, United Kingdom & Peter Werner, Germany	
Topic 1:	**Biodiversity of urban-industrial areas and its evaluation**	
Keynote	Rüdiger Wittig, Germany	
Session 1.1	Origin and development of urban fauna and flora	Jari Niemelä, Finland
Session 1.2	The value of different urban habitats for biodiversity	Stefan Klotz, Germany & David Knight, United Kingdom
Session 1.3	Urban habitats and ecological services	Stephan Pauleit, Denmark
Topic 2:	**Cultural aspects and urban biodiversity**	
Keynote	Andy Millard, United Kingdom	
Session 2.1	Evaluation of exotic plants and animals in cities	Moritz von der Lippe & Uwe Starfinger, Germany
Session 2.2	Cultural influence on the biodiversity of the urban forest	Wayne Zipperer, USA
Session 2.3	Evaluation of historical parks and gardens for biodiversity	Reinhard Böcker, Germany
Topic 3:	**Social aspects of urban biodiversity**	
Keynote	Sarel Cilliers, South Africa	
Session 3.1	Urban agriculture, community gardens, allotments & useful plants	Jürgen Breuste, Austria
Session 3.2	Human well-being and the green environment	Torsten Wilke, Germany
Session 3.3	Nature experience and wilderness areas in cities	Charles H. Nilon, USA
Session 3.4	People participation to design urban green areas	Keitaro Ito, Japan
Topic 4:	**Urban biodiversity and climate change**	
Keynote	David J. Nowak, USA	
Session 4.1	Urban ecosystem – anticipating climate change	Herbert Sukopp & Angelika Wurzel, Germany
Session 4.2	Potential of urban green areas in climate change mitigation	Wilfried Endlicher, Germany
Topic 5:	**Design and future of urban biodiversity**	
Keynote	Maria Ignatieva, New Zealand	
Session 5.1	From biodiversity analysis to evaluation and design	Ingo Kowarik, Germany & Glenn Stewart, New Zealand
Session 5.2	Urban biosphere reserves and master planning for biodiversity	Christine Alfsen, USA
Session 5.3	Preservation of original natural vegetation in cities	Clas Florgard, Sweden
Session 5.4	Shrinking cities – new chances for biodiversity	Ulrike Weiland, Germany
Session 5.5	Fast-growing cities – challenges for biodiversity	Richard Boon, South Africa
Session 5.6	Ecological restoration and design for biodiversity in urban areas	Colin Meurk, New Zealand
Session 5.7	Ecological design and management of parks and gardens	John Kelcey, Czech Republic
Session 5.8	Living walls and living roofs	Manfred Köhler, Germany

Due to the quality of submissions, the reviewers and organisers found it difficult to design the conference programme and select which contributions should be given as oral presentations. As we could not accommodate many of the excellent submissions as talks, we were pleased to be able to at least include them as posters. Consequenlty we have decided to publish all submissions, whether chosen as oral or poster presentations in this book of abstracts. Equally, due to the high number of submissions, we felt it necessary to limit each author to a maximum of one talk and one poster.

Our thanks go to all reviewers of the advisory board who carefully and competently evaluated the abstracts:

Jürgen Breuste (Austria), Sarel Cilliers (South Africa), Clas Florgard (Sweden), Maria Ignatieva (New Zealand), John G. Kelcey (Czech Republic), Manfred Köhler (Germany), Colin Meurck (New Zealand), Andy Millard (United Kingdom), Jari Niemelä (Finland), Charles H. Nilon (United States of America), David J. Nowak (United States of America), Stephan Pauleit (Denmark), Glenn Stewart (New Zealand), Herbert Sukopp (Germany), Ulrike Weiland (Germany) and Rüdiger Wittig (Germany).

Also we are grateful to all chairs who announced our conference and invited colleagues to their sessions. An overview of all topics and sessions is given in table 1.

Last not least our thanks go to the staff of the conference office Urbio2008 at the University of Applied Sciences Erfurt, namely Anita Kirmer and Jan-Tobias Welzel, who have done excellent work to prepare the abstracts for the review process and for the publishing of this book.

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Abstracts - Keynote Lectures

The order is chronologically according to the topics of the conference.

Introduction Keynote

Cities and the Convention on Biological Biodiversity – from Rio via Curitiba to Erfurt - facing the main challenges of this century for life on earth

Norbert Müller[1 *], David Knight[2], Peter Werner[3]

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[2] Natural England, Wakefield, United Kingdom
[3] Institute for Housing and Environment - Research institution of the State of Hesse and the City of Darmstadt, Germany

* Presenting author

Climate change, loss of biodiversity and the growth of an increasingly urban world population - the main challenges of this century - are all strongly connected. With two-thirds of a considerably larger world population predicted to be living in urban areas by 2050, the battle for life on Earth will be lost or won in cities. The role of cities in the loss and degradation of global biodiversity is described in the Convention on Biological Diversity (CBD) from 1992 and has been discussed in the following eight Conferences of the Parties. Whilst cities pose major challenges for protecting biodiversity, the opportunities they offer have, so far, been little considered. Cities are centers of economic, social, and political power, of culture and innovation. They are also the places where most people have contact with nature. In this sense cities are not only the problem but also the solution to the global challenges we face such as the 2010 biodiversity target of halting biodiversity loss. A major step toward recognizing the potential of cities for biodiversity was made in Curitiba in March 2007, when 34 mayors and numerous high level officials from cities across all continents initiated a global partnership on “cities and biodiversity” to engage local authorities in implementing the Convention on Biological Diversity in towns and cities.

There are two complementary ways for cities to play their part in halting biodiversity loss:

1. the sustainable use of ecosystem goods and services;
2. the sustainable design of all urban areas to maximize their ability to support biodiversity.

This second function is the focus of our congress. The introduction keynote presents the main challenges in achieving this objective in support of the aims of the CBD.

A major outcome of the congress will be to initiate and support a new work program within the Convention on Biological Diversity and to promote applied research and education on urban ecology, biodiversity and sustainable design.

Keynote Topic 1

Biodiversity of urban-industrial areas and its evaluation

Rüdiger Wittig[1 *]

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* Presenting author

Without any doubt urban industrial areas are rich in species, in particular of vascular plants, but also of at least some groups of animals, e.g. birds. Therefore, at first glance it seems that urban industrial areas strongly contribute to biodiversity. However, in contrast urban industrial areas are regarded as main drivers for biological invasions and biotic homogenisation at a global scale.

From a general point of view it, at least, has to be questioned where and to what degree urban industrial areas contribute to biodiversity.

As a basis for evaluation this presentation will focus on some general aspects and characteristics of urban biodiversity. This will be done by the example of plants and their habitats in Central European cities. The main topics are:

1. Distinctive characteristics of urban biodiversity in contrast to biodiversity of natural and cultural landscapes.
2. Origin and history of urban biodiversity.
3. Trends and dynamics of the urban flora and vegetation.

Keynote Topic 2

Cultural aspects of urban biodiversity

Andy Millard[1 *]

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School of Architecture, Landscape & Design, Leeds
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United Kingdom

* Presenting author

Culture, sometimes defined as the collective manifestation of human intellectual achievement, is what most distinguishes our species from other biodiversity. From a relatively light environmental impact when it first emerged, human culture now has profound effects on biodiversity world-wide. Rapid global urbanisation means that this effect is increasingly mediated through the city and its demands on the natural environment. Interactions between culture and urban biodiversity constitute a two-way complex of influences and drivers. Cultural processes, directed principally at human well-being, affect the composition and distribution of urban biodiversity, both as the result of deliberate decisions taken on how to manage biodiversity in urban environments but also as unintended side-effects of other social and economic phenomena. At the same time, urban biodiversity is the first and main contact that an increasingly large proportion of the world population has with biodiversity generally and is therefore key in shaping perceptions and attitudes to the natural world. This key note presentation will explore these issues, particularly within the context of how future urbanisation and associated cultural developments might influence, not only urban biodiversity and its management, but also human perceptions of biodiversity.

Keynote Topic 3

Social aspects of urban biodiversity

Sarel Cilliers[1 *]

[1] School of Environmental Sciences and Development,
Potchefstroom Campus, North-West University,
Potchefstroom, South Africa

* Presenting author

Urban ecosystems are complex social-ecological systems with important functions. The role of cities in functions such as provision of ecosystem services will largely be determined by patterns of biodiversity within the city. Several studies have indicated that these patterns are driven by socioeconomic characteristics as human cultural and social aspects influence the types of ecological features people desire while their economic status influences the ability to realize those desires. Biodiversity may, however, also act as an agent for reconnecting people to their living environment and the creation of awareness of their social responsibilities towards the environment. Integration of social and biogeophysical processes are important in any attempt to understand the ecology of human-dominated ecosystems, and theoretical frameworks to integrate humans into ecosystem studies have been constructed in the past. In this presentation these issues will be explored using case studies from developing countries. Issues such as poverty, equity, health, redistribution of wealth and wealth creation are bigger concerns in developing countries than “green” issues such as conservation, biodiversity, energy efficiency and rehabilitation. It is therefore an ongoing challenge to bridge gaps in understanding, and to drive the empowerment of local government and communities to commit towards sustainable management and use of urban nature.

Keynote Topic 4

Urban biodiversity and climate change

David Nowak[1 *]

[1] USDA Forest Service, Northern Research Station,
Syracuse, United States of America

* Presenting author

Urban areas are typically warmer than rural areas due to the urban heat island effect and thus urban areas can potentially be used to help understand future impacts of global warming on urban plant composition and diversity. In addition, existing urban species structure and composition can help mitigate urban heat islands, and thereby reduce greenhouse gas emissions. However, as climates change, the species composition and structure of urban forests may also change. This presentation will explore existing urban tree composition, species richness, and diversity in several cities; how trees affect urban heat islands; the potential to alter vegetation structure and composition in cities to cool air temperatures and provide other ecosystem services; and the potential effect of climate change on future species tree composition and diversity in urban areas.

Keynote Topic 5

Design and future of urban biodiversity

Maria Ignatieva[1 *]

[1] Landscape Architecture Group, ESD Division,
Lincoln University, Canterbury, New Zealand

* Presenting author

The beginning of the 21st century can be characterised by tremendous growth of urban areas and associated process of globalisation and unification of urban environments. Today the process of globalisation associated with using similar urban design and planning structures, landscape architecture styles, similar plant material and construction materials. In such a globalisation crisis the role of urban biodiversity (especially native biodiversity) has shifted and received a different emphasis. Urban biodiversity is seen today as one of the most powerful mechanisms in creating sustainable living urban ecosystems and as the foundation for ecological and cultural identity of urban cities around the world. Because of the origin of Western Civilisation in Europe, European understanding of urban biodiversity and way of reinforcing, reintroducing and designing of nature in urban environment is different from the view for example in the Southern Hemisphere where native biota was lost or dramatically suppressed by introducing thousands of 'familiar', "mother-land" species from the Northern Hemisphere. This presentation will explore existing approaches (case studies) in dealing with design of urban biodiversity in different countries (Germany, United Kingdom, Russia, USA, Australia and New Zealand). Approaches such as "go native", "plant signature", "spontaneous vegetation", pictorial meadows, xeroscaping, low impact urban design and development will be discussed. Evaluation of their ecological, design and social potentials will also be provided.

Abstracts - Talks and Posters

The order is alphabetically according to the presenting author.

Topic 2 Cultural aspects of urban biodiversity

A comparative flora of urban parks: intraurban and interurban similarity in the megalopolis of Cairo, Alexandria and Aswan (Egypt)

Monier Abd El-Ghani[1 *], Rim Hamdy[1]

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* Presenting author

A comparative flora of four large urban parks located in or bordering on Cairo, Alexandria, and Aswan was created. These included Prince Mohammed Ali's palaces in Cairo City (Rhode Island and Shubra), Antoniadis (Alexandria City) and King's Island (Aswan City). Patterns of species presence or absence were analyzed to determine whether a common urban park flora exists; to determine interpark similarities; and the relationship between species diversity and human population of the cities in which the parks are located. Comparisons of the past and present vascular plant floras of urban parks indicate native species richness has decreased while non-native species richness has increased. Diversity of both native and non-native arboreal plants of the landscaped and maintained National Parks (Cairo) declined over the past century and a half. The goals of the present study were to investigate the following: 1) whether a common flora developed in the large urban parks of the megalopolis of three cities of Cairo, Alexandria and Aswan; 2) whether the similarities of native and non-native species compositions of park flora are greater within cities than among cities 3) whether the population of a city affects the diversity of native and non-native species?

Topic 5 Design and future of urban biodiversity

Ecological design and management of parks and gardens – making it mainstream for landscape architects and gardeners

Sascha Abendroth[1 *], Norbert Müller[1]

[1] University of Applied Sciences Erfurt, Faculty Landscape Architecture - Biodiversity Group, Erfurt, Germany

* Presenting author

Ecological design and management of parks and gardens means creating sustainable habitats for biodiversity by low impact design. Looking forward to main challenges of the 21st century this will be one of the main tasks for landscape architects in future. In Germany ecological design started in the 1980's. As a result of the first investigations to the biodiversity of cities – biotope mapping in urban areas – several cities changed their management of public parks. Species poor lawns where changed into species rich meadows by reducing the cutting regime. Additionally biodiversity of natural landscapes are enhanced by reducing management within the park forests. Today ecological management of parks is common within many municipalities. In contrast ecological design of parks and gardens is still the exception. From this background we started several trials within the educational park for landscape architects in Erfurt: We designed (1) Species rich meadows by using seeds and mown material from native wild flowers – (an example of the biodiversity of cultural landscapes). (2) Flowering unsealed parking areas by using seeds of native and naturalized wildflowers – (an example based on the biodiversity of natural and urban landscapes (floodplain gravelbars and ruderal vegetation).

Topic 5 Design and future of urban biodiversity

Evaluation and utilization of urban brown field sites for open space design in shrinking cities

Sascha Abendroth[1 *], Cornelia Geyer[2], Norbert Müller[1]

[1] University of Applied Sciences Erfurt, Faculty Landscape Architecture - Biodiversity Group, Erfurt, Germany
[2] Stadt Erfurt, Stadtentwicklungsamt

* Presenting author

Characterised by stagnating economies, migration processes and shrinkage the Central European cities are posing new challenges in town development. The abundance of former industrial and housing areas offers new open spaces and the possibility of sustainable town development. From 2003 to 2005 the research project “Implementing the Convention on Biological Diversity (CBD) in urban areas - Development of guidelines and strategy concepts in a case study for the City of Erfurt” was carried out at the University of Applied Sciences Erfurt in cooperation with the Municipality of Erfurt. The project tested the assumption that in general the increase of brown field sites is associated with negative perceptions among many inhabitants but that old brown fields can be of high social and biological values. They are often already used by citizens as informal playgrounds and recreation areas and they are important for the ecological value of spontaneous urban natural vegetation within the city. Based on an inventory and evaluation of the biological and social aspects of brownfields we developed concepts – from corridor networks to nature experience areas, some of which are already being implemented by the local people.

Topic 2 Cultural aspects of urban biodiversity

Ornamental plant diversity characterizing the urban landscapes in Turkey: a case of Trabzon city

Cengiz Acar[1]*, Engin Eroğlu[1]

[1] Karadeniz Technical University Department of Landscape Architecture, Trabzon, Turkey

* Presenting author

In spite of the fact that Turkey has an important floral richness depending on its position between Europe and Asia and the country also has many endemic native plant species in rural sides, it is quite possible to recognize lack of native plant species in planting designs of urban areas. Although it is hard to see clear adaptations belonging to a definite space organization in urban areas because of traditional and indigenous cultures coming from the past, traditional plant species diversification can easily be recognized in urban landscapes through the country. However, there is no doubt that biodiversity regarding plant species will naturally be affected by improving urban life necessities and changing land use demands especially in and near the city centres. In this study, general characteristics of urban areas in Turkey regarding ornamental plants were given and a sample city, Trabzon, was analyzed in terms of woody plant diversity depending on land use types such as residential areas, public spaces, industrial areas, parks etc. Then, usage types of plant species in urban areas were defined and some proposals regarding plant species in urban area designs were determined.

Topic 5 Design and future of urban biodiversity

Spatial concepts and theory for urban biodiversity planning and design

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* Presenting author

Landscape ecology has established principles for spatial planning and design to support biodiversity that are largely based on island biogeography and meta-population theories. These principles have increasingly been accepted and applied internationally, mainly for broad-scale conservation policy and planning. New challenges remain for addressing biodiversity planning in the urban context. Many of these challenges arise from national and city-based goals for sustainability, and consequently biodiversity is increasingly being addressed in the context of spatial planning and design. In this presentation, I review a range of spatial concepts and theories that have been applied to structure urban environments to support urban biodiversity often in the context of multi-objective plans that also address water management, transportation, green space and land use. From these applications I draw conclusions in the form of guidelines for designers and identify questions for future research needs. Among these conclusions are: the primacy of connectivity, the role of built- or grey infrastructure to support biodiversity, and other functions in urban environments, and new models of professional collaboration urban biodiversity planning and design. The research builds on my recent book “Biodiversity Planning and Design: Sustainable Practices?” featuring a series of case studies in the USA.

Topic 5 Design and future of urban biodiversity

Integrating biodiversity knowledge into scenario-based studies for sustainable landscape development

Christian Albert[1 *]

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* Presenting author

Anthropogenic influences on the ecosystems of planet Earth increasingly diminish the thriving of biodiversity from local to global scales. Against this background, conserving nature is widely considered a key aspect of sustainable development. Information from ecology and biodiversity analysis is clearly a major component of the knowledge needed for making progress towards sustainability. However, how this knowledge can best be conveyed into the complex discussion and decision making processes among experts, stakeholders, and decision makers is still widely debated. This paper addresses the question of how spatially explicit scenario-based studies that integrate knowledge gained in biodiversity assessments can be designed and conducted to most effectively influence processes of social learning for sustainable landscape development. An overview of relevant and recently concluded case studies from Europe and North America will be provided. It will be discussed how the studies were executed, how information on biodiversity was integrated, how the potential consequences of future land changes on biodiversity were assessed and evaluated, and to what extend the processes and products of the studies have yielded influence in local discussion and decision making processes. In conclusion, innovative approaches for participatory scenario development will be proposed for enhancing scenario effectiveness in practice.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Plant communities in dry urban areas before and after urbanisation

Harald Albrecht[1*]

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* Presenting author

Before Munich grew out of its historic old town area, much of the actual urban territory was dry, nutrient poor and extensively used calcareous grassland. Since great parts of these ecosystems have been preserved in the north of the Bavarian capital, favourable conditions were provided to compare the pre-urbanisation plant formations with the actual vegetation on anthropogeneous substrates and typical urban use like traffic or industry. The studies were carried out in 5 urban and 5 rural areas with 8 sampling sites each. Although no differences occurred in the median number of species, endangered taxa were significantly more frequent in old grassland. However, one of the urban areas also habitated numerous rare species. In the calcareous grassland, percentages of Festuco-Brometea- and Molinio-Arrhenatheretea-species were increased; the urban areas hosted higher proportions of Sedo-Scleranthetea- and ruderal species. The pH-level and the percentage of coarse grained soil particles were higher at the urban sites whereas the grassland showed higher nutrient concentrations and a closer plant cover. These findings may be representative for calcareous landscapes. Studies in siliceous regions could lead to other results. Investigations in *Medicago minima* in Nuremberg showed that diverging living conditions between urban and rural areas may also cause intraspecific differentiation. In typical urban habitats, ripening had finished earlier and fruits were significantly smaller than in the rural ones. These results suggest that the global process of urbanisation can generate independent urban ecotypes or sub-species.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Population diversity - variation of the diaspore pool of spontaneous plant communities in urban wasteland

Harald Albrecht[1] *, Thomas Langbehn[1], Clara Tschiersch[1], Elisabeth Eder [1]

[1] Vegetation Ecology, TU Munich, Freising, Germany

* Presenting author

The spontaneous vegetation of urban areas is frequently exposed to stochastic disturbance by weed control or substrate movement. Revegetation is then determined by the seed bank in soil and by the seed production in the surroundings. Since no standardized investigation has been published up to now, this diaspore pool was analysed in three abandoned railway areas in Munich. Since these sites are “biotopes” according to the Bavarian law, the results also provide information on the regeneration potential of areas with a high nature conservation value. Great within and between site differences in population features indicate a high spatial variation compared to natural and rural habitats. Hence, median numbers of diaspores in soil ranged from 1,400 m-2 on the ruderalized calcareous grassland at “Virginia Depot” to 2,300 m-2 on the rail track beds in “Steinhausen” and 8,900 m-2 on ballast and calcareous gravel at “Gleislager Neuaubing”. The annual seed production was 11,000, 50,400 and 49,400 seeds m-2, respectively. The soil seed bank of all three sites was dominated by perennial ruderals. Grassland species that were frequently found in the above ground vegetation scarcely emerged from the soil samples. On coarse grained substrates, xerothermous species significantly contributed to the seed bank. There, also several endangered species occurred. In general, population features were closely related to the site conditions. The importance of these results for a future management is discussed.

Topic 5 Design and future of urban biodiversity

How green is green? Comparison of urban green space and conservation practises on five brownfield redevelopment projects in Europe

Wendy Altherr[1] *, Daniel Blumer[2], Heike Oldörp[1], Peter Nagel[1]

[1] Universität Basel, Institut für Biogeographie, Basel, Switzerland
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* Presenting author

Disused railway sites have become a focus of redevelopment projects in many European cities. As sites that offer economically lucrative opportunities for building projects, as well as important habitats for threatened pioneer species, they are contested ground. We compared the allocation of green space in five urban development projects on disused railway sites from Switzerland, Germany and the United Kingdom. We show that distance to the city centre, the involvement of the stakeholders, and the current legislation are important in explaining the quantity and type of green space allocated. Our comparison also illustrates that 'conventional' green spaces are of major importance for the public acceptance of urban redevelopment projects and are highlighted by developers as an important image factor. We identified three strategies to protect the valuable natural sites in such railway brownfields: protection of the pioneer habitats in-situ, reinstallation of similar habitats on roofs (ex-situ) and safeguarding of the natural process of succession. For future brownfield redevelopment projects we would encourage guidelines that take into account the special kind of nature on such sites and guarantee planning reliability for investors.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Measuring the functional connectivity of urban corridors for the wall lizard (*Podarcis muralis*)

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* Presenting author

A key feature of urban habitats is their high degree of fragmentation and isolation. To assess the functional connectivity of habitat patches in an urban area, we analysed the population structure of the wall lizard (*Podarcis muralis*). 209 individuals were genotyped with six microsatellite loci. The subpopulations on sites connected to railway tracks were closer related than subpopulations on sites not connected to railway tracks. The two sites not connected to railway tracks also showed the lowest allelic richness and the lowest observed heterozygosity. The values of genetic differentiation were correlated with a geographic model based on cost-distances to identify relevant factors of dispersal. The model scenario, where the dispersal was facilitated on railway tracks, explained 46 % of the genetic differentiation. The isolation by distance scenario and two other scenarios were not significant. These results suggest that railway tracks in the region of Basel are important routes of dispersal for *Podarcis muralis*. If preservation of genetic diversity is a priority for species conservation, then the important corridor function of railway tracks should be considered in the green space management of cities.

Topic 3 Social aspects of urban biodiversity

Effects of the Illegal Settlements on Natural Conservation Areas in Turkey

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* Presenting author

In Turkey, illegal settlements appeared in urban areas at 1950. Migrants from the agricultural areas to urban changed the landscape of the urban because of the reason of poor people choose to settle in public areas that are outskirts of the cities. After years these areas have services and they gain the statue of neighbourhood. There are a lot of settlements that break the rules for the natural conservation areas. In paper it will be studied in deterministic method for the effects of illegal settlements on natural conservation areas. Legal aspect and present situation will be studied in comparison with the legal revisions through the accession of European Union of Turkey.

Topic 2 Cultural aspects of urban biodiversity

Biodiversity in the urban forest: an overview of current research, patterns and processes, and management options

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* Presenting author

Efforts at mitigating global biodiversity loss have too often focused solely on preserving large, intact areas of natural habitat. However, in an increasingly urbanized world, the need for also preserving biodiversity in urban and suburban areas becomes apparent. Research on biodiversity at both the city and landscape scale has shown that urban areas can surprisingly contain relatively high levels of biodiversity when compared with the surrounding landscape. Research and examples from various countries are discussed. City planners and urban foresters need to recognize that urban areas can harbour biodiversity before selecting management practices that preserve and promote that biodiversity. City planners and urban foresters also need to understand the patterns and processes that affect urban biodiversity, such as the urban-rural gradient and biotic homogenization, in order to manage efficiently.

Topic 5 Design and future of urban biodiversity

An ecological network for the Northeastern Metropolitan Arc in Portugal

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The Northeastern Metropolitan Arc is an area with over 2 million inhabitants and a complex matrix where dairy farming, vineyards, fresh products and forest coexist with urban sprawl. The opportunity to identify and introduce an ecological network was understood as a prospect for the organization of a territory that seeks to follow the rapid changes of the city-region concept where the meaning of public spaces and ecological systems has also evolved. The delimitation of the ecological network was guided by the understanding of the dynamics installed in the metropolitan area in articulation with the urban and transportation networks as the support for the renovation of the territorial development model. The Ecological Network is expected to act as a mean of support for the strategic measures to be taken in the perspective of environmental qualification and sustainable development of the Metropolitan Arc's economical activities. Two systems, lowlands and highlands, essentially focused on water resources and biodiversity protection identified the best agricultural soils and consequently the best water retention and infiltration ones, the high altitude land uses, biodiversity values and the Arc's headwaters. To these two systems were still added the National Network of Protected Areas and the Natura 2000 Sites.

Topic 4 Urban biodiversity & climate change

Optimizing the urban watercycle

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Soil sealing in urban areas leads to high amounts of surface runoff, reduced groundwater recharge and a decrease in evaporation. Energy that under natural conditions would be transferred into latent heat by evaporation adds to the warming of urban areas. Considering that climate change scenarios forecast an increase of temperatures, the problem of the urban heat island will aggravate even more. Within this project, we try to measure and model the water cycle of the cross section of a street. We then want to model the infiltration and storage of rainfall into the soil in order to increase evapotranspiration in urban areas. The result should be the design of an improved cross section with a higher percentage of unsealed soil and vegetation. This project includes measuring, numerical modelling and urban planning aspects.

Topic 3 Social aspects of urban biodiversity

Bogor Botanical Garden

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Bogor Botanic Garden or known as Kebun Raya Bogor (KRB) in the heart of Bogor, is the first and the oldest botanic garden in Indonesia. KRB is an important part of Bogor city providing not only employment but a large recreational area for local residents and many passing tourists. It 87 ha area collects more than 15,000 of kinds of plants – 400 kinds of palms, 5,000 trees and over 3,000 varieties of orchids and some sorts of other rare plants of hundreds of ages. KRB is a centre of research, conservation and education.

Additional function to its main one brought many complicated problems coming from inside and outside. The internal problem emerges mainly from the visitors of KRB which has reached 1.4 million each year. They caused garbage problem scattering everywhere and the stealing of the collection of rare plants. One of the external problems threatening the preservation of KRB is the splashing water from the street in the rainy season. The west part of KRB hardly prevents it and the collections of the plants in there are vulnerable to the flood. If it goes on happening like this, it may damage them. Other disturbances come from activity held around where the KRB is. After a fair held there, the KRB turned into disposal land. These problems may jeopardize the main function of KRB as the centre of research, conservation and study. Some actions have to be taken to preserve its conservation!

Topic 2 Cultural aspects of urban biodiversity

Redefining the integrated concept of spatial urban ecology by social and environmental perspectives

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For decision and action toward the sustainable future, urban management and policies are relating to spatial diversity, involving overlapping frontiers and people. This paper redefines the general concept of built environment by categories of profiles addressed under the title of 'urban forest'. An integrated concept concerning the eight profiles was examined considering multiple factors: environmental, social, economic, political, local, urban, regional, and global. This examination incorporate another profile, the human that is considered as a crucial elementary scope, which is inherent in the combination of all other spatial structures including it very self. The horizontal and vertical distribution of the most recent profile have been categorized and described in a general framework, bringing together the original overlapping principle for understanding all categories of person(s) needing strategic approach by sustainable development.

Topic 5 Design and future of urban biodiversity

The natural drawing of urban forest: comparing the Metropolitan Regions of Sao Paulo and of Rio de Janeiro, Brazil

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Obeying a hierarchical order of structural dynamics across different scales of an urban forest, the main aim is to compare the natural design of the metropolitan regions of Sao Paulo (RMSP) with the one of Rio de Janeiro (RMRJ), considering natural territorial configuration for urban management and policy. The effect of urban expansion and pressure over water catchments areas are analyzed by integrating eight social environmental profiles bases on topologic pattern. By overlapping technique, different elementary vectors are combined with imagery to translate the urban trends relating to the social environmental force over the actual water catchments areas. Based on natural and cultural frontiers holistic analyses were applied by integrating rationalized lines that are representing each factor. The critical boundaries and zones of the two metropolitan structures were compared in the general framework. Visual results have ravelled a compressive drawing of the metropolitan structures and expressive areas associated to critical urban pressure. Satellite imagery (Landsat-7 UTM RGB-453) for urban elementary perception of land and water frontiers is strongly recommended for spatial analyses and territorial perception. Key-words: urban ecology, environmental design, natural catchments, regional landscape

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Fragmentation and plant invasions in native grasslands in and around cities in the North-West province, South Africa

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Grasslands are one of the world's major biomes and include some of the most diverse and productive terrestrial ecosystems. An increasing demand on land by urban development and agriculture has lead to the reduction and fragmentation of natural grasslands severely threatening the biodiversity in these areas. It is therefore important to determine the extent of habitat transformation in order to understand the impact of development on the persistence of temperate native grasslands. Within Potchefstroom and Klerksdorp approximately 20% of native grasslands were transformed to urban development and agriculture over the last 25 years. Fragmented habitats have higher perimeter to surface area ratios than continuous habitats and are therefore thought to be more vulnerable to invasion by exotic species and loss of indigenous species. In our study, along an urban-rural gradient, results indicated that grasslands surrounded by different landscape types (urban, suburban and rural) have displayed different patterns of exotic species invasion. These patterns of exotic species invasion will be compared by means of spatial statistics.

Topic 5 Design and future of urban biodiversity

Preserving natural vegetation in Istanbul with a systematic guidance approach to native plant selection philosophy

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As a result of plant selection remained to the initiative of designers and depends on the facilities of nurseries, designated urban green presents a fragmented and heterogeneous vegetation in the city environment. In order to reverse this process we need an innovative approach for the application of “native plant selection philosophy” to designed landscape related to the urban context. Istanbul has shown a high potential for biological diversity and native habitats, due to its location is on the transition point of different climatic regimes around the region. However, comparison between the urban green vegetation and Istanbul’s natural forests shows us non-native and exotic species are more common in urban landscape. Although, there are many inventory studies about Istanbul’s vegetation, there is an urgent need for manage this data-set for decision makers, designers and plant producers. This paper seeks to find optimum design coding language for effective usage of native vegetation data-mass in Istanbul case. It aims to produce a systematic model of plant selection for guiding landscape designers as well as convincing to producers and decision makers in order to change trends of their bringing mass-produce hundreds of exotic plants from the abroad to Istanbul’s urban landscape.

Topic 5 Design and future of urban biodiversity

Green roofs – urban habitats for ground-nesting birds and plants

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Bird species in Switzerland are threatened by habitat loss and fragmentation due to increasing urbanization. New research is showing that green roofs can serve as feeding areas for some bird species. But little research has been done on the potential of green roofs to provide breeding locations for birds, particularly ground-nesting species. Methods have recently been developed to improve the design of building-integrated habitats for urban wildlife. Design criteria for the creation of these habitats on roofs include the substrate thickness and using natural soils from nearby areas. Our three year project examines two different aspects/mechanism of ecological compensation: one focuses on ground-nesting birds, the other on the vegetation on green roofs. The breeding success of ground-nesting birds such as the northern lapwings (*Vanellus vanellus*), little ringed plover (*Charadrius dubius*), eurasian skylark (*Alauda arvensis*) etc., is closely monitored, especially the behaviour of the young birds and their mortality with respect to specific effects of design changes of green roofs during breeding season. The vegetation experiments test either succession on different regional substrates or plant cover after the application of different seed banks (e.g. seeds contained in hey-mulch from local dry meadows).

Topic 2 Cultural aspects of urban biodiversity

Planning for urban trees: a case for ecological and biogeographical selection criteria

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The uniformity of using similar tree selection criteria such as planting exotic species better adapted to urban environments results in a loss of biological and cultural identity of urban areas on a global scale. At present selection criteria for urban trees is based on economic, social and cultural factors. Less attention has been given to the use of ecological and especially biogeographical criteria. Ecological criteria can provide information on species interactions such as providing habitats, shelter, food, pollination and seed dispersal. Trees are also part of larger habitats and plant communities with different aspects of competition, succession and community pattern. For biogeographical criteria aspects on the distribution of tree communities and tree habitats will be also covered. In our presentation we discuss “what role can ecological and biogeographical criteria play in the tree selection process to create resilient and sustainable urban ecosystems?” We use examples from Northern and Southern hemisphere cities to illustrate this question.

Topic 5 Design and future of urban biodiversity

Reimagining the Australian Suburb: Biodiversity Planning in the Urban Fringe

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Accelerating urbanisation in Australia is considered one of the greatest threats to biodiversity, with over 50% of threatened species occurring in urban fringe areas. Despite the introduction of planning legislation and frameworks to preserve biodiversity, many Australian cities are facing a looming extinction crisis; short-term economic gains consistently out-compete biodiversity concerns on a localised case-by-case basis. While the maintenance of biodiversity within and adjacent to urban areas brings numerous societal benefits, it involves complicated tradeoffs between competing land uses including transport, housing, industrial development and agricultural production. Conservation strategies are constrained by the complexities of multiple stakeholders with different motives undertaking numerous actions in the face of severe uncertainty. Biodiversity planners in the urban fringe often lack ecological tools to develop optimal strategies given these real-world constraints, and as a result, there is often little ecological input into the urban planning process. We present results of an ARC-linkage project that developed scientific tools to assist in the urban planning process to achieve better outcomes for biodiversity. Key outcomes of the project include protocols for surveying grasslands while accounting for detectability, tools to optimise growth area planning based on ecological modelling and mathematical optimisation, and simulation models to explore key sensitivities in habitat offsetting policies.

Topic 3 Social aspects of urban biodiversity

Perception of Biodiversity - The Impact of School Gardening on Getting in Touch with Plants

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In connection with the CBD and the German National Strategy on Biodiversity the perception of plant biodiversity is becoming a matter of increasing interest. Empirical studies, however, have pointed out the poorly developed perception of plant biodiversity. School gardens as situated learning environments offer multifarious opportunities to get in touch with biodiversity. In our comparative pretest-posttest design study primary school pupils (n =150) are tested on the effects of school gardening: Does school gardening develop a more distinctive perception and appreciation of plant biodiversity than traditional classroom lessons? The following questions are focussed on: (1) Are there differences in the competence to deal with plant biodiversity? (2) Are children able to perceive species richness in different plant communities? (3) Is there an influence of species richness on the aesthetic response? (4) What are the main factors involved in developing the perception of plant biodiversity? (5) Do children change their concepts about plants by school gardening? The methodological design follows studies on people's perception and appreciation of plant biodiversity (Switzerland, Germany). In pilot studies we have tested primary children (n = 80) as well as preschool children (n = 70). Results of the pilot studies and the pretest will be presented.

Topic 5 Design and future of urban biodiversity

Green Concrete - an EU-financed test of gravel turf consisting of recycled construction materials with grass and herbs for parking areas

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The consortium of the Green Concrete Project consists of nine companies and three research facilities from three different EU member states and the association of the Austrian construction material recycling sector. The main objective is to obtain extensive knowledge of gravel turf, consisting of recycled construction materials or natural gravel from quarries, as a permeable and planted method for surface consolidation of parking and low traffic areas. It improves the microclimate and thus the quality of life in urban areas. By absorbing precipitation gravel turf relieves the burden on the sewage system and fosters the renewal of groundwater in urban areas. Therefore gravel turf contributes to main objectives of the EU. Objective of the extensive investigations will be carried out to prove the suitability of gravel turf as a cost-saving and ecological alternative to the common practice of sealing surfaces by means of asphalt or concrete. For the first time recycled construction materials will be tested for their suitability for the usage as gravel turf. The outcome of this project is the product gravel turf and the knowledge about different kinds of planting-mixtures. The product gravel turf opens a new market to the participating companies and thus strengthens their competitiveness.

Topic 5 Design and future of urban biodiversity

The ARES sensor – a new airborne remote sensing sensor with high potential for ecological applications

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The ARES (Airborne Reflective / Emissive Spectrometer) is specified as an airborne whisk-broom imaging spectrometer for remote sensing of land surfaces covering the wavelength regions 0.47-2.45 µm and 8-12 µm with 160 channels. The instrument is being built by Integrated Spectronics, financed by DLR and GFZ, and will be available to the scientific community from beginning 2008 on. This poster presents the specifications of this new sensor and gives examples for potential applications in the field of mapping urban biotopes, vegetation types, urban surfaces, degree of surface sealing and water quality of lakes as well as retrieving vegetation parameters like vegetation stress, water content and chlorophyll content. A special feature of the sensor is to provide also hyperspectral thermal data. This can improve some of the above applications, e.g. the separation of urban materials based on their emissivity characteristics, but also offers additional applications in urban climate modelling by thermally mapping the urban environment with high spatial resolution (2-10 m).

Topic 5 Design and future of urban biodiversity

Towards an automated update of urban biotope maps using remote sensing data: What is possible?

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* Presenting author

Urban biotope maps are of high importance for ecological urban planning and well established in Germany. In common practice, area-wide mapping and monitoring of biotopes is based on visual interpretation of colour-infrared aerial photographs and field investigations. Up to now, there are only few investigations dealing with the automation of these mappings by an automated analysis of remote sensing data although such a automation, even of parts of the mapping procedure, holds the potential of being faster, reproducible and objective. This presentation shows a novel method for the automatic determination of the types of biotopes based on remote sensing data. This method is the essential part of an automatic update system for existing urban biotope maps. The determination of the biotopes' types is done by fuzzy logic models of the biotope types. These models consist of characteristic spatial features, that are calculated on classified hyperspectral images and on a normalized digital surface model (nDSM), relating to the composition of the biotopes of different surface materials and their arrangement within the biotopes. The potential of the method for updating an existing urban biotope map is demonstrated for selected biotope types for two study sites in Berlin and Dresden, Germany.

Topic 2 Cultural aspects of urban biodiversity

Are historical parks a contribution to biodiversity?

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* Presenting author

The tradition of parks is lasting for several hundred years. Plants from different origin had been collected and presented on small and large scale. Not only hardwood species were of high interest but also many kind of bulbs and herbaceous plants. So the number of presented plants may be high and concentrated in several types of parks and gardens. The question is: is this a contribution to local biodiversity or not. The example of the gardens of Hohenheim is documented since nearly 200 years, so by this the question may be elucidated. In 1800 the gardens included more than 1200 foreign hardwoods - the highest number in Germany of those days. Today we find within the garden about 830 spontaneous plants at all. Is this relatively high number related to a small area indicating a hotspot of biodiversity or only due to the activity, care and management in this gardens.

Topic 5 Design and future of urban biodiversity

Safeguarding the urban bat Common pipistrelle for the future

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* Presenting author

The urban bat Common Pipistrelle (*Pipistrellus pipistrellus*) is common in the Netherlands. Like all native bat species the Common Pipistrelle is listed at Annex IV of the Habitats Directive and is strictly protected. For the conservation of urban bats in reconstruction areas local authorities often apply an ad hoc approach. Measures involve preventing activities in the most critical periods (reproduction, hibernation) at the scale of individual buildings. This approach goes beyond long-term goals for a sustainable urban population. For maintaining the Favourable Conservation Status of bats in urban areas a strategy is needed at the level of the urban landscape involving the network of colonies, flight routes, hunting sites and hibernation sites. We propose a pragmatic action plan for the Common Pipistrelle in urban areas that focuses on the network of bat biotopes. The action plan is set up to help local authorities to facilitate legal procedures and to offer a strategy for sustainable urban populations.

Topic 5 Design and future of urban biodiversity

Designing green roofs for biodiversity – nature conservation and landscape transformation aspects

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* Presenting author

Adequately designed green roofs can be a habitat compensation serving rare and endangered species in urban areas. The studies showed the maximum benefit to the regional biodiversity on green roofs with different substrate thicknesses that create various habitat conditions. On the most bio-divers of the investigated green roofs 79 beetle- and 40 spider species were found. 13 of the registered beetle- and 7 of the spider species are classified in Red Data Books as endangered species. This research proved the transformability of nature close habitats onto roof tops. Compensations for river banks, rocks and rock debris, high mountain habitats as well as dry grasslands can be established. The research focussing on biodiversity issues of green roofs led to amendments in the building and constructing law in Basel. New buildings with flat roofs have to be constructed including green roofs on top. Further specification as guidelines take green roofs in the account of the biodiversity strategy of Basel.

Topic 3 Social aspects of urban biodiversity

Allotment gardens between gardening and recreation – actual trends and perspectives in Central Europe

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The allotment gardens movement represents general principles of utilization and social grouping. Allotment gardeners are a definable social group interconnected by common life-style elements. They are characterized by specific nature consciousness, social behaviour, by age structure, employment, and leisure referred action structures (garden use, use of alternative nature offers, leisure and environmental behaviour etc.). Despite changing social structures allotment gardeners are steady in their behaviour. In view of the demographic change also in the future is to count on a not insignificant increase of this group, at least however on a stable meaning. The allotment areas belong to the urban nature equipment of the cities and are important as part of the urban green and garden areas in Central Europe. The utilization of allotment gardens is characterized by the change of utilization from the fruit and vegetable garden to the recreational garden and the reduction of the maintenance intensity. There is simultaneously a lack of attention for allotment gardens in politics and planning and they are most endangered green space category. This is not connected to the especially intensive utilization, satisfaction of users and to their prognosticated demand. Allotments are valuable green spaces with high social functionality, belonging urban to the urban residential neighbourhoods, have still insufficiently used ecological potentials and are too wrongly opposite other green spaces often disadvantaged by planning. The study explains the actual situation of allotment gardens as part of the urban green pattern in selected cities in Germany and Austria. It is based on structural analysis of the urban green and the allotments as part of it and on the other hand on social surveys of the gardeners as utilizes of these areas. In that sense it is a landscape structural and social behavioural study summarizing the actual and exceptional trends.

Topic 3 Social aspects of urban biodiversity

Urban nature perception in socio-economic different urban neighbourhoods in Germany, Chile and Spain

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Cities are not socially homogenous, but are divided into socially and structural differentiated sub-units. Therefore, it can be stated that the individuals of a community, city, or neighbourhood present specific behavioural aspects and uses of their public green areas. This premise gives rise to the question of how the perceptions, uses, and behaviours of people from different countries, cultures, and socioeconomic levels differ or coincide as far as urban nature and landscapes are concerned. Thus, an international cooperative project was started among Chile, Germany and Spain in order to study the perceptions and valorisations that people of different social statuses and in different cities hold regarding nature. Due to the comparative nature of the project, research areas with similar characteristics were chosen, allowing an analysis and comparison of upper-middle and lower-middle class neighbourhoods in German, Spanish and Chilean cities. People from all six study areas were surveyed with the same questionnaires. The results revealed a differential use and perception of the urban landscape by people of different social and cultural backgrounds. Nature plays an important role in all investigated urban societies, independently from social status and nationality and specifically in their neighbourhood. As higher the social status as more the urban green is privatized. All urban dwellers use different kind of nature in their cities. The preference of specific nature depends on cultural elements, accessibility and tradition, not only on social status. Nature related open space activities are defined by this status, but reflecting a cultural status in the society. Urban landscapes have to include urban green as important elements to satisfy the urban population in their need of contact to nature. This has to be reflected much stronger and more precise in the urban planning to keep cities liveable and as urban landscapes attractive for the people.

Topic 2 Cultural aspects of urban biodiversity

Urban rivers as dispersal corridors for primarily wind-dispersed invasive tree species

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* Presenting author

Cities represent hotspots of plant diversity and may function as sources for the export of non-native species into surrounding landscapes due to human-mediated long-distance dispersal, a key process in biological invasions. Our study addresses the question whether tree plantations along urban rivers may act as initial foci for the water-mediated dispersal of invasive tree species. We released tagged fruits of three primarily wind-dispersed tree species into the river Spree in Berlin, Germany, and studied the subsequent dispersal in the river corridor. Our focal species are highly invasive in Europe (*Acer negundo*, *Ailanthus altissima*) or North America (*Acer platanoides*). Our results demonstrate the effectiveness of seed transport starting from embanked river borders within urban centres over long distances to possibly suitable habitats downstream. Hence, water-mediated dispersal may enable the establishment of these model species in riparian corridors even at great distances from seed sources within urban centres. Furthermore, we discuss consequences for urban landscape architecture and the need to include consequences of secondary dispersal in models on the spread of invasive species.

Topic 5 Design and future of urban biodiversity

Ecological Urban Regeneration? Urban Woodlands in Leipzig

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* Presenting author

In the last decades Leipzig experienced a comprehensive and rapid transformation process, both economically and in its physical structure. Although the population of Leipzig has begun to grow again the city appears perforated and fragmented. There are many gaps and derelict lots within the urban fabric, such as former industrial sites, closed railway goods stations and vacant residential buildings. The municipality faces the cities urban conversion with different strategies. It also acknowledges the demand for new types of land uses, such urban forestry. Leipzig City Council, in cooperation with Irene Burkhardt Landscape Architects, is leading a Feasibility Study about establishing woodlands and testing its impact on different sites in the inner city. Urban woodlands are integral parts of green networks in cities. As multifunctional urban green spaces, accessible for everyone, they can be an alternative to public parks with its high maintenance costs. Their benefits range from ecological and climatic to social and aesthetic and also economic benefits. They provide an experience of nature in the middle of urban life and contribute to urban biodiversity. The Feasibility Study is funded by the Federal Nature Conservation Agency with funding from The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

Topic 5 Design and future of urban biodiversity

Developing a methodology for predicting the impact of urban development on biodiversity in Scotland

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In common with many countries, the demand for housing in Scotland is increasing, resulting in increased urbanisation and consequent pressure on biodiversity in the wider landscape. It is therefore vital to know how urbanisation will affect biodiversity and what steps can be taken to ameliorate any potential negative impacts. In this talk, we present a methodological framework that can be used to predict the impacts of changes in land use, urbanisation and demography on biodiversity. This is a three stage process: (i) Generation of urban change scenarios based on predictions of demographic change and development at the regional/local authority scale; (ii) Quantification of the impact of urban development on changes in the amount of different land cover types on a regional/local authority scale; and, (iii) Evaluating the consequences of land cover change scenarios for biodiversity. We use scenarios of urban development in conjunction with land cover and spatially referenced biodiversity data to predict possible impacts of future urbanisation on bird diversity in Edinburgh. The assumptions underlying the model and the wider applicability of the methodology are discussed, in particular the potential for the framework to be used as an applied tool in the planning process.

Topic 3 Social aspects of urban biodiversity

Contemporary Urban Stewardship Practices and Landscapes

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Stewardship now can imply land conservation, watershed stewardship, the management of private land, urban greening projects, a land ethic, and restoration. The existence of a wide variety of formal stewardship organizations indicates the renewed interest and need in promoting stewardship through formal organizations in its different concepts of environmental ethics, environmental practices, wise use, individual ethical environmental behaviour and its application to different landscapes, different land management practices with different outcomes and different types of ownership. In urbanized areas, the practice of stewardship now is characterized by growing volunteer involvement as a participatory model of stewardship promoted by organizations. The different intentions and manifestations of land productivity evolved as patterns of land use, ownership, and technology such as alternative watershed restoration approaches changed accessibility to the land and the health of the land. The growing popularity of volunteer urban stewardship has implications for landscape design and management. This research examines theories around contemporary stewardship, compares the different typologies of urban stewardship approaches, practices, and landscapes and then discusses the implications to planning and design.

Topic 4 Urban biodiversity & climate change

Phenology of ornamental perennials in urban conditions

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The city landscape is modification of the past environments which have been transformed by advisable or unaware human activity. The specific urban environment has a great influence to almost every living thing. The main problems and simultaneously obstacles for the plants existing in the urban environment is xerisation and high toxisation almost every animated and unanimated element. Two year studies on ornamental perennials (stonecrop – *Sedum spectabile* Bor., heartleaf saxifrage – *Bergenia cordifolia* (Haw.) Sternb., avens – *Geum coccineum* Sm.) in urban landscape of Warsaw, Poland were carried out. Changes in phenology (BBCH code), blooming period as well as decorativeness of mentioned perennials were investigated. In both years urban's climate weather was different. This determined diverse changes in decorativity of chosen plants. Compare to the suburb species grown in the city centre started to bloom much earlier (to 10 days in case of stonecrop), also the whole blooming period was continuing longer. In the moderate type of climate (like in Warsaw) the duration of vegetation period, which can be mean as an ornamental time, plays great importance in urban green areas. The investigation shows earlier beginning of decorativity and also later down in case of plants existing in urban structure than in suburban landscape. This shows the strong connection between species used in the cities and urban environment. Vegetation in the cities is very much beneficial to the inhabitants. People have physical contact with plants in their gardens or parks but urban flora keeps well-being of the humans, too. City's residents among the plants are felt relaxed and calm. The important positive occurrence related with ornamentals is also aesthetic effect which has direct influence on the human sensoric sphere. This work was supported by Ministry of Science and Higher Education of Polish Government Grant No. N310 084 32/3457.

Topic 2 Cultural aspects of urban biodiversity

Urbanization promotes native plant species loss and replacement with non-native plant communities

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The rapid urbanization of the world has significant ecological consequences that shape global biodiversity patterns. This study, joining spatial and floristic data sets, examined plant species patterns in the New York Metropolitan Area, one of the most densely populated urban regions in North America. Examining 250 grid cells (25 square kilometres each), we show that urbanization increased alien species richness while decreasing native species richness. However, total species richness declined only slightly with increasing urbanization, indicating a replacement of the native species by alien species. This replacement of the native flora leads to the change in homogenization of urban floras; urban blocks are less similar in composition than rural blocks. These patterns show that urbanization is accompanied by the replacement of native species and changes in plant biodiversity patterns in addition to reduction of habitat. This study contradicts the paradigm in urban ecology that the most urban areas are the most species poor. Instead we show a rich urban flora dominated by non-native species which are differentiating urban plant communities. This has important implications for the metapopulation processes of native species.

Topic 3 Social aspects of urban biodiversity

Feral pigeons in the cities : cultural categories and wildlife management

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* Presenting author

To many aspects, one can observe that, by contrast with other times and places, feral pigeons do not have a definite status in contemporary European cities. They seem to be perpetually crossing boundaries between different categories that people usually refer to in order to understand and engage with the world surrounding them. As a part of wildlife in an urban environment, feral pigeons elicit contrasted feelings amongst inhabitants of cities and question cultural distinctions such as domestic/wild, public/private, clean/dirt, etc. This research was a part of a pluri-disciplinary project aiming at evaluating both ecological and anthropological dimensions of the presence of feral pigeons in Paris. It will be argued that feral pigeons in cities could be viewed as a kind of symbolic disorder. Political measures, scientific interest an citizen behaviours towards them could therefore be understood as attempts to give the pigeons a definite status. This perspective could help improving the management of urban biodiversity by providing clues to integrate its ecological and social dimensions.

Topic 5 Design and future of urban biodiversity

The use of herbaceous vegetation as an alternative to promote biodiversity in urban parks in Veracruz, Mexico

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Typically, urban parks in Mexico lack of biodiversity in spite of its greater variety of plant species and ecosystems. This paper will focus on preliminary results in a recent study carried out at Colegio de Postgraduados-Campus Cordoba (centre of the state of Veracruz, Mex.,). The objective is to promote the use of herbaceous vegetation in urban parks of the region in order to have more attractive and sustainable plantings. The methodology has three parts: A collection of potentially-attractive native and non-native plants from the region, and the propagation of the most potential species to be used in public plantings (part 1), establishment and adaptation of pilot plantings in public spaces (part 2) and the assessment of these plantings by the public (part 3). According to preliminary results, approximately 30 species have been collected and 13 propagated. An electronic catalogue with potential species is being produced and updated. Pilot plantings of mixtures of these vegetations have been established in Campus Cordoba, and positive acceptance seems to be shown by the visitors. Although the project is still ongoing, the results are promising and more people are interested in this new potential trend in México, especially local government and the public.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Bucharest's industrial wastelands – between ecology and development

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Bucharest's industrial wastelands – between ecology and development Wastelands, abandoned terrain, residues, these are just a few of the names with a negative connotation, given by the architects an urban planners to the, apparently, uninhabited spaces, unused spaces, industrial areas or areas with an uncertain ownership. Urban wastelands are spaces in a continuous transformation, being modified, on one hand, by humans who change the architecture, and, on the other hand, by the plants and the natural ecosystem through their evolution. Urban wastelands are spaces perceived in a negative way in Bucharest's dweller's culture, the plants being seen as weeds. The wastelands conquered by these types of plants, have an irrefutable value for the urban environment. Here, the vegetation is managed by nature itself, without human intervention, and therefore, these spaces are the closest thing to the natural archetype. In this study I have analyzed some of the wild plants found in the urban area which represent the majority of the species found in this type of habitat, in order to identify the exact features that allow them to survive in an urban environment. The flora found on abandoned terrains consists not only of indigenous plants, but also of pioneer exotic plants acclimatized to the urban environment. The rapid transition of only 40 years, from a grassy terrain to woody one, makes the urban wastelands' life is a relatively short one. Although some of the landscape architects and artist have understood the positive quality of these terrains, their demarche is powerless in front of the financial argument. Therefore, in order to preserve these spaces, it is necessary to sensitize every "player" that comes in contact with them, the population, the specialists and the authorities, to keep and incorporate them in the new functions. On the other hand, these spaces, which ensure the urban biodiversity and ecological balance, need to become part of the development projects.

Topic 5 Design and future of urban biodiversity

Effects of urban-rural gradient on the distribution of woodland flora

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The effect of urban-rural gradient on species distribution has already been extensively documented, but a main challenge in urban ecology is to better understand how such differential distributions occur. Hence, this study aims to compare the effects of urbanisation on woodland plant assemblages in three cities and to understand why differential distribution of species along urban-rural gradient occurred. The study was carried out in the cities of Angers, Nantes and Rennes (north-western France) where a total of 36 isolated woodlands were surveyed along an urban-rural gradient in each city. The analysis of vegetation shows the existence of a gradient with separation of ruderal and exotic species and species more typical of forest. These lists of urban and rural indicator species were compared with other studies on woodland plant ecology and with Ellenberg's indicator values. There is accordance between species preference for urban woodlands (respectively rural) and species preference for recent forest (respectively ancient) and species preference for hedgerows (respectively woodlands). Habitat quality (including pH and nitrogen content) may be involved in this species distribution. Overall, this study suggests that the effects of urbanization on woodland plant species can be related to other anthropisation effects and may involve similar processes.

Topic 5 Design and future of urban biodiversity

Indicators of sustainability for the mining industry

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Production clusters are well-located economic and geographic areas where a specific production chain is in operation and involves a variety of local enterprises (industrial, trade, services). Brazil released a public policy to incentive and build production clusters and, amongst them, the mineral branch. The sustainability matrix, as described in this papers, is a simple tool applied by the authors to provide a quick qualitative diagnosis of mineral clusters in order to check how the sustainability aspects (social, environmental, institutional and economical) are influenced by some of the most essential which controls the mineral activity, as for example: workers and managers skills, minerals prices, natural resource availability, banking loans, etc. This paper presents the obtained results from a given natural stone production cluster, thus exemplifying the usefulness of the sustainability matrix as a tool for checking public policies and treats to sustainability caused by production variables, among others.

Topic 5 Design and future of urban biodiversity

Design for Biodiversity in the Urban Fringe

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European and national policies for biodiversity firstly relates to the National Ecological Network and Provincial Corridors. The goals for biodiversity will not be achieved only by this strategy. This calls for new ambitions for agricultural biodiversity and ecological quality of areas in the urban fringe. Dienst Landelijk Gebied will in the next decade transform thousands of hectares of agricultural land into multifunctional recreational and natural areas. The central research question is: “How can landscape architects improve biodiversity in green areas that are influenced by urban processes and recreation & which starting points are essential in the design process in order to create sustainable habitats for wild species” Questions during the research were relating to indicators for biodiversity, selecting an approach for biodiversity in urban fringe areas, required areas for target species and ecological profiles for design. Research methods were literature research, interviews with ecologists and participating in the design process of actual planning projects. The ambition for biodiversity is defined from a variety of culturally defined viewpoints: environmental, psychological, economical and moral. The research results in a defined ambition for biodiversity for urban fringe areas and guidelines for the planning stages, from initial conceptual phase, masterplan to technical design.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Distinctive characteristics of castles within urban biodiversity – a case study at the Petersberg citadel in Erfurt (Germany)

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* Presenting author

Castles are able to act as microcosms of more extensive and more complex urban ecosystems. Their strongly anthropogenic structures have been modified over a long period and provide special living conditions for flora and fauna. In 2007 a case study was carried out at the city-centre Petersberg citadel in Erfurt (founded in the 15th century) to determine its distinctive characteristics as part of Erfurt's wider urban biodiversity. Through an area-wide survey flora and vegetation of the citadel were recorded. Additionally data about fauna were collected. Finally the vegetation of the Petersberg citadel was compared with the vegetation of other urban habitats as well as that of natural habitats (rocks). The Petersberg citadel is not only important for biodiversity. As a cultural monument within the city it is also important as a city-centre recreation area. Therefore proposals were given how to develop Petersberg citadel's ecological, social and cultural aspects in future. The Petersberg citadel is part of the mid-conference excursion during the international conference "Urban biodiversity and Design – Erfurt 2008".

Topic 5 Design and future of urban biodiversity

Urban biodiversity study and conservation in Italy

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Studies about urban biodiversity are important for local conservation and as opportunity for people - and particularly children - to develop an appreciation of nature. LIPU manages for different actions: - Italy is the most active country in the context of urban bird atlases, we have 41 studies (for 34 cities). A Working Group on “Urban Avifauna” has been operating since 1990 for the standardisation of the methodologies, definition of the limits of the urban environment, classification of the environmental types present in urban areas. - Sparrows are typical urban species, but now in many European countries both House and Tree Sparrow have declined. LIPU launched the “Sparrow Project” (Progetto Passeri) for monitoring and as an awareness campaign on the ecological problems of urban ecosystem. - Management of “problematic” (pest) bird species, as Feral Pigeon, Starling and Yellow-legged Gull. - Development of nature-trails (nest-boxes, bird-tables, etc.) and urban nature reserves for schools and citizens. - Mitigation of the impacts caused by infrastucture (roads, highways, windows and buildings) on fauna. A national project on urban biodiversity is in course with National Environmental Agency (APAT) and Environmental Agency for Tuscany (ARPAT). The author is also scientific director of journal Ecologia Urbana www.ecologia-urbana.com

Topic 4 Urban biodiversity & climate change

Securing the Multi-Functionality of Urban Public Green Spaces: Challenges from Climate Change and Potential Approaches for Adaptation

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Climate change already shows impact on urban biodiversity and the availability of resources. Lifespan, quality and diversity of urban plants are influenced by changing climatic effects, such as the persistent lack of water during heat-waves. The continuing concentration of cities, the lack of vegetation and the use of inappropriate materials and plants will cause a further shortage of resources and magnify the effects of extremely high temperatures. A diverse vegetation cover in an urban structure helps to improve and stabilise air quality and micro climatic effects and is positively contributing to the inhabitants´ quality of life. Urban green spaces are influenced by climatic changes in respect of design, construction, planting and maintenance. Changes in usability become evident due to rising temperature, changes in precipitation or varying frequencies of heat and frost periods. To fulfil future requirements, in particular changes of use patterns need to be considered. The poster presents preliminary results of a research project on sustainable design and climate change impact on maintenance and usability of urban public green spaces. Significant aspects of green space design and maintenance that show a strong interrelation with climate change will be discussed.

Topic 5 Design and future of urban biodiversity

Remote sensing and GIS in the study of grassland ecology along an urban-rural gradient

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Increasing urbanization influences most habitats on the planet, emphasizing the need for more urban ecological studies. The Grassland biome has a low conservation status and contains some of the largest urban agglomerates in South Africa. An urban-rural gradient approach is often used in urban ecological studies identifying a complex indirect gradient in urban areas. Previous studies were not truly comparative due to differences in measures used to quantify the gradient and a lack of a well defined definition for urban areas. Our study focused on testing a model from a study in Melbourne, Australia in an attempt to contribute towards creating a standard set of measures to quantify the urban-rural gradient. In our study, SPOT5 HRV satellite imagery and GIS techniques were used to calculate measures representing demographic and physical variables, as well as landscape metrics. Testing these measures in other studies could enhance comparative ecological studies between urban areas worldwide. Patterns and processes emerging from these studies could drastically influence planning and implementation actions concerning human development and identification of potential conservation areas in urban environments. In our study, potential changes in grassland ecology were identified with vegetation surveys, thereby quantifying the influence of human impacts along the gradient.

Topic 5 Design and future of urban biodiversity

Pictorial Meadows

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* Presenting author

The concept of Pictorial Meadows has been developed over the past 10 years by the University of Sheffield as a method of introducing diverse and naturalistic vegetation into high profile situations in urban parks, gardens and green space. It is a technique that has been very successful in establishing ecological design and management into locations where it would normally not be considered suitable. Pictorial Meadows are composed of direct-sown mixtures of annuals. They are ecological in that they are naturalistic in character, and require no irrigation, fertiliser or on-going maintenance input. They are innovative in character in that they are not composed solely of native species, but combine European and North American species to give spectacular colour and a very long-flowering season. The public response to these meadows is extremely positive. The meadows support very high invertebrate biodiversity. Pictorial Meadows have been applied across the UK, in large and small-scale locations, in public and private space. Applications include urban highways, traffic islands and roundabouts, urban parks, housing estates and developments, private gardens, flower beds, school gardens. They have been used at a very large scale on demolition sites and 'cleared' or vacant sites awaiting development. This presentation will demonstrate the range of locations and situations in which the meadows are used. Technical information about their establishment and maintenance will be given, as well as species composition. In particular, details about the social and community response to having vibrant, colourful meadows in high-profile locations will be given.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Spontaneous vegetation in cities and its contribution to urban biodiversity

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* Presenting author

Spontaneously-occurring herbaceous vegetation is important component of urban vegetation and play ecological role in urban ecosystems. Functional evaluation of the vegetation needs identification of its functions, categorizations into groups (categories), quantification based on ecological research and exact assessment of those functions. In this paper the benefits from the ecosystem services are discussed and possibilities for evaluation of the functions are demonstrated. Ecological functions were studied and evaluated on the basis of biomass production estimated for 17 ruderal plant communities in SW Slovakia. Primary productivity varied among communities due to the environmental conditions (habitats) and human effects. The spontaneous vegetation exhibited high effectiveness of ecological functions, transformational and/or productional and stabilizing.

Topic 5 Design and future of urban biodiversity

Urban ecosystem services and urban biospheres

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* Presenting author

The Millennium Ecosystem Assessment established the usefulness of the concept of ecosystem services in describing human benefits from ecosystems and in bringing different disciplines and stakeholders together. In urban landscapes, ecosystems contribute to services like reduction of air pollution and noise and enhancing recreational and cultural values. In a context of rapid urbanization, a major challenge is how to sustain the capacity to generate such services and provide urban inhabitants with equitable access. A number of cities such as New Orleans, Canberra, Istanbul and Stellenbosch are in response to these challenges considering the biosphere reserve concept (UNESCO). The added value is seen as contributing to: Regional Planning – Urban landscapes are complex, highly heterogeneous and dynamic and the biosphere concept is seen as a valuable tool providing a regional planning framework. Systems Integration –The biosphere concept provides an arena to focus on interconnections among urban systems and issues of scale. Sustainability Branding – In an increasingly global world, the prosperity of cities and their inhabitants often depends on how well a city market and differentiate itself from others. Placing emphasis on the larger context of sustainable development many cities are seeing value in international recognition from UNESCO.

Topic 3 Social aspects of urban biodiversity

Methods for landscape architects to analyze open-space situations

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The goal of my research is to find simple, “easy-to-understand”, “easy-to-make” methods for landscape architect to analyze open-space situation from environmental psychological aspect before the planning process. Methods adapted by psychologists are often too complicated, or too complex; and its’ statistic result can be difficult adopted into the local place setting for “architect-brains”. On the other hand planers getting used to plan indoors without perceiving the emotional impact of a place. All situations are different, but the core of the problem can be identified with several good exercises. Making notes on feelings, association, simple drawings-, mapping-tasks has to be elaborated for the “planner society” in order to create a more-dimensional analyze before the planning. The complexity and legibility of scientific psychological researches has to be translated into planers-language. Adding the “human dimension” to designing parks, gardens or open spaces can create environments where all alive well-being.

Topic 3 Social aspects of urban biodiversity

"Railway-gardens" – The diversified roles of the watchman-gardening-system along the Hungarian Railways in the 19-20th century

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* Presenting author

In my research I focus on a special community garden-type: on the railway-gardens along the Hungarian railroad. In parallel with building the railway-system in the 19th century, a great attention was paid on the railway environment as well, which reflected a great demand on the from the specialist and from the worker side as well. Articles written of the system of the track-watchman-houses are detailed in gardening knowledge (giving a bright list of flower-types, and special fruit-trees) as well as in ways of social care towards each other and towards the "Railway", the land's industrial commons. Watchmen were responsible for maintaining their track, for a successful farming – which gave a self-sufficient economy and a mental balance for their life. All this show us the harmony of nature and industrial settings, landscape and gardens, the harmony between economical benefits and maternal care. Further on, I try to answer in what ways this symbiosis can be recreated again along the railway-areas.

Topic 2 Cultural aspects of urban biodiversity

Contribution of homegardens to urban biodiversity in Turkey

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The agricultural patterns have formed the character of the cities in Turkey that is not systematically yet the urbanism. In this proceeding, the characteristics, functions and effects of home gardens in the north-eastern Black Sea Region to urban biodiversity have been studied. In this region, the homegardens having minimal and limited area, the importance and functions with effective systems contains mainly the hazelnut and tea plantations. Therefore, these gardens are unique for and play important roles in the formation of landscapes in the region. The city of Trabzon has been selected as study area, the woody plant species regarding biodiversity have been determined in homegardens dominated by hazelnut at the city and surroundings. The richness, diversity, distribution and traditional usages of species determined by landscape pattern dealt with. Considering the future of the selected and studied gardens, the importance of woody plant taxa related to adaptive characteristics, folkloric shapes and contributions to urban landscape has been put forward. According to the results, some suggestions were made regarding the conservation and assessments of home gardens species needed by urban landscape planning in the future.

Topic 5 Design and future of urban biodiversity

Potential use of some neglected broadleaved tree species for urban ecosystems in western black see region of Turkey

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Turkey is bestowed with great biodiversity: nearly 10,000 different plant species grow in the country. The heterogeneous ecological factors, which change in short distances, confer the western Black Sea Region (BSR) of the country especially high plant species richness. The richness of the region for broadleaved tree species has not been appreciated until recently. Many scattered native broadleaved tree species including eastern mountain ash (*Sorbus aucaparia* L.), Caucasian or ash-leaved wingnut (*Pterocarya fraxinifolia* (Poiret) Spach), and wild cherry (*Prunus avium* L.) are native to the western BSR and have long been neglected despite their great potential for ecological, landscape, economical and social values. These tree species are rare, scattered through the region's species-rich forests. Global climate change is predicted to favour the growth of broadleaved tree species than conifers. These trees have not only been neglected by forester but also never been considered for urban ecosystems as landscape elements. This paper discusses the potentials of eastern mountain ash, Caucasian wingnut, and wild cherry for urban uses in terms of site requirements and landscape values such as tree dimensions, canopy sizes, balance of canopy, canopy density, branches shape, tree forms, foliage texture, foliage size) in the western BSR.

Topic 3 Social aspects of urban biodiversity

Human relationships to private green in the metropolitan area of Buenos Aires

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Private gardens enrich the character of a surrounding neighbourhood, contributing to the attractiveness of an area. Their importance increases in highly build up areas where gardens represent almost the only contact people has with nature. Argentina is increasingly urbanized, with two third of the population living in the metropolitan area of Buenos Aires. The metropolis has insufficient parks or green places so that the existence of private domestic gardens contributes to diminish that shortage. In this contribution we explored the relationship between private green areas and people using different indicators. Sixty questionnaires were performed and compared by the χ 2 test .The written survey included questions about garden area, number and name of growing plants, purchase and care. Another set of items collected background data for respondents and their households, including age, gender, occupation, number of household residents and income. The garden flora consisted predominantly of cultivated exotics, ranging between 1 and 50. Women were very much fond of plants as men. They knew more about botanical names and plant care, furthermore their gardens were richer. This difference was higher in the 41-60 age range, by housekeepers and employees and in the group of no single living persons. Differences in gender were found in the assemblage of respondents with low middle income.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

South Atlantic tourist resorts: how afforestation influence biodiversity

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In Argentina coastal resorts, are located on dunes, originally covered by herbaceous native vegetation. Primary occupation remained in fishing and stock rising until the area became important for tourism. Up to that date, there was a law obligation to forest the dunes before land was divided into lots for settlement. Since then, exotic afforestations have been increased to stabilize blowing sands, perceived as a threat to urban developments. In order to know the effects afforestations may have on plant and bird diversity, we conducted pair wise vegetation and bird inventories in forested (fixed dunes) and non-forested (semi-fixed) dunes. Afforested dunes show a clear retrieval of psammophytic plants and those indicating humidity. Exotic plants represent 37% of the richness but cover only 13 % of the wooded lots. No single exotic plant was a clear dominant across sampled sites, suggesting that south Atlantic coastal areas are resistant to alien invasion. Birds, grouped in foraging guilds, have been associated to different habitats. Species observed in afforested dunes were opportunists and urban with a greater proportion of “forests” birds. Compared with urban parks, afforested dunes have a greater bird richness and density. Some differences between southern and northern locations are been discussed. Project PIP5573/PICT25285

Topic 5 Design and future of urban biodiversity

Restoring Eco-historical Village in Aceh after Tsunami

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The city of Aceh was become part of the several areas in the world that was affected by the earthquake of 9.0 Richter, followed by Tsunami on 26 December 2004. The catastrophe killed about 300,000 people and destroyed houses, infrastructure, community facilities, parks, agriculture, historical sites, as well as other economic assets. In Gampong Pande, a historical village that is about 1 km from the shoreline, 70% of the population was lost and all houses (except 1) were completely destroyed. Likewise, the tambak (fish and shrimp breeding ponds) was heavily damaged. One of the major concerns is area of stagnant water particularly low ground that is vulnerable to flooding Before Tsunami, this area was well known as a traditional settlement of some historical importance, which was the court of the ancient Rajas of Aceh in the 17th century. This paper will examine the degree of damage in regard to the ecological and historical site, then offer an alternative solution of restoring the village with eco-cultural approach, so that it will become a model of good urban-village that give significant contribution to the city ecosystem as well as well as maintaining the cultural heritage of future city of Aceh after Tsunami.

Topic 5 Design and future of urban biodiversity

The Ecological Restoration and Design of a Disturbed Eucalytus-Pine Woodland for Nature Recreation in Porto Metropolitan Area

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* Presenting author

The ecological restoration and design of a disturbed eucalyptus-pine woodland for recreation and environmental education in Porto Metropolitan Area develops a series of intervention and management procedures based on site ecological survey, landscape evaluation and landscape design proposal. It focus on the potential opportunities created by a recently launched environmental education centre of Douro-Paiva Water Company and the development of an outdoor activity programme on a steep hillside overlooking Crestuma-Lever Reservoir. The study area has been managed as production woodland of *Eucalyptus globulus* and *Pinus pinaster*, occasionally disturbed by fire, tree felling, earthworks and erosion. Although situated in the Atlantic region of Portugal, the rugged topography and slate type substrate creates opportunities for spontaneous vegetation characteristic to Mediterranean conditions, raising the biodiversity interest of the site. Design and management guidelines were produced according to future human access and ecological restoration principles, where the more significant spontaneous and cultural ecosystems are enhanced to promote biological and sensorial diversity.

Topic 2 Cultural aspects of urban biodiversity

The Exotic and Native Main "Communities" of Porto Green Structure - opportunities for contemporary diversity

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* Presenting author

The mild Atlantic climate of the city of Port, on the south west coast of Europe, together with a rich experience in trade and cultural interaction, developed through the past two centuries a relevant “collection” of garden plants. Such high diversity of species ranging from Australia no North America established a distinct character in the green structure of the urban landscape which has been integrated in the local culture. Most of this cultivated species have a definite character due to form, colour, texture or fruit interest and have also been incorporated in some of the local ecosystems, contributing for the enrichment of the landscape experience, wildlife opportunities and social involvement. Some ornamental species perform so well in the urban environment that they are preferred to the native ones; other species thrived so well that they became noxious weeds. By walking or driving along the streets of the city a survey of such patrimony has been made; opportunities and problems posed by such plant communities have been discussed. Gathered information also calls the attention for the combination of using native and exotic species in the urban scene.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Gradients of floristic diversity in Hamburg – Patterns of native and alien species richness in the urban Island district of Wilhelmsburg

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How do urban environmental gradients relate to species richness? Though of major importance for nature conservation in cities, few studies so far have dealt with this issue at the mesoscale, i.e. the scale at which land use planning and urban development decisions are made. We used the plant distribution database of Hamburg‘s 1 Km²-grid-mapping to calculate species numbers in Wilhelmsburg district, classifying them according to their status into natives, archaeophytes and neophytes. The three principal components (PCs) that explain 58% cumulative variance are interpreted as: “naturalness“, “environmental homogeneity“, and “extreme physical conditions“. The percentage of native species increases towards more natural, less disturbed habitats (PC1) chiefly due to an increase in rare hygrophilous species, while alien species richness decreases. Both native and alien species richness are driven by habitat and land use diversity in the built-up area (PC2), leading to a positive correlation between them already at the 1 km²-scale. The number of native species however increases faster than those of aliens due to the larger species pool of the natives. Availability of specific habitats like mires and dry oligotrophic grassland (PC3) increase the percentage of natives and archaeophytes, because they contain rare, red-list species otherwise not represented in urban habitats.

Topic 2 Cultural aspects of urban biodiversity

Significance of historical gardens for nature conservation

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The continuance of gardening measures often leads to a high species diversity and the persistence of many endangered species in historical gardens. Nevertheless, the significance of historical gardens for nature conservation has rarely been quantified. Here we compare data about historical gardens and nature conservation areas in the urban area of Berlin, where historical gardens are repeatedly part of reserves to maintain their biodiversity. We focus on the significance of historical gardens for specific conservation goals with regard to target species and biotopes. Therefore, we discuss the following questions: - Which species and biotopes are mainly confined to historical gardens? - Are there specific conservation goals for which historical gardens are particularly relevant in comparison to nature reserves? Emphasizing the habitat types ‘meadow’ and ‘old growth’, existing data from general biotope mappings and surveys on red list species serve as basis for our study. Such a comparison may help to reveal the relevance of historical gardens for nature conservation.

Topic 3 Social aspects of urban biodiversity

The importance and effects of outdoor environments on children's physical fitness and health

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National guidelines for physical fitness and health focus on improving living habits and conditions in the Norwegian population, with a special focus on young people. The aim and intentions of this study were to investigate the playground options for physical activity in different schoolyards to see how different structural determinants can promote physical activity in young children. Cohort studies including both kindergartens and primary schools were carried out and compared concerning space and structural determinants for physical activity in the different schoolyards. Children's activities in the outdoor environments were tracked by using global positioning systems (GPS), the activity level was measured by heart rate monitoring, and the effect on motor development was tested with the EUROFIT Fitness Test. The results show that playing in natural outdoor environments promote motor development in small children and indicate that landscape structures constitute determinants for physical activity play and motor development in children.

Given the space, the time and opportunities the 6-year-olds seem to be as active in any schoolyard, but gender differences in physical activity were observed in the different environments. Conclusively, it was tentatively proceeded to identify different structural determinants that promote physical activities at different intensity levels in small children.

Topic 5 Design and future of urban biodiversity

Natural vegetation preserved in cities – values, impacts, long term biotope and vegetation changes

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Preservation of the original natural vegetation to become parts of the green infrastructure when new city areas are developed provides aesthetical, social, functional and economic advantages. However, knowledge about the vulnerability of the vegetation is needed. In 1972, a research project concerning preservation of vegetation was started at Järvafältet, Stockholm. The study began when the area was rural, and went on during development and during later use. Direct impact as well as habitat changes and the following vegetation changes were studied. Effects on functions and amenity were also analysed. Impact and habitat changes during construction were found to be increased wind velocity, mechanical damage to trees close to developed areas, and damage caused by the builders. Damage mainly occurred on trees, while field and bottom layer were little damaged except limited areas subject to illicit landfill. Impact when the area was in use was mainly trampling, increased air pollution in limited areas, and treatment. Trampling affected the field and bottom layer. Treatment had a significant impact on trees and bushes. Damage caused by other habitat changes was not detected. Despite some damage to the preserved vegetation have occurred, the local residents highly appreciate the areas for recreation. Recommendations concerning preservation as well as management can be carried out.

Topic 4 Urban biodiversity & climate change

The relation between the biological activity and the land surface temperature in Budapest

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In our research we examined the relation between the biological activity, land use type and the land surface temperature in Budapest. We analysed the Lansdat 5 TM image of the area taken in 1st of August 2005 9:30 CET. The study was carried out as a supporting research while elaborating the Environmental Action Programme of Budapest. We have found significant negative correlation between the NDVI values and the Thermal Radiation values of the image. Using the mono window algorithm (Qin et al 2001), the single-channel algorithm (Himenez-Munoz 2003), we have calculated the land surface temperature. We analysed the relation between the biological activity (NDVI value) and the land surface temperature by the detailed examination of the Northwest-Southeast and Southwest-Northeast cross sections of Budapest. We also analysed the relation between the urban land use types and the land surface temperature by the examination of 95 sample areas of characteristic land use. We examined 14 different types of land uses. Using the finding of the research, our team made recommendations which are going to form part of the Environmental Action Programme of Budapest being finalised at the end of 2007.

Topic 5 Design and future of urban biodiversity

The Challenges of Conserving Biodiversity in Urban Fringe Areas: An example from Melbourne, Australia

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Australia is currently facing a biodiversity extinction crisis caused by a combination of historical and current land use practices. In the last 200 years, more than 90% of temperate woodlands and 75% of rainforest has been cleared, and, in the south-east, more than 99% of the lowland grasslands has been lost. With over 75% of the population living in urban areas, urban fringe biodiversity often provides the only link between people and nature. Today, more than 40% of our nationally-listed threatened ecological communities and 50% of our threatened species occur in urban fringe areas. The urban fringe presents a unique set of challenges to those responsible for biodiversity management, none the least of which is the critical balancing act required to protect biodiversity in areas where there is significant pressure for urban development. While the planning process has been set up in a way that ensures certainty for landholders and developers, land use decisions are often made in the face of considerable ecological uncertainty. Here we present a case study, set in Melbourne, Australia, that highlights the dilemmas of biodiversity conservation in urban fringe areas, and demonstrate ways in which ecological uncertainty can be incorporated into environment and planning policy.

Topic 4 Urban biodiversity & climate change

The increase of woody plant diversity in urban forests − an effect of climate change?

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In urban and urban-industrial woodlands of the Ruhr Basin an extremely high number of non-native woody species were recorded. These include a number of warm-loving and heat-loving species like walnut [*Juglans regia* L.], chestnut [*Castanea sativa* MILL.]; tree of heaven [*Ailanthus altissima* (MILL.) SWINGLE], princess tree [*Paulownia tomentosa* (THUNB.) STEUB.], turkey oak [*Quercus cerris* L.] and the common fig [*Ficus carica* L.]. Also, the observations indicate that other non-native woody species show expansion trends, namely European yew [*Taxus baccata* L.] and evergreen species like Oregon-grape [*Mahonia aquifolium* (PURSH) NUTT.], Japanese pachysandra [*Pachysandra terminalis* SIEBOLD et ZUCC.], Chinese barberry [*Berberis julianae* C.K. SCHNEID.] and rhododendron [*Rhododendron* spec.]. Mainly they escape from different kinds of cultivation like ornamental plantings in gardens, cemeteries, parks and public places. Partly, the occurrence of these species can be related to the impacts of urban climate. However, in the last two decades warm-loving woody plants have increased remarkably both in the number of individuals and in the number of species. Probably, this increase of woody plant diversity in urban forests is a result of climate change.

Topic 5 Design and future of urban biodiversity

No space for nature in our cities? How green roofs can help to bring biodiversity into our city

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Since 2000 there has been increasing pressure to develop on brownfield sites in the UK. In London and the Thames Gateway area (largest regeneration project in Europe) such sites are known to hold important populations of rare invertebrates and other species of conservation concern. There has been a growing interest in green roofs as an opportunity to provide refuge for rare invertebrates and other species of nature conservation concern within the nature conservation community in London. Could green roofs provide an opportunity to incorporate biodiversity within the built environment? This sought to investigate the potential of green roofs for urban biodiversity. The study sampled invertebrates on different green and biodiverse roofs and adjacent brownfield sites. The study sites were sampled by pitfall trapping. Apart from quantifying invertebrates the study focused particularly on identifying and quantifying spiders and beetles. The results showed that green and biodiverse roofs provide valuable habitats for invertebrates, and green roofs can increase invertebrate abundance at least ten fold compared to conventional roofing systems. Moreover at least 10 percent of the collected species from all identified insect groups had Nationally Rare or Scarce status. The study found that biodiversity can be incorporated into the built environment and that rare species associated with post-industrial landscapes can colonise such features. However this depends on design criteria not normally associated with proprietary green roof systems. Substrate type and depth are the two major factors in terms of invertebrate species abundance and diversity. Finally recommendations were set up for green roof design that would maximize the value of these green roof habitats for biodiversity.

Topic 5 Design and future of urban biodiversity

Establishment and enrichment of oligotrophic grasslands on urban and suburban sites

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Species-rich biotopes of considerable extent and at the same time visual attractivity are scarce in urban and suburban environments. Since they are refuges for rare and endangered species featuring a considerable diversity the available diaspore material can serve as potential source for the creation or improvement of open spaces in both ecological and aesthetical respect. They serve as a basis to restore, establish and design biotope networks with multiple functions for the present society. The contribution presents methods to develop corridors and networks of ecologically valuable, useful and attractive open spaces. In different project areas in and around Munich two methods of sowing were tested: (1) Application of hay threshing material from biotope management and establishment of a market for hay. (2) Sowing of seeds from regional plant species production (mother plants from original habitats), an additional option if special types of seeds are required. Both methods can be applied separately or combined. Derived from these project results species mixtures for specific vegetation types were developed for different geographic regions in Southern Bavaria. From a landscape architecture point of view, characteristic images of traditional landscapes can be utilized and transferred as historic citations with modern interpretation and functions.

Topic 4 Urban biodiversity & climate change

Epiphyte organisms as bioindicators of air pollution in central parks from Bucharest

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Bioindicators are targets for detecting the negative impacts on industrial activity on the environment and has a major role to develop strategies to identify and prevent it. Bacteria, fungi and yeast had been identified on leaves as epiphytes. Taking in account fluxes of UV radiation and pollution the most resistant are those with capsule and pigments as protectors. Yeasts are also representatives as bioindicators of pollution. Some of fungal genera like *Aspergillus* and *Penicillium* are very resistant to heavy metal so they are more abundant in that conditions. Lichens as epiphytes on *Fraxinus excelsior*, *Sorgus aucuparia*, *Keleuteria paniculata* and *Quercus* sp. are also bioindicators of air pollution. They are able to accumulate heavy metals and to react of pollutants by morphology and size of thalus. All results are included in data base of Environmental Ministry for assessment of air pollution for human health and conservation of biodiversity

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Evaluation Effects River Landscape on Human and Urban Biodiversity

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River corridors are ecological services that provide semi-natural environment in urban areas. Besides, they enrich human life with forth dimension (reflecting water) and visual landscape. Visual quality of river's landscape is determining various factors such as geomorphology, vegetation, land use, water, scenic and historic value, and perception. The purpose of this paper is to asses the change of visual quality of landscape rivers on human's perception. In this paper, visual quality of landscape of River on human will be analyzed and discussed. Assessment is based on perception research and public participation and photographs (observer-based Visual assessment).

Topic 5 Design and future of urban biodiversity

Engineering of Diverse Sown Communities on Fertile Sites

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* Presenting author

There has been a long interest in creating diverse and attractive sown plant communities. More recently this interest has started to focus on ecological restoration. Urban areas however pose new constraints and interests to the traditional field, and problems for the successful establishment of vegetation. Urban areas may hold a limited set of opportunities for the traditional communities in ecological restoration and a multitude of possibilities for more naturalistic and diverse communities. Research at the University of Sheffield has developed to application of forb rich sown communities, though diverse communities still need to overcome the constraints of fertility often found in urban areas. Experiments were carried out to assess the suitability of a less intensive method for removing the constraints of fertile soil, beyond soil stripping and inversion. The application of mineral mulch was tested for two simultaneous purposes; vigorous weed seed bank control and provision of a sowing medium. A number of substrates of urban waste have been assessed for use as the mulch, and field work has analysed the effects on establishment of native wildflower seed mixes. The findings will be discusses in terms of promoting the establishment of diverse communities and wider urban application.

Topic 5 Design and future of urban biodiversity

Contribution of urban areas to the Natura 2000 network: the case of the Brussels Capital Region

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Despite its limited surface (160 km²), high urbanization level and population density, the Brussels Capital Region hosts a wide and unexpected diversity in ecosystems and flora and fauna. This diversity is composed of fragments of natural landscapes, now encapsulated in the urban environment, (ancient woodlands, marshes, grasslands, …) as well as other man-made habitats (landscape parks, old walls, railway verges, derelict land, …) These habitats, with their associated species diversity, all have their place in the nature conservation context of a large city. However, Brussels' main contribution to urban biodiversity preservation is the implementation, in this urban context, of the European Habitat Directive, with the designation of 14 % of its surface as Natura 2000 site: 3 coherent network areas, composed of "core" and "connecting" stations. Basic assumption was the consciousness that typical urban habitats, such as old landscape parks with ponds, old buildings, and even derelict land, in combination with relics of more natural habitats, such as forests, have shown to have a particular contribution to biodiversity. The realization of the goals of favourable state of conservation of habitats and species (e.g. bats) is the « fil rouge » in Brussels' nature conservation policy and contribution to the CBD.

Topic 5 Design and future of urban biodiversity

Urban biodiversity research in the Brussels Capital Region

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Despite its limited surface (160 km²), high urbanization level and high population density, the Brussels Capital Region hosts a wide diversity in ecosystems and an unexpected diversity in flora and fauna. Since 1992, an information and monitoring network for major species groups of the flora and fauna has been installed. Data collection has been coordinated within the framework of the establishment of a bioindicator information network. Basis of this network and the long-term monitoring is the collaboration between public authority (coordination and funding of the research), scientific institutions and naturalist organizations, working in synergy with numerous volunteers. Reliable and recent overview data about species in this urban area are available for the following groups: mammals, birds, amphibians, reptiles, higher plants, mosses, macrofungi and tree-lichens. Since 2006, research has started on some invertebrates groups, such as butterflies and orthoptera. Some flagship species groups, e.g. bats, receive special attention. The data show that urban environment and development is compatible with wildlife. These data are essential information in the Brussels urban biodiversity and nature conservation policy.

Topic 5 Design and future of urban biodiversity

Greenways in peri-urban areas in Southern Sweden – how to combine goals for biodiversity and recreation

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The establishment of greenways for biodiversity and recreation has until recently got little attention in Sweden. However, recent and rapid expansion of urban areas has led to an increased demand for recreation possibilities at the urban fringe. Newly established residential areas often expand into areas with intensive agriculture, where public access is limited, and biodiversity is poor. Therefore, an increasing number of municipalities plan or have started to establish greenways in the peri-urban areas. These greenways are often supposed to be multifunctional by improving access as well as creating new habitats or corridors to enhance biodiversity. The present study investigates several aspects of greenway planning and design at the urban fringe: biodiversity, public preferences, planning strategies and landowner perspectives. Two species groups, butterflies and bumblebees, have been studied in different types of greenways and green structures that have been recently established. The results show that there is a good potential to create new habitats for these species and at the same time increase attractiveness for visitors. The aim of this project is to improve the design of peri-urban greenways that so far has been rather simplistic and does not optimize goals for either biodiversity or recreation.

Topic 5 Design and future of urban biodiversity

Urban floodplain forests in transition: how to evaluate changes in environmental conditions and the forest stand over long periods?

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Of major importance for urban biodiversity in cities are floodplain and riparian forests. Many floodplains and urban development share a long common history in Europe. To improve urban forest management there is still need to integrate biophysical, historical and forestry knowledge which reflects historic stages while predicting future developmental trends and requirements. This paper discusses indicators to determine historic and actual biophysical settings of urban floodplain forests, using the city of Leipzig as an example. It addresses an analysis of historic and current forestry measures from a conceptual perspective. The paper highlights the question of what the specific conditions are, under which urban floodplain forests exist in a growing urbanised environment and where current potential risks are for the remaining forest stands. Hereby, the paper scrutinises the importance of historical forest management for tree composition nowadays. The considerable change in tree composition and their drivers in forest management during the last two centuries are illustrated. In doing so, field experiment data prove the potential for long-term survival of floodplain tree species such as *Quercus robur*, *Fraxinus excelsior*, *Ulmus* spec. and Acer spec. For integrational purpose, spatial indicators that are incorporated into an urban 'floodplain GIS' are used to calculate the current boundaries and the extent of the floodplains. In doing so the paper examines relevant indicators such as floodloam expansion, groundwater table, relief and land use to see how useful they are for characterising current floodplain functionality in urban areas and to 'flesh them out' for an urban case study.

Topic 4 Urban biodiversity & climate change

Creating microclimatic spaces in overheated urban structures

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Climate change is taking place! Plant and animal species are reacting by moving steadily pole wards. How can we as urban landscape architects react to the more and more extreme climate in Central Europe? My paper faces the necessity of creating microclimatic spaces in overheated urban structures: both for the human thermal comfort and for the enabling of the preservation of the biodiversity that we (still) call our native flora. From History we know, that other cultures have been able to create opulent gardens under very extreme climatic conditions. An analysis of those can deliver important knowledge for a contemporary microclimatic landscape design. This study takes a close look on the design elements and their effect on microclimate of Moorish Gardens in Southern Spain and analyses the potential of their adaptation to our conditions and requirements.

Topic 5 Design and future of urban biodiversity

Designing for local ecological priorities in urban regeneration

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* Presenting author

The importance of action at a local level in delivering more sustainable development patterns has been made explicit for over 15 years. National governments have responded to this agenda, encouraging the integration of sustainable development principles into regional development plans, checklists and indicators. Ecological patterns and processes operate at a variety of scales, yet priorities are typically defined regionally and implemented by focusing on individual development plots. The heterogeneous nature of urban habitats suggest that their design and management should be informed by the patterns and processes operating in the landscape between these two extremes. The sustainability agenda has placed greater demands on development stakeholders and some question the benefit of introducing yet more guidance and checklists to reflect sub-regional priorities. The challenge is therefore to ensure new ecological features function as intended, without placing unreasonable demands on those involved. This presentation will explore existing approaches to defining and designing for ecological sustainability at the regeneration zone scale. The case study of Birmingham Eastside will be used to illustrate some of the logistical barriers and solutions to the design, implementation and evaluation of ecological sustainability at a fine scale in urban areas.

Topic 5 Design and future of urban biodiversity

Forest edge structure as a shaping factor of understorey vegetation in urban forests in Finland

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* Presenting author

We investigated the effects of edge structure (i.e. edge thickness and the composition of tree species) on the understorey vegetation at mesic urban conifer-dominated forest edges in southern Finland. We showed that forest edge structure had a significant and, mostly, predictable effect on understorey vegetation, and on the spatial extent of the edge effect. At open edges the edge effect penetrated up to 60 m into the forest patches, whereas closed edges may prevent these effects. A multilayered canopy with plenty of saplings and bushes, and 225-250 m3 ha-1 trees (dbh > 5 cm) at the edge is adequate to restrict the edge effect near the edge. In addition, due to fragmentation, the number of broad-leaved trees may increase at edges which in turn diminishes the abundance of mosses and favours nutrient-demanding herb species, thus changing the original natural understorey vegetation composition. We recommend that conifers be preferred at the edges of mesic conifer-d! ominated forest patches (appropriate proportion of conifers is 80% or more) if the purpose is to preserve the moss layer near urban forest edges.

Topic 5 Design and future of urban biodiversity

Restoring complex habitats and biotic connections in an arid urban area: from military base to public park

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* Presenting author

A 700 hectare military base in southern California has been made available to become a high biodiversity public facility, the Orange County Great Park. The park must have many functions including cultural, athletic, educational, social, and natural habitat spaces. A modern botanical garden will be included that teaches the ecological history and function of the site. Much of the landscape will be restored into a complex Mediterranean biome, including sage scrub, oak woodlands, riverine communities, and grasslands and meadows. One large natural stream that has been in a pipe for 50 years will be uncovered. These new habitats also will connect remnant nature reserves in coastal hills and inland mountains, to allow movement of animals and seeds through the region. An extension education program will make this new park a vehicle for understanding sustainable living in this arid region. The design is by a collaboration among ecologists, landscape architects, civil and structural engineers, and architects, all who are charged with making an ecologically sustainable landscape embedded in a large urban area near Los Angeles.

Topic 4 Urban biodiversity & climate change

Aspects of urban air quality in Dresden (Saxony, Germany) - passive monitoring of epiphytic lichen and changes in the contribution of several species

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Epiphytic lichens are suitable bio-indicators for estimating air pollution in a certain area. They derive water and nutrients from the atmosphere and species respond in varying tolerance levels to air pollution in short duration or long-term exposure. A high concentration of sulphur dioxide (SO^2) due to combustion of fossil fuels causes acid deposition affecting the growth and health of epiphytic lichen. Proceeding changes in frequency and distribution of lichen species and communities had taken place in the last decades. In particular large amounts of SO^2-emission in parts of the former east Germany, Czech Republic and Poland were responsible for a profoundly decrease in (epiphytic) lichen diversity. In the urban area of Dresden only two acidophilic species remain on the bark of trees: *Lepraria incana* and *Lecanora conizaeoides*. Since the 1990ies sulphur-based pollutants decline considerably and improved the condition for many sensitive species. Simultaneous nitrogen deposition increased and were implicated to promote the dispersal of nitrophilous species. In our study we carried out a mapping of epiphytic lichen for determining and evaluating the effects of ambient air pollutants with standard biological measurement procedure and consider to give an impression of lichen diversity and changes in distribution in the last twenty years.

Topic 4 Urban biodiversity & climate change

Climate change and urban biodiversity - consequence for land use and landscape planning

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The discussion about climate change and biodiversity must not only be led on expected changes for biodiversity, but also on future strategies of nature conservation. Moreover, possible contributions of land use and landscape planning to the adaptation to climate change have to be considered. That has not yet been widely discussed, but could be important for effective and successful measures. The presentation will discuss possibilities and constraints of land use and landscape planning to contribute to the adaptation to climate change. Necessary consequences for planning methods and procedures will be presented.

Topic 5 Design and future of urban biodiversity

The response of breeding bird communities to gradients of urbanisation in England

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* Presenting author

With up to 3 million new homes to be built in England in the forthcoming decades, urbanisation is expected to have a dramatic impact on the landscape as semi-natural and agricultural habitats are replaced by developed landscapes. Spatially referenced breeding bird survey data from c. 1500 1-km^2 sites in England was used in conjunction with remote sensed land cover data to model variations in bird abundance and diversity in relation to urbanisation. Overall diversity and the abundance of several individual species showed a peak at intermediate levels of suburban land cover suggesting that moderate development may actually increase bird diversity relative to many non-urban habitats. However, most of the individual species to show this pattern were habitat generalists with increasing or stable populations. Farmland bird specialists and several declining woodland species showed a decline as urbanisation increased in the landscape. This is especially important for the latter bird group, as non-urban squares adjacent to existing urban settlements (and therefore those thought to be most at risk from development) had significantly higher cover of woodland than squares more isolated from urban settlements. These findings can be used to inform future design of future urban development into rural areas.

Topic 4 Urban biodiversity & climate change

Jumping the garden fence gives a head start for plants on climate change

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* Presenting author

Conservation biologists are seriously concerned that climate change will cause widespread extinctions due to geographic shifts in habitat conditions that are too fast for many species to keep up with given their limited capacities for migration. To investigate the potential for commercial plant nurseries to provide a head start for northward range shifts of European plants in the face of ongoing climate change, we compared the natural ranges of 357 native species with their commercial ranges based on 246 plant nurseries throughout Europe. In 73% of the native species, commercial northern range limits greatly exceeded natural northern range limits, with a mean difference of ~1000 km. With estimates of migration rates of ≤1 km per year required for geographic ranges to track climate change over the next century, we expect nurseries and gardens to provide a head start on migration during climate change for many native plants. So jumping the garden fence provides an unintended mass "assisted migration", a concept which is heavily debated upon for the moment. Given the large amount of gardens in urban and suburban areas it is clear that these may acts as focal points from which migration may start.

Topic 5 Design and future of urban biodiversity

Landscape Ecological Planning: an approach to provide biodiversity conservation under urban expansion pressure in Southeastern Brazil

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* Presenting author

Rio de Janeiro urban sprawl has intensified in the last two decades. Important ecological areas have been almost annihilated. This predatory pattern spreads to the city's last natural mangrove and rain forest ecosystems refuges, in the Guaratiba district. The best conserved part of this district is located in a lowland hydrographic basin surrounded by Pedra Branca massif, where there are three Biodiversity Conservation Units. To protect this last biodiversity resorts, a landscape ecological plan, socially and ecologically sustainable is proposed. A green infrastructure planned and designed, principally structured by the blue system (hydrological/drainage networks), is appropriate to orient city growth, social needs and protection of sensitive areas, ecosystems and biodiversity. Landscape ecological planning is based on landscape ecology principles and abiotic, biotic and cultural assessments. Creating an ecological network that accommodates the needs of humans with a healthy urban environment, which takes into account natural forces, biophysical support and the connection of ecosystems fragments is crucial for a sustainable development and biodiversity conservation. South American countries have an expressive amount of biodiverse ecosystems being threatened by non-planned growth, therefore it may be decisive that ecological landscape planning be recognized as a helpful instrument to orient future policies.

Topic 5 Design and future of urban biodiversity

Biodiversity and normative "designed" urban vegetation

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Historically most ecologists have maintained a strong preference for rural vegetation that is relatively undisturbed by human beings or associated with aboriginal people or pre-industrial "sustainable agriculture". More recently some ecologists have become interested in the flora and fauna of urban habitats that has spontaneously arisen post industrialization on derelict land. Most mainstream urban landscape comprises domestic gardens and parks that are obviously designed. These may typically approximate to > 40% of the area of a city, and have been regarded as a biodiversity vacuum by policy makers and ecologists. This is because they are based on exotic species and their form and composition is very obviously determined by human agency. There is a growing body of research in Britain that suggests these attitudes are seriously misinformed, and that many of these landscapes and vegetation types are extremely rich particularly in plant and invertebrate taxa. The paper will explore the constructs that shape traditional attitudes to mainstream urban landscapes, and discuss research in both ecology and landscape architecture into both improving understanding of "normative" urban biodiversity and how the design of urban vegetation can be developed to better support this whilst maintaining cultural relevance to human beings.

Perception of Urban Green Spaces in Experts and Lay-people

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Green spaces in cities can contribute to quality of life; they however need to be designed accordingly. In doing that, landscape architects and urban planners are often left to intuition. It is also not certain whether results from general landscape perception research may be applied to urban green areas in special. Thus, we tried to systematically identify people's perceptions, needs, and assessments regarding urban green areas. It was studied how experts (landscape planners) and lay-people differ in that respect. We conducted a sorting experiment using photographs of different urban green areas varying natural vs. anthropogenic dynamics and vegetation type. The subjects (n = 82) were asked to sort the photos by similarity and to rate them in respect to personal preference as well as apparent biodiversity. The results show that vegetation height, artificiality, and accessibility are important characteristics in the perception of urban green areas. Within these features, vegetation height was the most important one for the lay-people group, while for the expert group it was artificiality. The two groups also differed in preference: while the experts preferred areas with high biodiversity ratings, the lay-people showed a strong connection of preference ratings to the perceived artificiality.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Using old isolated castles as models for the influence of settlements on biodiversity – a case study at the Wartburg Castle (Eisenach, Germany)

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* Presenting author

From the ecological point of view old castles can be regarded as prototypes for the influence of settlements on biodiversity in two aspects. Due to the climatic conditions native and exotic plants from warmer areas are concentrated here and form a distinct urban flora. As isolated urban settlements, castles have had a long influence on the biodiversity of the surrounding natural or cultural landscapes. On this basis the castle of the UNESCO World Heritage Site Wartburg was subject of a study in the year 2007. The 900 year old castle is situated on a hill in the midst of a nature reserve dominated by natural deciduous forests. Our research focused on the characteristics of the urban habitats of the castle as well as the influence of the castle on the biodiversity of the surrounding forests. The main question was whether the urban vegetation of the castle poses a threat to the adjacent natural vegetation. Beside a literature study on the land use history of the area we did an area-wide survey, analysing flora and vegetation of the castle and the surrounding area. The Wartburg is part of the excursions of the international conference “Urban biodiversity and Design – Erfurt 2008”.

Topic 3 Social aspects of urban biodiversity

Residents' attitudes towards urban nature in Swiss cities

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Two fundamental conditions exist if conservation research is to make a practical difference in urban environments. Sufficient knowledge of the state of the environment in question is required so that strategies can be developed. Sufficient knowledge of the motivations of those expected to implement the strategies, or tolerate the interventions, is required so that the developed strategies have a chance of success. An interdisciplinary project called 'BiodiverCity' adopted an approach of parallel social and ecological studies to the question of how to develop and implement strategies to enhance biodiversity in Swiss cities. Data from a nationwide survey showed that the perceived quality of nearby urban nature correlates with the perceived quality of life for urban residents. Comparison between an objective assessment of the biodiversity in particular urban landscapes and the perceived quality of nature in these landscapes showed that residents have both a consciousness and an appreciation of 'quality' urban nature. The implications of these findings for managers of urban green spaces are outlined.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Structural and dynamical differences of the edaphically mites populations (Acari: Mesostigmata; Oribatida) from urban and natural areas from Romania

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The researches were made in Ciºmigiu park (sit well structured from the vegetation point of view) from the centre of the Bucharest city and in an mixed deciduous forest from Bãneasa, a natural ecosystem from the suburban area. In park as well as in forest, the research of the edaphically mites (Ord. Mesostigmata; Ord Oribatida) was made by the transects method (T): T1= the long side (parallel with the boulevard or with forestry road); T2= the short side (parallel with street or with forestry path) and T3= the middle side (in the middle of the park or forest). From the total number of 44 identified mites species in park species 33 are decomposers (ord. Oribatida) and 11 predators (ord. Mesostigmata). In forestry ecosystem from the total number of identified mites species 42 are decomposers and 21 predators. Common species for the park and forest are 9 decomposers species: *Epilohmannia cylindrica*, *Lauroppia obsoleta*, *Protoribates capucinnus*, *Protoribates laphotrichus*, *Punctoribates punctum*, *Ramusella insculpta*, *Scheloribates laevigatus*, *Tectocepheus sarekensis*, *Tectocepheus velatus* and 4 predators species: *Lysigamasus truncus*, *Leptogamasus* sp., *Veigaia nemorensis* and *Rhodacarellus silesiacus*. Differences appeared between the decomposers and predators mites populations from the urban area and the natural ecosystem on the taxonomical spectrum, on the structural and dynamics parameters. The statistical analyse (x; s2; s) of the ecological structural parameters (x/m^2; CV; Ar %; C) of the mites populations showed an important representation of the oribatids as well as mesostigmatids from the Bãneasa forest, in comparison with Ciºmigiu park. Differences were observed in dynamic analyse of the numerical densities of the decomposers from Bãneasa 63200 ind./m^2, comparing with Ciºmigiu park 17200 ind./m^2. The predators were recorded in this park 5000 ind./m^2 and in forest 18400 ind./m^2. On the soil level, the litter and fermentation layer from forest offered the better environmental condition for the development of the edaphical population of the predators and decomposers. All these aspects are dued to the bioedaphical conditions, which were more favourable to the development to the both trophical categories from the forestry ecosystems, in comparison with urban area. The differencial researches of the mites populations from the urban and natural ecosystems can be a data base in peisagistic planning strategies.

Topic 5 Design and future of urban biodiversity

Public Parks Design : Integrating Biodiversity and Sustainable Technology

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The use of technology believed as the cause for nature devastation which collapse ecosystems. But the source whom is responsible for the nature devastation is man. Technology only tools which can be used with man wisdom to manage the nature. Natural environments have its own mechanism in order to preserve its existence, but when residing in human being environment, natural mechanism limited by man and even controlled and managed. To improve the quality of environment and maintain natural ecosystems, technology could be developed and integrated with biodiversity in urban context. So there can achieve a synergize between ecological, social and economic aspect. This paper will take a case that took place at Bandung City, Indonesia, which its public parks dominantly abandon and poorly maintain because the local government had financial difficulty, so the public parks have to self-supporting with low cost **maintenance**, and even generate income. Though the condition of the parks returned to ideal condition but without existence of goodwill to manage and **maintenance** hence its existence will not take a long time. A solution to lessen economic burden in conserve the ecosystems is maximized natural energy which can be developed by sustainable technology integrated with biodiversity.

Topic 5 Design and future of urban biodiversity

Lagos: a city of withered flora and extinct fauna - implications for biodiversity

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The growth of cities remains the most potent force against Biodiversity. Ironically, the Rio 'Earth Summit' concluded that the 21st century megacities are evolving, not in the developed world, but in the third world countries without the requisite technological and socio-economic development. This, therefore, makes most 21st century cities to be epicentres of deepening poverty and environmental degradation, thereby, posing formidable dangers to biodiversity. The average percentage of urban dwellers living in slums in sub-Saharan Africa in 2001 was 79.38%. This paper focuses on Lagos, Nigeria, with a population of 17 million, projected to become the third largest city in the world by 2015. Vegetation/green area has virtually disappeared from the city due to high demand for industrial and residential land. This paper examines the cause of the city's unrestrained population and industrial growth and its impact on climate change and biodiversity. The paper identified total neglect of the rural areas by successive governments, national economic recession, lack of incentives for farmers among the major causes and the effect include slum proliferation, worsening urban climate, diminishing vegetation, air pollution and health complications. The paper closes with recommendations for amelioration of the situation for a more sustainable environment, and biodiversity preservation.

Topic 5 Design and future of urban biodiversity

The impact of dams on biodiversity in Nigeria

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In the face of glaring global climate change, the physical environment has been undergoing tremendous transformation, resulting in change of habitat for fauna, even as flora are being lost. The rate of extinction of flora & fauna today is more than 1000 times the natural rate. Disappearing biodiversity portends grave implications for food supply and human health. This paper, therefore, examines the impact of these man-made features that has contributed to loss of biodiversity - Dams. It identifies the dangers of dam construction to include elimination of silt supply to flood plains, creation of aquatic environment which engenders the growth of harmful organisms, loss of fish in downstream areas amongst others. The paper chronicles the emergence of dams in Nigeria and the consequences of dam construction, management and failure on the immediate environment over a period of 20 years. The biodiversity loss is highlighted in each case along with socio-economic effects and loss of lives. The paper observed that several Nigerian communities and the entire flora and fauna have been totally sacked by dam construction, poor management or failure. It closes with recommendation for minimizing the environmental impact of dams on biodiversity in Nigeria.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Biodiversity of old street plantations generated by changes in the environmental conditions

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Urban biodiversity is mainly provided by parks and residential areas which comprise a great diversity of tree and shrub species, having an important role for human environment, and for the life of different biosphere components. (birds, insects, animals etc.) Street vegetation structure is less varied, especially tree lines, which generally require uniformity; having to respond to the street architectural features at the same time, the list of species is limited by the unfriendly street environment. This study investigates the changes in an old street plantation in Bucharest, due to the stress factors increasing (air and soil pollution, local climate changes). The status of tree species was evaluated in 2007 comparing with 2004 and 1990 assessments. Environmental benefits of the plantations determined its conservation as long as possible. In time, the affected trees replacement by other species, considered more adapted or being only the available material for the moment, is responsible for some kind of biodiversity that could be observed now on the site. Unplanned interventions in urban areas have major consequences in landscape perception, a great impact on vegetation status and also a major influence in urban ecosystem.

Topic 3 Social aspects of urban biodiversity

Attractivity assessment of the urban parks from Bucharest (Romania)

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Despite of the deficit in area (3 m^2 per inhabitant), the Bucharest's urban parks provide more natural services for the urban ecosystem. They are very attractive for visitors due to the endowments (vegetation, playing fields, pleasure grounds, etc.), the position in relation with the residential areas and accessibility to public transport. For the attractivity assessment of Bucharest's urban parks, we made between 2004 and 2007 a visitor's number daily census in 22 urban parks. Simultaneously, we applied a representative number of questionnaires in order to identify the visitor's profile (visit's interest, duration and frequency, motivation of park selection, etc.). The results permitted us to make a classification of Bucharest's urban parks depending on the visitor flows: municipal urban parks (over 10000 visitors/day), "sector" urban parks (2500-10000 visitors/day) and local urban parks (under 2500 visitors/day). Also, we identify the main factors that have a big influence on the visitor's flows: position, proximity, endowments, different cultural events and accessibility to public transport (especially underground and trams).

Topic 2 Cultural aspects of urban biodiversity

The determinants of woody plant invasion (*Ligustrum lucidum*) in urban vegetation

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The alien species *Ligustrum lucidum* has been planted as a roadside tree in Japan, and expansion of its range is now noticed in urban areas (Yoshinaga and Kameyama 2001), though it is not clear what kind of vegetation it typically invades. This study aimed to clarify what kind of vegetation *L. lucidum* invades easily. The survey site is Yokohama National University (YNU), including various vegetation types, and its surroundings, in the middle-eastern part of Yokohama. We conducted the following investigation and analysis:

Investigation: All vegetation on the YNU campus was meshed at 10×10m^2, and appearances of *L. lucidum* individuals in the mesh were counted. The data were layered onto a vegetation map (Tohma et. al. 1994, Fujiwara and Kusumoto 2001) and a point map of breeding individuals.

Analysis: We modeled the presence of *L. lucidum* individuals, as explained by distance from breeding individuals, cutting frequency, vegetation structure and height, relative brightness, and patch form and patch area, using a generalized linear model.

We found that the presence of *L. lucidum* was related not only to distance from breeding individuals, but also to the different vegetation types. The main determinant was difference between the presence and individuals of the *L. lucidum*.

Topic 3 Social aspects of urban biodiversity

Landscape Design and children's participation in a Japanese primary school: A planning process of a school biotope in 5 years

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The amount of open or natural space has been decreasing very rapidly especially in urban areas in Japan because of the development of housing. Preserving these spaces as children's play area and habitat of the living things is a very important issue these days. This project had started making a school garden for children's play and nature restoration since 2002 in Fukuoka-city, southern part of Japan. The aim of this project is: 1) Making a place for the children's play and ecological education, 2) Making one of the places for the ecological network in the urban area. As a result of this project, 52 kinds of plants has grown and several kinds of birds and insects come to the garden. The children play this garden in various way (over 50 kinds of play were found in this garden). Furthermore, they have learned about the existence of various ecosystem through playing and their participation by 48 times workshop. They have also actively participated in the development of an accessible environment and have proposed their ideas for its management.

Topic 3 Social aspects of urban biodiversity

Delivering cleaner, greener, safer city environments: Youth Roots Manchester

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Youth Roots, a 12 month programme of targeted activities focussed on Highfield Country Park, Manchester, UK managed by the BTCV, and set within the wider context of the UK Government's Cleaner, Safer and Greener Communities agenda. The programme aimed to engage children and young adults between the ages of seven and 24 in carrying out regeneration projects; including footpath clearance, pond work, managing wild flower meadows and mapping new pathways. A bespoke evaluation framework delivered a rich, holistic and detailed evaluation of the programme and revealed that: (1) The strategy to attract people to attend Youth Roots' events was at best partially successful. (2) Programmes with a delivery plan such as that of the Youth Roots programme should be funded in order that work with communities begins well in advance of the commencement of conservation activities. (3) Targets for projects based on individual engagement should be set at different levels than targets for group engagement. (4) The programme affected stated attitude and intentions of participants in line with those hoped for by the Cleaner, safer and greener agenda. Institutional learning developed by the BTCV during the Youth Roots programme should be shared widely as the drive for reconnecting communities continues.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Urban Flora: historic, contemporary and future trends

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The trend towards increasing urbanisation was set as the early farmers abandoned a hunter-gatherer lifestyle and began to settle in villages. City life is now the most common lifestyle as more people live in cities and towns than in rural areas. Each individual city has developed along a unique trajectory but they all share the common feature that native and exotic plant species exploit habitats which variously replicate those of more natural areas and are unique to urban areas. Three factors emerge as being paramount in the historic, contemporary and future development of urban areas: population growth, climate change and technological change. From a critical review of extant literature temporal and spatial trends in species richness, life-histories and origins of plants are identified. Trends and predictions for societal and technological influences in cities and towns are used to generate broad scenarios of future urban development. These scenarios provide a basis from which the author explores how the flora of cities may develop in the future. The resultant trajectories are assessed within the context of the Convention on Biological Diversity. This analysis raises research and policy challenges which have relevance for ecologists, planners and politicians.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Soil Microbial Diversity and Function in Fragmented South African Grasslands Along Urban-Rural Gradient.

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The diversity of microorganisms and the influence of their enzymatic activities in soil are critical to the maintenance of good soil health. Changes in these parameters may be the earliest predictors of soil quality changes, potentially indicating anthropogenic influences. The goal of this study is to investigate the soil microbial diversity and function of grasslands along an urban-rural gradient. Soil samples were collected in the Potchefstroom Municipal Area, South Africa in specific sites described as urban, suburban and rural according tot the V-I-S model over different seasons (dry cold and warm wet). Results from microbial culture dependent (plating) methods, using Shannon-Weaver diversity indices, showed that correlations exist between S-W indices within the different sites (urban, suburban, rural). Although differences between the rural, suburban and urban sites were found, these were insignificant ($p>0.05$). Analysis of enzymatic activities (microbial community function) showed similar trends as the S-W diversity. The differences along the rural-urban gradient were, in the case of some enzymatic activities, more profound as well as significant ($p<0.05$). The study continues and results on possible correlations between microbial diversity and plant diversity, soil compaction, soil pH as well as microbial molecular profiling will be included in this poster.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

A comparison of urban flora in Split, Dubrovnik (Croatia) and Mostar (Bosnia and Herzegovina)

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This paper made a comparison between the urban flora found in Split and Dubrovnik (Croatia), and Mostar (Bosnia and Herzegovina). The urban landscape in these cities is very heterogeneous, both in terms of geography (climate, geology, soil, morphology) and land use. The aim of the paper is to determine the degree of floral similarities, and to analyze city flora in terms of life forms and floral elements. Similarity coefficients (Jaccard index) between the flora found in Split and Dubrovnik, Split and Mostar, and Dubrovnik and Mostar were, respectively, 41.8, 17.9, and 19.0%. *Asteraceae* and *Poaceae* were the families characterised by the highest number of taxa at all three cities. Mediterranean floral element dominated (26-34%) in Split and Dubrovnik, while widespread taxa prevailed (22.8%) in Mostar. Therophytes prevailed (36-49%) in Split and Dubrovnik, and hemicriptophytes (44.8%) in Mostar. Most of the adventive taxa were neophytes. The highest percentage (18.7%) of neophytes was recorded in urban flora of Split. Of these neophytes, American taxa dominated in all three cities. Archaeophytes were much less common and were mainly of Asiatic origin. We consider Split and Dubrovnik a typical Mediterranean cities and its urban flora are comparable with those of other Mediterranean cities.

Topic 3 Social aspects of urban biodiversity

Finding out: Outdoor recreation habits and ecological literacy among new Swedes in urban settings

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This paper is a presentation of a human-ecological study of the outdoor habits and views and knowledge of nature among immigrants in Swedish urban areas. A concept central for this study is "ecological literacy" as a tool for sustainable planning. Is a basic ability to read and interprete ecosystems and ecological processes in the local nature a key to improved orientation in the local setting and to improved public health? Cultural integration, equality and involvement in environmental issues may enhance a feeling of belonging and local engagement in management processes. Focus will be put on women\'s needs and wishes for and knowledge about their local nature and green areas, as on possible threats and hindrances to experience outdoor recreation. The study is based upon empirical work such as focus group conversations and semi-structured in-depth interviews individuals.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Urban Land Use and Urban Vegetation of Beijing City, China

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This study analyzed the vegetation data obtained form a field survey conducted in a part of the city area, to reveal the feature of the vegetation, the relationship between plant communities and land use types as well as the contributions of different habitats to the urban plant biodiversity. The preliminary results are: (1) The vegetation of study area is different greatly from that of the whole Beijing region in the number of species and the flora composition. The number of species in study area is relatively fewer and is only 224. Compared with the natural areas surrounding Beijing, the proportion of Chenopodiaceae and Polygonaceae in flora composition of species are on the increasing. Judging from of the life forms spectrum of the flora, the therophytes is high in its composition. (2) From the downtown area of city proper to suburb periphery, the distributing area of the spontaneous vegetation increases along with the decrease of the density of buildings and the intensity of the land use. (3) The number of species increases along with the number of the habitats in an area. Especially, the increase of some special habitats, such as ruins of the natural habitat, water body, small hills, open space in the park and so on, is important to sustain the richness of species in urban area.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Old masonry walls as ruderal habitats for biodiversity preservation and enhancement in urban Hong Kong

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Of the different ruderal habitats, urban Hong Kong has a rather unique endowment in the form of old stone retaining walls (SRW). In 160 years of development, the lack of developable land has forced the city to adopt elaborate engineering measures to convert steep slopes into platforms by cutting or filling. Hundreds of SRW of various dimensions and designs have been established to support the unstable engineered slopes. Their rough surfaces and gaps between masonry blocks, soil lying behind the stone façade, and groundwater seepage, have permitted spontaneous plant growth, adding a varied vegetation mantle to the artificial cliffs. Many SRW have been colonized by large trees, mainly *Ficus* spp. with strangler habit of up to 20 m tall, accompanied by shrubs, herbs and wildlife that impart distinctive landscape and ecological characters. Recent unsympathetic wall reinforcement and urban redevelopments have brought SRW deleterious modifications or demolition. Efforts to protect this natural-cum-cultural asset are beset by inadequate understanding of the intricate association between walls and vegetation. This study assessed systematically the walls, vegetation, and association between them, pinpointing mural attributes that facilitate plant growth on the vertical habitat. The findings could inform management and conservation of a valuable and irreplaceable heritage.

Topic 3 Social aspects of urban biodiversity

Urban biodiversity as mirror for urban quality of life?

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The uneven development of cities in terms of population, housing stock and respective land use patterns contributes to a heterogeneous distribution of potential urban habitat qualities. There is recent evidence for Canadian and UK cities that urban bird diversity could serve as an indicator that mirrors socio-economic and quality of life differences within a city. Does this approach also work applied to a compact European city? In our poster we present a study of geographic species distribution as indicator for human life quality in relation to the socio-economic status of urban local districts. As study site serves the city of Leipzig in eastern Germany which is faced by socio-economic transition processes since the German reunification in 1990 and particularly since the 90ies with urban shrinkage. We suppose to find statistically significant correlations between the habitat quality (at community and species level) and major quality of life variables such as population growth rate, migration, household size, income, education, real estate property values and structure of the built environment.

Topic 3 Social aspects of urban biodiversity

People's participation in re-designing the forest in urban fringe area in Tokushima, Japan

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In Japan, mono-cultural plantation, which has been progressed from the 1960s under economy-oriented policy, resulted in fragmentation of natural forest. However, coniferous plantation, which covers wide area of Japan, has been abandoned due to economical and social change in rural area. Therefore, the Forest in urban fringe area is now facing to serious situation ecologically and socially. National and local governments have become to encourage re-establishment of natural forest and re-networking fragmented patches of natural forests under the collaboration with urban and rural people. At a site in Kamikatsu-Town, where is in a rural area in Shikoku Island, 29 volunteer groups have been participating in forest re-designing work; it was originally promoted by prefectural government, but is now managed by local group. Through the activities, local people expect urban people to widen an interest to other environments including the culture in the town. Motivation for participating in re-designing the forest differs among the groups and members; one is to enjoy within members of the group or to make new relation, and other is to touch nature and culture of Kamaikatsu. Through the analysis of motivation, a way and possibility to widen their interest is considered.

Topic 5 Design and future of urban biodiversity

Observation of some Ecological Changes in Last Twenty Five Years in the Fast Expanding Town of Rajnandgaon in the Central India A Case Study

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Rajnandgaon was a small town in Central India. Fast growing population, development activities and rapid urbanization of the adjacent villages in last 25 years drastically changed its as fast expanding city. The small tanks and ponds with crystal clear water were in the outskirts of town. It is now in the very heart of city. Untreated water of sewage, effluent and discharge from septic tank go to the ponds & tanks. It has gone like a cesspool. Wetland plants of Indian Lotus and other water plants are replaced with Water Hyacinth. Indian Lotus is globally rare and endangered species. Avenue trees are almost vanished in town. White-rumped Vulture has vanished. Loud familiar call of Blue-throated Barbet and chirping of House Sparrow are rarely heard. Three-striped Palm Squirrel and some insect, beetles, butterflies, glowworms which were common are rarely seen. Urbanization of villages, development of towns and change in lifestyle drastically declined natural environment, and biodiversity. Awareness and love to nature among the urban population is urgently sought and may be encouraged for planting trees along roads and in courtyards, keeping flowering plants on the pots, keeping water and feed for birds. Use of chemical insecticide and pesticides may be discouraged.

Topic 2 Cultural aspects of urban biodiversity

Strategies for adaptive forest management to maintain biodiversity: the case of Leipzig's urban forest

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The management of forest ecosystems in urban landscapes requires a different strategic approach than in other types of landscapes. In the case of the forests of the City of Leipzig this is a matter of dealing with a complex set of problems and challenges. In Leipzig, large areas of floodplain forests could maintain near natural characteristics with a relatively high biodiversity compared to other parts of the city. Thus, urban forest management has to be adaptive in order to maintain or redevelop a vital and healthy forest that has to serve multiple functions and services for the benefits of the citizens. However, many of the management problems and scientific questions are related to forest structure and biodiversity. Which areas of the forest are resilient and which are sensitive to change? Where should natural processes be promoted and where is human intervention required? Modern information technologies support the management processes, like e.g. forest inventory database and Geographical Information Systems (GIS). Beyond this, urban forestry needs to inform and involve public and private stakeholders. Based on examples of current management strategies related to urban biodiversity this paper will focus on good experiences and problems in this process.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Becoming urban: behavioral and evolutionary implications of living in the city

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The city may be the ultimate expression of the human effort to control our environment: in evolutionary ecological terms, it represents a strategy to minimize the risks of starvation and predation by creating habitats which dampen natural variability in climate and food availability, and provide shelter from predators. Simultaneously, humans also generate a considerable surplus of food, making cities attractive habitats to many other wild species. Recent theoretical work by myself and colleagues shows that typical changes in spatio-temporal patterns of food availability (≈ higher and more predictable) and predation regimes (may be lower) accompanying urbanization can alter competitive dynamics such that weak competitors survive better in urban than in more natural habitats. This has several implications for species that are able to invade the novel urban habitat: higher population densities, potentially reduced selection pressures, and in turn, greater vulnerability to sudden environmental changes. In this presentation, I extend the theory to evolutionary time-scales, and explore implications for the evolution of commensalism and the continued coexistence of other species with humans, using recent work on house sparrows (the ultimate commensal now at risk in urban habitats), corvids (suburban Scrub Jays), and south Asian primates (urban Macaques and Langurs).

Topic 3 Social aspects of urban biodiversity

Biodiversity and usability of green spaces in Greater Manchester, UK

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A general notion exists that the presence of semi-natural green spaces can be very important for inner-city residents, especially those living in areas threatened by social exclusion and community disintegration. However, the actual potential of these sites to sustain biodiversity and simultaneously provide services for the people needs to be investigated in more detail. This paper summarises the results of field studies carried out in socially excluded areas of Greater Manchester, UK that aimed to assess the potential of green spaces to sustain biodiversity and meet the needs of local residents alike. A random sample of 80 sites was assessed, using vegetation structure, habitat diversity and successional stages as surrogates for biodiversity, and accessibility, cleanliness and safety, provision of facilities and state of repair as surrogates of usability. The results indicate that the potential of the sites to contribute to higher biodiversity in urban areas is not associated with their usability for local residents. The results are discussed in light of the current policies on urban green spaces in the UK.

Topic 3 Social aspects of urban biodiversity

Urban green spaces: natural and accessible?

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The presence of semi-natural green spaces is seen as very important for inner-city residents, especially those living in areas threatened by social exclusion. Consequently, the UK Accessible Natural Greenspace Standard specifies that no-one should live further than 300m from the nearest green space. However, in many cites, semi-natural areas are absent from the places suffering from complex social problems. This paper investigates the provision of green space in areas of different levels of material deprivation and community disintegration in the Greater Manchester conurbation, UK. Green spaces were divided into three categories, based on the proportion of natural vegetation present, and then surrounded with 300m buffer using GIS. The number of addresses within the buffer was recorded in each green space category, together with their socioeconomic characteristics. Surprisingly, the results indicate no significant association between access to green space and material deprivation. Conversely, community disintegration has a strong negative correlation with presence of accessible green space (between -0.76 and -0.95 for the three green space categories, $p<0.01$). Therefore, while green spaces are evenly distributed in wealthy and poor areas, they are absent from the areas of social conflict where they could act as common, accessible ground for different communities.

Topic 2 Cultural aspects of urban biodiversity

Biodiversity in urban forests: chances and restrictions, characterized by data on forest structure and forest functions

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Forests, particularly urban forests, have to be managed under conflicting requirements. The allocation of certain forest functions to certain forest stands can contribute to solve these conflicts. In comparison to average forests both maps and definitions of forest functions have to be much more detailed under urban conditions. Biodiversity has to be regarded as only one aspect among various, to some part conflicting functions which can be summarized under three headlines: Production functions, protection functions and recreation functions. According to the results of a research project on optimizing forest functions for a larger forest area under urban conditions biodiversity aspects can be picked out for a special analysis of priorities and conflicts. Parts of the forest which are characterized by indicators for high biodiversity can be selected by using available data bases such as the forest management plan, habitat maps and information on forest structure and site quality.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

A preliminary survey to assess the plant and bird diversity in the urban greenspaces of National Capital Territory of Delhi, India

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There is an increasing interest in maintaining urban biodiversity because today, close to half the world's population live in urban centers, and the proportion is likely to grow as an increasing amount of the world's economic activities concentrate in urban centers. The issue becomes important specially in the light of achieving the biodiversity 2010 target. The present study was conducted in the rapidly urbanizing capital of India. The urban landscape of Delhi, the capital city of India, consists of a broad spectrum of environments ranging from the ridge area and city forests to highly modified artificial landscapes in certain parks. We randomly selected 19 greenspaces of Delhi to assess and compare bird communities, and their relationship with the habitat features. Results show that the presence of exotic trees in the greenspaces lead to a significant decline in bird species richness. Principal Component Analysis (PCA) shows that as the area of the greenspaces decreased, there was a corresponding decline in the shrub density and decrease in abundance of forest loving bird species. We suggest that larger greenspaces with high structural diversity will be effective in conserving plant and bird diversity in the study area.

Topic 5 Design and future of urban biodiversity

Mixed Perennial Plantings on Gravel Substrates as a Key to Diversity And Low Maintenance Demands

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To reduce weed competition in perennial plantings the on-site-stress should be emphasized by using stone chips as substrate. In five year trials mixtures of certain species/cultivars were randomly planted at Anhalt University using a gravel bed covered by a mix of topsoil and gravel. There is an improved visual appearance but no significant reduction in maintenance. Together with partners (parks departments and planning offices) plantings on pure gravel substrates were realized on several inner city sites, which showed very encouraging results: very low weeding requirement and exciting visual displays. Proposals for suitable plant taxa, fertilizing recommendations and application possibilities will be concluded from the studies.

From „lunar landscapes“ to biotope mosaics – the value of post-mining areas for nature conservation

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In eastern Germany more than 1200 km² are directly affected by surface mining of lignite. In 1990, only 55 % of this area had been restored. Between 1994 and 2002, we documented the results of up to 30 years of spontaneous succession on non-recultivated former mining sites in Saxony-Anhalt. Specific site conditions such as a high heterogeneity in terms of substrate, geomorphology, and hydrology in combination with nutrient-deficiency led to the development of biotope mosaics that offer niches for a wide range of plant and animal species. We found that colonisation processes are influenced by the availability of seed sources as well as the suitability of sites for establishment. Our studies resulted in the determination of the developmental potential of former mining areas on landscape, biotope, and species level. Based on these developmental potentials, close-to-naturalness and biodiversity are the main targets for priority areas for nature conservation. Today, 12,500 ha of priority areas could be secured in post-mining areas in eastern Germanys – mostly for process conservation and soft tourism. Especially in densely populated areas with intensive agriculture this can enhance the quality of life in the region.

Topic 5 Design and future of urban biodiversity

Near-natural restoration of post-industrial areas in eastern Germany

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The ecological restoration of post-industrial areas, such as surface-mined land, presents a great challenge. On most of these sites traditional restoration often destroys valuable ecological potential by levelling of the surface, ameliorating of nutrient-poor substrates, and seeding of species not suited to present habitat conditions. If the vegetation development must be accelerated due to a danger of erosion or public demands, suitable near-natural methods are available (e.g. application of seed-rich plant clipping material, mulch seeding of site-specific, autochthonous species) that ensure a high biodiversity on the sites. Beginning in 1994, large-scale trials were set up on different, unvegetated slopes in surface-mined land in Saxony-Anhalt/Germany. The target vegetation ranges from psammophytic to mesic grassland. Compared to untreated control plots these methods are very successful in establishing site-specific plant communities. During the observation period on all sites the number of target species originating from donor sites remains very high. Additional, the mulch layer ensured an effective erosion control from the very beginning. Despite the success of these methods, the transfer of knowledge between scientists, practitioners and administrative organisations has proved to be insufficient. Therefore, one of the main tasks in ecological restoration must be the establishment of a network of excellence to enhance the exchange of knowledge.

Topic 5 Design and future of urban biodiversity

Development of intra-urban green along the flowing waters of Erfurt

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Development of intra-urban green along the flowing waters of Erfurt Due its location in the Gera River's glacial valley the capital of the free state of Thuringia is rich of Special Landscape Areas. Several lateral branches of the Gera River are running through the centre of Erfurt. A huge number of ancient mills showing the past economic importance of these waters. Nowadays the intra-urban waters of Erfurt as part of sustainable urban development are designed to meet the requirements for species and habitat protection. Redesigning the waters north of the Kraemerbruecke is of particular importance. Aside from the new established Venedig Park there is good example for the balance of landscaping and a species-rich plantation already to be found in a smaller park facility called Daemmchen. A trail which leads along the river passes different urban-planning context. Finally it reaches the northern part of the Gera River Valley where some lager park areas are situated. Preservation and further development activities had been focused on riversides. According to location requirements different types of biotopes were created by graduated planting including perennials and groves. Meanwhile the green backbone of Erfurt's Old Town has a favourable effect on its historic buildings as well as on future building sites.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

The hotspot is not that hot – functional and phylogenetic patterns of urban species diversity

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Many cities are richer in species than their rural surroundings. This pattern has been analysed several times; other levels of species diversity, e.g. functional and phylogenetic diversity have rarely been examined within an urban-rural context. However, they can provide more detailed information than species richness. We asked whether phylogenetic diversity reflects the high urban species richness and whether phylogenetic patterns are functionally structured. From the FLORKART plant inventory and the BiolFlor trait database, we calculated the average phylogenetic distinctness (AvPD) of vascular plants per grid-cell (c. 130km² each) in Germany; for the total flora and for all plants with a selected trait state (traits: life span, leaf anatomy, floristic status). Phylogenetic diversity increases with increasing AvPD. We differentiated between urban, agricultural and forested/semi-natural grid-cells and compared their AvPD-values (z-statistic; Mann-Whitney-Wilcox-U-test). Phylogenetic diversity was highest in forested/semi-natural grid-cells for the total flora, pluriennials, plants with hygromorphic leaves and natives; but highest in urban or agricultural grid-cells for annuals, plants with succulent or scleromorphic leaves and neophytes. Phylogenetic diversity does not reflect the usually high urban species richness. The urban environment acts like a filter that affects species richness and phylogenetic diversity in different ways. Land-use homogenisation decreases phylogenetic and functional diversity.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Brownfield biodiversity: the value of open habitat mosaics on previously developed land

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Nature conservation in the United Kingdom (UK) has traditionally focussed on the semi-natural heritage of the farmed countryside. Previously developed or 'brownfield' land has, until recently, largely been neglected. The inclusion of a Priority Habitat within the UK Biodiversity Action Plan of Open Mosaic Habitats on Previously Developed Land reflects recognition that much 'brownfield' land shares common ecological characteristics which allow these sites to support species that are rare or declining within the wider environment. In landuse planning terms, 'previously developed' or 'brownfield' land encompass an enormous variety of land covers from derelict buildings to abandoned quarries and domestic gardens. The particular subset of sites considered here share structural characteristics, levels and types of environmental stress and disturbance. They represent a rare type of habitat in lowland Britain, namely a primary succession. Soil cover is patchy and sparse and compacted substrates commonly give rise to shallow and ephemeral pools of standing water. The resulting mosaics of open ground and vegetation support species of conservation importance across a range of taxa including birds, vascular plants, lichens and invertebrates, especially coleoptera and aculeates.

Topic 5 Design and future of urban biodiversity

Vegetation dynamics on extensive green roofs

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This contribution explains floristic composition of an Extensive Green Research Roof in the first 9 years. Two experiments had been done. The first; on a shallow layer of 7 - 8 cm of three different growing media the vegetation dynamic was investigated. This may be a minimum thickness to establish Extensive Green roof vegetation with a cover of about 60% higher plant species. The second experiment was prepared with the same initial species in 26 green roof research boxes with a depth of about 40cm on the same roof with two variations in growing media. Both experiments started in 1999. Annual vegetation analysis was done. The results were interpreted under the aspects of similarity between, the floristic composition, the variables and the years. Some interpretation to enhance species richness will be done The shallow growing media carries a Moss and Sedum dominated vegetation cover. The research variables with the deeper growing media carries a grass dominated vegetation cover.

Topic 5 Design and future of urban biodiversity

Restoring Satoyama and urban biodiversity through citizens' participation: A case study of Japanese urban forests in Higashiyama, Aichi Nagoya

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As a potential city for hosting 10th meeting of the Conference of the Parties (COP10), Nagoya designed a plan for urban biodiversity. Despite its size of 2.2 million residents, Nagoya has two unique ecosystems, tidal flat and urban forests within its area. Historically, the city struggled to balance urban pressure and resource needs against conservation of its urban biodiversity. Increasing pressures by neighbouring residents are threats to urban forests. Conservation of biodiversity is aimed by designing sustainable use patterns of urban forests. Based on past experiences, current plan targets the restoration of its urban forests by facilitating the participations of local residents. As part of the plan, urban forests are categorized into five areas based on human uses: Satoyamaya, animal watching, environmental education, cemetery and waterfront. Satoyama means forest areas that exist between residential and mountainous regions and they used to supply fuel and daily commodities for local communities. The challenge with the current plan is to translate conservation and sustainable use, two of the three objectives of the Convention on Biological Diversity (CBD), into implementation. Restoring Satoyama is regarded as a one model in achieving such objectives. In this paper, examples of citizens' participation will be discussed.

Topic 3 Social aspects of urban biodiversity

Wildboards, foxes and geese invade German cities

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Tattered garbage bags, stolen boots and toys, destroyed backyards, noise pollution and excrements in backyards and public greens are just a few problems wild animals cause in German cities. Fear of diseases, damages, injuries on the one hand and the feeding of wildlife downtown on the other hand, deepen the conflicts between humans and wild animals. To solve these problems it is necessary to use instruments of wildlife management. The tight connection of habitat, animal and human makes it necessary to analyse these factors especially the part of the human dimension. The citizen's attitudes and worries towards the specific wildlife problem and to the wild animal itself are indispensable for a professional, accepted and successful management plan and its implementation. At the example of wild boar, fox and geese, questionnaires and face-to-face interviews where used to reach the general public and people concerned (return rate up to 97%). The results have been evaluated to find people's attitudes towards their specific conflicts caused by wildlife in they're corresponding cities. The civil institutes track the aim to reduce conflicts between humans and wild animals as well as between humans themselves.

Topic 5 Design and future of urban biodiversity

Lost chance - open future. A historical manorial farms in town neighbourhood

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A rapid growth of polish towns lead to irreversible destruction of many manorial farms, which have been set in their closest neighbourhood. Especially after the World War II, destruction process have speeded up. In the beginning of XXIc, next stage of towns development is observed. In that process a wide areas of historical manorial farms are endangered again. As a large open space areas of high landscape importance and valuable reservoir of biodiversity, these grounds require protection during planning process, before developing lobbies force to built them up.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Function of different urban habitats for the establishment of sustainable plant populations

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Although urbanisation is mostly perceived as a threat to biological diversity, urban areas may harbour high numbers of both native and non-native plant species. While previous research mostly focuses on presence/absence data from grid mappings, we used a population-based approach by differing between the occurrence of transient or established populations in urban habitat types of Berlin, Germany, that vary in origin and levels of disturbance (high, medium, low; the latter divided in pristine and man-made habitats). The results show a decreasing species richness from pristine to highly disturbed sites that harboured between 46-27% of the total flora (1396 species). Patterns for native and non-native species strongly varied. Endangered species did occur in man-made habitats, but were mostly confined to pristine habitats. The percentage of species with only transient populations clearly increased from pristine to strongly disturbed habitats. Species traits analysis revealed clear differences between species that were or were not able to establish sustainable populations in different urban habitat types. Our results show that information on high species richness in urban areas has to be put into perspective by reflecting the varying potential of different species groups to establish sustainable populations in different types of urban habitats.

Topic 2 Cultural aspects of urban biodiversity

Ottomans' perspective of green spaces and biodiversity

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Green spaces have been admired by various civilizations throughout the history, and gardens had functional, aesthetic, symbolic and recreational importance. During the Ottoman Period, Ottoman sultans have respected and admired green spaces. Beauty and functionality were held together. The palace gardens, mesires (large greeneries for recreation) and groves had displayed prosperous biodiversity with the flora and the fauna they had embodied. The palace gardens of the Ottoman Empire in Istanbul had grandiose open spaces, as well as fruit gardens, vegetable gardens and hunting groves. Mesires and groves of the past, which could also be regarded as pioneers of modern parks, were parts of the green system of cities and contributed to the biodiversity in urban areas. In this paper, historical gardens which displayed social, cultural and ecological integrity will be touched upon. Thus, the imperial palace gardens, mesires and groves of Istanbul during the Ottoman Period will be discussed, and the importance of the flora and the fauna in the history will be explored.

Topic 3 Social aspects of urban biodiversity

"Kleingärten" - allotments as a component of sustainable customisation in social, economical and ecological structures in shrinking and growing areas

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Studies and monitoring in the process of the reconstruction of cities become even more focused and therefore extremely precise. In this process detailed decoding of the cultural landscape is seen as the basis of a sustainable development and arrange with the scale of "colony-clusters". "Colony-clusters" are spatial recurring elements of urban patterns, which were grown historically. They are linked with each other in terms of time-phased, social and collective relations. Their physical aspects are creating a density of "colonised" regions. Functional and infrastructural linkages lead to a temporary dense of utilization and centralizations of urban structures. The development of each "cluster" depends on the social and economic situation of its users as well as on the demand. Conditions, which are influencing life of citizens in urban structures, no matter if village or metropolis influence the scales for the development of its "colony-clusters". Therefore the inhabitant of a colony is a resource as well as the main generator of development. Based on own empirical data assessments the University of Applied Sciences Erfurt investigates effects from demographics, de-economization and suburbanization on the "colony-cluster" allotments since 2004. The case study for Thuringia shows that the effects of shrinking and growing have direct and spatially differentiated effects towards the allotments.

Topic 5 Design and future of urban biodiversity

Analysing urban public and private green areas in Buenos Aires using terrestrial and remote sensing data

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Results are presented of how remote sensing data can be used to detect and describe urban public and private green areas. In addition, examples are given of how this data can be combined with terrestrial field surveys to get detailed and updated information about the ecological design of public parks. The presented research was realised in Buenos Aires, following an urban to rural gradient in the Southern part of the city. Information about the amount and distribution of private green area was obtained, analysing high-resolution satellite images with different techniques. Six urban parks were evaluated, deconstructing their composition by combining terrestrial and remote sensing data. The advantage of using satellite images for urban biodiversity projects is their wide-ranging cover. Changes in the composition and design of green areas can be detected more effectively and less cost-intensively than realising field surveys. In the case of Buenos Aires, where private green areas like gardens are often located inside of one housing block and are not visible from the street, remote sensing data can produce exclusive information. Therefore, this type of data can play in an important role for an ecological urban development.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

What species changed in isolated evergreen broad-leaved forests around Shinto Shrines in Japanese urban areas and countryside over the past c. 30 years

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Protected temple and shrine forests, where natural vegetation remains, are valuable in Japan and China. These forests can aid conservation efforts by documenting species changes and other effects of urbanization on species composition of isolated evergreen broad-leaved forests. We studied this over the past 30 years in the urban area and countryside around Tokyo.

Vegetation samples and the locations of evergreen broad-leaved forests around Shinto Shrines and Buddhist Temples were collected up from the scientific literature: Miyawaki (1979), Environment Agency (1979, 1980), and Green Area Study Group (1974~1983). The vegetation was inventoried again at the same locations.

The past and present species compositions were compared, suggesting several patterns:

1.) In urban areas, bird-dispersed species from natural forests increased, such as *Neolitsea sericea*, ornamental and garden species also increased, such as *Eriobotrya japonica*, and *Ligustrum lucidum*,

2.) In suburban areas, deciduous secondary forest species decreased, especially decideuous shrubs such as *Viburnum dilatatum*. Understory herb species of evergreen broad-leaved forest, such as *Cymbidium goeringii,* which have relatively small areas belonging to them, also decreased.

In isolated evergreen broad-leaved forests of urban areas, seed dispersal and seedling establishment depend on birds. In the countryside, on the other hand, progress depends on succession.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Distinctive characteristics of urban biodiversity - old urban parks: case study of UNESCO world heritage "Park an der Ilm" in Weimar, Germany

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In order to examine the distinctive characteristics of urban habitats, in 2006 a case was carried out to analyse the diversity of higher plants and vegetation in historical urban parks. The UNESCO world heritage site "Park an der Ilm" in Weimar, Germany was chosen for the investigation area. Covering 48 hectares it is one of the largest parks of the federal state of Thuringia. Its beginning as a landscape garden dates back to the 18th century. The study verified that historical urban landscape parks are among the urban habitats with the highest diversity of species. They provide refuges for species and natural and semi-natural biotopes such as forests and meadows, which otherwise could not exist in urban areas. Historical urban landscape parks also host indicator species of old gardening art, e.g. *Ornithogalum umbellatum*, which are almost confined to these areas, at least in central Europe. Urban parks are important for citizens to have contact with nature and for recreation within the city and they make an important contribution to the biodiversity of urban areas. "Park an der Ilm" will feature one of the thematic excursions during this conference.

Topic 5 Design and future of urban biodiversity

Ecological Design and Management of public areas - 10 years of experience in the outside facilities of the Bavarian Environment Agency

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The Bavarian Environmental Agency (LfU) is situated in the city of Augsburg, in the valley of the river Lech. In former times the river carved out a wide valley with many patches of dry and oligotrophic vegetation. This vegetation was grazed by the sheep of nomadic shepherds until the mid 20th century, creating the heathland whose remnants can still be seen today. The construction of the Bavarian Environmental Agency took two years, from 1997 to 1999. The guiding principles when designing our outdoor facilities were to preserve the wide open spaces of the native landscape, to create a variety of different habitats, to reconstruct the former heathland, and the careful use of resources. Another important aspect was the establishment of long-term-monitoring areas to produce a survey of the development of the different habitats. As buildings and structures contrast strongly with the flat and open ranges of the original heathland, the architect tried to lessen this by letting the structures flow into the open landscape. By reducing fences, the outdoor facilities are much more available to the general public, and help inspire neighbours and visitors to implement ecological design of their own.

Topic 2 Cultural aspects of urban biodiversity

Behavior and spreading of *Ailanthus altissima* in urban habitats of continental Greece

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Tree of heaven (*Ailanthus altissima*) was brought in Greece for gardening purposes. This invasive species is spreading easily to areas where human activity occurs while it has recently been found to non urban areas. *Ailanthus altissima* is spreading rapidly in urban areas due to its wide-spreading shallow root system, its high seed production, its high competitive ability and its high tolerance in polluted environments. Its ecological characteristics could pose a serious threat to the urban biodiversity. The investigation of its spreading in urban environments could provide important information concerning its ecology and its habitats. The purpose of this study was to determine the urban habitats that this species is spreading in continental Greece. The collected data indicate that the tree of heaven is found along roadways, in parks, alleys and even through cracked walls and roofs.

Topic 5 Design and future of urban biodiversity

Master planning for biodiversity - the Bavarian concept of investigation and design of biodiversity in cities

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In 1979 the Bavarian Environmental Agency began habitat mapping of cities to document the biodiversity of urban areas. The mapping of 25 independent cities was completed in 1989 and has since been updated.

Cities only have a limited area at their disposal for nature conservation. Undeveloped areas are scarce and under high pressure from a variety of economic and recreational interests. Making the most of these limited resources is the idea behind the Master planning for biodiversity. Therefore habitat mapping is conducted as the basis of a city's Master Plan. Additional studies include mapping fauna, land use and urban structure mapping, as well as surveys on soil, water, climate and recreation.

The Master planning for biodiversity in Bavarian cities seeks to harmonize nature conservation, preservation of abiotic resources and outdoor recreation. The end product is a versatile tool to help cities fulfil their environmental obligation to preserve and maintain ecologically sensitive public lands. It shows important recreational areas, plans biotope network systems, explains abiotic conditions and indicates failures in those areas, which require a new design to meet with multiple and complex demands.

Topic 5 Design and future of urban biodiversity

Nature-Park Südgelände Berlin - Nature protection and recreation on a former railyard

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About 50 years of natural succession have converted the Südgelände, a derelict shunting station in the heart of Berlin, into a highly diversified piece of natural urban landscape. The idea of creating a “Nature-Park” on the site was more than anything a protest response by a local group of concerned citizens against the reestablishment of a new shunting station which had been proposed by the local authorities at the beginning of the 1980s. In 1999 the Südgelände was officially recognised as a nature protection area. There were two main challenges facing the project from its inception: (1) how to open the site to the public without endangering the rich flora and fauna present, (2) should the natural vegetation dynamic be influenced or not. The concept highlights the inherent qualities of the site. The immense variety of vegetation and the remnants of train use are presented by a concept of low impact in which most paths follow the tracks while an additional metal walkway construction traverses the four hectares of nature conservation area, allowing the patterns of vegetation development to continue. A maintenance and development plan was done to keep the qualities in the long term.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Evaluation of ornamental species as hyperaccumulator plants for soil remediation in urban green areas

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The problem of pollutants' deposition (metals and organics) in urban environment is a long-term natural phenomenon accelerated, during the last decades, by human activities. The rank of metals in soil and water can be dangerous for human health. Therefore, when the risk of human exposure to contaminants exceeds an acceptable level or when the soil needs to be restored to its original functionality, soil remediation is required. Phytoremediation is the use of hyperaccumulators and high biomass plants for the removal of contaminants in soil and water. It can be an effective soil remedial method, especially in urban environment, as sustainable alternative to conventional cleanup techniques. Plant species have different ability to remove and accumulate heavy metals, moreover plants in urban areas may have also significant ornamental values. So, the aim of the study was to explore the use of some ornamental species (*Alyssum, Brassica, Helianthus, Pelargonium, Silene*) with different phytoextraction capacities. A field study was carried out, from 2005 to 2007, to determine the efficacy in metal removal (Pb, Ni, Zn, Cr e Cu) from soil in three different urban green areas in Asti and Carmagnola (Piedmont - Northern Italy).

Topic 4 Urban biodiversity & climate change

Quantifying Benefits of Urban Green Spaces for Climate Change Mitigation: Experiences from a CITYGreen Study in Leipzig, Germany

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Greenery in urban areas are essential liveable-city ingredients, and many current research on sustainability of cities had favoured the implementation and conservation of urban green spaces. Some researches testified its important role on mitigating the adverseness of climate change, such as climate melioration, generating shading effects and energy savings, lowering storm water runoff, CO2 sequestration. Studies using the software CITYGreen, a GIS-based tree benefits evaluation tool, have been widely reported in the United States, while similar research experiences are hardly found in Germany. This paper demonstrates the initiative of analyzing and quantifying tree benefits related to climate change mitigation, which urban trees can provide to the community in the city of Leipzig, Germany. It is argued that this approach allows stakeholders in the community getting a better understanding of the added value from urban greenery as a benchmark and this should be used to support management decisions and future scenario planning of green spaces. Moreover, it has potentials to improve strategic policy-making and governance of urban forest issues dealing with the challenges of climate change in urban areas. Finally, the paper gives an evaluation of the applicability of the software tool based on the experience drawn from this German city.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

A Study on measuring the Habitat Functions of urban Wetland - Guandu Nature Reserve in Taipei City, Taiwan

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* Presenting author

With the development of urbanization, the urban ecosystem is under pressure of human activities; the urban rivers in mega-city reflect such kind of problems especially. Therefore, good river management could show the positive feedback to the quality of urban environment. Guandu Nature reserve is a typical estuary wetland (ca. 55 ha.) at the convergence of Keelung river and Danshui river, where is located at north-west of Taipei city. This area is a hot spot of migratory birds, great numbers of migratory stop by here in winter; it's also an important bird area (IBA) of Birdlife international. The main ecological services of this wetland are 1) Flood control, 2) Purification of water, 3) Natural habitat for plants and animals. However, the biodiversity of this wetland is getting reducing in recent years due to habitat fragmentation, water pollution, global climate change, and river canalization. This study would analyze the problems by PSR (pressure- state- response) framework, which will clear the impact of environment and herewith the targets are established, which are 1) Biodiversity promotion, 2) renew and maintain the habitat functions, 3) upgrade the ecological services of urban river.

Topic 5 Design and future of urban biodiversity

Integrating ecological modelling into urban planning processes considering biodiversity issues: a review

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Biodiversity is more and more becoming a key issue in planning, both in urban as well as in nature conservation areas. Still, our understanding of its functional role is not complete and planners do not have an established method how to deal with the concept of biodiversity in planning. In ecological modelling, there are several attempts to rate and assess biodiversity. In this contribution several published approaches from different European countries will be analysed, to suggest concepts of how ecological modelling can assist urban planning processes. We will ask: - What kind of indicators were used and why? - What correlations were analysed with which methods? - What were the main findings and how can they contribute in problem solving? - How much depend the findings on available data? - What kind of measures was suggested to restore, enhance and protect biodiversity? The investigation focuses on urban areas within European cities. The main aim of this review lies in formulating general paths to transfer ecological knowledge and methods into planning practice.

Topic 5 Design and future of urban biodiversity

Establishing low-maintenance wildflowers vegetation in urban parks in Piedmont, Italy

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The aim of this research was to investigate the establishment of wildflowers in northern Italy, in order to reproduce delightful landscapes in urban parks. Experimental fields were arranged by growing under low water availability conditions, low cultivation costs, fast growth, ornamental value and enhancement of biodiversity. Species chosen belong to 3 different groups: italian meadow, non italian meadow, North-American dry prairie. Each field was seeded with a mix composed by 20 species and sowing rate was 2000 seeds/m2. Sowing season and plant communities were the key variables of the study. Overall lowest emergence and plant density were recorded in late winter sown, in particular by north american species. Late autumn sowing of the same plant community revealed to be the best choice in order to obtain, during the next year, 100% covered plot and absence of weeds, here particularly aggressive because most of them characterised by C4-assimilation. The most successful species were *Echinacea pallida*, *Echinacea paradoxa, Asclepias tuberosa, Ratibida pinnata, Rudbeckia fulgida* and *Amorpha canescens*. By introducing to North-American mix european and italian species, like *Eryngium planum*, *Veronica spicata* and *Oenothera tetragona*, is possible increase beauty, range of available colours and dry tolerance of plant community.

Hybridisation as an evolutionary factor in the phytodiversity of urban-industrial brownfields in the Ruhrgebiet

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The phytodiversity of urban-industrial brownfields is significantly high in correlation to the diversity of habitats. Additionally to the brownfield specific phytocoenoses with a number of endangered and phytogeographic remarkable species (apophytic occurrences) a lot of anecophytic hybrids and hybrid derivative taxa can be found. Studies in the urban-industrial brownfield areas Waldteichgelände (Oberhausen), Brache Vondern (Oberhausen), Zeche Hansa (Dortmund) and Holzplatz (Kamen/Bönen) pointed out that most spontaneous hybrids are present in Onagraceae (*Epilobium*, *Oenothera*) and Salicaceae (*Populus*, *Salix*). In *Oenothera* the heterogamic breeding system leads to paraphyletic species-similar complexes. In *Epilobium* some hybrids become stable derivatic taxa after short times and now begin to spread. Also some Salix hybrids are generative stable. Apomictic and autogamous taxa are also present and take part in hybridisation. Especially primary *Rubus* sect. Corylifolii hybrids and their derivatives can be found. It seems that autosegregation plays only a minor role in apomictic species on brownfields, so hybridisation is a major evolution process in the development of anecophytes on brownfields.

Topic 5 Design and future of urban biodiversity

Landscape Valuation to Preserve Canopy Roads in Tallahassee-Leon County, Florida, USA

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Recent surveys showed natural open spaces, gardens with native plants, and wilderness areas were among the most valued features homebuyers look for when selecting residential neighbourhood to locate or live. As one of the most densely populated and fastest growing metropolitan areas in Florida, the City of Tallahassee-Leon County has lost much of its natural areas to residential and commercial development in recent years. In an effort to minimize the negative impacts of land development, the local government has designated a network of roads as canopy roads for their significant aesthetic, cultural, and historic values. We analyzed the relationship between housing prices and proximity to canopy roads using the hedonic pricing technique. Together with structural and neighbourhood variables, four environmental and landscape variables generated from satellite images using GIS were considered. Our hedonic model indicates significant financial incentive to preserve the canopy roads. The results also suggest that both local government policymakers and developers need to weigh the benefits with the costs of building commercially or redeveloping into more traditional roads system. Increased public perception of the value of canopy roads can guarantee success integrating protection for their ecological function into new projects.

Topic 5 Design and future of urban biodiversity

Ethno-cultural diversity in everyday neighbourhood space: planning and designing for interethnic interaction

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* Presenting author

This research investigates the potential for planning and design in everyday neighbourhood spaces as a means of promoting cross-cultural interaction. The research asks whether such everyday interaction over time will enhance residents' sense of belonging and stability in the neighbourhood population. Two San Francisco Bay area neighbourhoods are investigated – one which has high levels of ethnic diversity, but exhibits high levels internal segregation; the other which has high levels of ethnic diversity, with high levels of internal integration. Everyday spaces of diversity, like grocery stores, bus stops, and parks, are located within the respective communities and resident interviews and observations record the role of these spaces in promoting interethnic interaction. Interactions are then analyzed as to the ways that they might contribute to residents' sense of belonging and long-term residency. The main questions posed by the research include: to what extent do everyday spaces act as seams or barriers to interethnic interaction? What affect does interaction, both positive and negative, have on residents' sense of belonging and residency choices over time? In effect, the research asks whether planning and design of everyday spaces in ways that promote interethnic interaction might achieve greater resident satisfaction and neighbourhood stability over time.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Assessing gene flow in urban areas

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In fragmented landscapes, gene flow is generally known to increase population viability. This may be particularly crucial in urban areas, where plant populations can be highly isolated by the presence of buildings, and thus more likely influenced by stochastic processes. The persistence and composition of urban plant communities is consequently dependant on the ability of seeds and pollen to migrate across urban structures. In this study, we assess gene flow among sites in the urban area of Paris. Four complementary approaches are used: (1) estimation of pollen flow by tracking the dispersal of fluorescent dyes (2) assessment of seed flow by distributing “seedcaptors” throughout Paris; seedcaptors are pots filled with sterile soil, in which dispersing seeds may fall and eventually germinate (3) indirect assessment of gene flow using microsatellite markers and genetic differentiation among plant populations (4) indirect estimation of species migration via similarity indexes among plant communities. We show that the presence and characteristics of obstacles influence gene flow among populations at a small spatial scale (<100m). Even the Seine River appeared to act as a barrier for gene flow. In contrast, other structures such as feet of urban trees along the streets could favour migration among populations.

Topic 2 Cultural aspects of urban biodiversity

Plant biodiversity assessment of the Spanish Royal Gardens

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Spanish Royal Palaces are surrounded by 20,500 ha of green areas, of which 500 ha are gardens and 20,000 ha forested land. In order to understand the role of Royal Gardens in biodiversity conservation and the evolution of species composition, we conducted field surveys and complete tree inventories in the gardens of La Granja, El Escorial, El Pardo, Aranjuez and El Campo del Moro, in the provinces of Segovia and Madrid. Results of the inventories were compared with historic design documents and with surrounding natural ecosystems' plant diversity. Variations were found amongst the gardens due to the influence of their different locations, climates and sizes, though some common patterns were identified. The results showed that, despite management's consistently stated aim to preserve original characteristics, more adapted autochthonous plant and tree species made their way into the gardens, in some cases growing into significant specimens. Plant diversity of royal gardens was found to be slightly lower than that of natural forests but much higher than that of normal gardens; conversely tree species diversity was much higher than that of natural surrounding forests.

Topic 5 Design and future of urban biodiversity

LAB - Enhancing Urban nature through a Global network of Local Governments

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The management of biodiversity in cities is more challenging than anywhere else. Two of most important ways in which to deal with the associated challenges are by sharing lessons to finetune approaches, and through the raising of biodiversity's profile to increase high-level support and funding. Local Action for Biodiversity (LAB) is an ICLEI - Local Governments for Sustainability - initiative that recognizes the importance of city governments as drivers of biodiversity conservation within and beyond the urban context. The first phase of LAB involved stock-taking of biodiversity and its management in participating cities from around the world. Collation of the subsequent biodiversity reports has provided unique insight into the range of perceptions, experiences and approaches resulting from participating cities' varied backgrounds and circumstances. This information will be fed back to participating cities along with published versions of their own reports, which will also be used to raise awareness within the various cities and more widely. Further steps in the LAB process will advance this foundation with declarations of commitment toward biodiversity conservation, action plans and applied projects.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Urban sprawl and biodiversity loss: A case study from two coastal districts of Karnataka, India

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The impact of urban sprawl was studied on fauna in Dakshina Kannada (DK) and Udupi districts of Karnataka, India. Earlier studies have shown that the rate of development in DK and Udupi districts is far more than the rate of population growth. There was a significant increase in built-up area of a magnitude 107.52 percent from 1972 to 1987. Population in this region grew by 54% while the amount of developed land grew by about 146 percent. Regional and local level analysis was carried out to assess the changes in the fauna in these districts. Study shows that several mammal species which were common during late 19th century have become rare at regional scale. On the other hand, “human-habitation-adapted” species such as mongoose, rat and squirrels have proliferated at local scale. Among birds, the open country species have noticed to be reduced at the local scale. The notable example of the local extinction of the species is the Indian Crocodile, which was common during early 20th century. The forest cover has reduced considerably during last 75 years and is highly fragmented as revealed by GIS analysis. Implications and management of biodiversity is discussed in the light of population growth.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Effects of urbanisation on carabids - International perspectives

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To explore whether urbanisation has similar impact on biodiversity world-wide, the multi-national research project Globenet was initiated. In Belgium, Canada, England, Finland and Japan, the mean species richness of carabids significantly decreased from the rural area to the urban one. These results did support the increasing disturbance hypothesis according to which the overall diversity should decrease under higher levels of disturbance. In Romania, the mean species richness was the highest in the suburban area, providing support for the intermediate disturbance hypothesis. In Bulgaria, there were no significant differences in the mean species richness along the urbanisation gradient, while in Hungary and Denmark the mean species richness was significantly higher in the rural and urban areas compared to the suburban one. These responses of carabids suggest that habitat changes commonly associated with urbanisation have not affected carabid assemblages in a similar way. This paradox is resolved when forest specialist carabid species are evaluated by diversity ordering, in which all of the nine studies, the assemblages of these specialised species are more diverse in the rural areas than in the urban ones. Concluding, urbanisation reduced the diversity of forest specialist carabids. Research was supported by the OTKA F61651.

Topic 5 Design and future of urban biodiversity

The New York Biosphere project

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The New York Biosphere project, headed by the UNESCO-MAB program, is a collaborative effort among various local scholars to cultivate a greater understanding of the effects of urban activities on the changing environmental conditions in the greater New York metropolitan region. Among other goals, those involved aim to inform debates on sustainable urban form and urban resilience. Simultaneously, the CUNY Institute for Sustainable Cities (CISC), a research institution housed at Hunter College, is developing three core research projects in the following areas: climate change and energy, the city by the coast, and consumption cities. One element of the consumption cities project will focus on the identification and analysis of material flows through New York City. We are beginning to explore this issue with an emphasis on food. This presentation outlines a general research agenda related to food consumption, energy (food miles) and land use. Moreover we seek to emphasize the connections between these areas and other aspects of urban sustainable development such as biodiversity relating to land use change. One of the goals of the project is to identify related issues that are pertinent to long-term sustainability planning of New York City's food system.

Topic 5 Design and future of urban biodiversity

Biodiversity - a vital role in the landscape transformation

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For the landscape architects, landscape is understood as a product of human relations with the territory. This perspective is based in some concepts and methodologies of analyse, synthesis and proposes, linked with historic-cultural, spatial, ecologic and aesthetic components, associated with elements and structures, in a certain space and in a concrete time. On level of the landscape, biodiversity is linked with the natural and cultural systems, including the richness of the composition of elements and structures presents in each ecosystem and in between diverse ecosystems. So, we conceptualize this contribution as the opportunity to reflect about concepts essentially linked with the thematic of ecologic landscape structure, where we can consider biodiversity and sustainability as the main concepts of intervention. For that, we will value the physical organisation of elements and structures and its functions, as having a determinant importance, in the ecological processes. Combined continuities or fragmented specificities, are expressed in the presence of elements and structures that serve as point of reference in, and for the contemporary landscapes. This approach should have the ability to show the importance of the connection of the transdisciplinary phenomenon and multidimensional composition, associated with the complexity of landscape, and as a vital role in the practice of Project and Landscape Design.

Topic 5 Design and future of urban biodiversity

Urban Wastelands – a Chance for Biodiversity in Cities? Ecological Aspects, Social Perception and Acceptance of Wilderness by Residents

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Urban wastelands in many European cities are the only large areas where undisturbed development of wilderness was possible for over years. Even if extremely anthropogenic stamped, they do not seldom impress through their habitat and species diversity, as well as through rarities of flora and fauna. Under the conditions of shrinking, chances arise for incorporating urban wastelands into the green structures of cities. Wastelands are especially interesting for urban green systems, because with their various stages of vegetation they provide a brought habitat mosaic and therewith opportunities for increasing biodiversity. But how the wilderness and new biodiversity on urban wasteland is perceived and accepted by residents? Which visions and concepts can be suitable for urban biodiversity? Is it better to design wastelands or to leave them to natural succession? Do they need to be protected or will especially the (spontaneous) use be an interesting solution? Is habitat management necessary and how far creative changes make sense? On the conference will be presented and discussed the possibilities and restrictions of shrinking cities for increasing their biodiversity by using wastelands. Focal points will be social perception and acceptance of wilderness by residents as well as planning perspectives.

Topic 2 Cultural aspects of urban biodiversity

Reynoutria japonica Houtt. in urban wastelands : impact of an invasive species on soil and flora

Noëlie Maurel[1 *], Audrey Muratet[1], Nathalie Machon[1], Jacques Moret[1], Jean-François Ponge[1], Sandrine Salmon[1]

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While well-studied in natural areas, the effects of invasive plants on plant communities remain poorly understood in highly disturbed urban areas. We attempted to (1) assess the relative importance of invasive plants and environmental factors in controlling richness and composition patterns, (2) assess the impacts of invasive plants on soils, and their consequences on vegetation, and (3) consider the 'driver' vs 'passenger' status of invasive plants in an urban context. We focused on the Japanese knotweed, *Reynoutria japonica* Houtt., in urban wastelands, on invaded sites exclusively. By analysing soil and vegetation along transects running from the centre of knotweed patches towards the uninvaded periphery, we found similar species composition between invaded and uninvaded areas, but much lower richness and cover under the Japanese knotweed. We also noticed positive effects of the Japanese knotweed on organic matter incorporation and biological activity. Moreover, organic matter content significantly influenced specific richness. The Japanese knotweed thus appeared to enrich soils and to maintain a positive feedback. However this would not benefit other species, which are removed by the Japanese knotweed via high competitiveness. Longer term monitoring should allow to check whether those effects remain localized or can in the long threaten the urban flora.

Topic 3 Social aspects of urban biodiversity

Long-term change in public attitudes toward wildlife in the city of Turku, SW Finland

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Due to rapid urbanization, the conservation and values of urban wildlife are becoming increasingly important study objects. According to a comprehensive newspaper analysis, urban wildlife was frequently persecuted in the early 20th century Finland. Birds and mammals entering the city were often hunted, killed or sometimes captured as pets. Especially since the 1960s the attitudes have changed. Active persecution is now a negligible ecological factor. According to a recent questionnaire study 66 % of city residents have a high regard for nature as a part of urban environment. This change in attitudes has important consequences for urban environmental education and city planning.

Topic 3 Social aspects of urban biodiversity

Cities – on the road to apocalypse, or the soul of the (sustainability) party?

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With dire predictions of environmental and resource degradation, one must ask –what is the relevance of urban biodiversity? And how can urban design influence human survival? Utilitarian arguments do not address the imperative for biodiversity in the daily lives of urbanites (cf Louv's Nature Deficit Disorder). There are socio-economic prerequisites to a healthy city, but while economics is the bread and butter of human survival, the physical environment is the heart, and biodiversity the soul. Biodiversity contributes to sense of place - central to cultural survival. Each country's representation of nature becomes the local observable model for sustainability – demonstrating balance, efficiency, interdependence, adaptation, homeostasis, filtration, regeneration and recycling. Basically, we need to put the oikos back into economics. Design of nature in cities has to accommodate the viable presence of people and their economic and social activities – space will be limited and habitats edgy. Regardless of whether it is greenfields development or retrofitting, a balance must be found between human activity and viable habitat patches, meta-populations, and spatial dynamics of shifting seral ecosystems. Issues to be resolved are safety, NIMBY, legibility, appropriate forms of consultation (e.g. collaborative learning), and representation of ecology on decision-making boards.

Topic 4 Urban biodiversity & climate change

Estimation of Above-Ground Biomass and Net Primary Production in Environmental Protection Forests

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Estimations of forest productivity are required for reduction of atmospheric CO^2. There are, however, few studies that estimate forest productivity in environmental protection forests, which represent one method for restoration of natural forests, promoted in Japan since the 1970s. The purpose of this method is to restore original forest ecosystems using the native tree species in the region. By this method, a mixture of saplings of various native tree species is planted at a density of about 3-4 saplings /m^2 (Miyawaki et al, 1993).

The present study was conducted in environmental protection forests from 30 years old (after transplantation). Twenty-four evergreen broad-leaved sample trees were cut in an environmental protection forest in Oita Prefecture. After trunk diameters and heights were measured, the trunk, branches, and foliage of each sample tree were weighed. Total above-ground biomass amounted to 327.3 t/ha and that of leaves 21.7 t/ha.

The litterfall was measured for four years at the same site. The annual total litterfall averaged 6.74 t/ha (4.69-8.24 t/ha), and fallen leaves accounted for 78.5%.

These values are bigger than the average for evergreen broad-leaved forests in Japan. We discuss the determinants and behavior of above-ground net primary production and growth.

Topic 5 Design and future of urban biodiversity

BiodiverCity - Ecological and social value of urban nature. How to maintain and improve biodiversity and its acceptance in urban areas?

Marco Moretti[1 *], Thomas Sattler[2], Robert Home[3], Fabio Bontadina[4], Nicole Bauer[5], Sandra Gloor[4], Peter Duelli[5], Paolo della Bruna[6], Martin K. Obrist[1], Marcel Hunziker[1]

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In urban ecology it is generally assumed that a high urban biodiversity is esteemed by the citizens and improves their quality of life in the urban area. This appreciation has recently been questioned and was never investigated for different types of urban areas in the required detail. Yet, it has been shown that thorough knowledge of people's relationship with nature is necessary, if they should be motivated to accept or actively support nature conservation measures. In 2006 we started a trans-disciplinary project in three cities of Switzerland with the aim to enhance the understanding of the relationship between urban biodiversity, built environment (Ecological module), and the acceptance of residents (Social module), and to find measures to link ecological with social values of urban nature (Practical implementation). The project has involved the city authorities since the very beginning in order to consider their expectations. The poster illustrates the overall concept of the BiodiverCity project, while the results will be presented by Sattler T. and co-authors (Ecological module) and Home R. and co-authors (Social module) during the conference. We are convinced that the combination of the poster (as general concept) and the two presentations will encourage discussion and further contacts.

Topic 5 Design and future of urban biodiversity

Coniferous forest in a suburban and peri-urban landscape as habitat for forest birds

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* Presenting author

Old coniferous forest has high values for biodiversity also in suburban areas. However, rapid changes due to urban developments may be detrimental to this habitat. Such impacts need to be predicted and the knowledge integrated in the planning process. Adjacent to Swedish cities, forests are often managed in a different way than in the countryside, with less focus on production and more on aesthetic and recreation values. A consequence of this is that there are opportunities for forest-dwelling birds confined to old forest with decaying wood to breed in these forest patches. However, there are limits to the degree of fragmentation that can take place before the habitat becomes unsuitable. In this study, two forest bird species, *Parus cristatus* and *Parus montanus*, were studied in the suburban areas of the city of Stockholm. GIS-based habitat models of suitable and accessible habitat were built from the results and then used to predict suitable habitat under different planning scenarios. The results show the values of old coniferous forest that still remain in the suburbs. The results indicate the effects of forest fragmentation in these areas. Further, GIS-based habitat modelling help to fore-cast the persistence of forest birds under alternative planning scenarios.

Topic 4 Urban biodiversity & climate change

Environmental impact of using refrigerants on atmospheric ozone layer depletion and climate warming

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This paper discusses the effects of old chlorofluorocarbon (CFC) and hydro-chlorofluorocarbon (HCFC) refrigerants and other substances used in developed counters on the climatic conditions on the depletion of the atmospheric ozone layer. An overview is also presented about the various restrictions taken according to the international protocols held in the recent years, such as Montreal Protocol of 1987, USA Environmental Protection Agency (EPA) of 1990, Kyoto Protocol of 1997, to reduce the use of serious depletion substances. The characteristics of a number of new ozone-safe refrigerants proposed to replace old harmful refrigerants are also discussed from environmental view point and practical applications. The process of ozone reduction process and the extension mechanism of ozone hole over the South Pole are also explained in some details. The disadvantages of new alternative refrigerants such as the global warming and greenhouse gases (GWP) are also discussed.

Topic 2 Cultural aspects of urban biodiversity

Biodiversity of urban front gardens (I) – an integrated research on social, cultural and biological aspects in Erfurt (Germany)

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Urban front gardens play an essential role in regard to the social aspects of biodiversity: - They contain the only “biodiversity” with which most urban dwellers have contact daily - By designing and managing “their gardens” urban dwellers experience “nature”. Nevertheless until now there has been scarcely any research on the importance of front gardens for biodiversity. On this basis we started research in 2007 in the Wilhelminian quarter of Erfurt, built between 1880 and 1910, around the older historic city centre. Typically these front gardens are of a design characteristic of this period both in terms of plants and architecture. Today this type of garden has commonly changed due to “globalization” of garden culture. Our research focused on how do these gardens contribute today to diversity of native wildflowers, to diversity of typical ornamental plants (native and exotic) and the architectural elements of this period? A further question was whether the exotic ornamental plants of this period are a danger to biodiversity nowadays? The project involved 70 landscape architecture students of the University of Applied Sciences Erfurt. This presentation focuses on the methods and overall results of the study. Within the presentation of Schmittfull & al. the “hot spots” of urban front gardens will be presented (Biodiversity of urban front gardens (II)).

Topic 5 Design and future of urban biodiversity

Socio-ecological approaches to urban open spaces

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Socio-ecological Approaches to Urban Open Space Management: A Case of Klipriver wetland Corridor in Soweto, Johannesburg. Various impacts on the Klipspruit Open Space Corridor and its catchment area have partly contributed to defining the Soweto landscape from a socio-ecological context. These influences have decreased the water quality of the Klipspruit open-space system as well as the quality of life of the immediate inhabitants. This presentation explores the Klipspruit green corridor, its challenges, socio-ecological responses to the effects on open-space resources, institutional and management approaches to planning and development that negatively affect the open spaces, the complex balance between developmental needs, and social and natural resource management in the context of urban planning, governance, and sustainability.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

The role of wasteland habitats on the urban floristic diversity

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We explored the potential role of wastelands in maintaining urban floristic biodiversity, to help define effective urban management plans. We quantified floristic diversity in 98 wasteland sites of one of the most densely populated areas in France. We tried to characterize the environmental parameters and spatial distribution of sites, to identify some of the factors that influence plant species composition, and to explore the impact of urban environment on the floristic interest of wastelands. The floristic richness of the wastelands represented 58% of the total richness observed in the whole study area. Site richness depended on site area (the largest sites were the richest) and site age, with a maximum in sites of intermediate age (4 to 13 years). In the largest sites only (> 2500 m^2), the floristic distance among sites was positively correlated with geographic distance, which suggests that migration of species among large sites partly controls local floristic composition. In contrast, the environmental distance among sites was not correlated with floristic distance. Finally, we showed that the presence of collective and individual dwellings within 200 m of a wasteland decreased its floristic rarity, whereas the presence of rivers or ponds increased it. Finally, we propose several recommendations to optimize the management of wastelands with respect to conservation of urban biodiversity.

Topic 3 Social aspects of urban biodiversity

Community Involvement in Increasing Biodiversity Quality in Highly Populated Area

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* Presenting author

Tamansari area is a strategic and highly populated area in the central of Bandung, by Cikapundung river, West Java, Indonesia. It varies from slum to high density urban settlement area. Because of no area planning, the quality of environment and social is deteriorating. No private green area is available. The Cikapundung river is silting up and constricted because of waste dumping and dam construction in the river banks. They also build the houses on it. The area under the bridge has been polluted by ash from the vehicles and no plants. The community counselling to increase the interest and sense of belonging is the method for improving the quality. The technical strategies and technology involvement are needed. Ingenious plants identification is done by surveying the river banks and comparing with the river's head condition. The research is to identify the problems and the options to increase the quality of green area movements done both by community and government as one holistic solution. Currently, the community has initiated and organized the green movement within small groups. Government has planned to change the open area under the flyover to become urban agriculture and built middle rise housing to increase the green area.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Trends in bird richness and population in urban parks of Valencia (Spain) over the 1998-2007 period: A case study across seasons

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* Presenting author

Trends in bird richness and individual bird abundance were investigated in 22 urban parks in Valencia (Spain). The parks (range 18.6–0.07 ha, mean = 5.39 ha) included the largest parks of the city and the smaller parks between them. Each park was surveyed on one occasion per month over the period 1998-2007. For sixteen species data allowed to obtain population indices using loglinear models, for other fourteen species simple linear regression of total abundance against year was used. A total of 101 species were recorded; from the 27 breeding species three (Eastern Olivaceous Warbler *Hippolais pallida*, Sardinian Warbler *Sylvia melanocephala* and Long-tailed Tit *Aegithalos caudatus*) are recent additions, and one species the Greater Blue-eared Glossy Starling *Lamprotornis chalybaeus* is now extinct. In overall, the number of species experienced a moderate decline in all seasons excepting in summer which remained stable. Most of the breeding and wintering species declined significantly, notably the House Sparrow *Passer domesticus* and the Goldfinch *Carduelis carduelis*. Provide that habitat structure in urban parks has remained fairly stable across years, both the urbanization of the landscape surrounding the city, and shifts in climate patterns probably have influenced the observed trends in bird richness and populations across years.

Topic 5 Design and future of urban biodiversity

Challenges to the biodiversity in a fast-growing tropical city

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Expansion of urban boundaries, population expansion, uncontrolled urban migration and development activities have become challenges to the urban biodiversity in the coastal city of Kochi in India. Industrial expansion and construction activities increasingly destroy the wetlands and paddy fields surrounding the city. Inefficient pollution control measures have deteriorated the nearby river and the numerous inland canals, endangering the water living organisms. New roads and bridges affect the water flow and natural water recycling mechanism. Open land area and greenery has been fast shrinking, alienating the birds and plant-dependent species such as insects and also changing the heat condition within the city. Many types of plants with medicinal and aromatic values have disappeared in the last few decades. Economic expansion and rapid industrialisation associated with developments in IT sector threatens the remaining biodiversity in the city. Failure in the proper implementation of technical, administrative and legal mechanisms worsens the condition. This paper is a comprehensive analysis of the various challenges to the biodiversity in the city from the urban expansion and several social, economic and environmental factors linked to it. Suggestions for an appropriate urban policy have been provided, considering the present scenario and expected changes in the urban environment.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

The competition ”Bundeshauptstadt im Naturschutz“

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* Presenting author

The Deutsche Umwelthilfe (DUH) called out the competition “Capital of nature conservancy” in March 2007. Every municipality in Germany was challenged to demonstrate their commitment for nature conservancy. To quantify the strength of commitment in different domains the DUH developed a questionnaire. The topics are as follows:

- Nature conservation strategy
- Protection of species and habitats
- Education in environmental problems and environmental publicity
- Support of good practices in forestry and agriculture
- Water protection
- Co-operations with associations, enterprises and citizens

The municipality that get the most points is the winner of the competition and is allowed to call itself ”Bundeshauptstadt im Naturschutz“. In addition the participants in four different categories had been awarded:

1. Cities with less 10.000 inhabitants
2. Cities with less than 30.000 inhabitants
3. Cities with less than 100.000 inhabitants
4. Cities with more than 100.000 inhabitants

A total of 115 cities and municipalities participated. Large cities like Berlin, Munich and Hamburg as well as small municipalities with less than 2.000 inhabitants presented their broad activities. This year’s winner is Heidelberg, second Hannover and third Wettenberg in Hesse.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Changes in insect communities along urbanisation gradients

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* Presenting author

Urban areas consist of densely built cores surrounded by decreasing intensity of development and increasing 'naturalness'. These urban-to-rural gradients provide a framework for comparative studies on the ecological effects of urbanisation. Species respond differently to increasing urbanization and they can be divided into urban avoiders, urban adapters and urban exploiters. In this paper, I review research on changes in insect communities (mainly carabid beetles) along urban-rural gradients across the world. Generally, the studies showed an increase in abundance and species richness from city centres to the rural surroundings. However, there are species specific responses. The proportion of large sized, short-winged species having their origin in forests usually decreased towards the city centres (avoiders), while the proportion of species having their origin in open habitats increased towards the city centres (adapters and exploiters). These results suggest that (1) carabid beetles respond in a predictable manner to urbanisation in different cities, and (2) specialist species originating in forests are susceptible to changes associated with urbanization. The challenge now is to examine the processes causing these biotic changes in more detail, and to translate the results into planning and management practices.

Topic 5 Design and future of urban biodiversity

Urban green and the sustainable city – Do green areas fit into a compact city design?

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The “sustainable city” contains several city planning principles: the “compact city” and “city of short distances”. Both postulating a compact city structure, which is controversial to the demand of space, the basis for urban green areas. To respond to the question whether green areas fit into a compact city design, a combination of different methods was applied. Interviews were held with experts, studies about green areas in Vienna (Austria) were compared and analyzed. Furthermore, data on the actual situation of urban green spaces in 2 Viennese districts were tested to find out if the existing green areas match the desired values for urban green space. The experts were in complete agreement that urban green is an essential part of the “sustainable city”. But they differ on the design of these areas. The analysis of data on urban green shows that the different data collection methods complicate a direct comparison. The criteria to be considered for collecting data on urban green and for calculating the ideal size of urban green space were discussed. The conflict with the “compact city” model is mainly the mathematic lack of space. Nonetheless, the importance of urban green makes these areas essential to the sustainable city principle.

Topic 2 Cultural aspects of urban biodiversity

Economic valuation of urban forestry - environmental services valuation for the efficiency and maintenance of urban environmental resource

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* Presenting author

The present urban forest policy in the city of Rio de Janeiro shows a greater priority of public budget resources to plant trimming, through periodic pruning. Based on that fact it is possible to demonstrate that preservation measurements must be more efficient than those designed to meet individual needs for space, as a way to guarantee the continuous environmental services provided by the trees. The exploratory study of economic valuation of trees, based on hedonic value, has confirmed that community trees provide economic benefits on real state prices. Thus demonstrating that each additional unit on the variable "public tree" correspond to an additional R$399.967 in the variable "real state unit price", placed in the neighbourhood of Recreio dos Bandeirantes. This estimated value should be taken as a parameter for encouraging the development of public forestry plan, based on carbon measurement, still not established in Rio de Janeiro. This initiative will certainly guarantee significant environmental, economic and social benefits to society.

Topic 4 Urban biodiversity & climate change

GHG Mitigation in the Construction Industry – Analyses of the Efficiency of Rio de Janeiro's Legislation

Luiza Helena Nunes Laera[1 *], Kenny Fonseca Tanizaki[1], Margareth Simões Meirelles[1]

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* Presenting author

Rio de Janeiro was the first South American city to commit itself with the International Council for Local Environmental Initiatives (ICLEI) by making an inventory of its emission of Greenhouse Effect Gases (GHG) which established the basis for the Rio de Janeiro Protocol of Intentions and its measures to mitigate the effects of global warming on the city. Among this Protocol's initial actions are those related to the compensation of GHG emission by construction industry through the planting of trees. This article analyses the efficacy of the city's legislation from the environmental point of view as related to CO_2 gas emissions. A comparative analysis of estimated total emissions by licensed constructions and the estimated total carbon sinking potential of the legally required tree planting to license constructions reveals that the quantity of the required plantings is approximately 57 times smaller than what is needed to compensate estimated emissions. These findings evidence the inefficacy of present legislation on the compensation of emissions from constructions through tree planting and concludes for the need of new calculations to compensate the city's CO_2 emissions by its construction industry.

Topic 5 Design and future of urban biodiversity

Synanthopic vegetation of central parks from Bucharest (Romania) – diversity and bio-indicators of air pollution

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* Presenting author

Synanthropic vegetation in towns and cities is an important subject of urban ecology. Our studies were carried out in the framework of Life Air-Aware project in the pilot area from the centre of Bucharest (Romania) comprising one complex park, treated as a complex of ecosystems and other two parks, much simplified ecosystems with different degrees of management. In situ research (passive methods) had identified the diversity of vascular plants from a major urban centre from Romania and the potential bioindicators of air pollution. There is a shortage of available data for plants in Bucharest and many studies have been realized at the outskirt of the city. Where park maintenance work is not applied, the vegetation cover becomes very much degraded, with large expanses of bare ground. Amongst the vascular flora, heavy metal bioindicators were found; the native species have a higher capacity for bioaccumulation than the cultivated species. The park administration should be advised to use such bio-accumulators or plants resistant to pollution in the sowing, planting and management regimes. Ecological evaluation of urban spaces is based on vegetation, which serves as an indicator of environmental conditions and ecological processes.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Urban Landscape Characteristics Correlated with the Synurbization of Wildlife

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Investigations on various urbanized taxa often describe similar behavioural (reduced fear of humans, altered activity patterns, and increased intraspecific aggression) and population dynamics (higher densities and reduced dispersal) modifications. In addition to the presence of these changes in urbanized wildlife, little is known regarding the habitat and landscape features associated with these changes. The objective of our study was to identify habitat and landscape characteristics correlated with the behavioural and life history adaptations of urban wildlife. We sampled grey squirrels (*Sciurus carolinensis*) in six urban parks for density, wariness, intraspecific aggression, and activity patterns. We then used combinations of each parks ecological characteristics (size, canopy cover, tree basal area, and number of trees) and characteristics of the adjacent landscapes (tree cover, number of trees, building cover, and number of buildings) to develop models predicting grey squirrel wariness, intraspecific aggression, activity patterns, and density. AIC was used to evaluate candidate models and determine the best approximating models. Squirrel density and canopy cover were the most efficient predictors for wariness; squirrel density, patch tree basal area, and matrix tree cover for aggression; patch size, canopy cover, and number of matrix trees for squirrel density.

Topic 4 Urban biodiversity & climate change

A green infrastructure strategy to adapt cities to climate change

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In Central and North Europe, climate change is predicted to lead to a significant increase of extreme events such as more frequent and prolonged heat waves and more severe rainstorm events. These events will be amplified in urban areas where temperatures are already elevated and rainwater runoff is increased. Negative impacts on human health and well-being and damage to buildings and infrastructures, for instance, through flooding are to be expected. This paper will explore the role of urban green to adapt cities to climate change. It is based on results from a major research study with Greater Manchester (UK) as the case study. A detailed survey of the city's built and green areas was a main input into models of surface temperatures and rainwater runoff. Contrasting scenarios were used to assess the potential of greening strategies for mitigating climate change effects but also the consequences of a loss of green spaces through urban densification. Results suggest that a well planned green infrastructure can be an effective means to adapt cities to climate change. Implications for strategic planning of a green infrastructure in urban regions for adaptation to climate change will be discussed in the presentation.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

From Black to Blue and Green - Linking stormwater management with socio-cultural and ecological values for a multifunctional green infrastructure

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* Presenting author

Urban areas in Europe are more and more facing severe problems from sewer overflows during rainstorms due to the increasing proportion of impervious cover. With the foreseen climate changes this will become worse, and the potential to solve the problems via extension of the sewage system is reaching its technical and economic limits. In the Danish research project “Black, Blue and Green - Integrated Infrastructure Planning as Key to Sustainable Urban Water Systems” we explore the potential for stormwater management in a multifunctional green infrastructure in urban areas. What is its role to reduce stormwater runoff and enhance rainwater infiltration? Which consequences will the integration of stormwater retention and infiltration systems have on the social functions of green space and for urban biodiversity? A consortium of hydrologists, engineers, landscape architects and planners cooperates in the project with four Danish municipalities and two professional organisations to answer these questions. The paper will present an approach for assessing the potentials and constraints of stormwater management in urban green spaces from social, ecological and technical perspectives. Implications for planning of the urban green infrastructure will be discussed.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Constraints of urbanisation on vegetation dynamics in a growing city: a chronological framework in Rennes (France)

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* Presenting author

A three-year experimental survey was conducted in a urban-to-rural gradient in Rennes, France, that aimed to understand human action on ecosystem process and functioning in urban areas via human-induced abiotic modification. The approach used was a simplified chronological framework of vegetation dynamics, in order to easily compare modification occurring under the constraint of urbanisation. This approach allowed knowing some of the important parameters leading to different plant communities in and outside the city. Here, vegetation dynamic was divided into four consecutive steps (arrival, emergence, establishment and coexistence). Urbanisation tends to reduce seed flux density and specific richness. Between arrival and emergence step, urbanisation seems to act as an environmental sieve (urbanisation induces high mineral nitrogen stocks that may lead to higher germination rates of nitrophilous species and lower germination rates on non-nitrophilous ones). Urbanisation may induce a shortening of life cycles at both community and species level by selecting short flowering species and inducing a precocious flowering of non-ruderal species. Urbanisation selects a limited step of species groups (mainly annual, forming transient seed bank and anemochorous) whereas more species groups are selected in periurban area (several reproduction mode, forming permanent seed bank).

Topic 3 Social aspects of urban biodiversity

Gardens are for cities

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* Presenting author

This paper traces the success of community gardens in New York City. From fringe experience of hippie counterculture, the community garden has become vital to the revival of the New York City landscape, raising urban living standards. Thirty years ago small gardens started to spring up in abandoned city lots in lower Manhattan, without the permission of the landowner or the city's support. Their survival shows the keys of the success of the community garden movement. They have risen from the ground up, created and maintained by the local community, as a spontaneous response to a pressing need. The negative space of vacant lots, a dangerous eyesore, has become a positive green space, contributing to a healthy social network and adding beauty to the neighbourhood. Their flexibility has allowed them to adapt over time, and in different neighbourhoods. Community Gardens now have legal standing, and the support of some local authorities. They now number over three hundred, rarely bigger than the footprint of a single building. A very diverse group of green areas has emerged over time across the whole city, with individual statues and codes of practice. Each garden strikes a balance between individual personal expression and the achievement of a common goal, a consistent aesthetic.

Topic 3 Social aspects of urban biodiversity

Healing Green - Planning and Design of Hospital Gardens

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* Presenting author

Gardens as healing places and space of personal freedom with an activating atmosphere are not popular in a modern hospitals everyday life unlike original Viennese hospital gardens of the 19th century (so called “Pavillion Hospitals”. The Hanusch-Krankenhaus in Vienna is place of studies about contemporary requirements on planning and design of open spaces in hospitals. The investigation focuses on perspectives of patients, visitors and employees, their demands regarding a hospital garden as well as influential factors on the planning and design. Planting design is described with design instruments, characteristic qualities of plants and their influence on human well-being and convalescence. A preliminary draft and planting schemes comprises inventories, analysis, staff participation and resulting planning and design targets.

Topic 5 Design and future of urban biodiversity

Take Steps for Steppes in Towns – Naturalistic Planting Design

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Contemporary understanding of nature and the tendency to conserve and manage it brings us to a new understanding of gardens. Naturalistic gardening has begun be accepted as an aesthetic value in open urban space. During the past decades the scientific approach to planting design was determined by the use of plants in accordance with typical habitat sites. Due to the location in the Pannonic climatic zone, townscapes of eastern Austria are predestined for naturalistic planting design – in accordance with the surrounding native herbaceous vegetation as Steppes and Dry meadows and with the need of economical and ecological issues in open urban space. Beyond this setting plant assortments are being developed cultivating wild perennials from autochthonous dry sites (considering aspects of CBD). This focuses on enhancing production and use of wild perennials in Austria. Further the aesthetic impact of wild perennials and plant communities is being analysed to create design basics for naturalistic gardening and to improve quality and persistence in plant use. Studies of practical application take place inform of collaboration with local authorities: concepts to integrate extensive natural planting design in open urban space are being developed considering long term evaluation and scientific support of implementation.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

The factors that influence floristic diversity in the urban lawns

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This project aims at understanding the factors that influence the floristic diversity in the Parisian lawns. In particular, we focused on the impact of the urban structures in which the lawns are located (collective dwellings, parks...). For that purpose, we performed inventories in about 100 Parisian lawns belonging to 22 public and private gardens and parks and linked their floristic diversity to the characteristics of urbanisation given by the Land Use Pattern as well as factors like luminosity, vegetation height, type of management and human and animal access. The first results show that diversity is positively correlated to the presence of large open urban areas. The presence of invasive plants such as *Veronica persica* is also assessed as a disturbance for biodiversity.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Relationship of tree species distribution and urban environmental factors in Baltimore, MD, USA

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* Presenting author

Urban landscapes are spatial mosaics that represent a variety of ecological conditions. Natural sources of spatial heterogeneity in ecosystems underlie the effects of land-use and land-cover change; however, humans introduce an additional source of heterogeneity by altering landforms and drainage patterns, constructing structures, introducing non-native species, and modifying natural disturbance regimes. In this paper we investigate the relationship between urban environmental factors and tree species distribution at multiple scales in Baltimore City. Baltimore has 2.6 million trees resulting in a canopy cover of approximately 21%. Thirteen genera make up 75% of the total number of stems at least 15 cm in DBH. Non-native species made up 23% of the total stems. Roughly half of the total number of stems was established through natural processes. Soil pH separated primarily native species (6.4). At the neighbourhood scale, invasive plant species and soil contamination by heavy metals were associated with disturbed areas. These results suggest that both natural and urban factors affect the spatial variation of vegetation structure and soil properties at the city scale, while at finer scales urban factors are the most important.

Topic 5 Design and future of urban biodiversity

An Approach to Urban Park Design Based on The Principles of Landscape Ecology and Landscape Planning: An Application to Cibeunying Park, Bandung

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* Presenting author

Bandung is formerly known as Parijs van Java because of its garden city and the cool climate. Bandung now faces problems of visual and environmental degradation due to uncontrolled developments. This condition is caused by lack of understanding in the decision making process about the importance of these gardens/urban parks as the urban biodiversity catalyst and microclimate controller. Thus, this paper aims to give design principles recommendation based on urban quality improvement and preservation framework. The case study remains one of the oldest Bandung park system built by the Dutch and identified having most important role in the Bandung urban biodiversity. The goal of this research is to use concepts from both landscape ecology and landscape planning with intent of developing an approach which will help both government and landscape architects to plan and design open space in a way that meets long term urban biodiversity. This paper first reviews previous research about landscape ecology elements and social functions of Cibeunying Park. Then, this paper investigates contemporary condition and role of Cibeunying Park in the urban context, which comprising land use, function and activity. Result includes recommendation of space and activity programming, ecological preservation zone and community involvement scheme.

Topic 5 Design and future of urban biodiversity

Design Strategies for Using Common Local Vegetation ("Gebietseigene Arten") to Revaluate Unused Space in Shrinking Cities (Part 1: Design Strategies)

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Unused spaces in shrinking cities offer an enormous potential to increase biodiversity. Our project – beginning 01.09.2006 and financed by the DBU – combines design aspects with nature conservation aims to increase the quality of the new open spaces in these areas. Research projects are in specified areas within the cities of Dessau, Bitterfeld-Wolfen and Chemnitz. Part 1: Design Strategies Our project develops a design tool for the property owners of demolished building blocks which offer them alternatives to the common practice of just sowing standard lawn. We use the analogy of "High Bay Racking" to describe the character of this design tool. We identified six components which are part of any design process for these areas: Land-Use Management, Financing, Program, Planting, Maintenance, Nature Conservation. These components are the racks, and they are filled with appropriate design elements which we identified from literature and best practice examples – a coherent and flexible structure of relevant knowledge is offered. We will present design scenarios for areas in our partner cities which used this design tool. The scenarios prove that the design tool offers transferable knowledge for any open space in shrinking cities to combine design aspects with nature conservation aims.

Topic 5 Design and future of urban biodiversity

Prospects of biodiversity in the mega city Karachi, Pakistan: Potentials, constraints and implications

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* Presenting author

Preservation of biodiversity has become an important issue for the management of urban landscapes of mega cities; more specifically in the developing countries. Karachi is the business capital of Pakistan which spreads over 3530 km^2. Enormous population (18 million) growth and lack of effective planning have made it a hub of environmental problems. The target of this paper is to assess the current state of biodiversity in the city, by developing a conceptual framework which facilitates the identification of the potentials of this specific ecosystem. A multi-scale twofold methodology has been designed which helps in the identification of the nature areas - both at macro as well micro scale. Macro scale classification helps in assessing the overall state of biodiversity and site level study helps in analyzing the functional effectiveness and the transformation process. Remote sensing has been used for the estimation of biodiversity at city scale; it also facilitates the structural pattern analyses at site level. Sampling sites have been selected with multi-criteria development. Functional effectiveness of each site has been evaluated using the field investigation (in-situ observations) and social survey methods. This framework is adaptable to optimize the potentials and meet the challenges of constraints in the system. Development of an efficient decision support system (DSS) has been proposed where the representative of nature spaces of each type and multi-criteria method are the key elements. A long-term debate of local authorities of effective master planning can be resolved by adaptation of this system.

Topic 5 Design and future of urban biodiversity

Evaluation of ITB campus area for increasing Bandung urban biodiversity

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* Presenting author

Bandung is a city that was partly built by the Dutch colonial government following the garden city concept. Shade and street trees were planted to enhance streetscape quality and express hierarchy of circulation using diverse family and species of trees. However, no written evidence was present that the Dutch planted the trees to preserve diversity. Unfortunately, the city further development fell into the trap of developing country environmental responsibility ignorance. Using the Dutch concept for shade and street trees in the city of Bandung, efforts to increase biodiversity are exercised on ITB Campus land. Planting plan is a part of place making, the art and science of creating good public spaces where people want to gather, that is an important element in the appeal of a campus. ITB Campus occupies 42 ha of land located in the city of Bandung on a site that extended to the Cikapundung river basin. In 1920, the Dutch planned and built 36 hectares main campus that blends the Javanese and Renaissance landscape design. Recently ITB conduct an evaluation of the Campus Landscape to plan a restoration, preservation and enhance the quality of place, and by doing it increase biodiversity.

Topic 5 Design and future of urban biodiversity

Designing flat roofs for enhancing biodiversity while having good thermal insulation

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* Presenting author

The goal of our flat roof experiment, running for 9 years already, is to find optimal substrates and their most suitable depths for a) enhancing plant species diversity and b) good thermal insulation. Ten commercially available substrates, ranging from gravel with some organic material, to substrates with volcanic slag, lava, pumice, zeolites, recycled bricks, peat etc., were experimentally set up on three flat roofs in Basel and Zürich (Switzerland), whereby in four of the substrates, the depth was additionally varied. The plots were all seeded with the same mixture of 49 native plant species. For b) 200 temperature loggers were exposed in various depth in different substrates during winter 2006/2007. Increasing depth had a positive influence on species diversity with a mean of 11 species at 5cm and 25 species at 12cm per unit of survey of 2m x 2m. The properties of the substrates not only had an influence on species diversity, but also on species composition. Some rare species can be maintained very well, e.g. *Petrorhagia prolifera* on various substrates. Thermal insulation during winter was mainly correlated with the water holding capacity of the substrates, and that is also correlated with some characteristics of the vegetation.

Topic 3 Social aspects of urban biodiversity

Engaging children in designing landscapes - an example from Australia

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* Presenting author

Planning children's gardens in public landscapes requires consultation that interacts and engages children to ensure that they are active participants in the design process. Despite the increasing numbers of such gardens, there are few examples of consultation activities and outcomes and little evidence of children's involvement in decision making. This paper describes consultation used in planning and design of the Ian Potter Foundation Children's Garden in the Royal Botanic Gardens Melbourne, Australia, particularly participatory activities involving children. This involved a range of consultation activities for over three years, the most important being a collaborative partnership with primary school children. This resulted in changes to the overall design of the garden and a greater sense of 'ownership' of the garden by those involved. The paper also looks at opportunities for improving consultation and engagement with children in future landscape projects.

Topic 5 Design and future of urban biodiversity

Conceptual ideas to combine biodiversity experience and nature conservation in historical urban parks

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Inner-city historical parks represent high qualitative recreation areas and are often characterized by a high biodiversity. Therefore, urban historical gardens may be areas of conflicts between protection of historical monuments, nature conservation and recreational use. In case of the historical garden monument “Schlossgarten Charlottenburg” in Berlin a vegetation assessment was carried out which allows to define main focus areas from a nature conservation perspective. By comparing data of vegetation plots recorded in 1984, 2006 and 2007, the anthropogenic impact on vegetation of the historical park could be studied. Within an analysing of potential conflicts, different demands on the park vegetation were determined and main focus areas for preservation and recreation were defined. On this basis an aligned concept of use zoning and maintenance was deduced. To reconcile different demands on the park vegetation, some design- and management concepts were developed for various types of grassland. These concepts combine a tangible experience of biodiversity with requirements of nature conservation.

Topic 5 Design and future of urban biodiversity

RIPIDURABLE PROJECT – An example of ecological requalification in "Paul da Goucha", Alpiarça, Portugal

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Project of Requalification of "Paul da Goucha" is a part of a project co-financed by the European Union through the program INTERREG IIIC, and a part to a pilot project of ecological requalification in the scope of Ripidurable Project. The area was used as a sand extraction site and later as a deposit of garbage and construction waste. The "Paul da Goucha" represents a priority habitat of the Habitats Directive 91E0 and 92B0 being one of the three better places of the country with this habitat, because it has a old Salix wood with 35 - 40 years, and dominated by a single species, *Salix atrocinerea*. The project of requalification of "Paul da Goucha" intended to reach the following scopes: restoration of the habitat and develop an interpretative site having in consideration that riparian vegetation has a basic paper in the maintenance of biodiversity, being considered a very dynamic terrestrial habitat, diversified and complex. The importance as a structural element of the landscape and the development of environmental, ecological and biological functions had been target of several studies, as pollutant filter, slope stabilization, erosion control and his ecological use as green corridor for several groups of fauna. Work in progress!!

Topic 5 Design and future of urban biodiversity

Do “shrinking cities” influence “urban biodiversity”?

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Many studies and publications reveal the relationship between increasing numbers of inhabitants and city areas on the one hand and an increasing number of plant and animal species on the other hand. But does the number of species decline if cities shrink? We check the hypothesis that shrinkage (used in the sense of “demographical shrinkage of human population”) leads to decreasing biodiversity. Examples, results and tendencies for higher vascular plants in Middle European cities (within its administrative borders) were analysed to describe the causes for decreasing or increasing biodiversity – on the level of “species-diversity” – in urban areas. The hypothesis mentioned above is checked by using published studies and empirical data sets of urban biotope mappings in Germany. Nevertheless several factors can be identified which indicate a continuing increase of the number of plant species in Middle European cities including shrinking cities: For example climate change, an increasing number of plants offered on the “free market” (partly being able to establish) and effective nature conservation measures. As a result we can state the opposite hypothesis: Shrinking cities have the potential to increase – or to stabilize – biodiversity.

Topic 5 Design and future of urban biodiversity

Living Skins in the City Context

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* Presenting author

This research focuses on the environmental benefits derived from an overall intervention of living skins within the city; including roofs and façades. It creates evaluation tools for governments and planning institutions to improve planning strategies and policy developments. This would contribute to ameliorating the environmental impact of cities, including the following: reduction in cooling and heating demands; enrichment of urban biodiversity and urban agriculture; improvement of air quality; reduction in the urban heat island; contribution to carbon-neutral architecture; reduction of stormwater; improvement of indoor comfortability; and the economic evaluation of different construction systems. This paper categorizes previous research conducted in Stuttgart, Germany; Basel, Switzerland; Toronto, Canada; and Chicago, US. From this analysis it classifies current types of green roofs and identifies their environmental benefits and policies. It develops a set of measurable figures which determine the contribution of an overall green surface system and the essential policies to be implemented. This is applied to Vancouver, BC. The project concludes by arguing for the necessity of an overall intervention of green roofs in the larger scale of a whole city, in order to fully achieve their environmental potential. It consequently provides the evaluative tool that helps policy makers implement this hypothesis.

Topic 5 Design and future of urban biodiversity

Value of 'young urban soils' for urban biodiversity

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The following abstract contains main goals of the project „Integration of soil evaluation into land use planning focused on urban and industrial areas" (which is part of REFINA program supported by BMBF) for limiting land consumption by a high quality inner development. This high quality requirement includes evaluation approaches for urban biodiversity. Young urban soils are basis of living spaces in our agglomerations and they own some special and unique conditions. They can offer extreme and/or rare conditions for vegetation because of their origin and development and contribute manifold living spaces. The multifaceted urban biodiversity is linked with the functions on young urban soils. Therefore they should be considering in urban environmental-quality-targets because they are not just brownfields. Developing a soil-function-evaluation and its integration into a total evaluation with other criterions is one aim of our project. Another is to design a dynamic area protection system within a city. To achieve these goals it will be important to guide different forms of land-use to acceptable places. These are the main goals to point out in a presentation.

Topic 5 Design and future of urban biodiversity

Attempts to enhance biological diversity through development of public recreation areas in Upper Silesia, Poland

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Protection of biological diversity is mostly understood as passive protection of already existing plants, plant communities or biotopes. That leads to protect territories of highest natural value in various forms of protections. However there is still the question what can be done for enhancing biodiversity in the space between them? Protected area has limited size. It has the highest value, but territories between are of really high importance too. Attempts to rebuild degraded ecosystems are needed so as conscious use of introduced plants. Use of invasive plants may sometimes destroy valuable elements of nature. The paper describes some examples of designs treating post-industrial areas of Upper Silesian Agglomeration with the scope of support the natural succession processes. There is possibility to do that with aesthetic approach and with regard to local identity, fulfilling rules of sustainable development and European Landscape Convention. Method of area assessment is briefly described. Chosen examples are located in Upper Silesia, Poland. Chelm Sl. was designed as an ecological park on a coal mine dump. The greatest importance for design solutions there has sensibility of valuable nature elements of the surrounding. In Zabrze design tries to solve the problem of plant community changes in town forests. In Swietochlowice case were designed nature protected areas with elements enhancing needed targets of succession. The Sosnowiec example shows nature aimed solutions for post-industrial area of various origins and various identity values.

Topic 3 Social aspects of urban biodiversity

Fibers in the city

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The paper discusses the presence of the vegetation as a non dissociated component of the urban space organization to the life quality conditions. The arboreal vegetation importance and its efforts for long life, decurrently from cultural, social and economic factors are shown due to the capacity of big cities to produce micro climates. The benefits of the urban forestry are from the urban forest social conception and the interfaces with the outskirt population, where the techniques of handling vegetal fibers in rural, black, Indian and other cultures are found. Such techniques when re-elaborated add a meaning and transfer the vegetal fibers to a waste solid category getting into the tourism service system. This changing makes possible the setting up of a warehouse from the biomass which classifies stores and distributes the raw-material to the communities. The new objects act as storage of CO2 and contribute to the understanding that the sustainable life style is possible.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Analysis of the vegetated open spaces in the Apipucos district of Recife, Brazil

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The presented study was part of the project “Open spaces in Recife” Brazil. The objective was the classification of the existing urban structures by means of vegetation cover and characteristics. Between April and October of 2006 all vegetated areas have been sampled with subsequent species determination in the herbarium UFP, Recife. In the entire pilot area we recorded 364 plant species comprising 93 families. The fraction of exotic species was variable depending of the use type of the urban area. In the study area fructiferous trees are the most abundant woody species. The most abundant herbal species are mainly ruderal plants. Statistic results based on floristic similarity showed that the studied areas can be joined into five groups. Urban forests show the highest floristic similarity with an Atlantic Forest remnant. In this areas occur species typical for the north-eastern Atlantic forest. These species show as well a very high degree of spontaneous regeneration which is lacking in the other study areas. Thus, these types of urban green spaces have to be considered as valuable step stone habitats which can help to protect the autochthonic biodiversity, especially in fast growing tropical cities which a often embedded in endangered ecosystems.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

The influence of past and present human decisions on urban arthropod diversity

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While arthropods represent two thirds of total species numbers in most habitat types, including urban areas, they are often a neglected group in biodiversity surveys. Thus we analysed the relationship between insect diversity and urban environmental factors at 96 sites in three Swiss cities. More specifically, we tested the influence of three continuous gradients, (i) sealed area, (ii) age of settlement (both work on long time scale) and (iii) human management by mowing (short time scale) on the diversity of 24 taxonomic groups. Species richness was obtained by means of Rapid Biodiversity Assessment RBA, which identifies specimens to morphospecies level. Heterogeneity information obtained from GIS-layers describes the urban mosaic structure and help to explain the variation in arthropod richness. The taxonomic groups correspond to different trophic guilds (herbivores, carnivores, pollinators) and different spatial attributes (ground-moving insects, flying insects). Results show that human management exhibits greatest influence on insect species richness, especially in carnivores. These are encouraging news: the findings point at the fact that species richness is not only the product of past human planning and building activities but is most drastically influenced by ongoing management practices. These management cultures can be influenced, even though that changing human habits is a challenging task.

Topic 4 Urban biodiversity & climate change

Local actors' perceptions of the climate change issue in urban landscapes

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Climate change is one of the most challenging issues of our time. As cities are key sites for the implementation of policies on climate change, we used standardised questionnaires and semi-standardised qualitative interviews to discover how local actors in the city of Berlin, Germany, respond to existing scientific information on causes and consequences of changing climate. Our results show that the scientific knowledge on possible impacts of climate change has only a low level of importance for actors working in the administration due to a restricted information access or an inadequate form of information, causing a gap between local actors and scientific community. The main barrier appears to be the down scaling of possible overarching impacts to regional and local scales. There is a strong need for (1) an enforced and well structured exchange of information between local actors from the fields of science and administration, (2) for a better integration of climate change issues in local urban planning issues and (3) for mainstreaming adaptive strategies on different administrative levels. We propose a agenda to bridge the existing gap between science and urban planning.

Topic 5 Design and future of urban biodiversity

Shrinking cities – new chances for biodiversity?

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In shrinking cities a considerable surplus of brownfields and open spaces is emerging due to processes of demolition and land use perforation of the urban structure. In terms of urban green infrastructure and of the overall urban biodiversity these processes and related additional green space are often considered as a positive contribution to improve both the recreational function and the biodiversity in cities. In this paper we argue that these benefits can only emerge if prerequisites such as a structural and qualitative enhancement of green infrastructure and an implementation of new green spaces adjacent to existing ones are fulfilled. Accordingly, we show that the quality of green spaces matters more than simply its quantity. Examples from the city of Leipzig will be presented to provide evidence of these aspects: firstly, the prefabricated socialist housing estate of Leipzig-Grünau highlights a case of too much waste green space which appears to be unused while extremely monotonous. Secondly, examples from the Wilhelminian built-up residential area of Leipzig-East show that even small but well structured new green spaces such as “pocket-sized parks” serve as enriching elements in a cosy built-up neighbourhood.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Biodiversity of wasteland patches in the urban fabric - Evaluation and consequences

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Above all the spontaneous vegetation growing on urban wasteland contributes to the plant species richness of towns. With 2194 plant species Vienna`s flora (Austria) can be considered especially diverse in species. Despite a high fluctuation rate, Vienna`s urban wastelands and their vegetation are well recorded. For example, on 20 disused railway areas covering 10% of the urban area (41.2km²) 23.5% of the total number of Vienna`s vascular plants were found. Because of the ecological importance wastelands have through their species richness, these green areas should be rated highly in the urban biotope management. But since towns are primarily subjected to human use, the evaluation of these areas has to include – beyond the ecological value – the social significance. To meet the line of thought of urban planners, a practically oriented evaluation system – ISEE (Indicator key for Social and Ecological Evaluation of wastelands) – was developed, enabling a quick and comprehensive quantification of the ecological and social significance of urban wastelands. This key was positively tested for its practicability in a case study carried out on 60 wastelands in Vienna. It serves the Municipality of Vienna as basis for discussion and decision for specific town planning measures in the green area management.

Topic 4 Urban biodiversity & climate change

The importance of evaporation and latent heat flux for the urban and global climate change

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Urbanization increases worldwide. Main hydrological difference between urban areas and the natural landscape is the missing evaporation. The evaporation trough vegetation and open waters achieves the main global energy conversion. A cubic meter of water evaporated consumes 680 kWh of heat. This energy is released in the atmosphere where water vapour condenses as clouds. Monitoring of the real evaporation with lysimeters in combination with several shortwave and longwave radiation measurements allow distinguishing the following energy components: shortwave reflection, longwave emissions and the sensible and latent heat flux. The measurements are carried out on greened and non greened roofs, green facades and semi permeable surfaces. New innovative measures of rainwater management in cities focus on the necessity of evaporation rather than infiltration. The latent heat flux is mainly underestimated in all climate models. The evaporation on green surfaces consumes the global radiation and reduces surface temperatures and related longwave emissions. The global and local reduction in evaporation on earth is related to immense deforestation and urbanization. The correlation between CO_2 and global temperatures is related to the development of vegetation and the relation to latent heat flux caused by evaporation.

Topic 5 Design and future of urban biodiversity

Nature conservation and monument protection – antagonism or synergy

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Historic walls provide habitats for a wide range of species. In this study the interactions between flora, fauna, and different building stone materials as well as between wall vegetation and animal species were examined on four castles in Northern Bavaria. The project focused on implications of restoration activities on the biocenosis of plants and invertebrates. Despite striking differences in the building stone material´s physical properties, their implication on species composition of populations found on historic walls are surprisingly small. Rather than rock material is the availability of microhabitats and their quality of importance for species diversity on walls. Particularly open joints turned out to play a vital role in this context. Neither vascular plants growing in open joints nor mosses and most lichens could be implicated with mechanism of appreciable biodeterioration of the examined building stone materials. Moreover mosses and lichens showed rock-protective effects. However, for the crust lichen *Lecanora campestris* permanent damages on walls could be found in singular cases. In contrast to this finding, shrubs and trees clearly caused deterioration of walls.

Topic 2 Cultural aspects of urban biodiversity

Biodiversity of urban front gardens (II) – where are the "hot spots" in Erfurt (Germany)

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To increase awareness of the aims of the Convention of Biological Diversity and especially the conference "Urban biodiversity and Design" in Erfurt 2008 a project was started in May 2007 with 70 landscape architecture students of the University of Applied Sciences Erfurt. This project focused on the biodiversity of front gardens in the Wilhelminian quarter of Erfurt, which was built between 1880 and 1910. Using a standardized method we investigated 360 gardens with an average size of 100 m². Each garden was surveyed over two days and all higher plants were documented, as well as typical architectural elements of the Wilhelminian period. The subsequent evaluation focused on the data: species number of native wildflowers and Wilhelminian style plants (wild flowers and ornamental) number of plant individuals from the Wilhelminian period and presence of typical architectural elements. Three gardens with the highest value were selected and the owners were awarded in public. A poster exhibition summarized the project, including recommendations for a "user manual of Wilhelminian front gardens". Methods and overall results are presented by Müller & al. (Biodiversity of urban front gardens (I)).

Topic 5 Design and future of urban biodiversity

Challenge the Future - the Energiegarten® : a chance for new townscapes and landscapes with renewable energy

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* Presenting author

Germany is the world champion in erecting wind power plants. However, problems of acceptance are starting to dampen the euphoria. Nevertheless, the goal of environmental policy is to obtain half of all primary energy from renewable sources by 2050. It therefore remains to be asked, what is the situation in regard to other sources of renewable energy, apart from wind energy? Appropriate measures need to be taken in order that renewable energy supply systems may be perceived as both being of high standard and expressing the "culture of energy" in townscape and landscape. Good knowledge of the combination options available and courses of action that are sustainable will make them more acceptable. · Landscape architects can do more than merely steer clear of interventions. By presenting conceptual proposals, they can make a contribution to the development of a viable, future cultural landscape incorporating renewable energies. The lectures to “Energiegarten® - new townscapes and landscapes” is now an official project of UN-Decade education for sustainable development 2005 – 14.

Topic 5 Design and future of urban biodiversity

A Concept for Nature Conservation in Cities - showed on the example of the City of Linz/Austria

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The City of Linz, capital of the Federal State Upper Austria, is famous because of its prosperous economical and cultural identity. That´s just why Linz becomes "Cultural Capital of Europe" in the year of 2009 (beside of Vilnius/Latvia). Linz has also remarkable riches of biodiversity and great variety of different landscapes. The local authority make big efforts for preservation of nature in the whole district and maintain an institute for urban ecology and nature conservation, called "Naturkundliche Station" which is connected with the Botanical Garden of the Garden Department. With this efforts the city of Linz won an austrian wide contest as „The most nature friendly city of Austria" in 2006. The main characters of the concept of nature conservation are described as follows: (1) Ecological scientific basic research program (investigation of flora, fauna, biotopes), (2) Application of the data of basic research for Nature Conservation and Urban Planning (e.g. Local Agenda 21, concepts for special species protection, concept for ecological land use and spatial planning, financial supporting of ecological landscape management of city farmers,…), (3) Public relation for Urban Nature (publication of the popular magazine ÖKO.L, lectures, excursions, environmental education program for schools,…).

Topic 3 Social aspects of urban biodiversity

Getting Educated by Accident. From a street corner to the wider world, getting the best from the least likely locations

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* Presenting author

In a parable of what can be achieved from a single city location. This paper illustrates what can arise from a small creative conservation project on a Liverpool street corner, as an introduction linking to the wider a world of people, places, and opportunities that extend far beyond it in just three short years. Nature is about opportunity, necessity is the mother of invention. Often aspirations of what is possible in terms of landscape are very low, - dullness and uniformity are the result. There is an alternative route that can be both practical and uplifting. This may trade on creative ways of working and communication as much as landscape technique. It revolves around seeing is believing, and showing practical and attractive solutions are possible even in unlikely settings. Given such an efficient use of resources, it begs the question why these why these principles are not applied more widely. It is a journey of good applied ecology, creative thought, the best use of resources, social awareness, public engagement and cultural insight. Landlife has worked with a creative conservation philosophy for over 30 years and established the UK's National Wildflower Centre in 2000.

Topic 3 Social aspects of urban biodiversity

Linking neighbourhood and nature – Local Action Group for Urban Nature Experience (LAGUNE)

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* Presenting author

Manifold offers in jobs, culture and consume draw people into cities. But living in cities is also away from nature and tends to anonymity. LAGUNE - Local Action Group for Urban Nature Experience is a working group of BUND (Friends of Earth) and consist of 6 members with qualifications in the fields of horticulture, landscape restoration and urban planning. In supporting neighbourhood activities on urban brown field sites LAGUNE observe enormous potential for a sustainable town development, especially with participation of citizens. The increasing diversity of abandoned areas creates new natural habitats in the city. Main objective is the re-utilization and improvement of such urban brown field sites for inhabitants and visitors of Erfurt. Negotiating contracts, concept development and fund raising are only some guiding and supervising tasks for the ambitious team aiming to establish citizens of Erfurt as planners of their own quarter. Project ideas, which were issued, accomplished or still being under process are, for instance, school garden projects, playgrounds for nature experience or community and district gardens. The presentation will give an overview on latest projects and show impressions of activities since foundation of LAGUNE in autumn 2005.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Which factors determine plant invasions in vegetation of man-made habitats in the Czech Republic?

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Factors determining the invasibility of different types of anthropogenic vegetation were studied in the Czech Republic. A data set of 3420 vegetation plots recorded between 1945 and 2005 was used. A set of climatic variables, propagule pressure, and local habitat conditions was obtained for each plot. All species were classified as native, archaeophytes, and neophytes and their relative proportion was calculated for each plot. Regression tree models were used to determine the ecological characteristics of the most invasible man-made habitats in the Czech Republic. The plots contained on average 31.9% archaeophytes and 7.3% neophytes. Both archaeophytes and neophytes were found predominantly in strongly disturbed habitats with a high nutrient supply located at low elevations in warmer climatic areas of the Czech Republic. The highest proportion of alien species was found in annual ruderal vegetation. Archaeophytes prevailed in alliances Malvion neglectae and Bromo-Hordeion murini, while neophytes were mainly found in Salsolion ruthenicae alliance. Archaeophytes are more influenced by local habitat conditions and preferentially colonize sunny and dry man-made habitats with higher soil reaction. Neophytes have no special preferences for local habitat conditions and their highest proportion was found mainly in disturbed habitats at low elevations.

Topic 5 Design and future of urban biodiversity

Challenges and opportunities of Green Space Development - Notes on the Process of Formulating an Urban Greenspace Strategy

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Green spaces assume a key role in enhancing the urban environment and improving the quality of urban life – they make cities more liveable places and play a key role for performing sustainable ideals. Frequent deficits in quantity and quality require appropriate strategies for the development and improvement of urban green systems. Backed by these premises the GreenKeys (www.greenkeys-project.net) consortium developed a methodology to formulate and implement a green space strategy. In our contribution developed tools and approaches will be discussed and illustrated with some good practice examples. Particularly the process of formulating an urban green space strategy plays a central role. The methodology aims at proving support for cities in the formulation of their green space strategy for enhancing the ecological, social or economic quality of their urban landscapes. Based on the experiences of the cities a "pool of green space strategies", with focus on the learning potential and transferring possibilities of new inputs and innovative ideas, is developed. Another tool to be presented refers to an indicators-based approach directed towards monitoring, steering and making visible the changes reached (or those to be reached) by the implementation of the green space projects

Topic 1 Biodiversity of urban-industrial areas and its evaluation

The Natterjack toad (*Bufo calamita*) living at the edge in urban biotopes

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* Presenting author

The Natterjack toad (*Bufo calamita*) is fairly common in the Netherlands. Next to dunes and riparian areas as their natural habitat, it also occurs frequently in agricultural and urban areas, where it benefits from human activities. The species pioneers in temporal biotopes in urban development areas, it can have a sustainable population where human practices involve constant soil activities. Due to its opportunistic character the Natterjack quickly benefits from temporal favourable situations but is also quickly exposed to high risks. The species is listed at Annex IV of the Habitat Directive and is strictly protected. Its strict protected status implies practical legal problems, which makes the species unpopular at local policy makers. We present some examples of Natterjacks living at the edge in urban biotopes. We propose a set of practical measures for handling local urban populations.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

The geographical distribution of avifauna and the factors affecting avitopes of some urban areas on the South African Highveld

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Biodiversity is a significant element of our everyday experience of urban environments. Fragmentation of habitats is recognized as the greatest threat to biodiversity and has thus attracted considerable research. There are many variable environments that are encompassed in urban landscapes. These levels of disturbance and broad range of environments have the potential to facilitate and accommodate a diverse avifauna. Various socio-economic factors can also affect the distribution or abundance of birds. As a result of the various factors involved within urban ecosystems, it is important to make use of research that integrates aspects of natural and social sciences in order to better understand the functioning of urban ecosystems. For this reason, socio-economic factors have been included in this study. Cities in the grasslands of southern Africa are often characterised by secondary woodland, resulting from urbanisation, and vegetation structure analysis was also included. This study is based on a continuation of a study that started in 2004. This current study aims to further refine the dual concepts of Active Habitat Selection and avitopes, to try and establish the delineation of avitopes in Potchefstroom, and to determine whether this technique is applicable to other types of cities or towns. Originally, in 2004, 56 grid sites separated 2km apart, was used. For the continuation study, the number of sites were doubled and only separated by 1km. Another town was also included for comparison, namely Viljoenskroon. Various parameters were measured during the course of this study, with two repetitions at each site for summer, fall and winter.

Topic 5 Design and future of urban biodiversity

What are the different design and management options for nature at business sites?

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Current practices in various countries show that business and industrial sites provide unexpected opportunities for nature conservation. Based on real-life cases and on general principles in landscape ecology we designed a range of spatial scenarios for business sites in which different options for nature conservation were elaborated. We optimized the business site characteristics that support its potential for biodiversity conservation: the large amount of flat roofs (could become green or gravel roofs), the high land use dynamics (derelict land offers pioneer habitat), the city-edge location (stepping stone between urban and rural nature) and its nine-to-five culture (relative low disturbance for nocturnal species). With literature and experts we defined (socio)economic and environmental criteria and thus could provide an MCA effect table that describes each scenario. Besides financial costs and benefits it shows how different design and management options affect non-monetary aspects like appearance and representation of the site, the opportunity for companies to show their ambitions for sustainability, benefits for health and recreation of employees and the contribution to local and regional biodiversity and water and air quality. With this we illustrate how nature can be part of multifunctional business sites, and therefore how business sites can contribute to sustainable development.

Topic 5 Design and future of urban biodiversity

Urban Greening Program in Indonesia: between the illusion of a good city and the reality of good urban environment

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In 2007 the Government of Indonesia announced a revision National Spatial Regulation, enforces a requirement for cities to allocate 30% of land for green open spaces. While simple and logical, the implications this requirement are vast. The number of new cities are growing fast as a direct consequence of the year 2000\'s autonomy regulation, and these tend to follow the trend fast-growing physically. Thus, greening program is somewhat going against the tides. Benchmarks for better-managed cities, like Jakarta or Bandung, are averaging only 7% green urban areas of area, battling high priced lands in fulfilling the required amount of green urban spaces. This paper discusses the need of a ‘landscape planning approach’ to green urban space issue rather than ‘spatial planning approach’. Spatial planning approach tends to view urban green spaces as part of city functions and allocate a certain quota needs fulfilling. Thus urban green spaces are reduced into merely another function rather than a means to achieve better environment and biodiversity. This paper will argue that a landscape approach would be suitable in accommodating a balance between quality and quantity of green urban space, allowing site-specific, holistic, and applicable greening programs that includes promoting urban biodiversity.

Topic 5 Design and future of urban biodiversity

Effect of pollution on human health and unsustainability in modern cities (case study: Tehran)

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The ever-increasing growth of world population, as some believe, has adversely and often disastrously affected the natural habitats of each globe. Uncontrolled and irregular consumption of fossil energies, destruction of forests and the extinction of faunas and plant species have been considered as consequences of them. Concern over the future environment on earth and its natural reserves is an undeniable truth, the thing that has attracted most attentions in the world. Man's activities on earth has, on one hand, ending eared the opportunists and possibilities of coming generation and on the other hand threatened the cities where people have selected as their chief places of performances and where the natural reserves and resources are consumed in great volumes. At present, the concept of sustainable development is singly that which most experts and practitioners agree on it. As a whole, an urban sustainable development can be defined as a typical development that brings about long-term social and ecological health in cities. It appears in a such way that the sustainable development and it's different concepts are suited well to the purpose and aims of modern architecture; urban planning and can be introduced as an effectively operating factor to achieve our sustainability aims.

Topic 3 Social aspects of urban biodiversity

Urban Agriculture - an ecological, cultural, economical, social and aesthetical approach for the urban voids design

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More of the world's population lives in urban than in rural settings. Its urbanisation process causes great challenges in the planning, management and conservation of urban areas. The expansion of the city is uninterrupted. Its speed depends on the changeability of land values, the immediacy of local urban needs and politics, and disputed interests within the reality of a city that has become socially, spatially and temporally fragmented. This extensive growth of the urbanisation led to new interrogations on the diversity of the urban voids and on their appropriation. Together with high and persistent deficits of environmental infrastructures, new experiences of understanding the urban voids and the landscape quality appear. The possibility of the city reconstruction could have its genesis in these spaces. They should be an actual expression of the landscape "continuum", where it would be essential a landscaped infrastructure connecting them. In this paper, emphasis will be placed on the integration of cultural, ecological, aesthetic and socioeconomic aspects of urban agriculture as a great potential for the appropriation and design of these areas. The main objective is a proposal of a new design approach that provides the creation of a productive and recreational landscape infrastructure.

Topic 5 Design and future of urban biodiversity

Approach and results of urban biotope mapping in Erfurt

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First urban biotope mapping in Germany took place end of the 70's as well as in the early 80's in Munich, Augsburg and Berlin. Already in 1978 the federal 'Working Group for Biotope Mapping in Developed Areas' was founded whereas their basic programme was updated and improved in 1990. As examples for Thuringia mappings in Erfurt, Jena and Gera can be mentioned. This presentation will give an overview about mapping activities in the area of Erfurt. In 1991/92 the first comprehensive- representative urban biotope mapping was elaborated for the entire city area and done by the Department for Environment and Nature Conservation. In the period from 1998-2001 exemplary mapping of different parts of Erfurt was made within the scope of seminars and diploma thesis's at the University of Applied Sciences Erfurt as well as projects of GRÜNE LIGA Thuringia. Approaches and results were presented in the journal „Naturschutz und Landschaftspflege in Thüringen". From 2001 to 2002 a new assessment of the entire city area was done. Accomplished by the National Environment Agency (Staatliches Umweltamt) this open land habitat mapping also addressed settled areas with amplified procedure.

Topic 5 Design and future of urban biodiversity

Using the urban biosphere concept in strengthening the jurisdictional landscape in Stellenbosch towards supporting sustainable development practices

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Cities are crucial centres of human existence and play an important role in creating sustainable futures. The projection is that 60% of the world population will be living in cities by 2025. Africa will be the fastest growing region. Cities thus also need to be regarded as places for finding best practices aimed at achieving sustainable development. Urbanization places increased pressures on social systems and ecosystems. Research towards sustainable cities will benefit from regarding cities as coupled social-ecological systems and to focus on their mutual interactions. The ideas and principles contained in the concept of urban biospheres emphasize the interaction and interdependence of humans and the natural world. The city of Stellenbosch is the focus of a research study with emphasis on the relationship between the built-up environment and the natural resource base. Municipal planning documentation and the recently proclaimed Cape Winelands Biosphere Reserve provide the context for exploring these issues towards “Re-inventing Stellenbosch”. Research will focus on the role and value of biodiversity in sustaining valuable urban ecosystems. The objective of the project is to identify best practices within the Stellenbosch Municipality that seem crucial in building a more holistic approach and implementation of sustainable development within sustainable landscapes.

Topic 2 Cultural aspects of urban biodiversity

The action programme *Ambrosia* in Germany

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Ambrosia artemisiifolia (Asteraceae) is known to have severe impacts on human health by producing highly allergenic pollen. While this neophyte has been present in Germany at least since 1860, it was neither widely distributed nor abundant and most of its stands have not been established. Only recently an increase in was observed - a possible explanation for this change is climate change which enables this annual to produce ripe seed more regularly. In 2005 an interdisciplinary working group was founded, with experts from the fields of allergology, ecology, botany, meteorology and aerobiology. The working group devised an Action Programme to halt the invasion in Germany. Elements of the Action Programme are a national monitoring and information on potential control and prevention measures for the public and relevant branches in the administration. Since most stands are founded by feeding Ambrosia contaminated sunflower seed to birds, information on this pathway is essential. Aims and first results of the Action Programme are reported.

Topic 5 Design and future of urban biodiversity

Comparison of Chinese and European evaluation approaches and resulting challenges for supporting biodiversity conservation in Shanghai

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The presented study searches to give an overview of existing approaches for the evaluation of Biodiversity in urban areas in China and tries to identify the main differences to criteria commonly used in Germany (and other European countries). It shall focus on some best practise experiences in both countries and identify the appropriateness to enrich each other. Shanghai will serve as example for the analysis. The city is constantly expanding and room for natural or semi-natural habitats is decreasing. A challenge for the city lays in a better understanding of the factors affecting biodiversity within the ongoing process of renewal and growth and to promote methods for evaluating them. This will help to identify potentials of the green infrastructure to support urban biodiversity within the dynamic mega-urban conditions. A characterization of the underlying planning system and instruments will help to learn about the suitability of different strategies for the local practise in Shanghai. A review of the pros and cons of the identified approaches shall lead to a conclusion about the appropriateness of European versus Chinese evaluation methods to support biodiversity conservation in Shanghai.

Topic 5 Design and future of urban biodiversity

Function and evaluation of urban biotopes in a southern temperate city, Christchurch, New Zealand

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Many approaches have been used globally to evaluate urban biotopes. These vary from classical phytosociology approaches in Europe to the urban – rural gradient approaches in North America. In our New Zealand studies we adopted more multivariate statistical methods that recognise urban biotopes. We collected compositional, environmental, and "social" data at a range of spatial scales. Our goal was to sample, define, and classify urban biotopes as a foundation for understanding the composition of urban vegetation, its structure, and potential for native species enhancement. By way of stratified random sampling of 90 neighbourhoods in Christchurch city (350,000 inhabitants), we sampled 350+ lawns (including 128 species), 250+ urban woodlands/parklands (including c. 500 woody species) and 250+ flower beds, walls, pavement cracks, shrubberies and hedges. It is interesting to note what drives compositional variation. For example, In Christchurch City lawns it is management practices, but for urban woodlands it is fashion and popular choice. Notwithstanding that natural successional processes are also influencing change. To fully understand composition variation in urban biotopes we need more inter- city and inter- hemisphere comparisons. What do we mean by biodiversity? Total species assemblages or just the relevance of indigenous biota? In the northern hemisphere most of the species are indigenous but in the southern hemisphere the majority of species in urban biotopes wee introduced from around the globe. We address these issues using our Christchurch city data in comparison to relevant global datasets.

Topic 5 Design and future of urban biodiversity

Birds and the city: responses of the bird community to altering uneven urban land use patterns

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The urban region of Leipzig has undergone large-scale land use changes since 1990. Socio-economic driven processes such as population decline, deindustrialisation and demolition of parts of the housing stock along with suburbanisation and over dimensional expansion of the transport infrastructure considerably altered grain, density and connectivity of urban patterns. Urban habitats correspond to these urban patterns and therefore the urban bird community can be understood as a result of the urban structure. This leads to the hypothesis whether bird diversity can be utilised to evaluate uneven urban land use developments such as growth and shrinkage. Is it possible to perform an evaluation based on either the Red List as an indicator connected to targets of nature protection or based on functional diversity as an indicator for ecosystem integrity? In our paper, we analysed the changes in the bird community and their spatial distribution in the region of Leipzig mirrored by respective land use changes. We used presence-absence bird data for 1993-1995 and 2003-2005. As a result we will show whether urban shrinkage and perforation lead to positive changes of the bird diversity while urban sprawl is expected to cause negative impacts.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

A shaped diversity (diversity of forms) of walnuts in settlements of Northwest Caucasus

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Usually biological diversity is examined by many researchers at a specific level. The variety of forms inside of the separate species, which growing in city or towns, is not studied so often. At the same time this diversity provides evolutionary process, and the survival of species under different conditions of environment. The territory of researches is located in the south of the Russian Federation in a northwest part of Caucasus. Here in settlements the significant amount of trees of walnut grows. For many years we have made works on studying shaped variety of fruits, force of growth, productivity, stability to illnesses and wreckers. The most valuable sorts from economic point of view were allocated, which then were used for the further selection and cultivation

Topic 5 Design and future of urban biodiversity

Restoring urban biodiversity using the flagship image of butterflies, Bangalore

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Several effective conservation strategies have been put into practice lately in order to conserve remnant urban green spaces and its biodiversity. Conservation of urban green spaces is highly complex due to the presence of multi cultural communities. Bangalore, IT capital of India, has attracted people from all over India, thus causing urban sprawl. As the city is growing outwards, peri-urban and rural areas which once were green lungs for the city are now being destroyed. Initiating an urban conservation and conservation conscious society may depend on the socio cultural background, their attitude, mindset and varying levels of exposure to nature. The most popular biodiversity conservation model has been trying to recreate habitat using the nearest wilderness as reference site. This may be irrational in many cases as the social system may not be resilient to this change in their surroundings as they have long been used a manicured lawns and gardens. This calls for an approach that transcends all the dimensions of such complexity. We explored the possibility of using butterflies as flagship species across many sections of the society to make many existing landscapes and gardens in Bangalore more eco-friendly so as to regain some of its natural functions.

Topic 2 Cultural aspects of urban biodiversity

Earthworms, Isopods and Millipedes on the Urban Landscape: Patterns in European and American Cities

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Urbanization is portrayed as one of the leading causes of biodiversity loss. Soils in cities are transported and heavily managed leading to altered soil community composition. Moreover, urban areas have been hotspots for exotic species introductions. We have collected soil fauna data in Baltimore, MD, and in several European cities. In this presentation we focus on three groups: earthworms (*Oligochaeta*), terrestrial isopods (*Isopoda*, *Oniscidea*) and millipedes (*Diplopoda*). Analysis of our records as well as published data revealed important patterns of urban soil biodiversity: 1) biodiversity loss or as well as presence of non-native species is taxon dependent; 2) species rich taxa respond to urbanization more strongly; and 3) there is a considerable overlap in species composition among cities. Some species exhibit extreme adaptations to novel urban habitats. Studies on altered urban soil communities enable us to address more fundamental ecological questions such as the relationship between biodiversity and ecosystem function, and the issue of species redundancy.

Topic 2 Cultural aspects of urban biodiversity

Re-establishment of the quality of life in a city of Algeria, Tlemcen

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Tlemcen is called the city of art and history, because of its Arabic traditions, and its musical, vestimantary and culinary art, it has been neglected since “the hard years of Algeria” (terrorism 1990) in the point of view of hobbies, music and other cultural activities. To remedy to all these established facts, the authorities of the town have renovated a very large basin, which was during the roman’s period water tank to a summer garden with a green park and with different places, like sportive, musical and cultural ones. The population of Tlemcen and its visitors enjoy this nice environment where they organise for example the national Festival of the Andalous music. The look of the town has changed, the large basin has become the green lung of the town centre and the place of relaxation for the population. We show in this presentation, through the commented photos the setting of the urban ecology, the evolution of work and the change for a durable development of an abandoned site in the centre of Tlemcen city. Key words: Algeria - Arab city - Tlemcen - urban ecology - durable development.

Topic 5 Design and future of urban biodiversity

Biopositive buildings as real way of support of urban biodiversity

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Environmental problems of megalopolis cannot be solved without biopositive construction. Biopositivity of buildings and engineering structures is their ability to be an organic part of natural ecosystems. Biopositive buildings and engineering structures in every megalopolis can allow to a certain degree "to return" to nature some part of territory with soil-vegetable layer and to create new additional planted greenery areas. Biopositive buildings cannot destroy and cannot pollute natural environment. They must restore the nature, must be adapted (bio-adaptive) for existence of animate nature on external surfaces of buildings and inwardly volumes of engineering structures. Thereby, biopositivity of buildings and engineering structures is integral notion, inclusive main requirements to nature savings and nature restoring objects. Biopositive decisions may be used by new designing and by ecological reconstruction of old non-ecological buildings and engineering structures. Biopositive reinforced-concrete constructions are buildings and engineering structures, which are perceived organically by an environment as cognate to its objects, they allow the existence of plants and small animals (for example birds) on the surfaces. The author has developed a wide complex of biopositive constructions for conditions of the complicated relief of the Black Sea coast (Crimea) assisting to restoration and conservation of nature.

Topic 5 Design and future of urban biodiversity

Architecture may provide unexplored opportunities for urban biodiversity conservation: case-studies from the Netherlands

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In many cities nature appears spontaneously at unexpected places. Traditional urban ecological research provides the opportunity to determine the crucial habitat factors which enable nature to colonize cities. For several animal species that can be linked with artificial stony habitats (peregrine falcon, common swift, coastal birds, bats, amphibians) habitat factors can be described based on existing literature and current practices. We used this knowledge to explore how biodiversity conservation measures could be included in the architecture and management of buildings and other man-made constructions. Together with (landscape)architects, project developers and environmental NGO's we came up with new building concepts in which breeding and hibernation sites became an integral part of the building structure. We even designed a building across a highway in which the green roof may act as an ecological corridor. At this moment some of these projects are already realized, others are in different stages of planning and design. So far, we conclude that architecture provides a new, promising area for urban biodiversity conservation, and that cooperation with architects and urban developers can be a strong tool to really conserve plants and animals in cities.

Topic 5 Design and future of urban biodiversity

Facilitating biodiversity and quality of life in urban settlement areas by ecological compensation measures

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Cities are developing daily by investing, planning and building activities. In the city of Zurich whole districts completely change appearance after ceasing the former industrial use. Furthermore construction regulations allow substantial extensions of buildings which result in structurally compacted quarters and subsequent restrictions on the extent of open space. The attractiveness of developing quarters strongly depend on the supply and design of open spaces. Green spaces have also an ecological and micro-climatic compensatory effect. In cooperation with architects and landowners the Department Green City of Zurich promotes a sustainable design of the outside space by facilitating ecological compensation measures. The intention are attractive and modernistic open spaces, well usable for recreation, reasonable in maintenance as well as offering habitat for Flora and Fauna outside of protected areas. Based on various examples the presentation will light up ecological compensation measures in the city of Zurich referring to: 1. Guiding principles: Legal basis, goals and indicators of ecological compensation measures to promote species and habitat within the urban settlement area. 2. Implementation: Integration in planning and administration procedures, quality standards and attendance of construction processes. 3. Motivation: partnerships, raising public awareness and support for maintenance. 4. Monitoring results of implementation and success.

Topic 5 Design and future of urban biodiversity

Biodiversity protection of urban-industrial area, by the example of Paljassaare Special Protection Area, Estonia

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Prior to joining the European Union, Estonian Government identified three special areas of conservation in the capital city of Tallinn. Paljassaare Special Protection Area (SPA) was designated 5 km from the city centre in a military area of the former Soviet Union. Nowadays the site, located on a peninsula, is surrounded by the city wastewater treatment plant, landfill, cargo ports and several industrial facilities. Despite the industrial neighbourhood, but due to the attractive coastal region and the proximity of the city centre, many significant housing projects are being planned in the brown fields just behind the border of the Natura 2000 site. In order to ensure the protection of the site and to prevent any irreversible damage from the development projects, SPA management plan was drawn up in 2006. It was a public process in which different interests and positions of stakeholders were considered. As a result, timely and open process of management planning of the Paljassaare SPA helped raising the awareness of stakeholders and achieving a smooth implementation of the management plan and ensuring the favourable conservation status of the site. Experiences of management planning of urban biodiversity in cities of Europe are also drawn in the article.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

The omitted value of boreal urban biotopes in Europe

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Since the year 1979 most European nations include natural biotopes in their policy for biodiversity. Main tools in EU have been nature protection areas, Natura 2000-network and the species and habitat directive. Without information and implementation it may still be impossible to stop extinction by 2010, as EEA admits in ”Europe´s environment – The fourth assessment”(2007). Intensifying agricultural and urban land use policies have regionally variable effects on biotopes. Urban areas suffer everywhere from the same problems of fragmentation, spatial decrease and neglect. Boreal urban biotopes are still unclassified and mixed to larger scaled land use (Vähä-Piikkiö & Maijala 2005). In Europe, the boreals host most indigenous species and profit from their slow urbanisation. Cases like ruderal, dry meadows, ramparts, historical parks and lush herb forests point out possibilities to habitat conservation, urban and green planning, management and design. Integrated management adds endangered guilds to cultural modernisation. Regional harmful planning fashions can be fought with ecological environmental impact assessments and open planning discussion. Green structure planning is very important, but unpopular in countries with an integrated planning system. Hazards may still be a worse threat than climate change for most boreal urban biotopes.

Topic 5 Design and future of urban biodiversity

Environmental and economic development shrinkage of Atenquique

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This paper is aimed to analyze the environmental economic development shrinkage of Atenquique after the industrial boom of the paper mill during the second half of the last Century. The town of Atenquique was settled down and grew up in terms of population, social and economic development in the same proportion that the Industrial Company of Atenquique did during the period when the company was property owned by the Mexican State. After the Company has been privatized, the town started declining and shrinking in population, social and economic development, and the most disastrous is the environmental hazards. The impact on the environmental and economic development has initiated the shrinking and declining of Atenquique but also of the surrounding cities and towns. Key words: Atenquique, environmental development, economic development, shrinkage, neoliberal model, globalization

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Thrips species resistant, sensitive bioindicators for urban pollution (insecta: Thysanoptera)

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The LIFE02ENV/RO/000461 project has the main purpose of identifying and using bioindicators for air quality monitoring in three public parks in downtown Bucharest, a city area heavily polluted by intense car traffic. In 2006, in each studied park, Thysanoptera insects presented a biodiversity that increased from the park edges, more exposed to the air pollution, towards the centre, less polluted. *Frankliniella intonsa* immerged as the species most resistant to air pollution, with high numerical density at park edges. However, those individuals presented numerous morphological antennal anomalies. The total amount of thrips collected in 2006 was 1570 ind/m^2, higher than in 2007, when only 1080 ind/ m^2 were sampled. However, the species richness was higher in 2007, with the research pointing out to an increase in xero-termophylous thrips at the expense of the mesophylous ones. This change was the result of a very hot and long summer in 2007 as well as of the interaction with pollutants. We expect the future analysis of heavy metal accumulations on *Frankliniella intonsa*, *Haplothrips niger* and *Bagnaliella yuccae*, to confirm that these herbaceous layer species are very sensitive bioindicators of urban pollution.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

City matrix as hot spot for introduction and shelter for native fauna elements: examples on Isopods (*Crustacea*, *Oniscidea*) from Hungary

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Isopods as soil dwelling decomposers play an important role in ecosystems, but we know few about their habitat needs, species richness and assemblage composition in urban environments. We aimed to find general patterns in faunistic composition of human influenced habitats and to analyse the isopod fauna of Budapest, a metropolitan city. We found that the areas in question share a common basic fauna (cosmopolitans and native generalists) and may harbour a high diversity adding native and accessorial elements. The example of Budapest (28 species; 49% of the Hungarian oniscids) shows a mixture of native (43%), introduced (35%), established introduced (11%) and cosmopolitan (11%) species. Sampling sites possessing various urbanisation levels (native forests, city forests, gardens, public parks, city core, and botanical gardens) differed in their species richness: it was highest in the gardens of Buda (17) and in botanical gardens (16). Sørensen similarity was highest between native- and city forests (81%), and lowest between Pest gardens and the city core (47%). Our conclusions: 1) forested areas, gardens and parks may be of importance in survival of native isopods in cities; 2) species richness increases greatly with a number of introduced and non-native species restricted mainly to greenhouses and gardens.

Topic 2 Cultural aspects of urban biodiversity

Traffic as agent for plant invasions along urban-rural gradients

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Urban areas are among the land use types with the highest richness in plant species. A main feature of urban floras is the high proportion of non-native species with often divergent distribution patterns along urban–rural gradients. Urban impacts on plant species richness are usually associated with increasing human activity along rural-to-urban gradients. As an important stimulus of urban plant diversity, human-mediated seed dispersal may move species across urban–rural gradients. We used long motorway tunnels as sampling sites for propagules that are released by vehicles to test for the impact of traffic on seed dispersal along an urban–rural gradient. Both the magnitude of seed deposition and the species richness in seed samples from two motorway tunnels were higher in lanes leading out of the city, indicating an 'export' of urban biodiversity by traffic. As proportions of seeds of non-native species were also higher in the outbound lanes, traffic may foster invasion processes starting from cities to the surrounding landscapes. The findings demonstrate that dispersal by traffic reflects different seed sources that are associated with different traffic directions, and traffic may thus induce plant invasions starting from cities to the surrounding countryside.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Environmental history and urban colonizations

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An important objective of urban ecology is to understand urban colonization processes. A practical problem is that colonization processes may be slow, and are hence impacted by multiple and sometimes conflicting ecological factors at different phases of the long process. For instance, the population of the Hooded crow started its rapid growth in the Finnish cities in the 1970's, 50-60 years after the initial colonization. In such cases data on urban environmental history, e.g. on biological waste production, may be essential for understanding causal relationships. A common problem is that historical data may not be easily accessible, or if available, may have been collected with different methods at different times. In the case of Hooded crow urbanization in Finnish cities, historical data on biological waste production and its spatial patterns suggested that waste production has had only a minor effect on the urbanization process.

Topic 5 Design and future of urban biodiversity

An Analysis of the Spatial Distribution of the Urban Norway Maple and its Implications for Park Management

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Invasive species can have a devastating effect on the urban forest by altering its ecological functioning and structure. This study examined the risk of invasion by Norway maple street trees into a forested park in the city of Kitchener, Canada. The primary research question was: What are the spatial distribution and dispersal patterns of street trees and park trees in urban areas? The objectives were to: a) examine the spatial dispersal of exotic street trees; b) develop tree inventory data; and c) make management recommendations. An inventory, point-quarter sampling and spatial analyses were used. Despite the well-established population of Norway maple on the streets, spatial assessment of the forested park revealed that few Norway maples had actually invaded. Explanations for the lack of invasion include: the existing ecological integrity of the forested park (in part due to its high biodiversity), physical barriers around the park and prevention of establishment by common buckthorn. The main recommendations for the City of Kitchener's urban forest management plan were to: i) not cut down the Norway maple street trees; ii) remove Norway maples currently growing in the forest; and iii) replace dead street trees with a diversity of hardy, native trees.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Determinants of plant species composition in urban brownfields

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Brownfields are known as important sites for urban biodiversity, but only few attempts have been made to evaluate the influence of ecological parameters on species composition. This study aims to assess the importance of site conditions for plant species composition and its changes during the course of succession (annual-, herb-, shrub-, and tree-dominated stages). The study was carried out in six disused railway areas in Berlin. Using Canonical Correspondence Analysis with a forward selection procedure, the predictors photosynthetically active radiation, C/N-ratio, temperature maxima and sums, potassium, soil moisture, and temperature minima were the most important factors to explain species composition in all successional stages (pooled data). By means of variation partitioning, total variation explained and partial effects of the three predictor groups soil, temperature, and photosynthetically active radiation were determined. Temperature was the most important predictor for species composition in annual and shrub stages. In herb stages, floristic composition was mainly influenced by photosynthetically active radiation. The largest amount of variation in species data of tree-dominated stages was equally explained by both soil and photosynthetically active radiation. Thus, relative importance of site conditions clearly varies throughout succession.

Entente Florale – a contribution for more awareness on biodiversity in European cities and villages

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Green is essential for the quality of life in towns, for health, well being and recreation. For the "green development" in urban places, the European Competition Entente Florale was founded in 1975, initially between France and Great Britain. Twelve countries are members by now. This competition encourages public authorities, private bodies and the local economy of the towns to cooperate in improving the quality of life for inhabitants and visitors, by planting flowers, developing and maintaining landscape, green and open spaces, and by generally fostering an ecologically and environmentally sensitive development. The contest encourages actions that foster an increase in environmental awareness, improve environmental education, contribute to sustainable development and to environmentally sensitive landscape policies, thus ensuring a better quality of life for urban dwellers. Biodiversity on fauna and flora being among its grading criteria, the contest promotes landscaping policies in line with the European Convention of landscaping. Caused by the contest participating the town is literally experiencing a "sustainable push". Ideas and initiatives are often supported by local sponsorships or public interest groups. Each town is getting its final Jury report with recommendations for development initiatives.

Topic 5 Design and future of urban biodiversity

Toward Sustainable Urban Design

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This paper deals with typical ecological urban problems at two different areas (Braga and Tamansari) along the Cikapundung river in Bandung in relation with the growth of the "unplanned settlement" und commercial projects. The discussion focuses on the role of urban green open space within the historical development of the former colonial Bandung, which had been strongly influenced with the ideals of garden city principles. Urbanisation and urban development in Indonesia, mostly driven by socio-economic development, have been very impressive during the last three and half decades. The rapid pace of urbanisation has brought massive consequences, especially: air and water pollution and conversion of open space as well as many social problems. With an observation of these urban areas, which are currently experiencing economic pressures, this paper will finally highlight the nexus between the socio-cultural context and the formulation of urban development policy. The case studies reveal that for the formulation of urban development policy socio-cultural aspects should also be taken into account. Thus, sustainable development and design must be more than merely "protecting" the environment; rather they must improve the human condition through capacity building, as this paper argues.

Topic 3 Social aspects of urban biodiversity

Urban Nature – Habitat and anthroposphere from the view of nature conservation

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Nature conservation in urban areas takes place under other basic conditions than in open landscapes. In settled areas, the main focus is not only on elements of habitat and species conservation. Nature conservation strategies for settled areas must take sociological and social economic factors into account. In this respect it is our task to strive towards the preservation and development of green structures and open spaces in cities and urban areas. In the German national strategy to the biological diversity the following purposes were formulated for urban area with the time horizon to 2020: • Up to 2020 the residential near green in the cities is clearly raised (for example plants on roofs, claddings and courtyards). Publicly accessible green is available within walking distance. • Living spaces for endangered, city typical species (as bats, sparrow, swift, kestrel, chicory, wall-fern) are preserved and extended till 2020. This happens in a way which also allows furthermore an active inside development of the cities and municipalities and a comprehensive energetic building renovation. The Federal Agency for Nature Conservation supports the search for intelligent solutions for more nature conservation and a management for urban open spaces protecting the quality of life in the cities.

Topic 5 Design and future of urban biodiversity

The impact of contrasting urban planning models on biodiversity preservation: native grasslands in Australian cities

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Bioclimatic differences and the often unique, historical, political, cultural and economic circumstances of cities make comparing the effect of different urban planning models on the preservation of natural ecosystems in cities difficult. In Australia, temperate native grasslands, one of the country's most endangered ecosystems occur in two similar major cities with contrasting planning models; Melbourne and Canberra. Melbourne followed an urban planning pattern, common to many Australian and North American cities, of rapid expansion from a relatively small core after the Second World War and recent more orderly expansion into growth corridors. Due to its pattern of growth the destruction of native Melbourne's grasslands has been recent and rapid, with 44% of the native grasslands known in 1985 destroyed by 2000. Canberra has been shaped by the Garden City and New Town Planning movements and its polycentric distribution of urban functions has become a model of idealised planning widely respected throughout the world. Although its more centralised urban planning has saved some native grassland from urban development, recent destruction has still occurred. In this paper we compare the urban planning models and processes of the two cities and their success in preserving native grasslands.

Topic 3 Social aspects of urban biodiversity

Nature Preserve Management and Cooperative Educational Programs Produce Ecosystem Restoration in an Oak-Hickory Woodland and Tallgrass Prairie

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Pohickory Nature Preserve of Wadsworth, Illinois, USA, is owned and managed by The Land Conservancy of Lake County (LCLC). This preserve is a good example of a quality natural area that could not be conserved without the intervention of a small scale, private, not-for-profit foundation. Prior biological inventories had noted the quality of this 32 acre (12.5 Hectares), although its size and proximity had disqualified it from inclusion in the Lake County Forest Preserve District system. LCLC has a 10 year history of utilizing cooperative educational programs in the restoration and management of the site. The activities of the various grades levels of the participating classes and schools are summarized. Student restoration activities included brush cutting, seed collecting, greenhouse plant production, sowing of seed in the field, and prescribed burning. The success of the student volunteer activities have been monitored by a grid of belt transects. The resultant data, as well as photographs, indicate that the low-impact, hand-tool methods employed have been successful in producing the planned project goals. The educational benefits to the participating students are also considered and discussed.

Topic 2 Cultural aspects of urban biodiversity

The spontaneous flora around street trees in cities: An example for the homogenisation of the urban flora

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A comparison of the spontaneous flora growing around street trees in West and Central European Metropolises (London, Paris, Copenhagen, Hamburg, Berlin, Warsaw and Vienna) shows a high degree of homogeneity. And even in North American cities the species composition existing around street trees in urban areas has a high similarity to that of European Cities.

Topic 2 Cultural aspects of urban biodiversity

Effects of some heritage areas to woody plant diversity and green spaces in urban areas: a sample of Trabzon city

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The term “biodiversity” is often used to explain a variety of genomes, species, and ecosystems occurring in a geographically defined area. As for woody plants, they are very important parameters in this system owing to their relatively larger bio mass and longer life span. When talking about urban areas, green areas have always been under serious pressure because of necessities and demands of cities for long years. Although these areas are very important to provide a healthy environment for those who live in a city, it is quite possible to see that some sites, roads and large building masses divide them into smaller pieces or degrade them in anyway. Heritage areas, which are often protected by laws or indigenous cultures, have always been important places to provide green spaces in urban areas. In this study, some heritage areas of Trabzon city including historical castle, mosque, Hagia Sophia museum etc. were chosen as the research areas and their woody plant structures and green spaces were examined using some satellite images and field surveys. According to the results, importance of these areas regarding biodiversity for the urban environment was identified and some proposals to protect and to improve this diversity were determined.

Topic 4 Urban biodiversity & climate change

Effects of climate change on urban biodiversity and ecosystem services in Finland

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IPCC estimates that average temperatures in Finland will increase 2-7 ˚C until 2080 and rainfall will increase 5-35 % especially during winters. Moreover, according to estimates snow and ice cover will diminish, and changes will happen in soil moistness, structure and frost, extreme weather phenomena will increase, and sea level will rise in the long run in Finland. Climate warming related changes in species distribution have already happened in Finland, as several insect species have rapidly expanded their range towards north. Climate change will also affect urban green and water areas, their biodiversity and ecosystem services. For instance, exotic species can thrive in urban areas and threaten native species by competition, and urban parks and forests can suffer from draught, land frost changes, new pests and increased storms. Effects on urban ecosystem services can include changes in supporting services (e.g. nutrient and water cycling, provisioning of habitat), regulating services (e.g. regulation of climate, water and some human diseases) and cultural services (e.g. recreation, aesthetic experiences, traditions). Urban planners need to technically develop such urban environment that will sustain the climate change and potential extreme weather events, and also address the combined effects of urbanization and climate change on urban biodiversity.

Topic 1 Biodiversity of urban-industrial areas and its evaluation

Assessment of ecological and recreational ecosystem services in urban habitats

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Our assessment approach focuses on ecosystem services (biodiversity, groundwater re-charge, recreational) based on ecological properties at a settlement structure level. Due to varying urban designs, settlement-open space-compositions, utilisation intensities, ownership structures or soil sealing rates, urban units – urban cores, continuous urban areas, discontinuous detached housing, large-scale housing, old industrial areas, suburban areas (residential/commercial) – possess different ecological and recreational values. Furthermore they are differently affected by urban growth or shrinkage processes like urban deconstruction, renaturisation, conversion, reurbanisation (gentrification of housing stock) or revitalisation (industrial landscape, waterfront development), suburban reconcentration (edge city, big box) or exurbanisation. Despite the multifunctionality of urban ecosystems, urban habitats are subject to conflicting societal demands and trade-offs for recreation and ecological conservation. These results are influenced by drivers such as demography and household dynamics of the particular urban setting. Is it possible to measure the width of ecosystem services and distinguish between different urban structures and to set up rules accordingly? How will they change in case of urban growth and shrinkage? Can they be placed into a generic urban, peri-urban and rural setting to assure comparability among European regions? Answers to these questions will be given in the paper using empirical data of European case studies.

Topic 5 Design and future of urban biodiversity

Migrating birds' stepping stone - urban design for habitat value in Nanchang City, China

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Dramatic landscape changes caused by rural-to-urban migration and rapid industrialization in China have uncertain impacts on biodiversity and the quality of urban life. With a goal of protecting and enhancing biodiversity in the fast-growing cities in China, normative scenario design strategies are applied in this project to investigate and propose plausible future landscapes. The normative scenarios embodying hypotheses about landscape functions rely on simulation modelling and GIS to invent landscape patterns that have certain ecological, economic, and cultural effects. The case considered here is an 8.3 km2 site in Nanchang, the capital city of Jiangxi province in south-eastern China. The city government has identified this greenfield site, located in a floodplain adjacent to downtown, for development due to increasing land demand. Poyang Lake, China's largest freshwater lake, is situated 25 miles away and attracts half a million waterfowl each year, including 95% of the world's Siberian Crane population. In the route of the bird migration, the floodplain and the wetlands in the city provide habitats and important stepping-stones to the wildlife. Based on the scenario landscape patterns, alternative urban plans can be designed, compared and directed to foster biodiversity.

Topic 2 Cultural aspects of urban biodiversity

Cultural influences on exotic species in urban landscapes

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Exotic species are pervasive across the urban landscape. Yet, we actually know very little about their distribution. In this paper, we use vegetation plot data from Syracuse, New York; Baltimore, Maryland; and Gainesville, Florida USA to examine exotic species distribution in urban landscapes. Data were collected from remnant and emergent forest patches, riparian habitat, and URFORE plots by land use. Exotic species were divided into two groups: invasive and non-invasive. For land uses, unique species distributions were observed. For example, *Acer platanoides* in remnant and emergent forest patches occurred principally in older residential areas and in those patches exhibiting a high frequency of human disturbances. Site legacies played an important role too. Non-invasive species (e.g. *Syringa* spp.) only occurred on abandoned urban sites. Species patterns varied by patch size and type. For large-remnant forest patches (>5 ha), species patterns varied by plot location—interior vs. edge—and age of residential areas. By comparison, for small-emergent forest patches (<1 ha), species patterns varied by land use. Conservation efforts to maintain native vegetation need to be cognitive of these results when rehabilitating forest patches in urban landscapes.

Topic 3 Social aspects of urban biodiversity

An interdisciplinary approach to a comprehensive evaluation of urban biodiversity

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The research provides a comprehensive framework for interdisciplinary evaluations of urban biodiversity as part of nature and landscapes. Thereby, it takes into account the ethical, economic, psychological, culture-historical, social, educational, and scientific values of urban biodiversity as mentioned in the preamble of the Convention of Biological Diversity to be applied by a condensed amount of evaluation criteria to two practical examples of the urban green space Nunhead Cemetery in London, UK, and of the neophyte London Plane-tree (*Platanus* x *hybrida*), which is frequently planted in parks and avenues of urban areas. The research makes obvious the high dependence of citizens to urban biodiversity in quantity and quality due to the higher human population density in comparison to rural areas. It discusses the different aspects of the relations of the human being in cities to biodiversity and their consequences in “Urban Biodiversity & Design” for participative management and planning processes in administration and politics.

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