



Group work summary

CITIES AND BIODIVERSITY



2021 - 2022

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"Transforming our cities for a better urban future"



Editorial

Cities have a major part to play in terms of biodiversity due to their unique advantages- having access to important resources, the latest innovations, and the governmental means to quickly and efficiently make changes on a local level. Today, it is our responsibility to improve the coexistence between urban spaces and nature by implementing public policies that serve both biodiversity and people. The stakes are high; now more than ever, we need to return to protecting the interests of nature.

Though the decline of biodiversity had been predicted by the scientific community long ago, the Covid-19 pandemic and the repeated lockdowns that followed brought a new awareness to our need to reconnect with nature. This newfound appreciation presents an opportunity to re-imagine our urban spaces with the interests of nature at heart.

The World Urban Forum, taking place in Katowice in June of 2022, is the most

important global conference on the topic of urban planning. This opportunity for shared reflection will bring to the forefront the relationship between urban living and biodiversity. Following the Nature Future Framework defined by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), three main perspectives will be taken into account: Nature for Nature, Nature as Culture, and Nature for Society. These perspectives will serve as guidelines as we strive to integrate the interests of biodiversity into our plans for the future.

At the 2022 World Urban Forum, global actors from a multitude of sectors will ensure the implementation of the 2050 Vision, set by the Convention on Biological Diversity (CBD), by considering the best approach to developing sustainable cities that serve both nature and their inhabitants. This responsibility of the conference cannot be neglected, as cities serve as a means to address large-scale biodiversity issues on both a global and local level.

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Introduction

Climate change and the loss of biodiversity are the two most pressing challenges of the 21st century. While many human activities are to blame, the way we build our cities and how we live in them are the principal causes of global warming. According to UN Habitat, cities are responsible for more than three quarters of global energy consumption (78%) and more than 60% of global greenhouse emissions.

Human activity is also the principal driver of the continuing decline in biodiversity. Over the last decade, 435 species have gone extinct and an estimated 28% of known animal species are threatened with extinction. This is the result of poaching, hunting, overexploitation of the sea, and animal trafficking.

These two issues- climate change and biodiversity loss- are interconnected in both cause and consequence and therefore must be addressed with a comprehensive solution. Approaching these crises separately has resulted in unprecedented social, economic, and health problems. However, the current international agenda seems to be taking into account the need for holistic action: high-level events such as COP15 2021 and 2022, held in Kunming, and COP26 in Glasgow, have presented actions and

agendas designed to address these issues both nationally and internationally.

The most important part of the fight against climate change and biodiversity loss, however, will play out in our cities. More than half of the world's population lives in cities and that number is set to reach 68% by 2050, according to the UN. This means that cities are going to face new challenges: both demographic growth as well as sustainable development will have to be taken into account when formulating urban planning policies that can address climate change and biodiversity loss. At the intersection of nature and development, urban planning has become an increasingly important subject of debate. Events such as the World Urban Forum highlight the importance of urban planning strategies that are in line with biodiversity and improve living conditions for urban populations.

The urban model, therefore, needs to evolve and prioritize biodiversity when addressing the most energy-hungry sectors: urban development, housing, and transportation.

Challenges, perspectives and achievements having to do with the linkage of cities and biodiversity must all be considered. Particular attention needs

to be paid to the challenges and goals for cities to meet by 2050. In this booklet, real-world cities will share their expertise and other useful lessons relating

to urban development, followed by a summary of the challenges and trajectories presented herein.



Adeline Faure



CHALLENGES

Biodiversity, or biological diversity, refers to:

- The diversity of known, unknown, and extinct species (microorganisms, vegetal and animal)
- The diversity of the ecosystems in which these species live and the connections between them; or, the living network of species in a local territory
- The genetic diversity of individuals within a species (intraspecific diversity). This is a lesser known but highly important definition of biodiversity because it directly determines a species' ability to evolve and adapt to changes, particularly those relating to the climate.

Therefore, fostering actions in favor of urban biodiversity is imperative. A city endowed with plenty of natural space can be a haven for certain species (such as bees) as well as a valuable contribution to the city's social and economic development.

Changing the way we develop our cities will require us to:

- Address issues related to construction, transportation and household ways of living collectively
- Prioritize green spaces in urban planning
- Ensure clean public transportation for inhabitants and encourage their use

- Join citizens in learning about eco-friendly behaviors in order to minimize waste, and increase awareness of energy consumption (from household appliances, for example)

Cities are unique hubs of biodiversity, with the resources and potential to support natural life that must be protected. In Paris, for example, despite the constraints of agglomeration in the Île-de-France region, 2,800 species were identified between 2010 and 2020, including 831 vegetal species, 1,618 animal species, and 350 species of fungus. Urban biodiversity in Paris is found in green spaces (parks, gardens, woods and cemeteries) and moves around using ecological 'corridors' (tree-lined streets and alleys, train tracks, the banks of rivers and canals, and the rivers themselves, such as the Seine), according to the "green and blue" framework (trame verte et bleue or TVB) of Les Chemins de la Nature ("Pathways of Nature").

Paris provides an example of the challenges that an international metropolis faces, and how such a city can make itself an agent of change by accounting for the richness of nature as well as the solutions it can bring.





2050 SCENARIO

Cities implementing the 2050 Agenda Goals for 2050

The 2050 vision must be based on the implementation of the Sustainable Development Goals (SDGs) developed by the UN. In keeping with this timeline, cities must be constructed with the following goals in mind: improving society's social, health, and economic situation; promoting the preservation of biodiversity; and fighting against climate change. Succeeding against the climate crisis and biodiversity loss will come about by creating green spaces, re-establishing nature in and along waterways, adding vegetation to buildings, and developing local and national projects that promote environmental protection- all of which should be addressed collectively rather than separately. From now until 2050, international cooperation must continue, particularly at the COP15 in Kunming, intended to reinforce local authorities' implementation of this vision. National and international exchange will allow us to keep learning and to share the knowledge of each region.

Implementing a "green and blue" framework

"Green and blue" frameworks are designed to preserve and rebuild the networks of natural exchanges, or 'ecological continuities', so that plants and animals can move, rest, feed, reproduce, and continue their life cycles, just as humans are able to. Ecological continuities are made up of biodiversity 'reservoirs' connected by ecological 'corridors'.

Although usually found in natural environments, green and blue frameworks can be created within cities and metropolitan areas, as long as they are as concentrated as possible for the species that depend on them. Green and aquatic spaces, tree-lined streets and alleys, squares, courtyards, and buildings can all be inhabited by wildlife, provided that city management can adapt while keeping in mind the needs of its citizens. Many animal species use existing infrastructure as a means to move around, for example. The first step is to thoroughly understand which species are native to the land and how they adapt to the urban environment or infrastructure in their habitat. For example, the Petite Ceinture train tunnel in Paris was recognized as a hibernation site for the common pipistrelle, a type of bat.

Focus

"Natural Gardens" of Milan

To remedy the lack of suitable habitats for vegetal and animal species in Essonne, the Department Council established the "Natural Gardens" program, designed to promote the development of a network of gardens on a territorial level. Each garden is managed in a site-specific manner and the network of gardens complements those of the Department and other local authorities. The goal: to preserve (and improve) biodiversity in Essonne and to strengthen ecological continuities in urban and suburban areas.
<https://tinyurl.com/363vvu4m>

Green roofs in Malmö

Malmö, Sweden was one of the first cities to develop 'eco-neighborhoods' with the establishment of Augustenborg in 1998. Green spaces located on roofs provide a new ecosystem. The result: a 50% increase in biodiversity and a 20% reduction in greenhouse gas emissions.
<https://tinyurl.com/5n7yjjb4>

The green "forest" of Milan

In 2007 and 2014, two residential buildings (one 80 and one 112 meters tall) built on a former industrial wasteland were covered in vegetation. The results: a -3°C decrease in temperatures inside the buildings and a 30% reduction in fine particles in the air. The cost: \$80 million. Cost: \$80 millions.
<https://tinyurl.com/2s59nuxv>

Green corridors on the riverside in Amsterdam

With the right conditions for growth, a green corridor can provide a habitat for a variety of species and become a natural reserve. This was the case in Amsterdam, where native plants were grown on the walls along the riverside.

Nature-based urbanization in Stuttgart

To take an active role in the restoration of nature in the city and to combat the development of heat-pockets, Stuttgart, Germany imposed strict building regulations that encourage the use of nature-based solutions. As a result, more than 60% of the city is made up of green spaces, 39% of which have a protected status.
<https://tinyurl.com/2xczkrue>

Restoration and anti-flood efforts at Grémillon, Nancy

Beginning in 2017, restoration efforts along the stream of Grémillon, which is 6km long and runs through the urban area of Grand Nancy, have greatly improved its connection with the surrounding wetland environments and benefitted local aquatic species. Efforts have included redirecting the stream, protection of its forest riverbanks, bringing it above ground, and expansion of flood areas.
<https://tinyurl.com/mr3mfjha>

The city of Orléans

In favor of an urban evolution and to assert its identity as a "city-garden", the city of Orléans has implemented green zones by improving vegetation in public spaces and on buildings. This has included the use of local plant species that don't require a lot of water and are resistant to drought, as well as the creation of soils that are less artificial and more permeable.
<https://tinyurl.com/2xczkrue>



Improving vegetation on buildings

Green corridors can be strengthened at the local level by developing habitats for biodiversity on the surface of buildings, such as green spaces on roofs and facades.

Adding vegetation to buildings requires a few specifications. The selected plants must be able to adapt to a limited environment, and regular maintenance is required to ensure that the supporting wall or roof does not deteriorate.

Developing biodiversity cannot be a purely quantitative process; it must also be qualitative, considering the quality of species present and the quality of its maintenance and management, in order to maximize its environmental benefits, particularly in terms of public health and resilience to climate change.

Creating green pathways

Even a minimal space suited to support biodiversity can contribute to green urban corridors. Planting flowers, adding green floats, or developing pedestrian pathways are all actions that can foster their development. The key is that these spaces are connected beyond the territories in which they are found.

Restoration and reopening of waterways

The restoration of ecological continuities in aquatic environments is crucial to preserving blue urban corridors. These corridors enable species to move freely between their different habitats over the course of their life cycle (reproduction, feeding, growth, etc.). Making sure that waterways are well connected ensures that aquatic ecosystems can carry necessary sediments to build habitats, purify waters, dissipate hydroelectric power, and so on.

Biodiversity to fight climate change

The development of biodiversity is one of the ways we can limit the effects of climate change. By 2050, climate change will have transformed our planet's green cover, forcing it to adapt to new climate conditions and to the constraints of reduced water and soil quantity and availability. Our selection of vegetation used to improve urban spaces and farming must take into account the evolution of biodiversity; therefore, climate issues must be linked to biodiversity issues. It is imperative for us to prioritize biodiversity in our agendas as a means to limit and adapt to climate change. The challenge for cities in 2050 will be to find the tools to cohabit with nature peacefully and with an equal balance of power. This means that we must take into account the contexts of local flora and fauna, the climate, and the potential effects of biodiversity on city inhabitants, in order to avoid projects that are inadequate to support human life.

Focus

A rehabilitated water stream in Seoul

The Cheongyecheon River in Seoul, South Korea has been underground since the 1960s and was rediscovered in 2005 in a plan to revive the city center. The project entailed the reorganization of traffic, the creation of bridges and the development of riverside areas. The result: a decrease in temperatures by 3 to 5°C, a new barrier against flooding, and the creation of more than 400 hectares of park areas, resulting in a more peaceful living environment for inhabitants.

A restored river in Strasbourg

With floods from the Souffel River becoming increasingly frequent, the Euro-metropolis of Strasbourg decided to divert the river's course and return it to its original riverbed. The project also included the creation of ponds that would diversify the natural environment and the planting of trees and bushes along the riverside.

<https://tinyurl.com/mr3mfjha>

Superblocks in Barcelona

Beginning in 1993 but really only starting in 2016, Barcelona has transformed its streets into "superblocks" to reintroduce green corridors in the capital despite its historically dense urban planning. Speed limits were reduced to 10km per hour, the number of streets was cut in half, and a wide sidewalk with plenty of green space (trees, plants, and grass) was added. As a result, 92% of public space was opened up, leading to the creation of shaded areas, more people using bikes, and a reduction in city noise by 4 decibels.

<https://tinyurl.com/2p8w54w8>

Restoring nature in the cities of Seine-Saint-Denis

Today, the department of Seine-Saint-Denis is 93% urbanized, putting many areas at risk of flooding. To prevent this from happening, the department began orienting its policies around the preservation of natural ecosystems, particularly rivers, in the 1990s. By supporting rain water infiltration and other urban development projects, the region has seen a major restoration of natural ecosystems along with the benefits they provide to the inhabitants' well-being.

<https://tinyurl.com/2p93s6fm>



Creating refreshing spaces

The city of tomorrow will be made up of green spaces, designed to provide a source of refreshment and well-being to city-dwellers, particularly during heat waves.

Nature-based solutions that fight climate change and serve biodiversity

Climate change and biodiversity are closely related; changes in one directly impact the other. Therefore, the development of projects intended to reduce the effects of climate change must also support biodiversity, as such projects tend to provide ecological improvements and increased well-being to city environments (draining and permeability of soil, improved air quality, added green spaces, etc.). In cities around the world, local biodiversity systematically improved as a result of projects initially meant to fight climate change.

Preventing floods

Ecological engineering can be a powerful tool when paired with civil engineering to prevent natural risks. Biodiversity can be an easy and sustainable means to leverage flooding hazards, for example, when properly implemented. Choosing biodiversity-based approaches over purely risk-focused alternatives also helps increase awareness and global participation in ecological matters.

Biodiversity to serve citizenship

Creating shared gardens

The Covid-19 crisis resulted in an increased demand from citizens, particularly those in urban areas, to return to nature. Biodiversity has become a key source of support for well-being, physical and mental health, and social as well as territorial cooperation in cities; as such, it is key to building camaraderie among citizens and improving public living. Communal gardens have multiplied in cities and have demonstrated their usefulness in social appeasement.

Participation in urban development

Cities are crossroads of ecological, economic, and social challenges. Eco-citizenship is, therefore, a means to connect individuals with the ecology and nature of their environment. This is especially important in urban areas, where citizens' connections to nature are less apparent. Besides their ecological goals, eco-citizenship projects help relate individuals to their natural and urban environment and to society, making them powerful tools for promoting citizen participation.

Focus

“Landscapes of nutrition” in Nantes’ city center

The city of Nantes has taken on a strategy that encourages citizens’ participation and solidarity in improving urban vegetation and implementing urban farming projects. Following the Covid-19 pandemic, the idea was born to create individual food gardens throughout the city that would use cooperation and problem-solving to work together. Young farmers were trained to turn these individual gardens into places where citizens could participate in food production. The result was the creation of a network of organic food gardens, dedicated to populations in need. <https://tinyurl.com/3ftc7w5y>

Gardening spaces in Portland, Oregon

The city of Portland, USA provides citizens with gardening spaces under the condition that they respect city rules. They also provide websites such as Portland Yard Sharing that connect landowners with gardeners in search of free space. <https://tinyurl.com/5b4sfntt>

Participation in the redevelopment of an urban park in Perpignan

Saint Vincens Park, measuring 10 hectares today, is the result of joint landscaping efforts by the Perpignan Mediterranean Metropolis and the City of Perpignan. Formerly the site of cultivated orchards, the park was redeveloped with the participation of residents, companies, community organizations, schools and landscape service providers, with the goal to reduce the risk of flooding and create green spaces within the city. The park now hosts the annual “Fête de la Nature” (Celebration of Nature) and many other events that promote biodiversity. <https://tinyurl.com/mr3mfjha>

Reintegration of nature through urban planning in Bordeaux

Urban development policies within the BIODIVER’CITE project, led by the city of Bordeaux, are targeting heat pockets by reintegrating green spaces in the city, connected by ecological corridors. The project starts by identifying parts of the city’s road network that capture too much heat and don’t allow for proper water flow. This method of management has created a new culture of mobility, improved quality of life for inhabitants, and increased solidarity among citizens through shared green spaces. <https://tinyurl.com/yxcrhuy7>



Focus

Creation of “buffer zones” to mitigate the effects of global warming in Seine-et-Marne

The Department of Seine-et-Marne, in collaboration with local authorities and experts in Aquatic Environment Management and Flood Prevention (GeMAPI), is working to identify and preserve aquatic “buffer zones” to limit excess water runoff and flooding due to climate change. Based on a hydro-morphological analysis of the Ru d’Ancoeur, a small tributary of the Seine, projects to restore ecological continuity along the river were carried out in 2015, addressing recreational and landscape issues. These efforts help mitigate the risk of flooding and were supported by various educational programs, schools, and residents. The Department is also a co-leader of the award-winning “Ancoeur 2030” project, in conjunction with the AQUI’Brie Association, INRAE, and the mixed syndicate of Des 4 Vallées de la Brie. The project foresees the creation of 10 “buffer zones” in central Brie to demonstrate, both in the field and scientifically, how effectively nature-

based solutions can help us adapt to climate change.

Restoration of the alluvial forest- Isère Amont

Led by the Symbhi (mixed syndicate of the Isère river basins) the Isère Amont project was launched in 2004, with work starting in 2012 after a long and rich period of consultation and development. The project covers the 29 municipalities located between Pontcharra and Grenoble, home to more than 300,000 inhabitants collectively. A budget of 135 million euros over 10 years was put towards redesigning the river dykes in order to protect the land from flooding and to improve the river’s ecology. The project is now in its completion stage. 10km of dykes between Saint-Vincent-de-Mercuze and Champ-près-Frogès are set to gradually disappear, in order to feed the 300 hectares of alluvial forest. Other benefits of this development include a reduction of the amplitude of floods and droughts, purification of the water and revitalization of the water table, creation of

new habitats for plants and animals, and a more peaceful travel corridor for wildlife. The topographic and aquatic situation will greatly improve the ecosystem for many terrestrial and underground species.



PATHWAYS

Conserving existing biodiversity Protecting ecosystems

Biodiversity entirely depends on the existence of functioning and well-connected ecosystems. The prerequisite for any action relating to biodiversity should be to check the health of the biodiversity in that area and identify any potential sources of destruction. Some primary factors that have already been identified and should be a priority when implementing public policies are:

- Limiting soil artificialization and restoring soil permeability
- Limiting plastic pollution
- Supporting nature-based solutions

Local urban plans (plan local d'urbanisme - PLU)

PLU or PLUi are regulations in France written and voted on by cities, towns, or public inter-city organizations (such as communities or metropolitan areas). The role of these regulations is to set an urban planning framework that will apply to the territory within and between cities outside of national regulations. Local urban plans include sustainable development projects (PADD), development and programming directions (OAP), as well as rules and procedures.

Local urban plans:

- Are established after conducting a diagnosis of the biodiversity within the territory and the challenges related to its preservation
- Include a map of the territory categorized into three zone types: natural, forested, and urban. Natural and forested zone offer the best protection to biodiversity by prohibiting urban development; therefore, these zones must be maintained.
- May include specific provisions, such as the number of surfaces that must remain permeable to nature or eco-friendly regulations for buildings. Local urban plans also allow for the implementation of preemption land rights in order to ensure specific protections for the territory. These rights often apply to sensitive natural areas.

Focus

Sensitive natural areas in Côte d'or

Included in the Côte d'or Departmental policy and located on two towns near Dijon (Talant and Plombières-lès-Dijon), this sensitive natural area is home to the grass patches of the Ouche valley (measuring 200 hectares). It is made up of a variety of environments and is home to 5 protected plant species as well as 9 threatened plant species. As a part of the Dijon Metropole's local urban plan, the creation of this sensitive natural area has helped to preserve, manage and discover local biodiversity.

<https://tinyurl.com/2p8ckz4b>

Convention of Nature in the City- Essonne

The Convention of Nature in the City ("Convention de nature en ville", or CNV) is part of the "Foster and Promote Urban Biodiversity" program, itself part of the departmental plan for sensitive natural areas in Essonne (2012-2021). It has several goals: to preserve local nature, to stop the destruction of biodiversity in urban and suburban areas, to support Essonne's ecological networks on a departmental level, and to strengthen the green and blue corridors in the area. This convention acknowledges the efforts made by the different parties involved (the department, local authorities that own the sensitive areas, and local organizations).

<https://tinyurl.com/5e64tafx>

A national reserve in the region of Montbéliard

Locked within urban surroundings, the natural reserve of the low valley of Savoureuse (located between three towns in Bourgogne-Franche-Comté) is composed of several natural ecosystems, thanks to mineral extractions long ago. Local waterways have also remained in the reserve, bringing with them erosion cliffs, gravel beaches, dead wood, etc. This has created a beautiful white willow forest, naturally occurring in the department.

<https://tinyurl.com/uabn5hu7>



Natural spaces and protected areas: sensitive natural areas and natural reserves

Sensitive natural areas (ENS) and natural reserves (RN) traditionally relate to rural towns and are often more developed there; however, they can be adapted to include suburban locations in order to ensure sufficient biodiversity protection.

Since July 18, 1985, the French Departments have been able to determine and implement policies to support sensitive natural areas. These areas may:

- Represent a significant biological or landscape-related interest
- Be fragile and/or threatened, and be protected and managed as such
- Become places to learn about the richness of nature

The goals of a sensitive natural area are:

- To preserve the quality of natural sites, landscapes, environments, flood expansion fields and ensure the protection of the natural habitat
- Remain open to the public, except in case of legitimate concern for the fragility of the natural environment

For cities that wish to highlight and protect one or several of their ecosystems, based on the criteria defined by the local departmental authority, there are a few options: they may establish sensitive natural areas, manage these areas directly, or delegate their management to a third party organization. They can then receive part of the development tax money collected by the Department's local authority.

A natural reserve is a means of protecting for the long term certain areas, species and geological discoveries, as well as functioning natural ecosystems that are representative of biological diversity in France.

These areas are managed by local organizations alongside representatives of the Department. The organization in charge of managing the area creates a five-year plan that identifies goals for the area as well as the means to restore ecosystems.

The limitation (or prohibition) of certain activities, the absence of artificialization, and the prevention of destructive activities make natural reserves highly protected areas. If a city wishes to do so, it can protect some of its natural environments and biodiversity by establishing a nature reserve.

Measure, assess, act

Protecting biodiversity and implementing actions to do so first requires sufficient knowledge and information. Diagnosis, knowledge, representation, and evaluation, once synthesized, are the assets to developing actions that effectively address the environment's needs and reality. These quantitative and qualitative tools can create diversified and integrated representations of the territorial system as well as the territorial plan, which may be complex.

Focus

Maps summarize environmental challenges in the city of Haguenau, Bas-Rhin

Mapping ecosystems and species is the groundwork of any environmental analysis that seeks to assess the ecological value of a site or territory. This step is crucial to spatially identify and prioritize potential challenges in order to establish the goals of a future plan or project. <https://tinyurl.com/dhp3adup>

Identifying urban tree cover at MIT

MIT's Senseable City Lab created a method of analyzing the percentage of tree cover in a city and tracking the evolution of tree cover over time. Paris, for example, has 8.8% tree cover on its streets, which is 4% less than London, 10% less than Frankfurt or Amsterdam and 15% less than Montreal.

A tool to assess urban biodiversity: the Singapore Index

Singapore's City Biodiversity Index is a means for local authorities to assess their urban biodiversity by taking into consideration certain factors: whether there are sufficient places to host nesting birds, the presence of water quantity and climate regulations, and the amount of budget shares put towards the protection of biodiversity. An agenda can then be developed with goals and funding in order to support biodiversity. The city of Paris used this tool to calculate its index twice- in 2015 and 2020- and observed a positive change between the two.

Conservation easement in the United States

Conservation easement is a tool created in the US to help public persons preserve the heritage of private persons. It was noted in article L132-3 of the French Code of the Environment as an "environmental obligation", though little use has been made of it. This legal instrument enables an owner to draw a contract with a city authority or an organization that protects the environment in order to ensure that his or her real estate remains in adequate condition or protect biodiversity. The goal is to preserve, manage, or renew elements of biodiversity or ecological functions.



Innovative legal tools

The relationship between lawmakers, biodiversity and nature has been tainted for many decades because nature has always been considered, in a legal sense, a thing meant to serve humanity. Climate change and the environmental crisis have inverted this dynamic because they highlight the need to include nature-related issues in laws and for lawmakers and legal systems to act in the service of biodiversity. Some legal tools have been created, especially for local authorities, to ensure the protection of biodiversity: Article L132-3 of the Environmental Code allows property owners to enter into a contract with a city or environmental planning organization to ensure that their property continues to be biodiversity-friendly despite a change in ownership.

Fighting pollution from land to sea

Waste creates significant amounts of pollution that impact aquatic biodiversity. The Seine is a striking example: each year, more than 360 tons of waste are poured into the river. Some elected representatives in the Île-de-France region are trying to prioritize this issue by calling for general estates to find solutions in the fight against floating waste. Being responsible for drinkable water, the city of Paris is also responsible for wastewater treatment and preventing toxic spills from reaching streams. The city uses a system of phytoremediation, a technique used in countries such as China and the United States and currently being tested in smaller French towns. The process is simple: water is purified using the roots and microorganisms of aquatic plants that act as living filters. Three major advantages to using this process have been observed: it prevents water streams from being contaminated, it is cheaper than industrial treatment processes, and it supports the development of biodiversity. More direct measures can be taken to fight against water-borne waste, for example, by creating floating dams with a system of vortex plastic, organizing clean-up projects, and increasing public awareness.

Policy acceptability

Acting in favor of biodiversity requires that we change our habits and behaviors; this may mean that we have to stop certain activities or change them significantly. This challenge is not always easy nor can it only be accepted by a small group of people- in order for our actions to be effective, they must be accepted by the majority. However, acting in the interests of biodiversity is also acting in our own favor, because our health is directly connected to that of the living world. In other words, our species cannot live well if the rest of the world's species do not. In the cities of France, 8 out of 10 citizens consider proximity to a green space to be a determining factor when choosing a place to live. Biodiversity- outside of its intrinsic value- must be seen as an asset to the attractiveness of our cities (targeting social inclusion, education, health, employment, ecotourism, leisure, and so on).

Transversality of challenges

For many years, cities have been involved in initiatives that bring together different parties to promote the protection of biodiversity in public and private policy (for example, the implementation of dedicated organizations and tools, the creation of new partnerships, or the establishment of common goals, and so on). Given how

Focus

An environmental convention adopted in Aisne

The city of Laon agreed on a convention of environmental obligation (obligation réelle environnementale, or ORE) along with the start-up Trees Everywhere (recognized as being "in a position to guarantee environmental protection") to create a forested 'island' of biodiversity, made up of 10,000 trees and measuring 3,400 square meters, in the neighborhood of Ardon. Engaging and high-quality landscaping projects have been planned all throughout the area, including sensory pathways, green theaters, a conservatory orchard, and food gardens. The town hall also plans to implement an environmental education program about the forest.

<https://tinyurl.com/yxdbadpr>

"Ici commence la mer": preventing marine pollution in Dijon

By adding the message "ici commence la mer" ("the sea begins here") to its sidewalks, the city of Dijon is trying to raise awareness among citizens that waste left in public space is likely to travel to oceans and seas via sewers, streams, and rivers. The city has also implemented innovative means to prevent marine pollution: catching plastic and cans before they reach rivers, and filtering systems in water treatment plants that eliminate micropollutants and microplastic. <https://tinyurl.com/53tz697h>

A "natural" cemetery in Niort


Set apart from traditional graveyards, which tend to be highly mineralized, the Souché cemetery in Niort has represented 4,000 km of natural space since 2014. Municipal services manage it in such a way that vegetation growth is preserved and phytosanitary products are not used, based on an ecological rather than solely landscaping-based approach.

<https://tinyurl.com/5h7u6f9a>

Mediation with a bat colony in Bas-Rhin

The inter-city organization of Sauer-Pechelbronn, in partnership with the town of Niedersteinbach, conducted a joint project in the space under the town church's roof in order to be more welcoming to native bat populations and to improve the cohabitation between bats and church-goers. The main objective of this collaborative, French-German project was to raise awareness among the public of the importance of protecting and improving the acceptance of this species.

<https://tinyurl.com/uabn5hu7>



broad this field of action is, it is essential for cities to ensure that biodiversity protection is integrated at all levels of organization, policy and action.

The “prevent, reduce, compensate” principle (ERC, ‘éviter, réduire, compenser’)

The French Code of the Environment asserts and confirms the “prevent, reduce, compensate” principle (in French, “éviter, réduire, compenser” or ERC) by implementing projects intended to limit the effects of urban development on the environment. Because cities are responsible for granting building and development permits, it is their responsibility to ensure that this principle is followed.

Prevention

This element of the ERC principle refers to the importance of preventing natural and agricultural areas from being artificialized, and to use urban areas (such as abandoned industrial sectors) for the development of projects rather than these protected areas. The Paris Region Institute estimates that industrial wastelands in Paris and the surrounding areas take up close to 776 hectares, significant space for the construction of infrastructures.

Reduction

This element refers to the reduction of urban projects’ effects on nature. While these projects are being developed, the consequences for the environment must be considered. This is an essential question in terms of protecting biodiversity and the continuity of habitats for flora and fauna.

Compensation

If a project is unable to prevent or reduce its environmental impact, the law requires that the project developer provides a mandatory compensation at the point of request for a development permit. This compensation should be carried out as closely as possible to the location of the project, in order to minimize the risk of biodiversity deterioration at the project site.

Awareness of biodiversity challenges

Building awareness through programs

Growing awareness is crucial to ensuring that ecosystems are managed sustainably. Awareness can be raised through education, making people—especially young people—aware of how important it is for them to become mediators of the alliance between human and urban society and the ecological system that is home to biodiversity.

The role of education

Increasing awareness among people of all ages is essential.

It is fundamental that we communicate the definition of biodiversity and how human life is a part of it, that we rely on other living creatures to breathe, eat, drink, be cured of illnesses, and conduct economic activity, as well as to dream, create and relax. In short, without biodiversity we are not able to live. We are responsible for its destruction but we also have the ability to preserve it, even in cities.

Focus

The Biodiversity Committee in Haut-Rhin

Committed to the implementation of Agenda 21, the city of Saint-Louis sought to support citizen participation in environmental policy. A Biodiversity Committee was created, made up of “expert” citizens (entomologists, ornithologists, landscapers, beekeepers, and so on from the community), elected officials, and representatives of municipal services.

<https://tinyurl.com/pasypza9>

Lights Out in the USA

The “Lights Out” program is an initiative in several American cities, including Chicago, New York and San Francisco, intended to prevent city lights from disorienting migratory birds. “Lights Out” creates awareness about light pollution and its effects and enables authorities to take action by turning off public lighting during migration periods to create a temporary dark passage for birds to fly through.

Cross-section mobilization for biodiversity in Marseille

Seeking a framework that would protect its biodiversity, the city of Marseille, with support from the French Committee of the IUCN (International Union for Conservation of Nature & Natural Resources), launched a local program in 2013 to support biodiversity that would involve a variety of actors. The program relies on the participation of voluntary partners, each of whom contributes unique skills. This collaboration has led to a significant development in the biodiversity of Marseille and its socioeconomic connections.

<https://tinyurl.com/uabn5hu7>

Revision of urban plans in Pas-de-Calais

In 2018, while developing new residential areas, the local urban plan (plan local d’urbanisme, or PLU) of the town of Fouquereuil predicted that more than 8 hectares of farmland and natural areas would become artificialized, which would hamper the ecological functionality of many aquatic environments. An ecological diagnosis of the land was conducted, which led project developers to avoid building in areas in which ecologies would suffer while still being able to address the urban development needs at hand.

<https://tinyurl.com/2p89xtrm>



Focus

The return of butterflies in Marseille

The result of a close-knit collaboration between the city of Marseille, the Population Environment and Development Laboratory, and various citizen parties, the Urban Park for Butterflies is an experimental facility meant to attract and host butterfly species in the heart of Marseille. The park is also a way to share naturalist research with the schoolchildren, students, professionals and general public that come to visit.

<https://tinyurl.com/uabn5hu7>

"Ring des Ulis" road project in the Department of Essonne

As part of the "Ring des Ulis" road project, the Department of Essonne is implementing ERC ("éviter, réduire, compenser" or "prevent, reduce, compensate") strategies that go beyond those prescribed by the State. Several actions have been proposed for the natural site of Cent Arpents: work to disartificialize the soil, experimenting with permeable materials, and raising awareness among the public, for example. A reflection on the long-term preservation of the site, beyond the duration of the compensation period, was also conducted. The operation will respond to the call to regain biodiversity, soil quality, natural landscapes and the living environment at the fringes of the urban zones in Ulis. This project is part of the new departmental policy in the fight against soil artificialization (ZAN).

Youth engagement for biodiversity in Bouches-du-Rhône

Organized by the Youth and Environment services of the Department Council of Bouches-du-Rhône, the Youth COP represents the importance of getting young people involved in the preservation of biodiversity. 200 youths participated in the simulation of negotiations and called for the department to reintroduce biodiversity in urban spaces. Now, the topic of 'nature in the city' can clearly be seen in the Provence Agreement, a policy document that was drafted by the youth before being passed on to elected representatives of the Department at the end of the negotiations.

<https://tinyurl.com/yckradzp>

Focus

"Paris Oasis"

Winner of the 2018 European "Innovative urban action" call for projects, the "Paris Oasis" program focused on renovating 10 elementary and middle school yards during the summer of 2020, in order to combat the effects of climate change and provide children with more comfortable living spaces. Today, the goal of the project is to spread the Oasis renovation philosophy across France and around the world, transforming 760 schools in Paris (73 hectares in total) into urban green spaces by 2040. These spaces will be accessible to city inhabitants outside of school hours.

<https://tinyurl.com/yc3uhu4h>

The Sensitive Natural Area on the island of Herblay-sur-Seine

The Val-d'Oise Departmental Council has committed to creating a sanctuary for biodiversity on the island of Herblay-sur-Seine. Such a completely protected natural area, which is rare and unprecedented in the metropolitan Île-de-France region, presents an opportunity to extend a landscaping and ecology project that will assess our relationship with nature. Since 2019, the Department has acquired all the plots that make up the 11 hectare island, thanks to the right of preemption granted by the title of Espaces Naturels Sensibles (Sensitive Natural Areas or ENS) and revenues from the Development Tax. The site has been marked to be left to

evolve freely due to its natural isolation and location on a bird migration route. It is also home to flora and fauna that belong to aquatic ecosystems. Several proposals to convert a forest and grassland environment into open and closed environments are being studied. Experiments will be conducted in close collaboration with technical and scientific partners, in order to study the natural dynamics of an ecosystem in an urban context. If successful, two other islands could be renatured on the Oise, a tributary of the Seine.

<https://tinyurl.com/pasyza9>



Focus

Complementary compensation and the sensitive natural areas of the Department of Indre-et-Loire

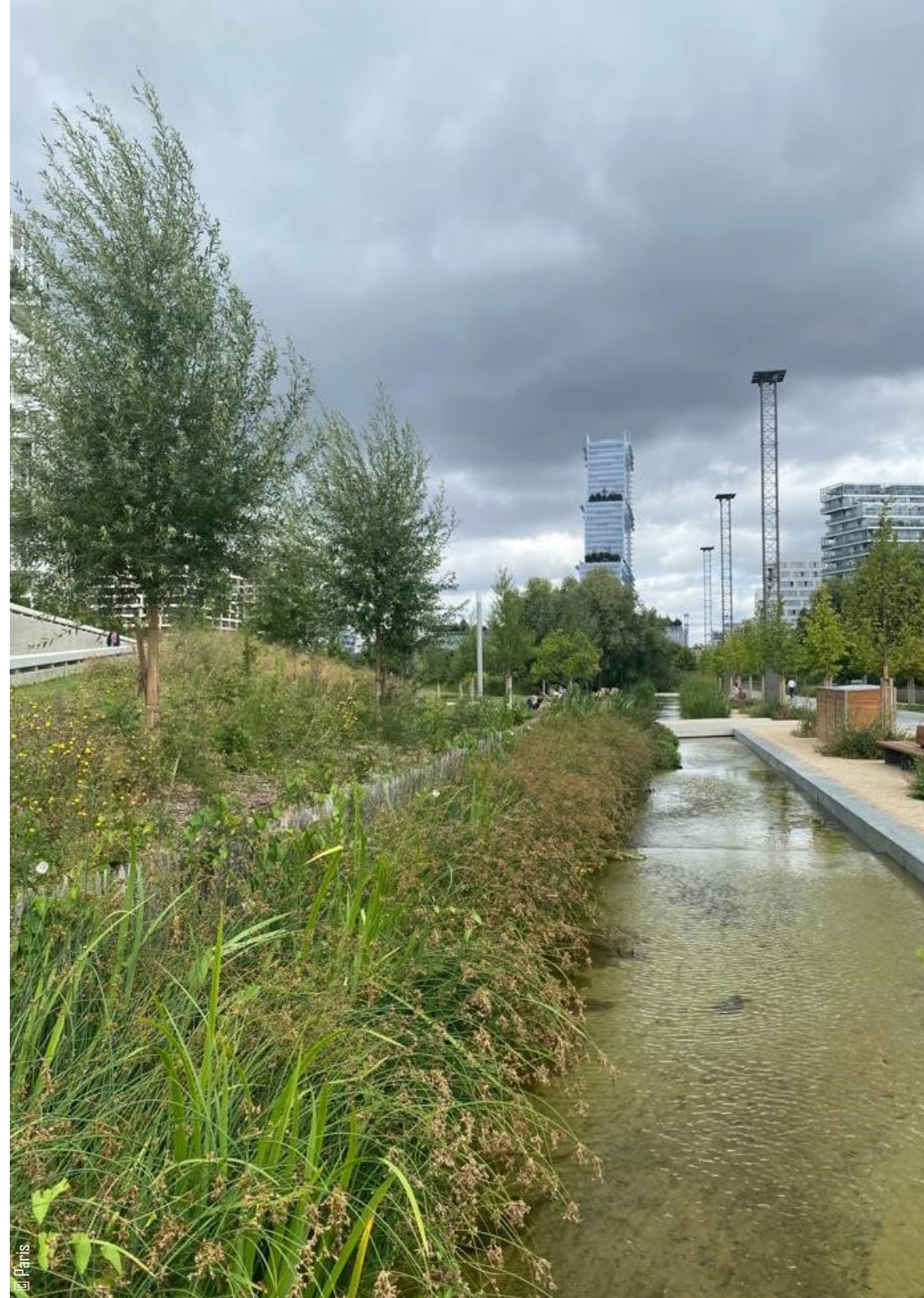
As part of its efforts to support sensitive natural spaces and compensate for the development of roads in Touraine, the Department of Indre-et-Loire has created a new marsh: declining agricultural plots have been redeveloped into manmade wetlands that will help reduce flooding, develop biodiversity, and de-pollute the urban rainwater redirected to the basin. The Pallau marsh, with an area of 5 hectares, is now part of a 150-hectare natural site, the plots of which are managed naturally by sheep grazing and mowing under an agreement with a neighboring agricultural high school. Parking areas and hiking trails have been created to allow public access, and trails paired with interactive activities allow visitors to discover the richness of the wetlands' biodiversity. The space has become a heart of the nature in the Metropolis of Tours, appreciated by locals and naturalists alike.

Territorial movement on the issue of nature in the city: the Departmental Water Plan of Seine-et-Marne

For 15 years, the Departmental Water Plan (Plan Départemental de l'Eau or PDE) has been a tool for territorial coordination that sets policies to protect water and aquatic ecosystems in Seine-et-Marne, a region populated by 1.4 million inhabitants. The PDE is an agreement between the State, the Water Agency, the Departmental Council, the Regional Health Agency, the Union of Mayors, the Regional Chamber of Agriculture, and the Chamber of Commerce and Industry. It mobilizes many partners, experts and local authorities, including the Thematic Working Groups (WGs). The "Invasive and Impactful Species" WG limits the impacts of invasive alien species (IAS), the "Water and Nature in the City" WG uses nature-based solutions to optimize water management and regain biodiversity in communities, and the "Rivers and Wetlands" WG works to restore the region's green and blue frameworks.

Sparrows' neighborhoods in Paris

The "sparrows' neighborhoods" operation is a scientific procedure taking place at three pilot sites, in partnership with the League for the Protection of Birds (Ligue de Protection des Oiseaux or LPO). Public meetings and exploratory hikes are some of the actions intended to help existing but weakened sparrow populations find places to nest that are adapted to their needs. Though the sparrow is a symbol of the city of Paris, the species' population has declined by 70% since 2010. <https://tinyurl.com/ycxea44c>



Conclusion

The decline of biodiversity in our cities is very real; however, there are ways we can address these challenges, if we choose dynamic and innovative governance that takes advantage of our resources and places natural life at the heart of all our projects. While urbanization has been the source of many threats to global biodiversity (due to large-scale soil artificialization and impermeabilization), it can also play a crucial role in preserving biodiversity.

There are several examples of successful management of urban and suburban areas. Through discussions and development, we can maintain and promote many vegetal and animal species in urban areas. We have the ability to (re) create a broad diversity of habitats, food sources, and services for the well-being of city inhabitants.

Creating a positive impact on urban diversity relies on taking into consideration certain ecological parameters: the richness of specific habitats, the connections between different green spaces (ecological corridors), the existence of indigenous vegetal species, etc.

“Biodiversity in cities isn’t the problem; it is one of the solutions.”

Cities must have committed policies whose impact and resonance go beyond the administrative limits in order to ensure that biodiversity continues to grow. Such proactive policies must also last longer than running political mandates, because this timeline is too short for any impact of development to be truly sustainable and long lasting. Success will therefore rely on unifying public actors, setting budgets that match the stakes, and professionalism.

We must make nature one of the primary components of our cities by strengthening and developing all policies that promote the preservation of urban and suburban ecosystems. The Convention on Biodiversity’s COP15, to be held in Kunming, China, will be a driver of post-2020 biodiversity policy and the implementation of the 2050 Vision, among other important items. This urgent need for international commitment is also written in the Edinburg decision, which calls to reinforce the role of urban territories in preserving biodiversity. The connection between these two efforts will be echoed in the conversations held

on nature in our cities at the World Urban Forum in June of 2022, an event that will have guaranteed political impact.

“Healthy biodiversity and the ecosystemic services that it provides are key

for human well-being and to build the resilience of our cities and regions, both during and after the pandemic, and it should be central to our recovery.”

(Excerpt from the Declaration of Edinburg)





Started in 2011, the **French partnership for cities and territories (PFVT – Partenariat Français pour la Ville et les Territoires)** is a platform meant for the exchange and valorization of the French urban actor's expertise at the international level. It is a multi-actor partnership headed by Hubert JulienLaferrière, Member of Parliament, supported by the Ministry of Europe and of foreign affairs, the Ministry of territorial cohesion, the Ministry of the ecologic and fair transition, and the Ministry of culture. It brings together close to 200 organizations representing the diversity of the French expertise, contributing to the construction of a shared French vision based on a capitalization of exchanges and of innovative and sustainable experiences. <https://www.pfvt.fr/>

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