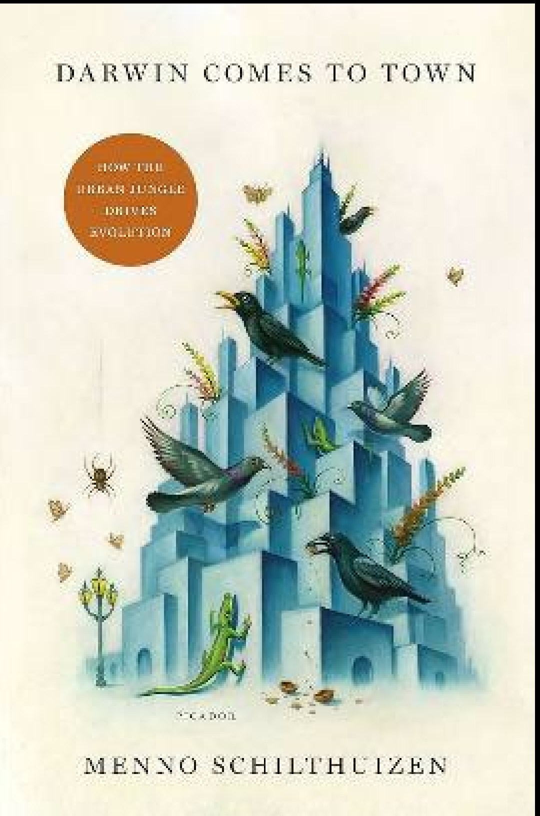
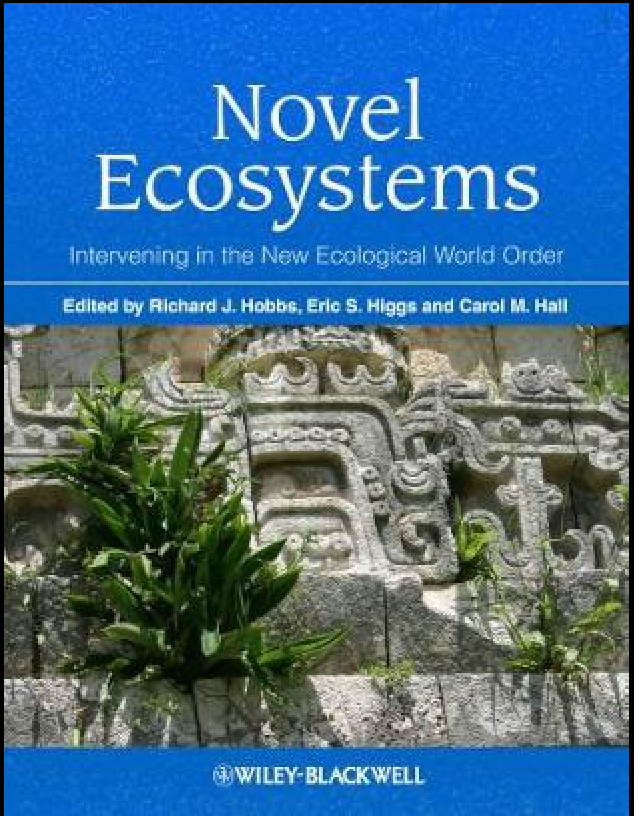
Center for Environmental Research at Hornsby Bend

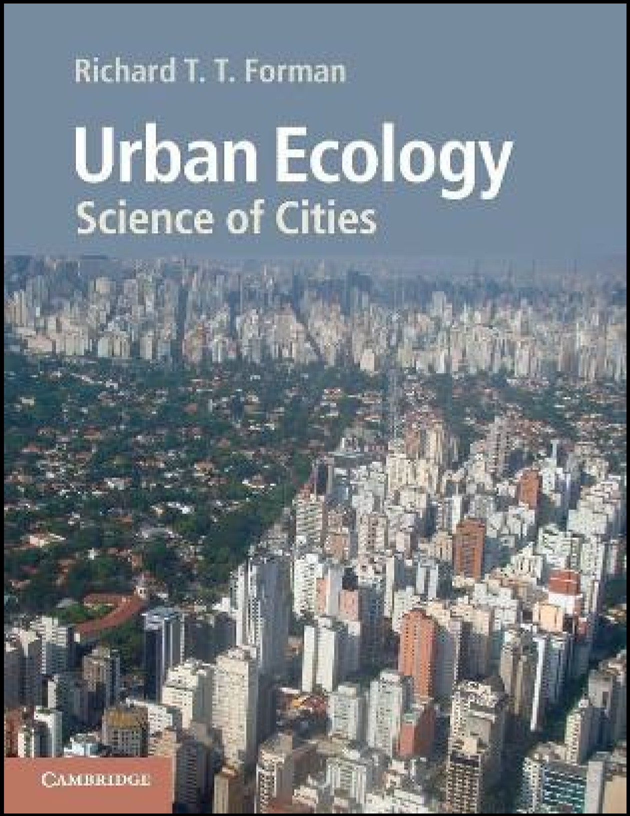
Austin Water

Nature Out of Place: Biological Slumming and Urban Ecology

Kevin M. Anderson, Ph.D.
Austin Water – Center for Environmental Research







The Problem of Urban Nature - Tallmadge

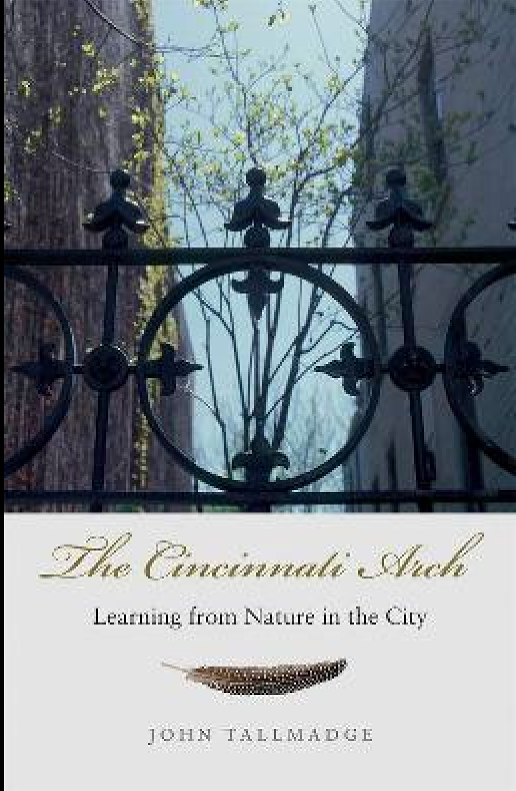
"Urban nature is not sublime…There's too much sterility in the form of roofs and pavement, and, oddly enough, there's also too much wildness, too many weeds and wooded borders and tangled banks, not to mention vacant lots going to brush.

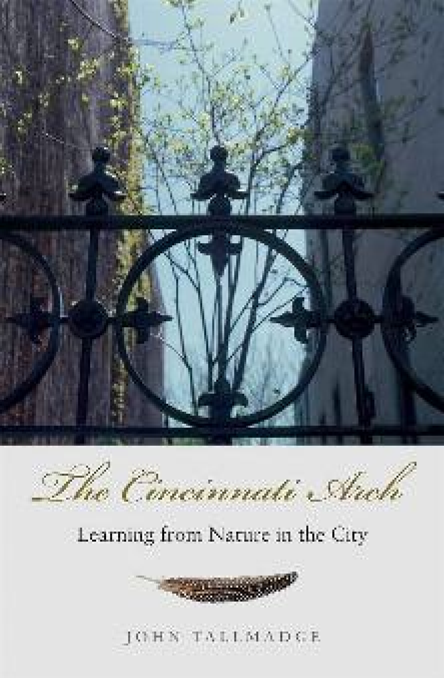
Of course, "wilderness" won't do to describe such landscapes either. Despite the degree of wildness, there's too much human impact, too many alien species, too few large animals to meet the legal and cultural criteria.

The fact is that urban landscapes are just too mixed up, chaotic, and confused to fit our established notions of beauty and value in nature.

Maybe it's not really nature at all, not a real ecosystem, just a bunch of weeds and exotics mixed up with human junk."

John Tallmadge
The Cincinnati Arch: Learning from Nature in the City (2004)





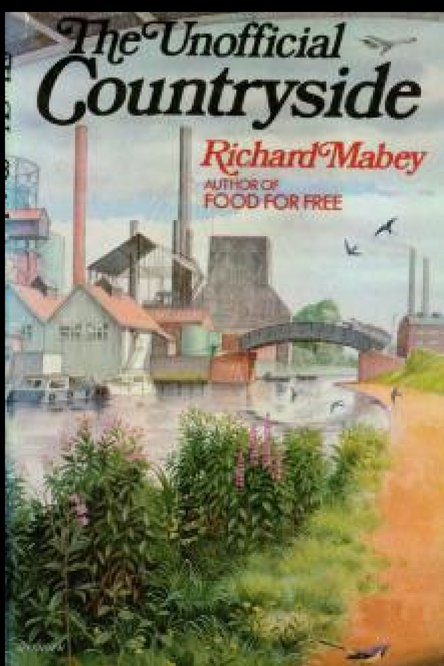
Perceptions of Urban Nature

The Danger of Biological Slumming

Ecological Expectations

"Maybe it's not really nature at all, not a real ecosystem, just a bunch of weeds and exotics mixed up with human junk."

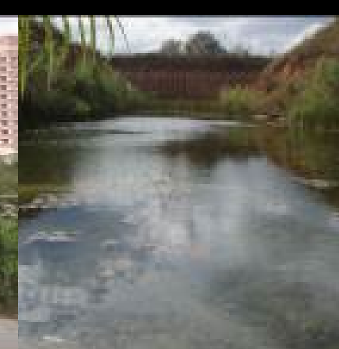
John Tallmadge

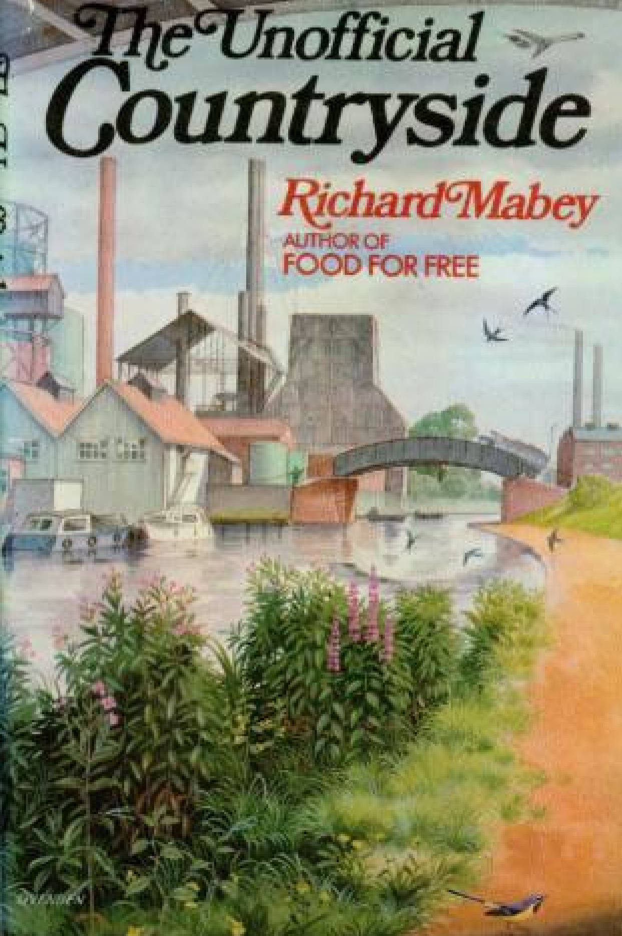


"…the danger…is being tempted into some biological slumming. The habitats I've described in this book are in no way a substitute for the official countryside. Nor are they something to be cherished in their own right, ***necessarily***."

Richard Mabey, *Unofficial Countryside* (1973)





Nature Out of Place
“Find our bearings in a landscape”

Richard Mabey *The Unofficial Countryside* (1973)

“I have called it the unofficial countryside because none of these places is in the countryside proper, nor were they ever intended to provide bed and board for wildlife.

Yet I think all these places do have one quality in common, and that is that, in them, the labels ‘urban’ and ‘rural’ by which we normally find our bearings in a landscape, just do not apply.

It is not the parks but the railway sidings that are thick with wildflowers.”

The Countryside Code
RESPECT • PROTECT • ENJOY

Romanticism and Gloom

"Our attitude towards nature is ***a strangely contradictory blend of romanticism and gloom***. We imagine it to 'belong' in those watercolour landscapes where most of us would also like to live."

Persistence and Change

"For it is nature's fight back which is such an inspiration, ***her dogged and inventive survival in the face of all that we deal out***. It is a survival story, and what it can mean for us, that is the subject of this book."

"If the ability of wildlife to survive literally on our doorsteps is remarkable, ***its persistence in the face of this ceaseless change is amazing***. It is also, I find, amazingly cheering. For it is a bleak view to see this story as nothing more than one of survival, with Nature irrevocably opposed to Man, forever just holding on.

Looked at more hopefully ***it is a story of co-existence***, of how it is possible for the natural world to live alongside man, even amongst his grimiest eyesores."

Lucian Freud
Wasteground, Paddington, 1970

American Perspectives on Nature and the City

- The Sacred and the Mundane (Profane)
- Natural vs. Artificial
- Wilderness and the City
- Persistence and Change
- Pristine vs. Degraded
- Native vs. Nonnative

Once a rock dove, now the winged rat of the city

Socioecological Narratives of Urban Nature

- What it is
- What it does
- What it means
- Where it is

Geography

Science and the City

"When talking about nature, why do we always implicitly or explicitly factor humans out of the equation?

Why consider that ant nest hanging from that tree over there as natural, but our human cities not?

Why do we admire the leading part that these ants play in the ecological workings of their bit of rainforest, but at the same time do we express disgust at the way humans may dominate a landscape?

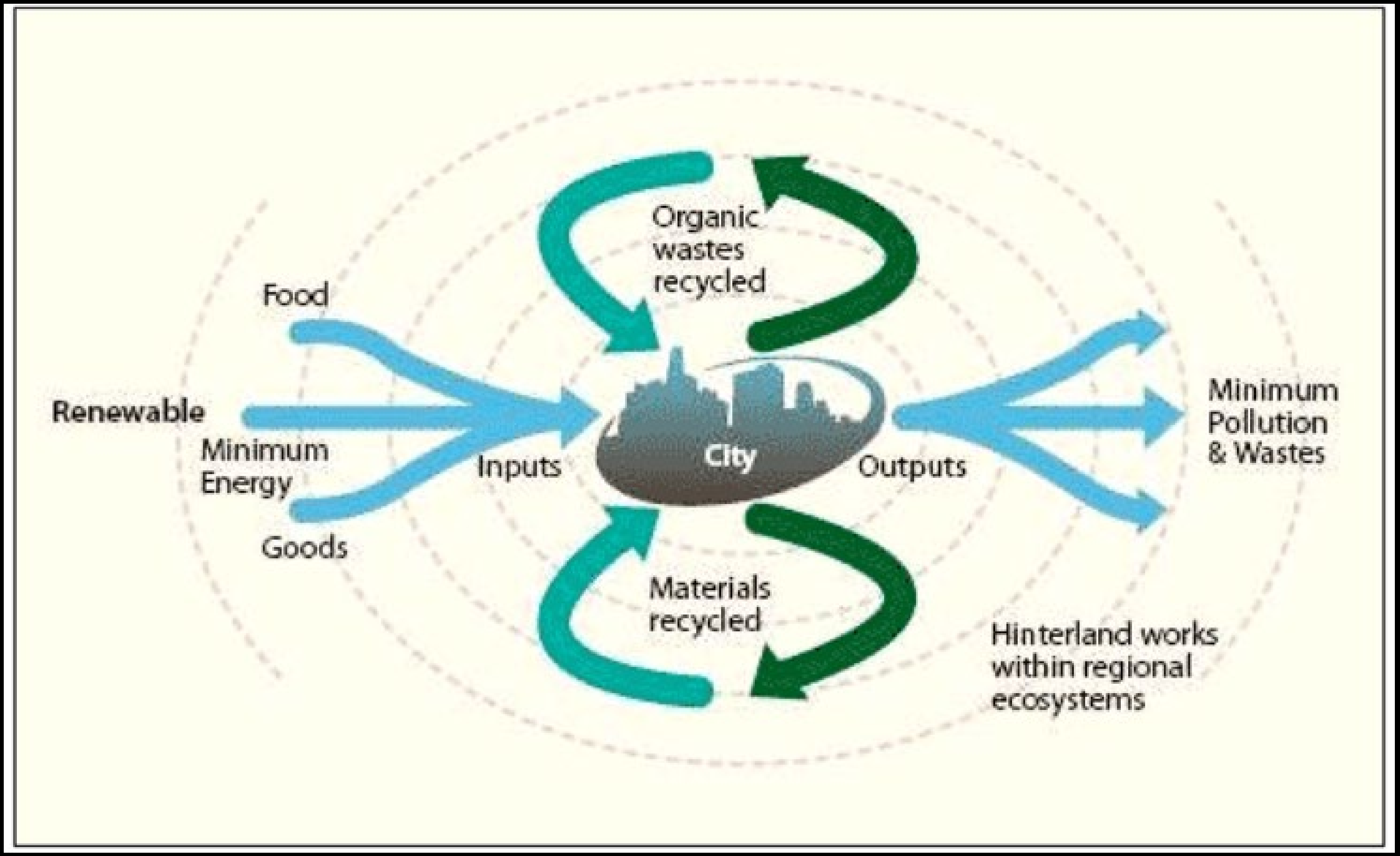
There is no essential difference."

2018

Biological Slumming and Urban Ecology

The Problem of Urban Ecology

The ecology "in" cities
or
The ecology "of" cities



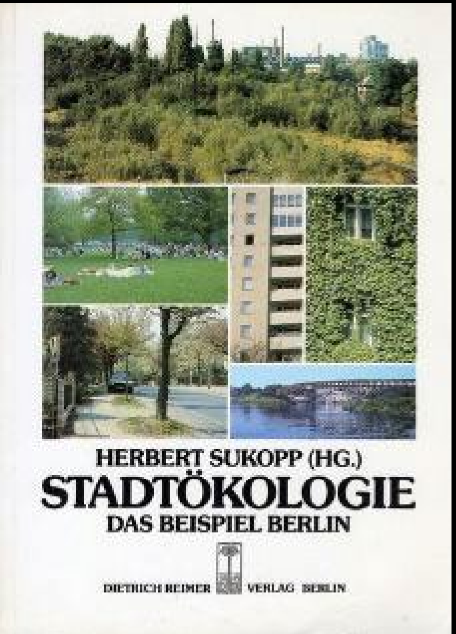
The ecology “of” cities?

German urban ecologist - Herbert Sukopp
Technische Universität Berlin, Germany

One of the pioneers of urban ecology who works in Berlin since the late 1950s and is often referred to as the founder of the "Berlin School of Urban Ecology".

At a time when most ecologists sought out remote, pristine ecosystems, Sukopp and his colleagues focused on urban wastelands, known in German as Brachen. They reminded him of volcanic rubble—ecological clean slates ripe for species to colonize.

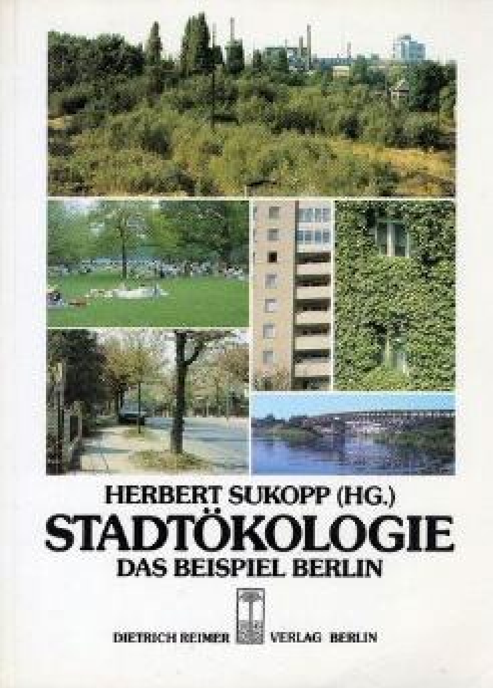
“*A cosmopolitan community of uniquely adapted organisms*”

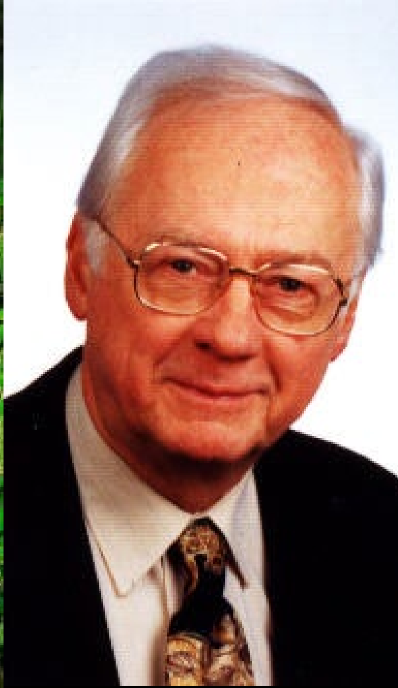


European Urban Ecology Perspective on Urban Nature
The Ecology of Cities

“The **field laboratories** where possibly new and well-adapted ecotypes of our native or naturalized wild plants will originate in the changed environmental conditions.”

“***Ecosystems which have developed in urban conditions may be the prevailing ecosystems of the future***.”





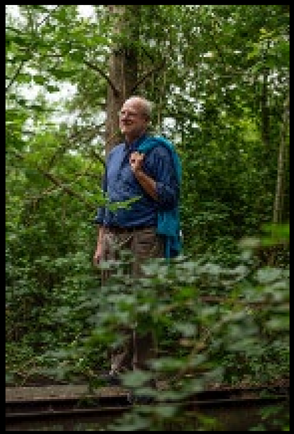
Ingo Kowarik

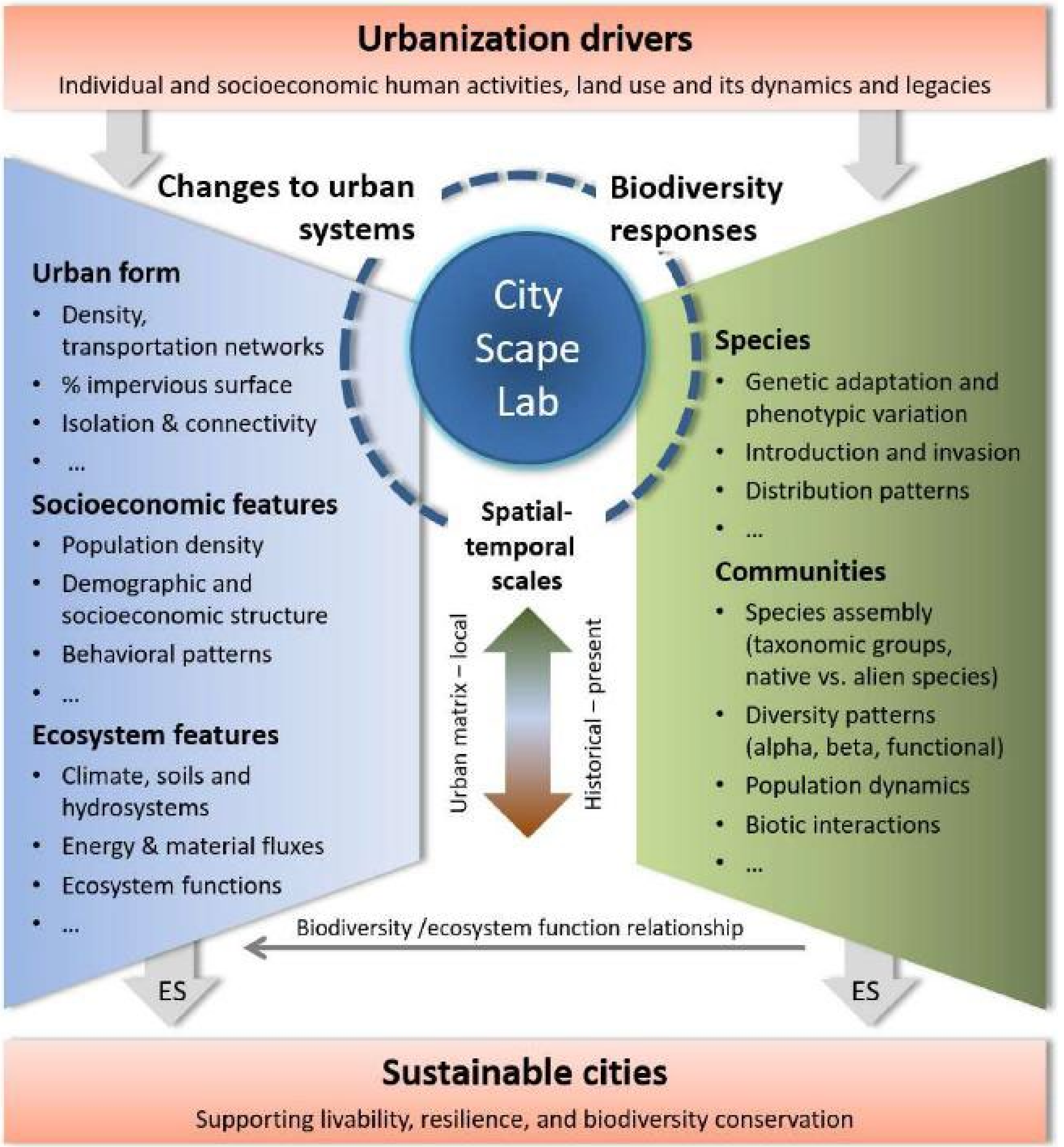
Technische Universität Berlin, Germany

Field Laboratories

Studying the Prevailing Ecosystems of the Future

The CityScapeLab Berlin is a novel experimental research platform that allows the testing of theories on how urbanization affects biodiversity patterns and biotic interactions.





Science for Environment Policy
DG Environment News Alert Service
European Commission
08 November 2007

Benefits of Wastelands for the Protection of Urban Biodiversity

Recent research has emphasised the role urban wastelands can play in preserving biodiversity in urban areas. Large connected wasteland seems to be a significant source of floristic diversity and thus disseminates and colonises surrounding neighbourhoods. Scientists suggest that preserving wasteland in urban areas could be necessary to protect urban biodiversity.

Land use planning can have a significant impact on biodiversity. To address this concern, the European Commission issued a strategy on biodiversity[1] in 1998 and four biodiversity action plans in 2001. In May 2006, the Commission adopted a Communication[2] which sets out an ambitious policy approach to halting the loss of biodiversity by 2010. In particular, it provides an EU Action Plan which proposed concrete measures and outlines the responsibilities of EU institutions and Member States, respectively. Furthermore, the European Commission also adopted a Thematic Strategy on the Urban Environment[3] in January 2006 aiming at improving the quality of the urban environment. However, even with this initiative, the specific link between urban wasteland and biodiversity has still received limited attention.

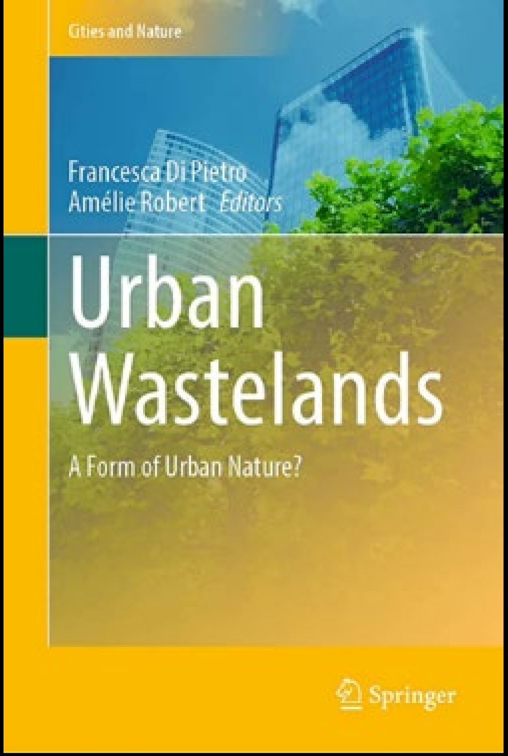
Recently, French researchers tried to determine the role of urban structures in the distribution of wasteland flora in urban areas. Within the framework of this study, they focused on 98 wastelands ranging from a few square meters to more than 18,000 m² over a French department in the greater Paris region. Researchers assessed three parameters quantifying the floristic importance of wastelands: the number of species, the frequency of occurrence of species and the proportion of indigenous versus naturalised species.

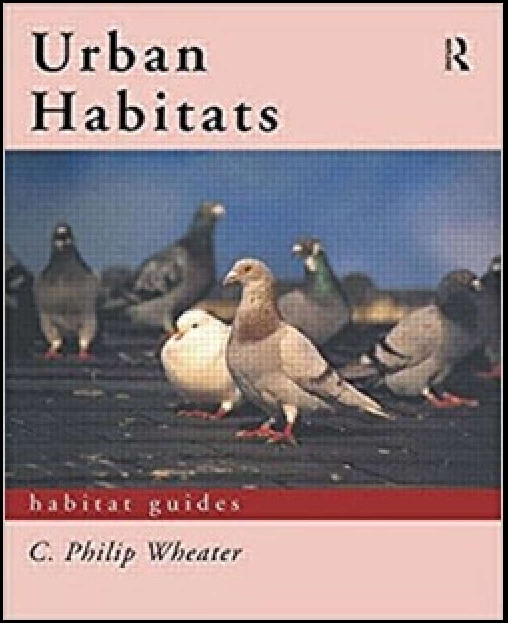
The main results from this study are as follows:

- Urban wastelands host a substantial proportion of the floristic diversity of cities: nearly 60% of the total species recorded over the whole department were found in the wastelands under study.
- Large wastelands and wastelands of intermediate ages contain the highest number of species. This is the result of the traditional evolution of floristic diversity: after some years of colonisation and competition among species, a relatively small number of species remain settled.
- Wastelands witnessing the presence of water within a close radius have a higher chance of containing rarer species. Adversely, acting as a biodiversity pool, urban wastelands could have a positive impact on the biodiversity of neighbouring areas according to the authors.
- Individual and collective dwellings around sites have a negative influence on the floristic significance of areas by reducing their overall quality: rare species are less frequent in this type of wasteland.
- Unexpectedly, the environmental characteristics of the area, such as geomorphology and exposition, were not crucial factors in the floristic importance of wastelands. Though these parameters are considered unavoidable by the authors, no evidence could be provided by the study: the fragmentation of the landscape, and the introduction and covering of alien substances in wastelands could have hindered these parameters.

Overall, the authors suggest that the maintenance of wastelands is necessary considering their role in the spreading of species and the colonisation of surrounding areas. Large and connected wastelands contribute to the preservation of biodiversity in urban areas. Therefore, this study provides new insight in the dynamics of biodiversity in urban areas that could be taken into consideration when planning urban land use.

[1] The European biodiversity strategy is available at http://ec.europa.eu/environment/docum/9842sm.htm





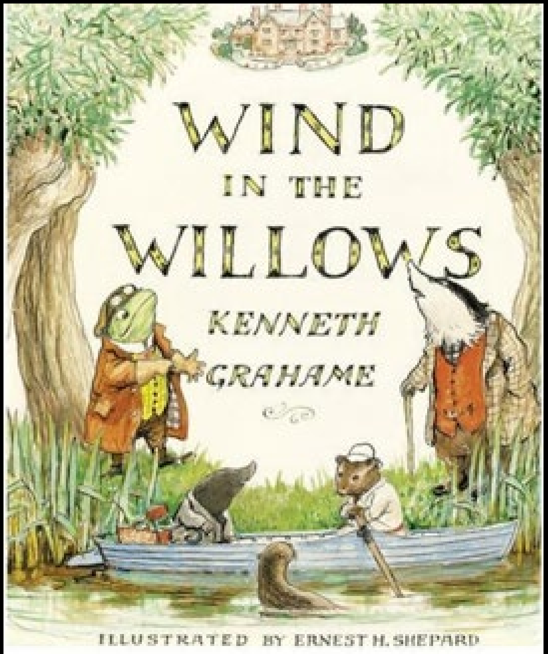
Fall and Rise of British Water Rats – Coexistence

The water vole is found throughout riparian habitat in mainland Britain. However, the water vole suffered a catastrophic decline in the latter part of the 20th century through habitat lost from agricultural intensification and development of the floodplain, and predation by the introduced American mink.

A survey carried out by the Mammal Society (1989-90) showed that the species had been lost in 94% of the sites where it had occurred earlier in the century.

But then, a survey conducted by the Urban Wildlife Trust (1997) indicated that population decline in urban areas might not be as dramatic as elsewhere.

The urban landscape appears to provide a stronghold for the water vole.

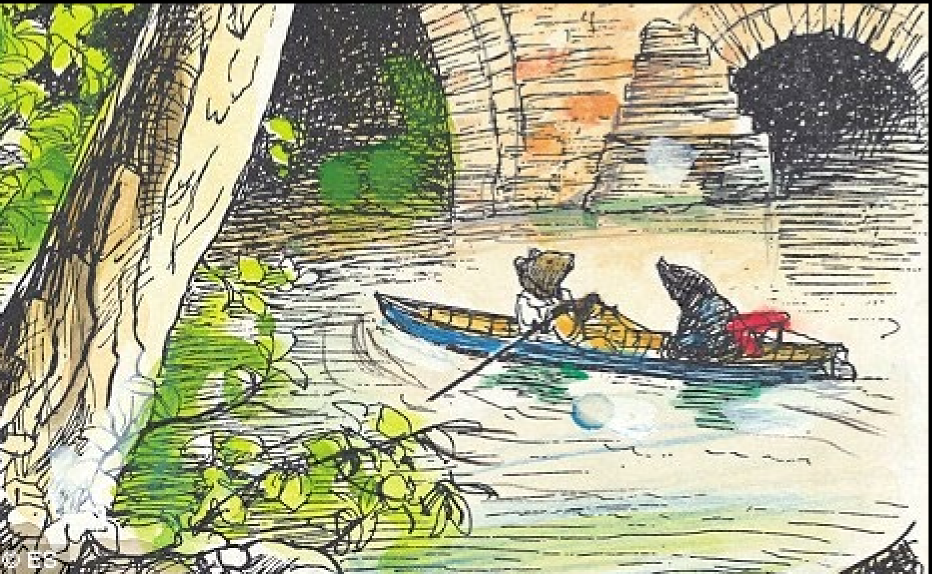


Ratty – the Water Vole (Arvicola terrestris)

Messing about in cities - Urban water voles

Lancashire Wildlife Trust has discovered healthy populations of endangered water voles on some stretches of the Leeds & Liverpool Canal and is actually widespread there because the canal still has brickwork banks in many places and water voles are able to burrow between the bricks.

Ecologists have discovered that urban water vole populations are doing much better than rural populations probably because there is less intensive management of riparian areas in urban wastelands and abandoned canals and no American minks, since they avoid urban habitat.



Coexistence - Marginal Nature

"Maybe it's not really nature at all, not a real ecosystem, just a bunch of weeds and exotics mixed up with human junk."

What emerges in these urban wastelands is a hybrid type of nature both weedy and wild - the unintended product of human activity and Nature's unflagging opportunism, which I call **Marginal Nature**

Marginal Nature: Urban Wastelands and the Geography of Nature

Anderson 2009 UT Geography

The Geography of Unofficial Urban Habitats

Wastelands - whole patches

- Vacant lots
- Dumpsites
- Industrial Wasteland
  - Brownfields
  - Greenfields
  - Quarries and Gravel Pits
- Urban Infrastructure Land
  - Power plants
  - Water treatment plants
  - Reservoirs
  - Wastewater treatment plants
    - Sewage ponds
    - Constructed wetlands
  - Stormwater retention structures
- Unusable Land - bits and pieces
  - Slopes, gullies, corners, fragments

Margins – edges and ledges

- Urban waterways
- Canals, drainage channels
- Utility corridors
- Waysides
  - road waysides
  - railway verges
- Alleys – paved, unpaved, grass
- Walkways and pathways
- Fencelines
- Walls and ledges
- Pillars and bridge abutments

"Urban ecology highlights all the spaces" Forman

Urban Ecology Highlights All The Spaces

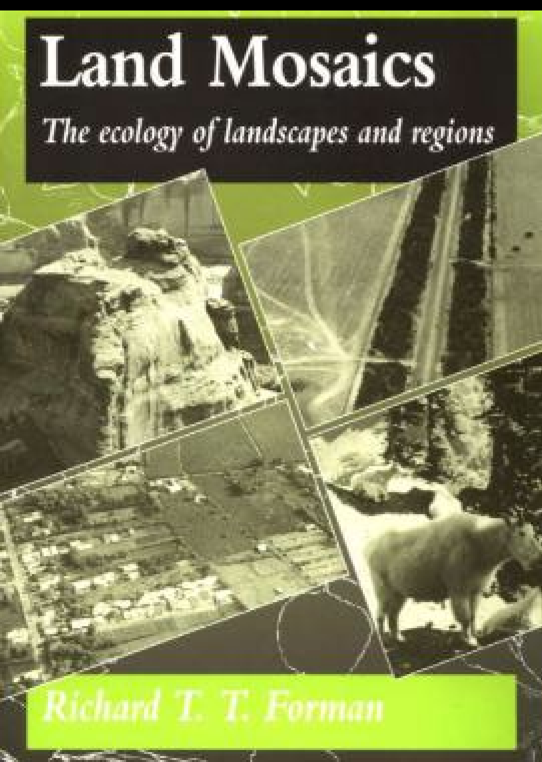
Richard Forman – Harvard University, Professor of Advanced Environmental Studies in the Field of Landscape Ecology

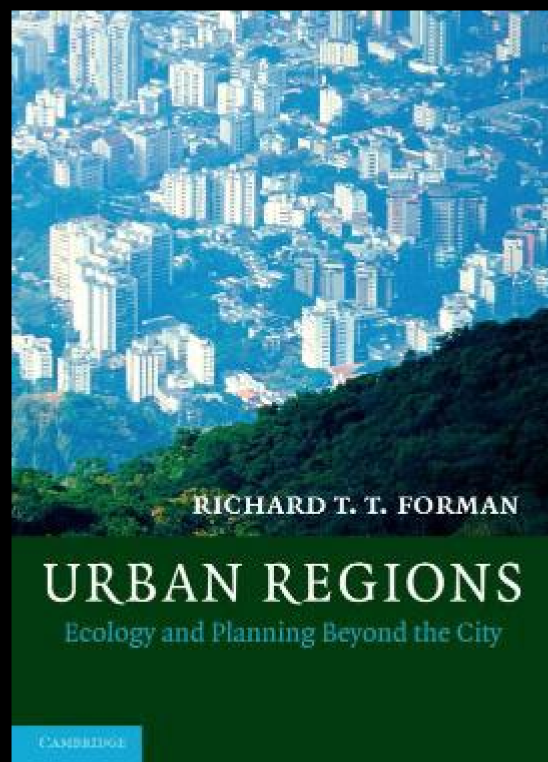
Spatial Patterns – **Cities as heterogeneous mosaics**

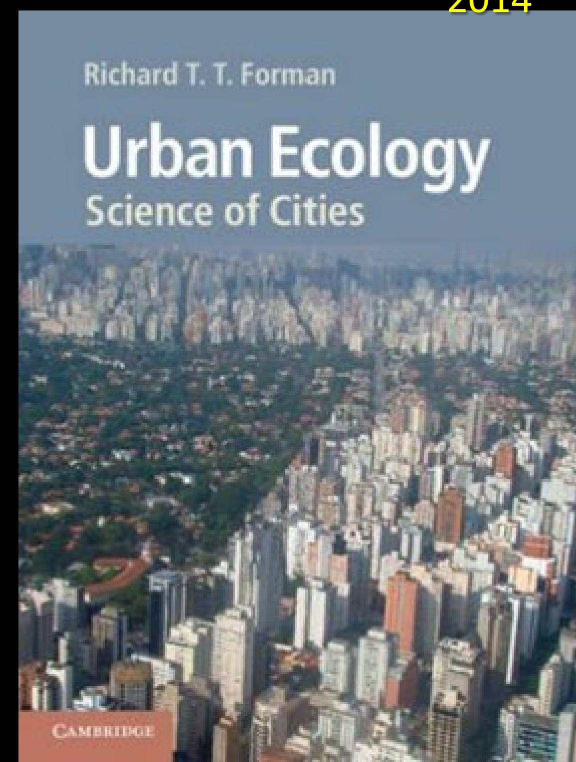
Two approaches to the study of urban ecosystems

- **The ecology "of" cities (not just ecology "in" cities)**
- **"Urban ecology highlights all the spaces, not only parks and other greenspaces, but also the rich variety of built spaces."**

2014







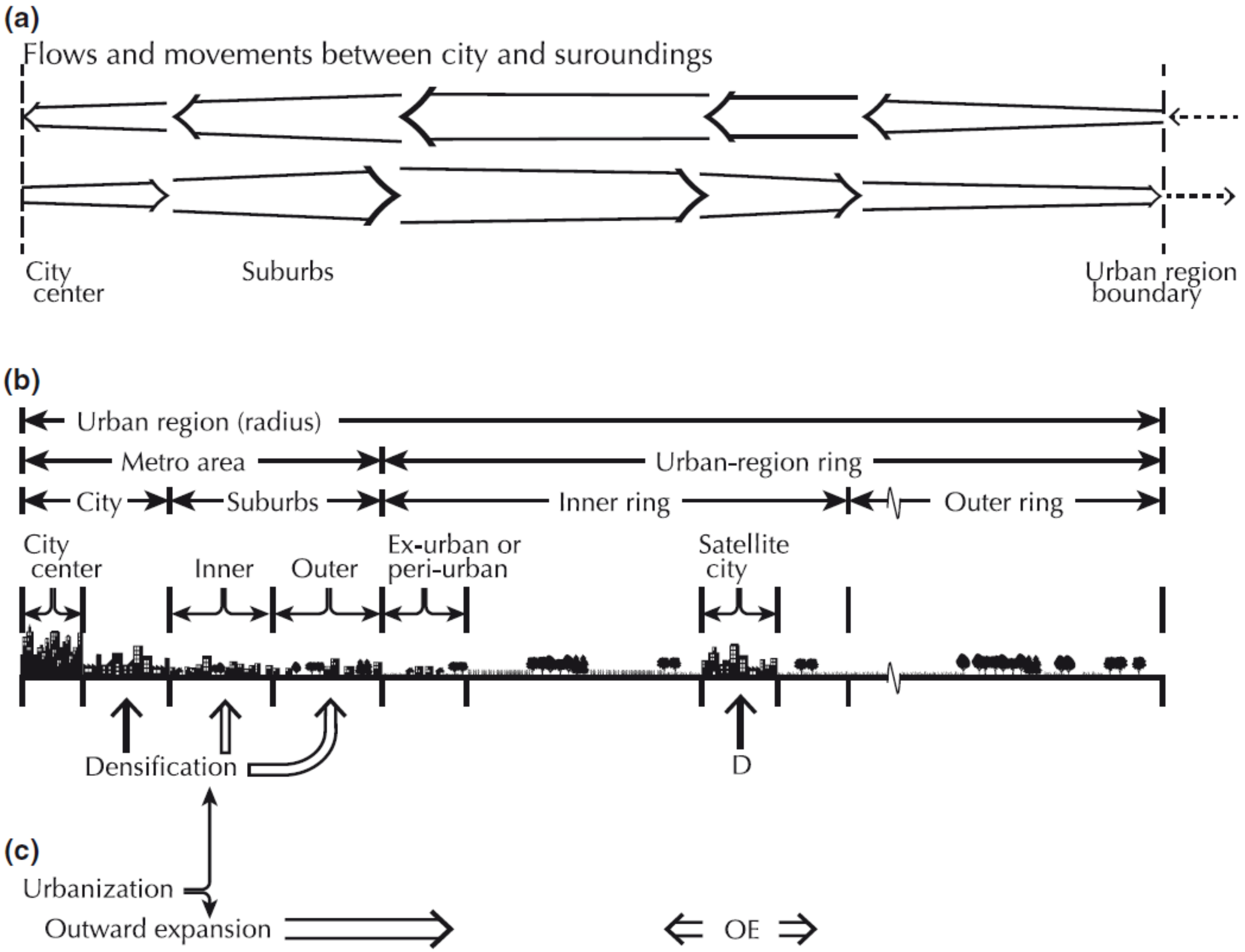
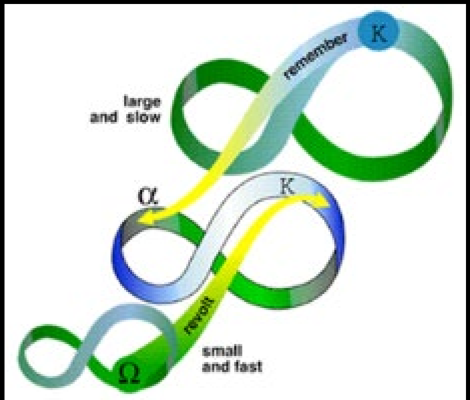


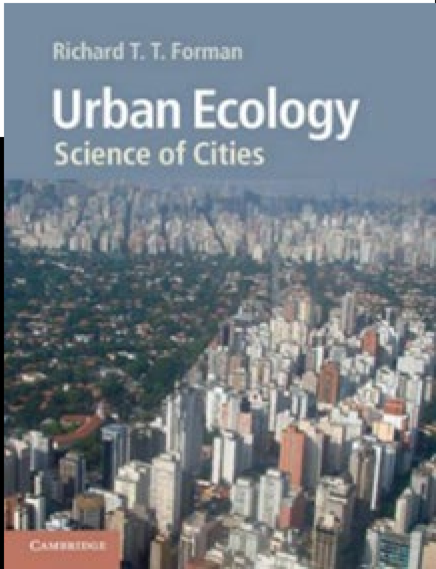
Figure 1.4. Concepts and terms for urban ecology. Metro area extends outward to the edge of the essentially continuous all-built area. Some suburbs extend beyond the metro area, and include some or all of the exurban or peri-urban zone. The urban-region ring also contains separate towns and villages. (a) Width of arrows roughly proportional to amount of flows and movements. (b) Concepts and terminology used in this book. (c) The two components of urbanization in different areas [see (b)] of the urban region. (d) Examples for bits of green cover (in built space) = window box, street trees, back yard space, green roof; examples of created greenspaces = city plaza/square, cemetery, vacant lot, dump, waterworks, golf course. Based on Forman (2008) and other sources.

Cities as heterogeneous mosaics

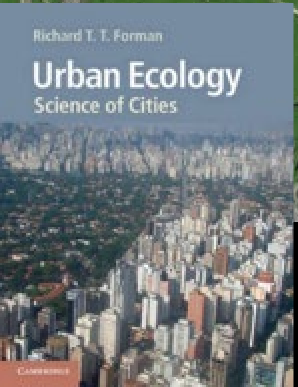
Dynamic Change

The Ecology of Urbanization Gradients





“For a natural or agricultural landscape, **these patterns would be bizarre**.
In urban areas, they predominate.”



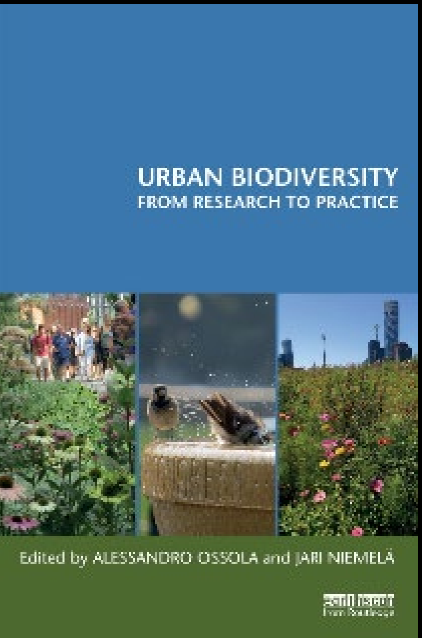
Looking Backwards to Historical Naturalness

Perceptions of American Urban Biologists, Ecologists, and Environmentalists

Urban Ecosystems are: ***A weedland community of inappropriate nature*** needing restoration back to historical naturalness

“(Urban growth) replaces the native species that are lost with widespread “weedy” nonnative species. This replacement constitutes the process of biotic homogenization that threatens to reduce the biological uniqueness of local ecosystems.”

Michael L. McKinney, “Urbanization, biodiversity, and conservation”. *Bioscience* 52(10), (2002), 883–890.



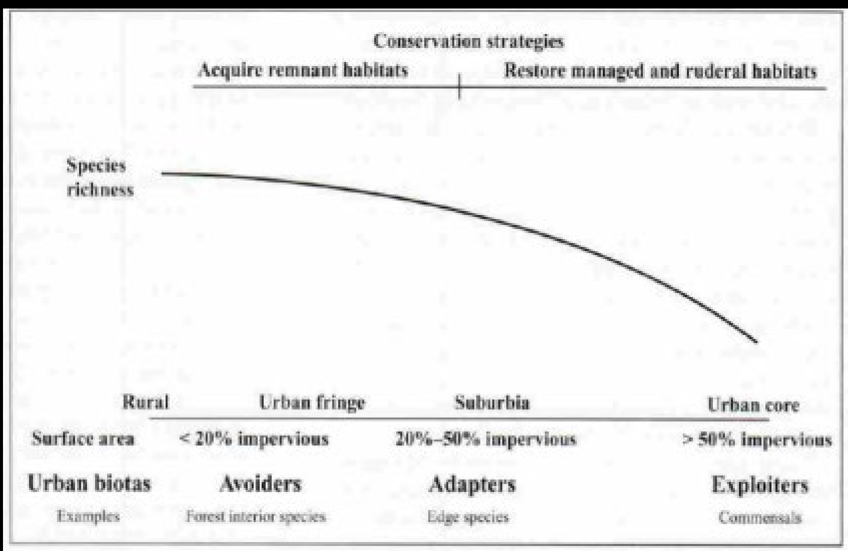
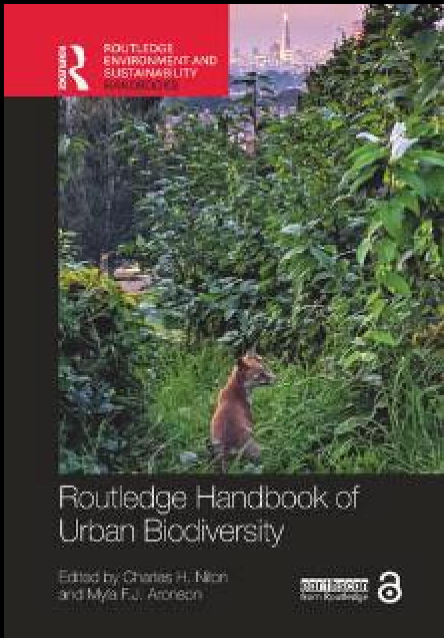


Figure 2. Urban–rural gradient. This is a very generalized and simplified depiction of changes in surface area, species richness, and composition, as compiled from a number of sources discussed in the text. Two basic conservation strategies with respect to urban sprawl are shown at the top.



American Alternative Perspectives

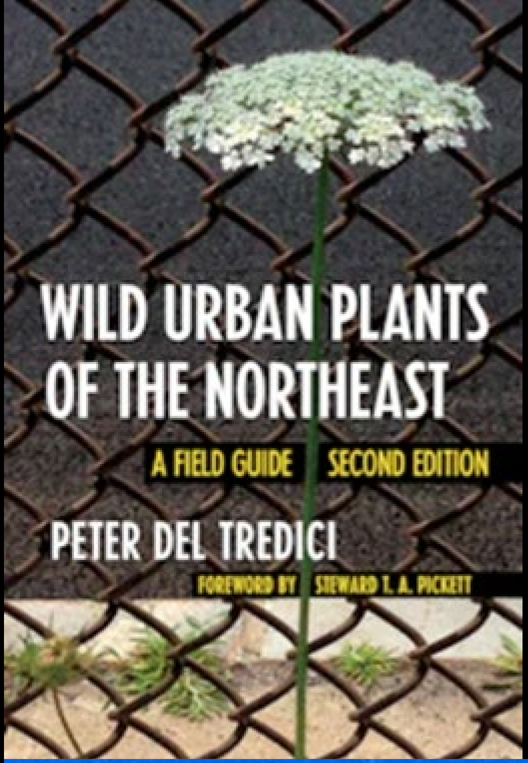
Peter Del Tredici,
Harvard/MIT Applied Ecology and Planning

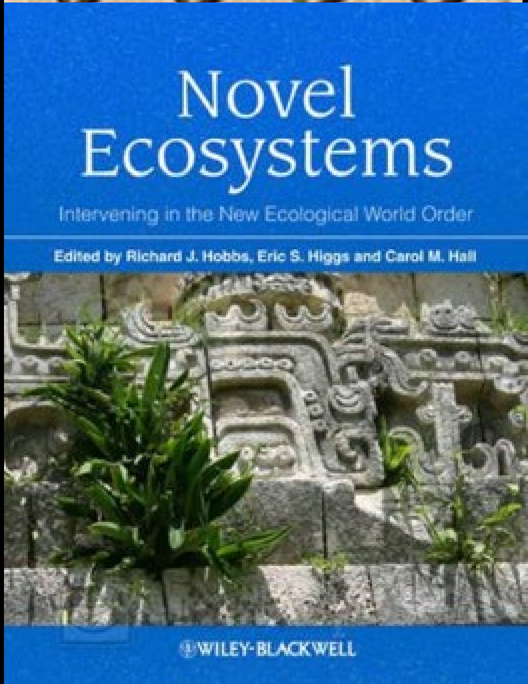
"Urban ecologists and climate scientists have become more convinced that the continued human movement of organisms to cities, along with changes in climate and associated local environmental conditions, have transformed them into "**novel ecosystems**."

These new combinations of species have no analogue in the past and their future trajectories are unknown.

On the one hand, this realization suggests that the plants that spontaneously establish in cities are capable of adapting to ongoing environmental change; on the other hand, **it shows that managing the ecology of urban ecosystems strictly by looking backward is a poor strategy for keeping pace with our rapidly changing environment**.

These conclusions may seem radical and, to some perhaps, ***disturbing***."





How does Nature work?

Biotic Change - Integrity and Instability

- Assemblages of species in a given area that have not previously occurred.
- They lack historically natural analogs
- Novel ecosystems are not really all that novel, except in their species composition.

The interplay between persistence and change

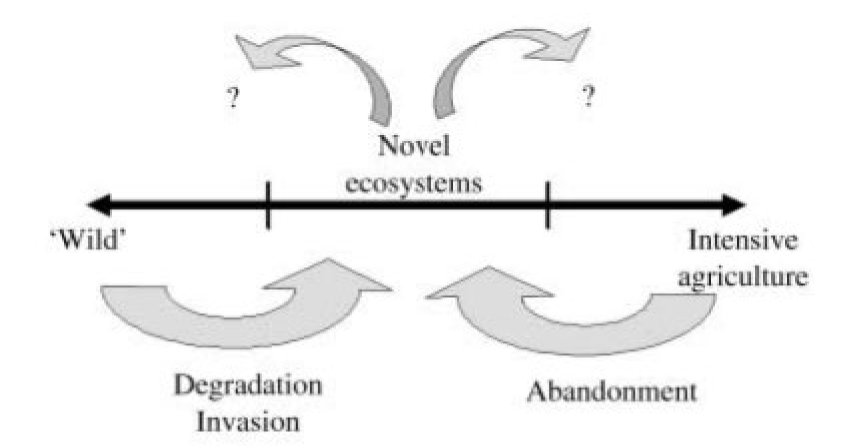
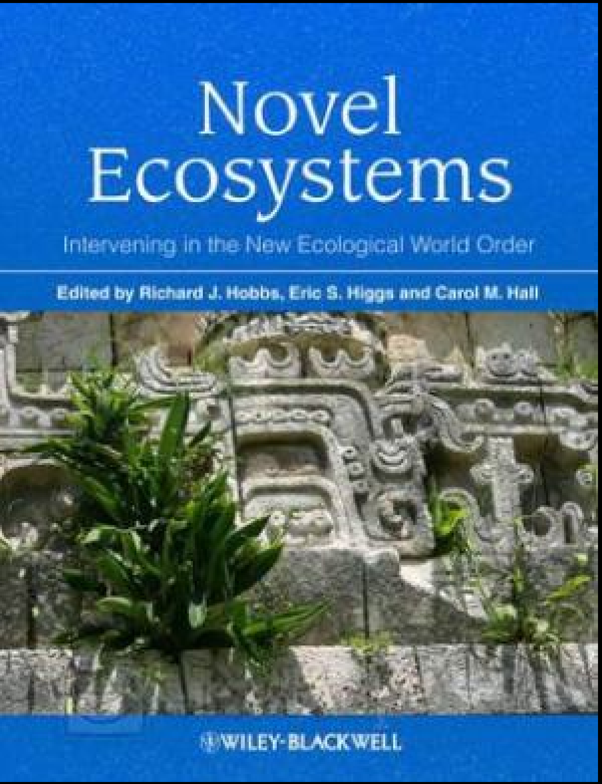
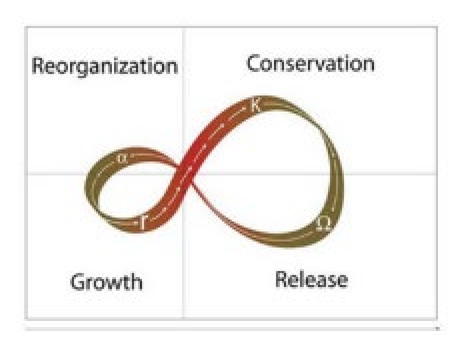
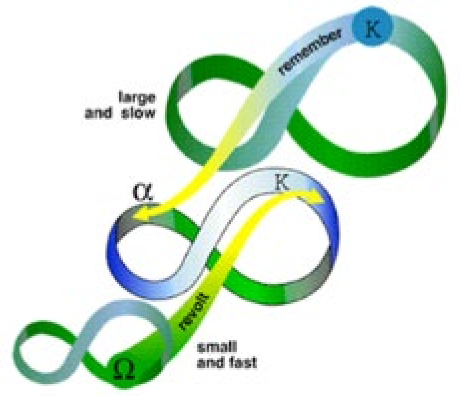
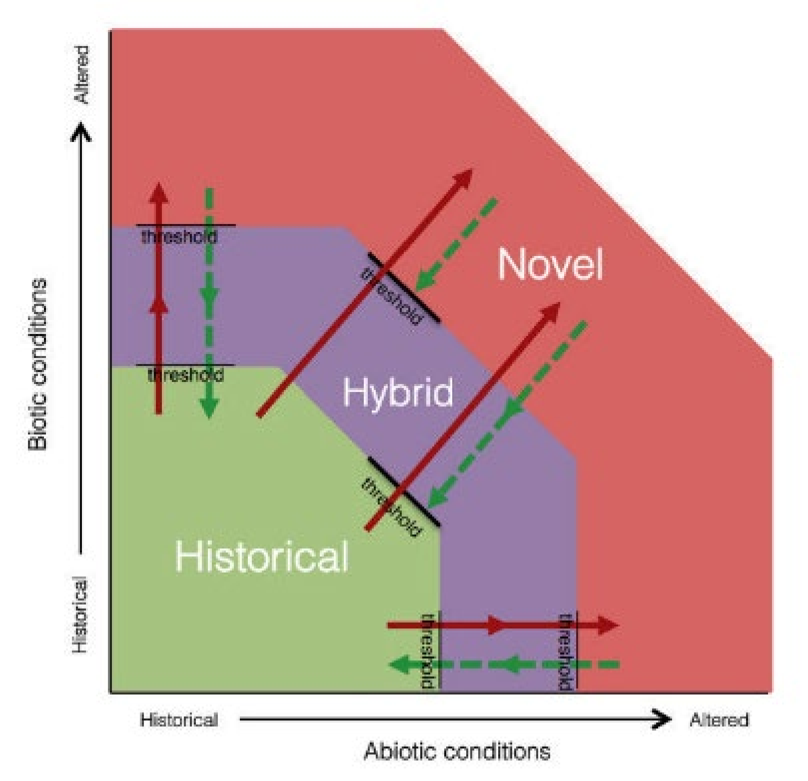


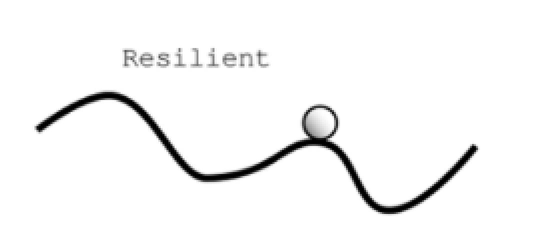
Figure 1 Novel ecosystems arise either from the degradation and invasion of 'wild' or natural/seminatural systems or from the abandonment of intensively managed systems.







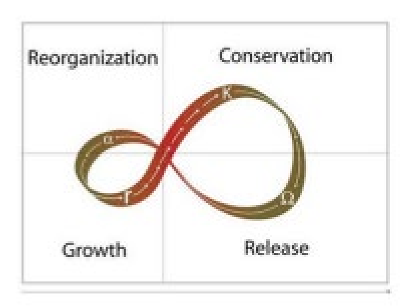




The New Ecology of Change

Ecological Resilience

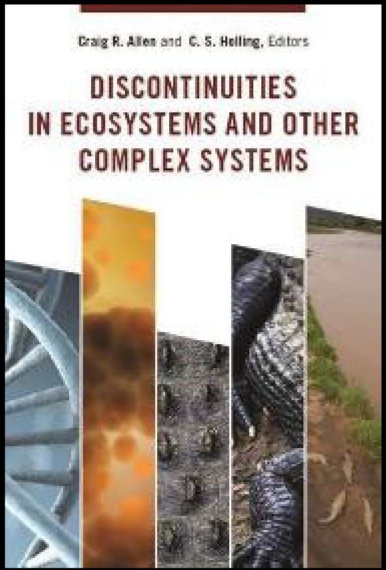
Permanence vs. Change

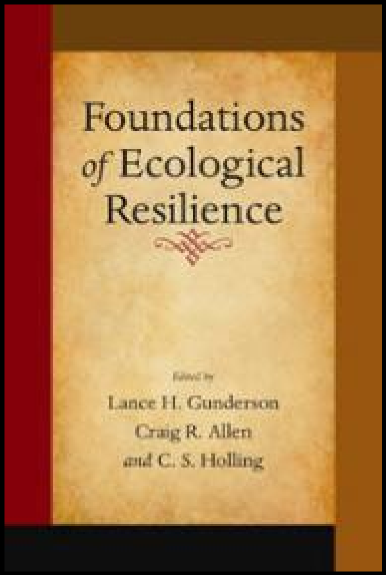


- **The concept of resilience** - first introduced by the Canadian ecologist C.S. Holling in 1973 ***to describe the persistence of natural systems in the face of changes in ecosystem variables due to natural or anthropogenic causes***.
- **Resilience**, derived from its Latin roots 'to jump or leap back', is the ability to recover from or adjust easily to misfortune or change.
- Ecosystem resilience is ***the capacity of an ecosystem to tolerate disturbance***.

Holling, C.S. (1973). "Resilience and stability of ecological systems“

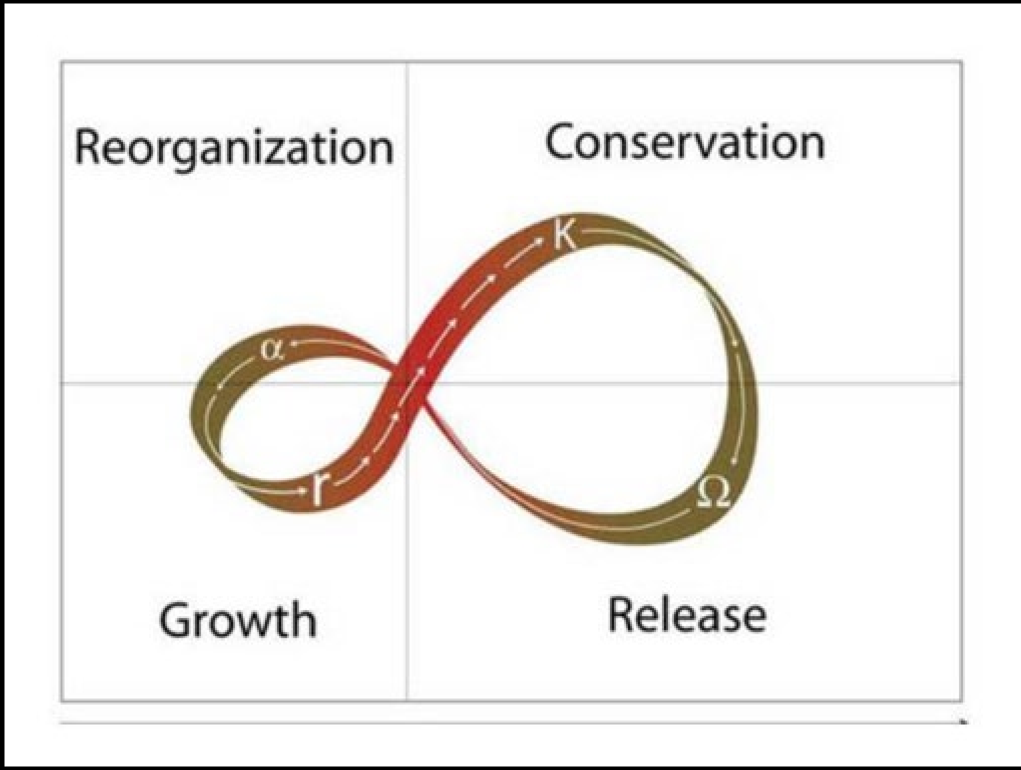
C.S. Holling 1930-2019



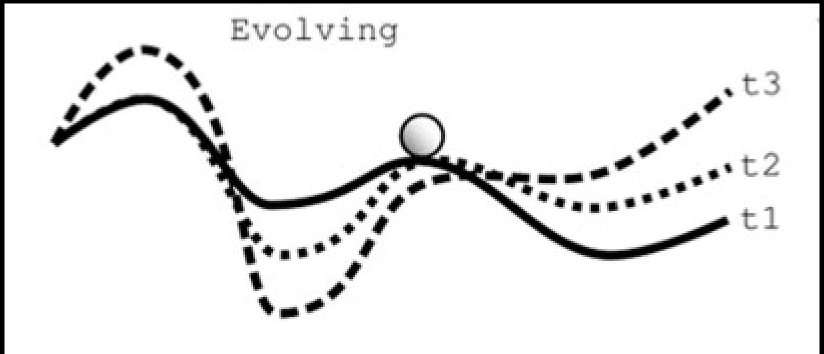


How Does Nature Work?
The Adaptive Cycle

- **Growth** - species and systems grow and diversify to exploit new opportunities and develop entirely new ecological ways of being.
- **Conservation** - species are tightly connected and organized, and systems “stabilize” into often hierarchically nested systems, where there is little or no room for innovation or growth.
- **Release** – where “mature” systems destabilize and collapse and become increasingly discontinuous and chaotic
- **Reorganization** – systems return in new ways, which creates a new field of conditions and possibilities for the next growth phase



- **Incremental change** in the r and K phases, which are smooth and fairly predictable
- **Abrupt change** in the transitions from K through Ω and α

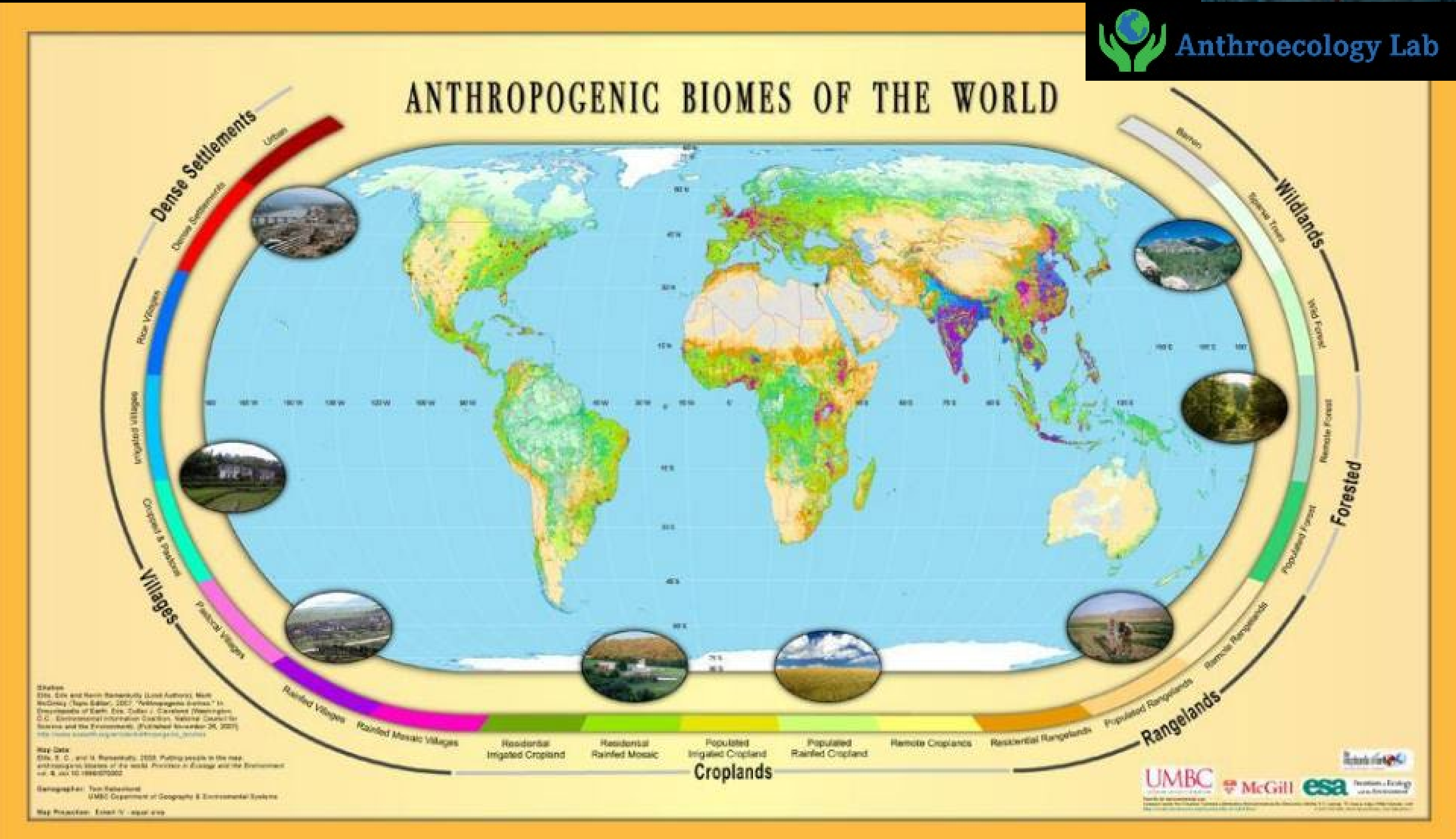


The Socioecological Earth – A Coproduction

Erle Ellis, University of Maryland

Anthropogenic Biomes ("Anthromes")
"Global ecological patterns shaped by humans"

Anthroecology Lab



Anthropocene
A Completely Different Story

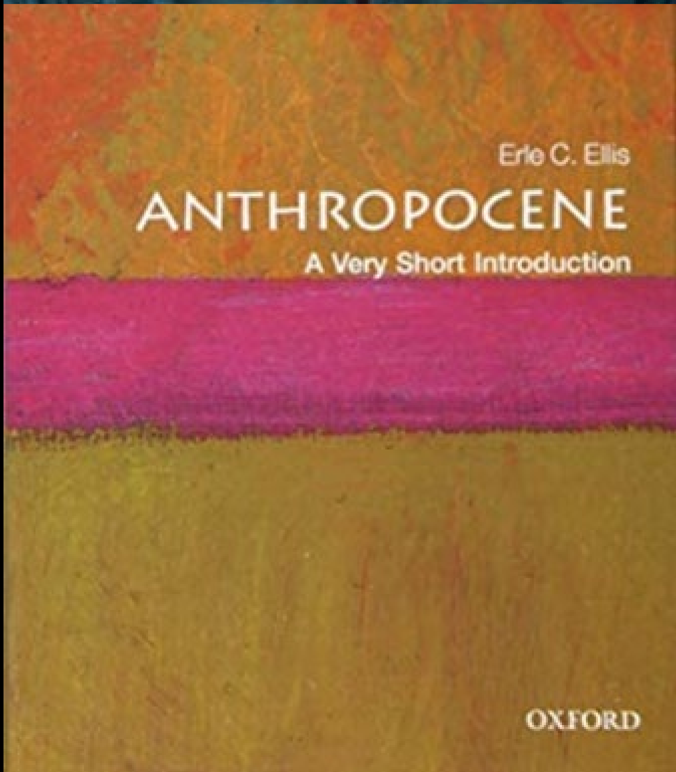
"Anthropogenic biomes point to a necessary turnaround in ecological science and education, **especially for North Americans**.

Beginning with the first mention of ecology in school, the biosphere has long been depicted as being composed of natural biomes, perpetuating an outdated view of the world as 'natural ecosystems with humans disturbing them'.

Anthropogenic biomes tell a completely different story, one of 'human systems, with natural ecosystems embedded within them'.

This is no minor change in the story we tell our children and each other. Yet it is necessary for sustainable management of the biosphere in the 21st century."

Erle Ellis

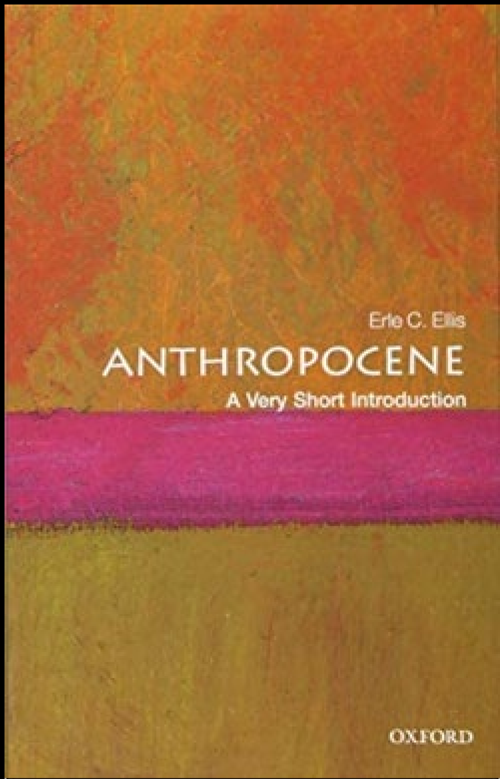


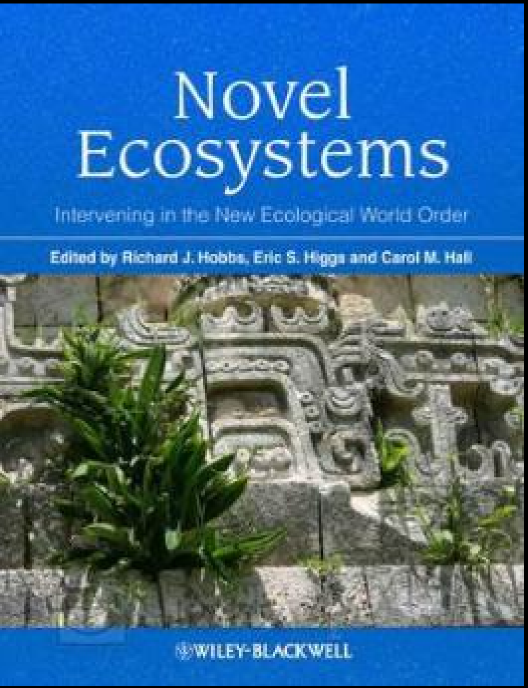
Global Change and the Biosphere
Anthropocene – the Age of Humans

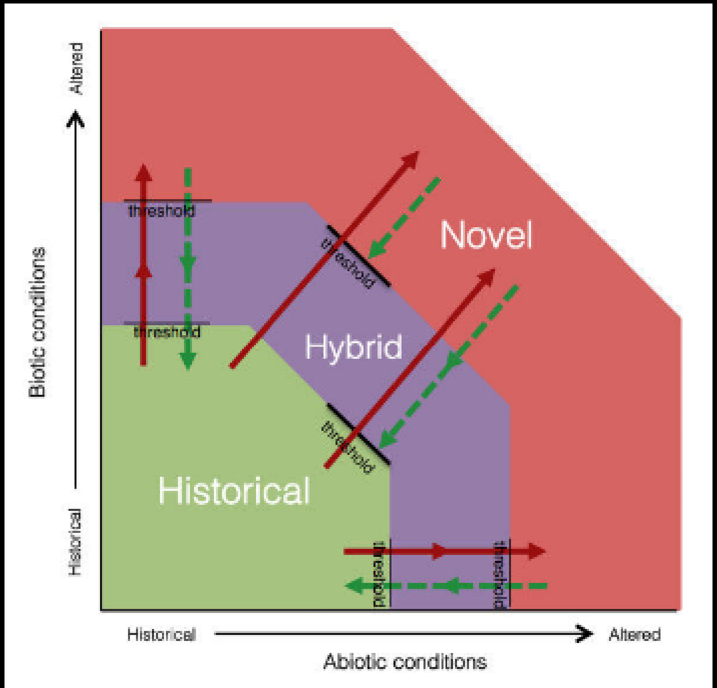
Nearly all humans live in anthropogenic landscapes, especially in urban, suburban and densely populated rural village landscapes.

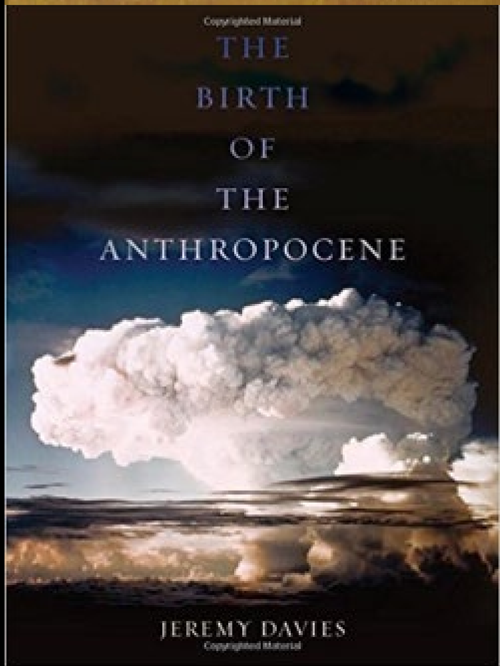
Anthropogenic landscape transformation (land-use change) is one of the primary drivers of global changes in climate, biodiversity and biogeochemistry.

Ecological processes in anthropogenic landscapes are different than those of historical ecosystems.



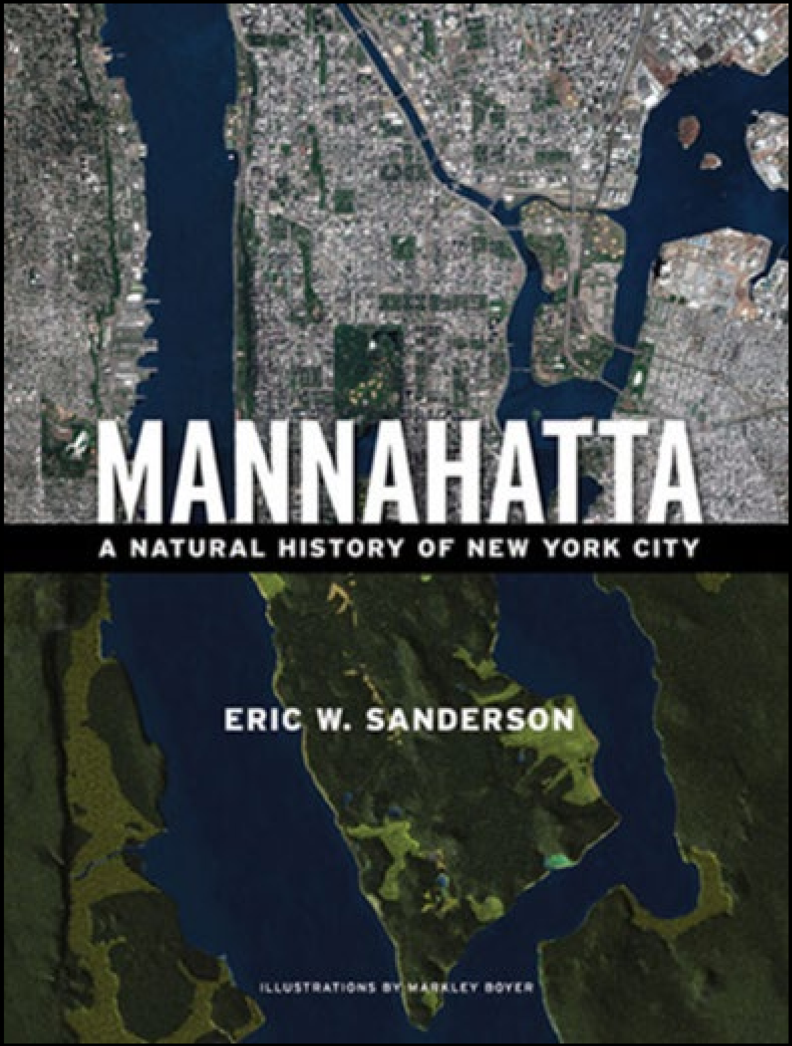


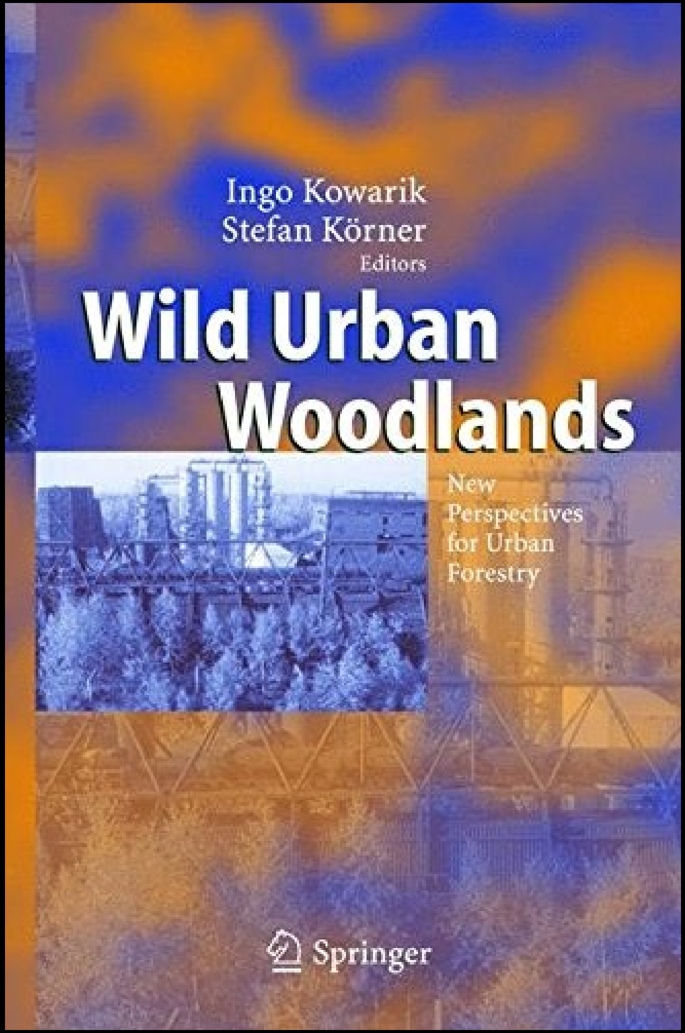




Retrospective vs. Prospective Ecology

Scientific Knowledge and American Urban Nature

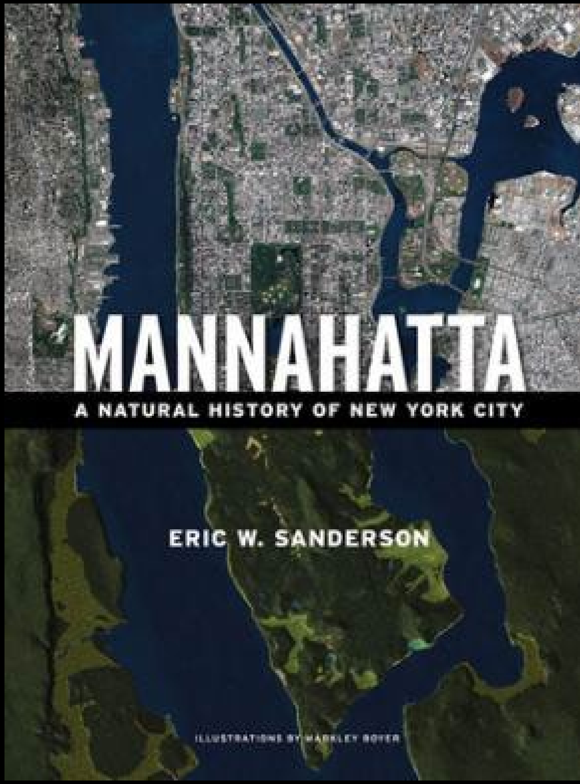


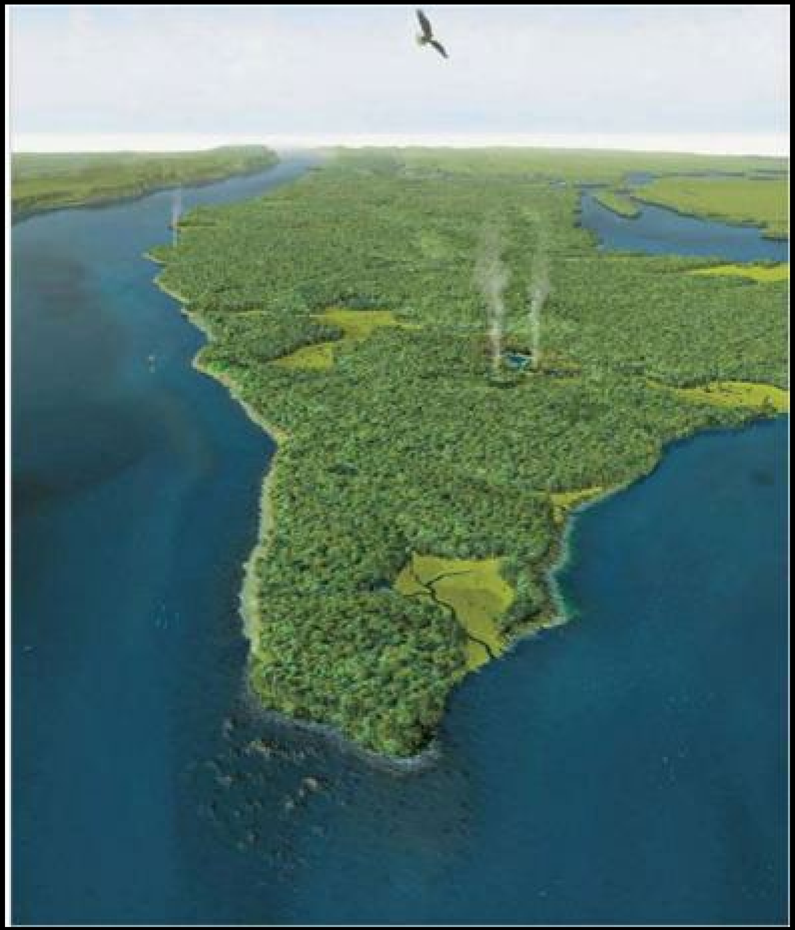


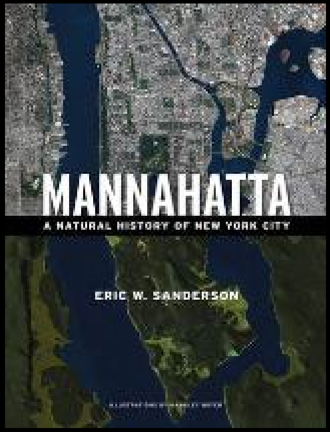
Retrospective Ecology, Historical Naturalness

American Urban Ecology – Perception Problem

- The Mannahatta Project began in 1999, when landscape ecologist Dr. Eric Sanderson moved to New York City to work for the Wildlife Conservation Society….
- “**to fully appreciate the concrete landscape** of streets and buildings that was his new home, he would have to **‘go back in time’ to recreate the its ecology from the ground up**”
- “Going back to ***1609*** allows us to see what New York City was before it was a city and to reimagine the city’s development in a way that would incorporate more of the natural cycles and processes (such as the hydrological cycle) ***that made the island the ecological gem that it was.”***





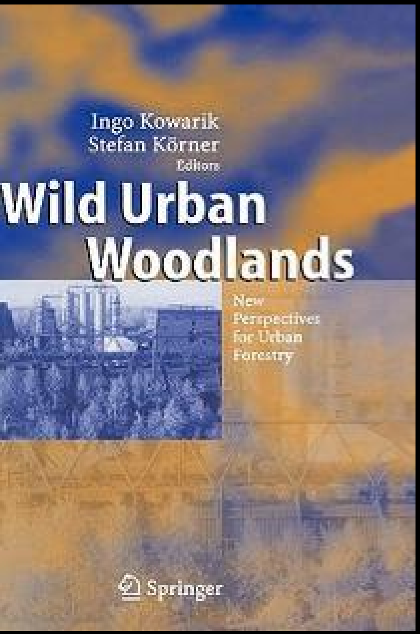


Retrospective Ecology and Historical Naturalness

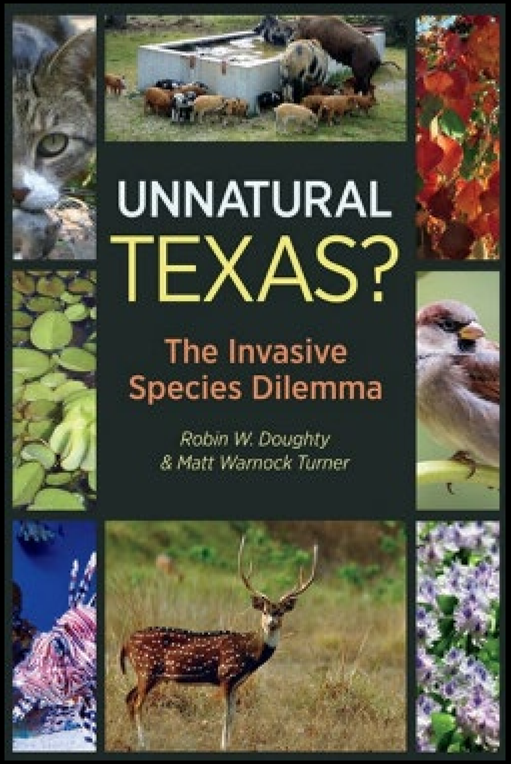
On a hot, fair day, the twelfth of September, 1609, Henry Hudson and a small crew of Dutch and English sailors rode the flood tide up a great estuarine river, past a long, wooded island…locally the island was called Mannahatta, or “island of Many Hills.”

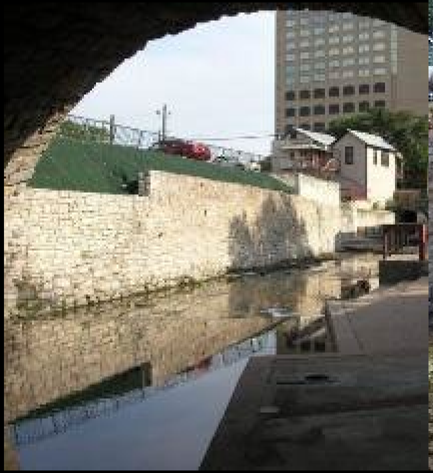
Retrospective Ecology and Historical Naturalness

The Problem of Wild Urban Woodlands – Waller Creek 7th Steet Bridge



2024





2005

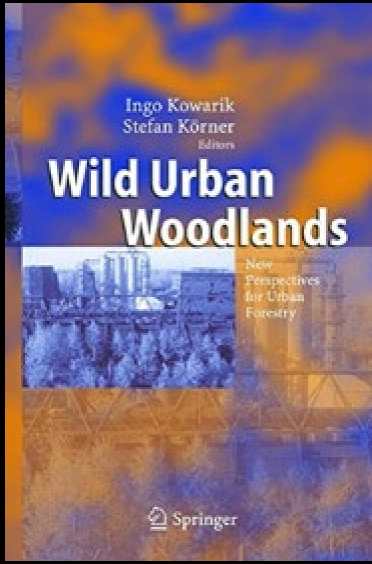
2009

2012

2017

Retrospective Ecology and the Problem of Urban Trees

Retrospective Naturalness - Native Historical Habitats

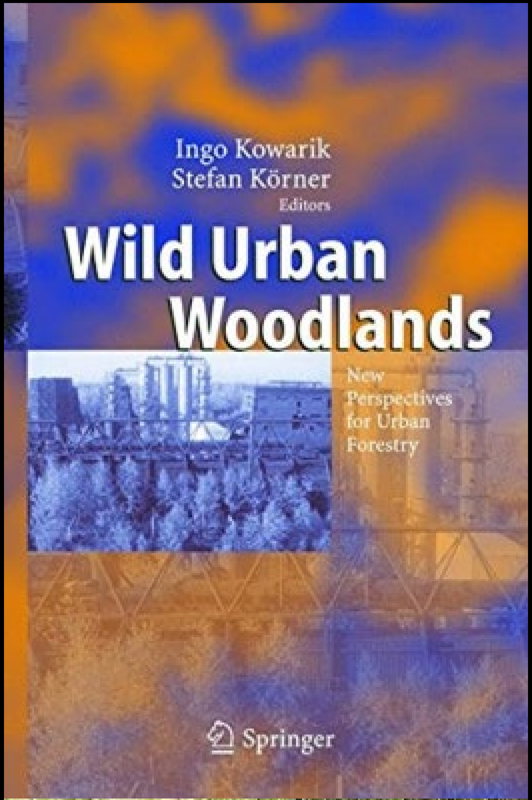


- “**The point of reference is therefore, pristine vegetation uninfluenced by humans**. Based on the cultural history of the relevant area, the reference period may lie decades or a few millennia in the past.”
- “remnants of pristine woodlands are **most natural**.”
- “**natural woodlands composed of historical native species can be analyzed well**.”

The Problem of Wild Urban Woodlands

- “With **the evaluation of new development of ‘wild’ urban woodlands**, however, the traditional concept of naturalness oriented toward ***historical comparisons runs aground***.”
- **New/Novel Wild Urban Woodlands cannot be “analyzed well” with a list of historical native species**

Prospective naturalness?



Wild Urban Woodlands vs. Remnant Woodlands

A Bipolar Kind of Nature
Nature and Culture
Kowarik 2005

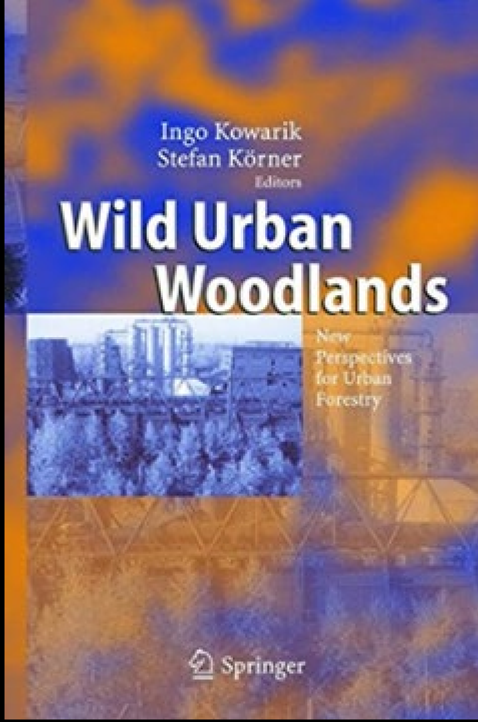
- "***What shapes the character of the new wild urban woodlands*** is, briefly, the sharp contrast between a cultural layer of rubble, ruins and rusted iron and a natural layer that grows untamed and often surprisingly quickly.
- In the context of the remnant woodlands and retrospective ecology, one could evaluate wild urban woodlands as completely artificial, but, in the context of the urban landscape as having a special natural wilderness character – **bipolar kind of nature**.
- This bipolarity… **brings about confusion and insecurity in the general classification as well as in the scientific classification of these spaces**.
- The perception of and the value given to urban wild woodlands is **revealed through terminology**, with whose help those value judgments are further conveyed."

Natural Agency – "Agency of natural mechanisms"

"The leeway for **the agency of natural mechanisms** is significantly greater in urban wild woodlands than in woodlands used for forestry or in those resulting from urban greening."

Cultural Agency – "Agency of cultural mechanisms"

"In contrast to pristine forests, urban wild woodlands are **heavily culturally influenced**. This is true of abiotic conditions as well as biotic."



Process, Prospective Naturalness and Types of Nature

"A **second type of naturalness can be identified beyond a historic naturalness**… **the reference point is not an original condition of a natural landscape**, but rather a condition defined based on the current site potential and the greatest possible degree of self-regulation. From this perspective, therefore, **the natural capacity for *process* is the central point**, not a particular, retrospectively determined and often idealized, *picture* of nature."

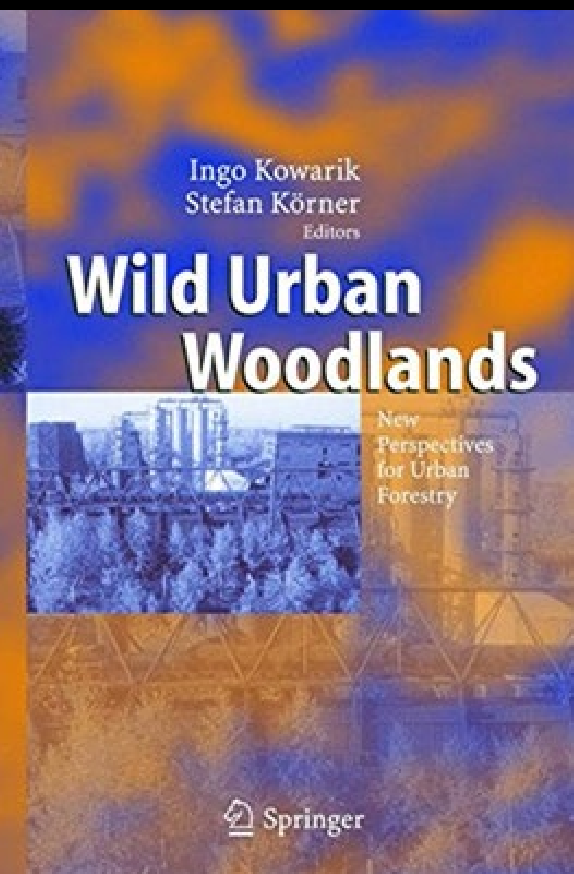


Table 2. Historical differentiation of woodlands according to the history of their development and use. The four types of woodlands vary conspicuously in terms of the agency of natural versus cultural mechanisms and in their habitat continuity. The forest types are further classified according to the "four natures approach," see text for explanation). H – Habitat continuity; N – Agency of natural mechanisms; C – Agency of cultural mechanisms

Types of forests	Types of ecosystems	Types of "nature"	H	N	C
Remnants of pristine forests	Pristine ecosystems	Nature 1: "old wilderness"			
Forests strongly characterized by silviculture	Ecosystems shaped by silvi-/agriculture	Nature 2: "traditional cultural landscape"			
Planted tree stands in green spaces	Ecosystems established by urban greening	Nature 3: "functional greening"			
Woodland succession on urban-industrial sites	Ecosystems evolved on urban-industrial sites	Nature 4: "new wilderness"			

Classical Western Ideas of Nature

Iterative Natures

First nature - wilderness or pristine (untrammeled by humans) the realm of the gods or “primitive” humans

Second nature – pastoral arcadia – farms, gardens

Third nature – Renaissance geometrical gardens

The illustration shows a distant mountain (first nature) giving way to cultivated agricultural land (second nature) and then a formal garden (third nature).

Frontispiece to l'Abbé de Vallemont's *Curiositez de la nature et de l'art* (1705)

Four Kinds of Nature - *Wild Urban Woodlands* Ingo Kowarik 2005

1. **First Nature** the "original" nature (old wilderness) - Natural Agency
2. **Second Nature** "includes elements of the landscape that arose through traditional or modern agriculture and forestry practices, for example, meadows and pastures, crop fields, intensively managed forests, etc." (pastoral nature) – Cultural Agency
3. **Third Nature** "comprises the greenery that has emerged through horticultural plantings, maintenance and upkeep. This includes…gardens and parks created during different eras of garden history, but also other urban greenery such as street trees." Urban Horticulture – Cultural Agency
4. **Fourth Nature** "encompasses the natural development that occurs independently on neglected urban sites, without horticultural planning or design. This starts with cracks in sidewalks or in colonization of walls and buildings as "artificial cliffs" and leads to growth in abandoned areas and to impressive wild urban woodlands."

Fourth Nature – Natural and Cultural Agency

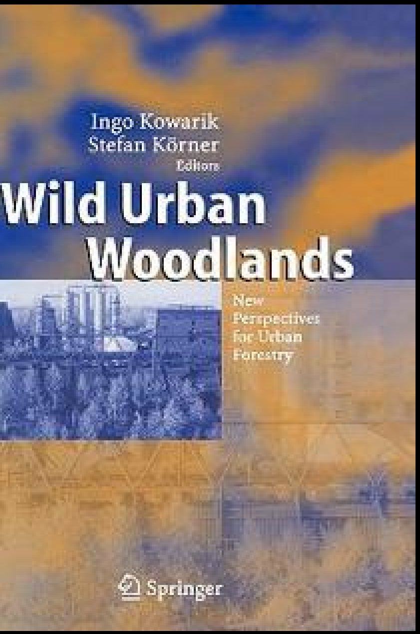


Prospective Ecology, Prospective Naturalness and Types of Nature

Table 2. Historical differentiation of woodlands according to the history of their development and use. The four types of woodlands vary conspicuously in terms of the agency of natural versus cultural mechanisms and in their habitat continuity. The forest types are further classified according to the "four natures approach," see text for explanation). H – Habitat continuity; N – Agency of natural mechanisms; C – Agency of cultural mechanisms

Types of forests	Types of ecosystems	Types of "nature"	H	N	C
Remnants of pristine forests	Pristine ecosystems	Nature 1: "old wilderness"			
Forests strongly characterized by silviculture	Ecosystems shaped by silvi-/agriculture	Nature 2: "traditional cultural landscape"			
Planted tree stands in green spaces	Ecosystems established by urban greening	Nature 3: "functional greening"			
Woodland succession on urban-industrial sites	Ecosystems evolved on urban-industrial sites	Nature 4: "new wilderness"			

The Problem of Austin Wild Urban Woodlands – Waller Creek 7th Street



2024

Fourth Nature "encompasses the natural development that occurs independently on neglected urban sites, without horticultural planning or design. This starts with cracks in sidewalks or in colonization of walls and buildings as 'artificial cliffs' and leads to growth in abandoned areas and to impressive wild urban woodlands."

2005

2009

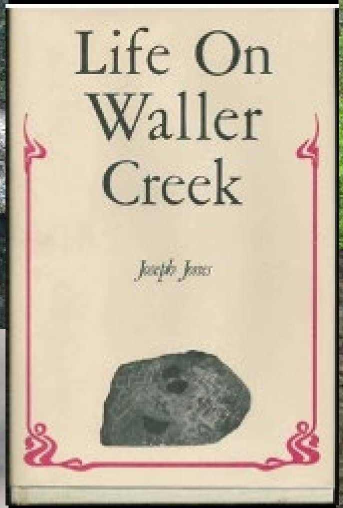
2012

2017

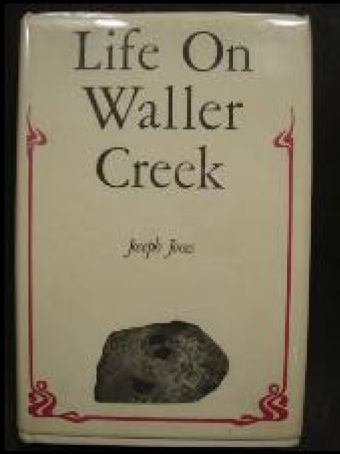
Waller Creek - The Perennial Weed

"Waller Creek is that kind of a natural organism, very pertinacious, luckily almost impossible to kill – a perennial weed, so to speak."

Joseph Jones, *Life on Waller Creek* (1982)



Waller Creek – Continuity and Process (Change)

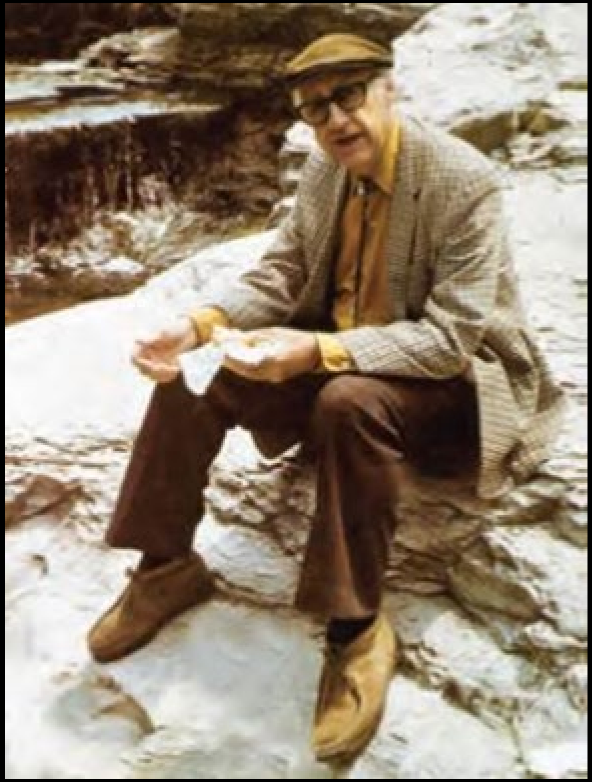


"The Creek is an ever-visible manifestation of continuity, of life...

it is the sum total of many processes, an intricately integrated process in itself...

The fact that it has been interfered with by man, and continues to be interfered with, must be accepted as part of such total process, whatever opinion may be held as to the merits of the interferences."

Joseph Jones 1908-1999



Ecological Expectations: Ratty and Biological Slumming

"I'll learn'em to steal my house!" Toad cried. "I'll learn'em, I'll learn'em!"

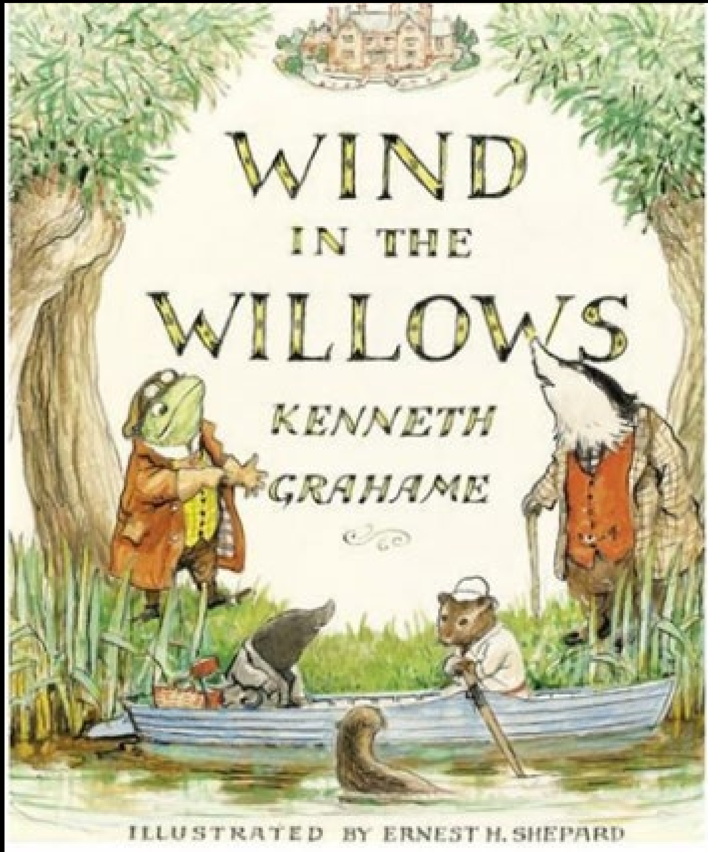
"Don't say 'learn'em,' Toad," said the Rat, greatly shocked. "It's not good English."

"What are you always nagging at Toad for?" inquired the Badger, rather peevishly. "What's the matter with his English? It's the same what I use myself, and if it's good enough for me, it ought to be good enough for you!"

"I'm very sorry," said the Rat humbly. "Only I think it ought to be 'teach'em,' not 'learn'em.'"

"But we don't want to teach'em," replied the Badger. "We want to learn'em – learn'em, learn'em! And what's more, we're going to do it, too!"

(1908)



Nature Out of Place

Nonhuman Agency and Urban Ecology = Resilience

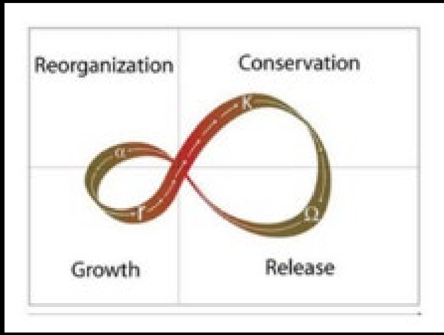
Process – Continuity and Change

Waller Creek 7th Steet Bridge

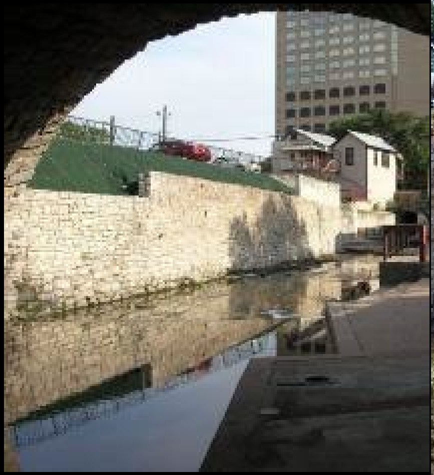
The Wild Urban Woodlands of Waller Creek

Socioecological Nature

- Dynamic
- Self Organizing
- Tolerant of Disturbance
- New Combination of Species



2024



2005 2009 2012 2017