



Biodiversity enhancement on the Regent's Canal: Coordination of science, planning and management



Photos by author, July 2014

Cities can be a haven for biodiversity. Among the reasons for promoting biodiversity enhancement are resilience, well-being, recreation and financial benefits. Interests for urban ecology are quite new and constantly evolving with research. The biodiversity enhancement goal has been developed through a series of spatial planning documents and strategic guidance throughout the years. These international, national or local documents rest upon management groups and actions, which have evolved to serve the interests of biodiversity. The presence of wildlife in cities raises several challenges: acceptance of unknown species, the challenge of space, administrative coordination and financial burden. This paper examines the relationship between science, planning and management in the development of biodiversity enhancement. Theory shows that these three elements are interconnected and necessary to understand wildlife in cities. However, in practice other factors come into play, complicating the framework and questioning the perspective of cohabitation between humans and wildlife.

1	INTRODUCTION.....	3
2	LITERATURE REVIEW	6
2.1	SCIENCE.....	6
2.1.1	<i>Urban ecology: nature doesn't stop at the cities' doors.</i>	6
2.1.2	<i>Urban ecology: a link between science and social science</i>	7
2.1.3	<i>Production and use of science</i>	7
2.2	MANAGEMENT.....	8
2.2.1	<i>Need for management and relationship between science and management ...</i> 8	
2.2.2	<i>Challenges for a strategic cooperation</i>	9
2.3	PLANNING.....	10
2.3.1	<i>The role of the planner</i>	10
2.3.2	<i>It makes sense in England</i>	10
2.3.3	<i>London</i>	13
2.3.4	<i>In theory, it can all work pretty well!</i>	13
3	CASE-STUDY	15
3.1	ECOLOGICAL CORRIDOR.....	15
3.2	REGENT'S CANAL.....	16
3.3	METHODOLOGY.....	19
4	FINDINGS	21
4.1	PLANNING.....	21
4.1.1	<i>A partnership that wears away</i>	21
4.1.2	<i>The role of Biodiversity Action Plans in addressing Regent's Canal</i>	22
4.2	MANAGEMENT.....	23
4.2.1	<i>Is this even useful?</i>	23
4.2.2	<i>No obvious coordination on the day to day actions</i>	23
4.2.3	<i>An innovative management</i>	24
4.3	SCIENCE.....	24
4.3.1	<i>Desperately seeking information</i>	24
4.3.2	<i>On evidence, planning and management</i>	25
4.4	AT STAKE: WHAT THEORY DOES NOT TELL.	25
4.4.1	<i>It does not always go according to the plan</i>	25
4.4.2	<i>Can we enhance biodiversity on the Regent's Canal?</i>	26
4.4.3	<i>An ambiguous human-wildlife relationship</i>	26
5	DISCUSSION AND CONCLUSION.....	28
6	SOURCES AND KEY REFERENCES.....	30
6.1	BOOKS AND ACADEMIC PAPERS:	30
6.2	OFFICIAL DOCUMENTS:	31
6.3	WEBSITES	33
6.4	ORGANISMS THAT ISSUED DATA FOR THE MAPS	34
6.5	INTERVIEWS.....	34
7	APPENDIX 1: SAMPLE OF INTERVIEW QUESTIONS.....	36
7.1	LOCAL AUTHORITIES AND GOVERNMENTAL BODIES.....	36
7.2	MANAGEMENT GROUPS ON THE REGENT'S CANAL	37
8	APPENDIX 2 : GLOSSARY	38

1 INTRODUCTION

“Although London is one of the largest urban areas in Europe, almost two thirds of the area of the capital is green space [...] Consequently, despite a very high proportion of developed land, London has a huge ecological range with varied landscapes and over 3,000 different species have been recorded here.”(Natural England, 2013)

“The richness of London’s biodiversity is [...] dependant on private gardens, parks and open spaces and green corridors along canals and railways as well as on the River Thames and its tributaries [...] that allow essential interconnection between London wildlife sites.” (London Plan, 2011, p. 234)

The notion of ‘wildlife’ refers to non-domesticated species of microbes, plants or animals. In scientific literature, the term has often been restricted to animals (mainly mammals and birds) but a wider definition can be: “the concept of a species that grows or lives ‘wild’ in the area.” (Usher, 1986, p. 4) The expression ‘biodiversity’ stands for the number of species present in the environment and can be “viewed at smaller scales (e.g. genetic variation within populations) and larger scales (e.g. variety of community types presents in a region).”(Townsend et al., 2008, p. 480) In this dissertation, the terms biodiversity and wildlife will be used indifferently to address the enhancement of the diverse fauna and flora that has not been domesticated nor introduced in London.

Cities can be a haven for biodiversity. Even if the quantity and diversity of urban wildlife depend on the configuration of geographic areas, “some urban communities, particularly if they include reservoirs or other water bodies may have more diversity of habitat than the areas they replaced. Often these urban areas contain more birds - if not more species- than rural agricultural and wooded areas.” (Leedy, 1978, p.2)

There are several reasons for enhancing wildlife in cities. Firstly, city residents experience psychological benefits from the connection with green spaces. Their well-being increases with the number of species present in their environment. (Fuller et al., 2007; Arnould, 2011) By permitting a better quality of life, green spaces enhance the sustainability of cities. (Chiesura, 2004, p. 131) Because people value nature and its influence on their quality of life, they can consider it as a valuable resource. Secondly, urban biodiversity permits a concrete approach to educational programs on the environment. These educational programs can benefit children residing in cities. The direct experience of nature is often considered as a better way to learn about the environment as it enables cognitive, physical and emotional development (Rivkin 1995; Hudson, 2001; Louv, 2008; Freeman & Tranter, 2011). Practical activities, directly linked to the biodiversity in cities can undermine the “psychology of despair” which tends to develop when dealing with environmental issues. Thus, it permits an emphasis on the tangible and positive actions occurring in urban areas rather than the catalogue of harms done to the nature. (Hudson, 2001, p.287) Raising environmental awareness among

children puts an emphasis on the future. (Freeman & Tranter, 2011) This should make them deny environmental degradation as a norm. As a consequence, there is a belief that raising environment-friendly individuals permits better city resilience. Finally, urban wildlife provides financial benefits as it can be considered as an aesthetic amenity or a source of recreational activities. (Leedy, 1978, p.5) Thus, wildlife can bring additional economic returns through increased property values. Furthermore, “open space management programs directed toward wildlife frequently reduce management costs.” (Ibid.) For these reasons, biodiversity enhancement should be of the best interests for developers.

Interests for urban ecology are quite new and constantly evolving with research. Thus, the knowledge gathered has made relatively recent appearance in policy. In England, the Natural Environment and Rural Communities Act (2006) defines the duty of public authorities to conserve biodiversity as: “in relation to a living organism or type of habitat, restoring or enhancing a population or habitat.” (HMSO, Section 4)

The biodiversity enhancement goal has been developed through a series of spatial planning documents and strategic guidance throughout the years. These international, national or local documents rest upon management organisations and actions, which have evolved to serve the interests of biodiversity. Wildlife management can be characterised as “the manipulation of wild (i.e. free living) plant and animal species behaviour or abundance for a specified goal”. (DEFRA, 2010, p.3) Wildlife management practices follow three main principles: conservation of rare species and habitats, enjoyment of the benefits provided by wildlife resources and control of species dangerous for public health and safety. (Ibid.)

Nevertheless, the presence of wildlife in cities raises challenges. If nature is needed to avoid ‘environmental amnesia’, there is however a question of what type of wildlife “humans are calling for”. (Saglie & Thorén) In fact, if wildlife and mankind seem to coexist in cities, reluctance towards unknown species exists. Moreover, the challenge of space needed both for biodiversity and humans is even more urgent in cities like London. So urgent, that we could question the compatibility of wildlife enhancement with city development. Furthermore, habitats and species do not occupy the space in a “tidy” way. That is, they transcend administrative boundaries and consequently question the coordination between public authorities. Finally, enhancing wildlife has a cost that can only be addressed if considered as a priority for cities.

The Regent’s Canal, in Central London, exemplifies all these challenges. Running through five boroughs, it is the theatre of new developments and uses. It also raises interests within a diversity of management groups, research teams and local planning authorities.

Is the objective of wildlife enhancement achievable in our cities? Is there a global strategy coordinating the use of space and the interests of both humans and wildlife? Can research, planning and management work together to provide for this strategy?

In the first section, the three domains of science, planning and management are explored and their interconnection is outlined. To do so, the literature on urban ecology, wildlife management and biodiversity planning is explored as well as a review of the UK context. Next follows an explanation of the concept of ecological corridor and of the case-study of the Regent's Canal. This section also comprises methodology used to study the canal's challenges in relation to wildlife enhancement. Afterwards the findings of the research are presented, highlighting the relationship between research, planning and management in practice. Finally the last section discusses the consequences of the findings on the framework developed in the literature review, before concluding.

2 LITERATURE REVIEW

This dissertation is rooted in the urban ecology literature. Urban ecology is an applied science linking research in natural and social science. It seeks to influence actions for the protection, development or conservation of biodiversity. These actions are difficult because of the conflicts of interests, uses and organisations around an urban environment. Literature reveals that the role of planning in this context is to translate science into action, as well as to mediate management conflicts on specific territories. This permits to establish a clear relationship between science, planning, and management.

2.1 Science

2.1.1 Urban ecology: nature doesn't stop at the cities' doors.

Urban wildlife is not a new phenomenon. The presence of animals in the city has historically been a concern for health. Indeed, the development of agriculture and the domestication of animals have long been associated with epidemiological risks. (Karlen, 1995; Benton-Short & Short, 2008)

Nowadays, a new way to look at nature in cities has emerged. The field of urban ecology focuses on the study of biodiversity within cities. That is, it looks at the relationship between the biophysical and the social processes in urban settings. (Benton-Short & Short, 2008) Urban ecology is considered as an applied science that applies research in the planning and management of green areas. (Niemelä, 1999)

This recent field is still restricted, as ecological research tends to focus on more “natural” environments. Urban systems are usually seen as a threat to native species because of their pressure on the environment. Yet, a city often shows the characteristics of an “ecological mosaic” with a wide range of species and habitats. (Benton-Short & Short, 2008, p. 149) For example, London has a vibrant biodiversity. The bombing of the capital during WWII has established exceptional conditions (low competition) for the ecological patterns that had not existed for 10,000 years. (Gilbert, 1991, pp.180-181) Today, we can observe the proliferation of species that were formerly rare such as the rosebay willow herb or the Canadian fleabane, witness of the “bomber ecology” (Davis, 2002, pp.381 - 382). That is, cities are experiencing a unique form of ecological phenomenon that increases with urban development, generating “more urban-tolerant plant, animal and bird life”. (Benton-Short & Short, 2008, p.150)

In fact, the complex relationship between humankind and wildlife creates conflictual situations and builds stress on the wildlife species residing in urban areas. This stress, by imposing “substantial constraints on the biology of these animals” can impose them to “modify their behaviour and strategies” (movement, reproduction, density, diet) to survive. (Ditchkoff et al., 2006, p. 6) For example, human activity being the greatest during daytime, some animal species may switch their activity to night-time periods. This can impact these species' diet and reproduction conditions. Urban wildlife may also not

be the one expected. The urban biodiversity that people are more likely to be in contact with is robust and adapted to them. Species have grown to adapt to disturbance and noise and are opportunistically taking advantage of the shelter and food present in the city. (Freeman & Tranter, 2011) Therefore, the wildlife species found in urban environments can have different behaviours than their rural counterparts, hence the relevance of urban ecology studies. (Ditchkoff et al., 2006)

2.1.2 Urban ecology: a link between science and social science

Science and social science are not permeable subjects. Social scientists look at the environment through the scope of power relationships and social tensions linked to the environmental quality while ecologists compare urban environments to ecosystems. Therefore, there is an interesting link to make between the social scientists that consider the nature of cities and scientists that look at the city itself and its environmental processes. (Benton-Short & Short, 2008) The two different domains can merge into new approaches; urban ecology being one of them. Urban ecology is a broad term that permits different interpretations. (Niemelä, 1999) This dissertation uses urban ecology to look at the partnership of science and social science in the process of planning and management actions. It borrows to the subject of political ecology the study of influences of social and environmental factors on environmental science and the influence of science on politics. (Forsyth, 2003)

The field of urban ecology permits the translation of science into planning and management actions. The translation of information is possible through a social learning process. In this context, science is not the only determinant factor in decision-making but assists a more communicative conception of planning. Key stakeholders need to develop a shared understanding of the information through the process of knowledge production. It is therefore important for all stakeholders to fully understand what is in the “black box” of scientific processes. More than only understanding those, stakeholders participate in the fabrication of knowledge. This leads to the demystification of science by following scientists and their reasoning “before the box closes and becomes black” (Latour, 1987, p.21). The participation of different stakeholders in the making of science creates a collective perception that will be embedded in concrete actions. (Latour, 1987; Innes, 1998; Castro & Kartez, 2008)

2.1.3 Production and use of science

The production of urban ecological science necessitates the development of new scientific partnerships: to study urban biodiversity, community ecologists must ally with behavioural ecologists because of the specificity of animals’ behaviours in urban environments. (Jokimäki et al., 2011) It also requires the development of specific methods such as biotope mapping that can be used to assess the biotic characteristics and physical properties of urban patches. The information can then adopt relevant forms for planning such as databases and maps. (Niemelä, 1999)

However, ecological findings can show difficult to use. The way research is used depends on the message authors want to get across. For example, concerning the classification of species, some authors (Weather, 1999; Blanc, 2000) refer to specific noxious or pest species: cockroaches, feral pigeons, rats and mice. Others (Rees, 2002) use a more scientific classification, using a binomial system. The first type of classification takes into account people's perceptions of wildlife whereas the second type reflects the diversity of species present in cities. Thus, there is a chance that research will be conducted differently depending if it is used in science, policy, or wildlife management. In the context of invasiveness, Boonman-Berson et al. (2014) explain that science will look at the origin of the species; policy will focus on their impact, and management on their behaviour. Therefore, the spaces and types of data differ from one subject to another. (210)

2.2 Management

2.2.1 Need for management and relationship between science and management

Biodiversity management can be seen as the direct application of urban ecology. (Leedy, 1978) Because in cities, wildlife needs to cohabit with human beings, it cannot be left without management. The presence of wildlife in urban settings creates several challenges for their human counterparts. A specific management strategy must be designed for each type of challenge.

Firstly, urban environments are witnessing the arrival of new plant and animal species that can be considered as "noxious" if they create a hazard to native wildlife and/or humans. These noxious species threaten residents' health and create an environmental nuisance. (Weather, 1999) Managing noxious species consists in trying to control them or to get rid of them. Secondly, cities are constrained by tighter environmental pressures than their surroundings. They feature fewer open spaces, more air pollution and energy consumption. They are subjected to more risks such as flooding and can experience ecosystem fragmentation. All these factors can lead to a reduction in the diversity of species. (Benton-Short & Short, 2008) Management will here consist in preservation by creating or protecting habitats favourable to wildlife. The first two types of management are often complementary. Finally, management is needed because of the direct interaction between humans and wildlife. In this context, educating the users will be a primary goal for management groups.

However, conceiving and imposing an adapted management strategy can reveal challenging. In cities, species are exposed to anthropogenic stresses than can modify their behaviour and patterns of development. Information on wildlife management is usually more developed for rural species. That is why some management actions can be ineffective if they are not based on accurate urban species data, corresponding to the actual behaviour of urban wildlife populations. (Ditchkoff et al., 2006; Jokimäki et al., 2011)

Moreover, there are uncertainties in the day-to-day management actions because of the lack of data on specific urban ecosystems, the absence of time to do experiments and the difficulty in knowing an ecosystem that is constantly changing. (Van Der Windt et al., 2008)

To some extent, scientific information can appear insufficient to produce a satisfactory strategy for the general public. In fact, some species, considered as noxious are nowadays widely accepted in urban settings because of the aesthetic value they provide. (Ditchkoff et al., 2006) The question of each species to control or to let free is then very ambiguous and can be left to interpretation.

Moreover, the use of science at the local level can defer depending on the perception one might have of nature. These perceptions depend on the stakeholders involved. For example, conservationists and ecologists can have a preference for “wild” nature (for biodiversity use) whereas public authorities and residents value a more functional nature (for transport and recreation use). (Van der Windt, 2008) To gather effective information for conservation action at the local level, it is therefore important to engage a wide network of local actors so as to take into account different interests and perceptions.

2.2.2 Challenges for a strategic cooperation

Biodiversity enhancement can be the source of conflicts that endanger the coherence of the management strategy. Indeed, wildlife management presents governance challenges. (Gautier, 2010)

Conflicts in biodiversity management can be the consequence of a multiplicity of interests around a geographical entity or a resource. For this reason, the conservationist may have to adopt a position of mediator or translator. The position will consist in “a clear weighing of all interests, values and knowledge.”(Van der Windt, 2008, 130) It requires the provision of transparent scientific knowledge and “active participation in the extended forum of knowledge production in the decision-making process”. (Ibid.)That is, the scientific facts will be socially robust if they are supported by politicians, stakeholders and citizens.

Wildlife management is an activity that mobilises a diversity of stakeholders that act at three different levels: within a locality, between localities and between different geographic scales. Within a locality, the engagement of many stakeholders can be gathered under the concept of transactional management. This transactional approach involves the gathering of a “diverse group of people representing resource users, management agencies, and non-governmental organisations.” (Zollinger, Daniels, 254) It aims to counter the lack of understanding around the issue by creating a dialogue among conservation groups. Thus it permits conflict management among stakeholders and better dialogue and understanding towards decision-making. Between localities and across different territorial scales, wildlife management can face the confrontation of different

political entities. Because wildlife spaces do not fit administrative boundaries, an overall strategy is needed to harmonize all the entities.

2.3 Planning

2.3.1 The role of the planner

The planning discipline has tools that are useful to tackle cooperation difficulties. Dealing with economic, social and environmental objectives is a role proper to the planning discipline. When dealing with biodiversity enhancement, the planner can therefore adopt her competences as a translator, negotiator and promoter to reach her objectives. Moreover, planning documents are useful to target the international, national and local objectives for biodiversity enhancement. The planner here is not only a translator between different groups of people but also between knowledge and practical actions.

In fact, information being difficult to collect and interpret, it cannot be easily transcribed into conservation or management actions. The role of the planner appears as an asset in the process of translation as an intermediary actor. Thus, there is a need to merge natural and social science into urban planning. (Niemele, 1999; Jokimaki et al., 2011)

For scientific knowledge to be integrated into a coherent planning strategy, it is necessary to institute a strong partnership between scientists and urban planners. How to integrate scientific knowledge to urban planning? Miller and de Roo (2004) give a list of principles for integrating urban planning with a strategy of environmental quality improvement. Among these principles is the expansion of comprehensiveness, that is, the integration of basic planning features (density, infrastructure, location) with a full range of environmental characteristics. The integration of urban planning with natural science must rely on reliable evidence but also include lay knowledge through the involvement of the public in the planning process. (pp. 4-8).

The planner is therefore supposed to ease the combination of science and social science. However, to produce actions, planning must integrate the difficulties faced by management groups. For planning to capture the subtle challenges faced by urban wildlife, a collaborative strategy must merge from relationship between planning, science and management. This relationship is set in the planning documents and programmes affecting biodiversity in England.

2.3.2 It makes sense in England

Figure 1: Sample of the planning documents and programmes affecting biodiversity in England

Man and Biosphere Programme (MAB, 1971) UNESCO Intergovernmental Scientific Programme that seeks to establish a scientific basis for the improvement of relationships between people and their environments. Its objectives are to reduce biodiversity loss through an interdisciplinary work on ecological, social and economic factors.

Wildlife and Countryside Act (1981) UK Act that gives protection to native species, controls the release of non-native species, and enhances protection of SSSIs.

Convention on Biological Diversity (CBD, 1992) Multilateral treaty signed at the Rio de Janeiro Earth Summit, with three main goals: the conservation of biodiversity, sustainable use its components, and fair and equitable sharing of benefits arising from genetic resources.

UK Biodiversity Action Plan (UK BAP, 1994) UK Government's response to the CBD describing the national biological resources and providing detailed plans for conservation of these resources. The production every five years of national reports showed the UK BAP contribution to the reduction of biodiversity loss.

Natural Environment and Rural Communities Act (NERC, 2006) Creating Natural England, the Act also places new duties upon all public authorities.

- Section 40: Duty to conserve biodiversity
- Section 41: List of the living organisms and types of habitats of principal importance for conservation.

Cities and Biodiversity Outlook (CBO, 2010) Linked to the CBD, it is a global assessment of the links between biodiversity, ecosystem services and urbanization and the local practices for integrating biodiversity and sustainability issues into public policy.

Aichi Biodiversity Targets (2010) Established at the 10th Conference of the Parties to the CBD in Nagoya, Japan, the 20 biodiversity targets constitute the Strategic Plan for Biodiversity 2011-2020. These targets are set to measure progress on biodiversity. Some targets and strategic goal are directed towards planning.

Biodiversity 2020: A strategy for England's wildlife and ecosystem services (2011) Strategy stemming from the Natural Environment White Paper and showing the implementation of international and EU commitments. It is part of the Post-2010 Biodiversity Framework.

Environment White Paper / The Natural Choice: Securing the value of nature (2011) Second White Paper on the natural environment since 1990 that sets the recommendations for local measures (development of Nature Improvement Areas, biodiversity offsetting, Local Nature Partnerships), reconnection of people and nature. and capturing and improving the value of nature by integrating natural capital in a green economy.

EU Biodiversity Strategy to 2020 (2012) European strategy emphasising the economic value of environmental services and that sets targets to halt the loss of biodiversity through better management, control and legislations.

UK Post-2010 Biodiversity Framework (2012) Replacement of the UK BAP resulting of the new strategic thinking after the CBD's Strategic Plan for Biodiversity 2011-2020 (2010, Nagoya) and the new EU Biodiversity Strategy (EUBS, 2011). The framework shows the work and strategies of the four countries to reach Aichi Biodiversity Targets.

Conservation of Habitats and Species Regulations (2012) Regulations that implement the European Habitat directive into national legislation.

EU Biodiversity Strategy to 2020 (2012) European strategy emphasising the economic value of environmental services and that sets targets to halt the loss of biodiversity through better management, control and legislations.

The planning system can help deliver biodiversity benefits. It is based on evidence, including bio-geographical features of an area, protected and priority habitat and species, climate change records and beneficial ecosystem services. The 1992 Rio Convention on Biological Diversity has marked a determinant point in this process. International initiatives have been continuous throughout the years. More recently, the Aichi Biodiversity Targets (2010) have put planning at its core: its strategic goal E is to “enhance implementation through participatory planning, knowledge management and capacity building” (Convention on Biological Diversity, 2010).

The European context also pushed for biodiversity enhancement measures at the local level. European Protected Species benefit from the legal protection (under the Wildlife and Countryside Act 1981 and the Conservation of Habitats and Species and Regulations 2012) as well as the sites of national and international importance such as Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SACs), or Special Protection Areas (SPAs). (Tainton, Natural England, 2014)

The National Planning Policy requires Local Planning Authorities to respect habitats and species listed at Section 41 of the 2006 Natural Environment & Rural Community (NERC) Act. Moreover, the publication of “Biodiversity 2020: A strategy for England’s wildlife and Ecosystem services” places a responsibility on public authorities to protect biodiversity in general and not only to focus on those listed on S41. Before approving a development, local planning authorities must sometimes process to an Environment Impact Assessment (EIA).

By signing the Rio Convention, the UK Government committed to limit biodiversity loss by implementing a UK Biodiversity Action Plan framework. It consisted in a set of nationally agreed priority species and habitats. This framework has recently been replaced by the UK post-2010 Biodiversity Framework, which responds to the Aichi strategic goals and targets.

Local Biodiversity Action Plans (LBAPs) are compiled by Local Biodiversity Action Partnerships and Regional Biodiversity Forums. LBAPs are linking Local Authorities, Government Agency and voluntary organisations together. The goal of LBAPs is to identify local priorities for biodiversity conservation and to deliver a coordinated action to reach these priorities.

At the difference of sites for international and national importance, UK BAP Priority Habitat/Species and Local Biodiversity Action Plans do not carry any legal protection from development. Therefore, they are not mandatory to produce or to take into account. However they have the advantage of creating and maintaining inventories of UK BAP Habitats and Species, reporting on changes in condition and status, and promoting management, restoration and creation of BAP habitat through the planning system. (Tainton, 2014)

2.3.3 London

In London, following the Greater London Authority Act (1999) the Mayor is required to produce a Biodiversity strategy. Moreover, biodiversity conservation is one of the objectives of the All London Green Grid (London's green infrastructure network). The Greenspace Information for London (GIGL) holds the data on biodiversity in London in relation with the London Wildlife Trust (LWT). Thus, there is an entity in charge of gathering, managing and sharing information.

Like its counterparts in the UK, the London Biodiversity Partnership (LBP) has delivered a London Biodiversity Action Plan. The London BAP identified priority habitats and species of particular biodiversity importance in London (Habitat Action Plans and Species Action Plans).

2.3.4 In theory, it can all work pretty well!

If we look at the way biodiversity enhancement is considered in the literature and in the UK, we can see that planning, science and management are highly connected. Planners, biodiversity managers and scientists can work to develop a coherent strategy with sound science and a comprehensive vision of the situation.

In the context of urban ecology, research consists in the collection of data and the study of species' populations and behaviour. This collection of information can be done by the ecologists but also necessitates the input of all the stakeholders in the management partnership.

Planning is the entity that should ease the dialog between science and actions as it gives indications and information for concrete applications. In this partnership, the planner facilitates the dialogue between management groups at several levels. Therefore planning appears to have two important values for biodiversity enhancement: mediator and translator.

Finally, management groups are the ones that are in charge of concretely enhancing wildlife species and habitats. They collect information for their own actions, but also need the expertise of scientific research. Moreover, they need to respect a set of plans for their coordinated action. As a consequence, the three groups are connected and are intrinsically linked.

It remains to see if practice proves theory accurate.

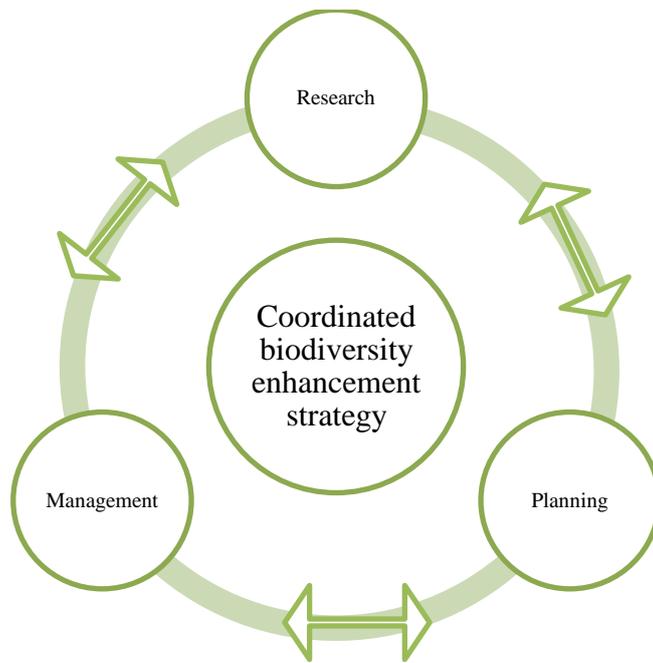


Figure 2 – Elements for a coordinate biodiversity enhancement strategy

3 CASE-STUDY

3.1 Ecological corridor

In cities, different types of morphology are of interest for biodiversity. Among them are the ecological corridors that “tend to channel movement along their length”. They can act as a conduit, a filter and habitats. (Forman, 2014, pp.362) Green corridors such as rivers and railways have several benefits and values. Firstly they permit the flow of air, animals, water, seed and people. Secondly, they support biodiversity through habitat heterogeneity and nesting. Thirdly, they can be an asset for residents, by reducing traffic noise or shaping the urban environment. (Forman, 2014)

The concept of ecological corridor is widely accepted by ecologists, politicians and conservationists. Its scientific basis has however been contested: in 2003 Rientjes and Roumelioti have conducted a survey among European conservationists and ecologists from 31 different countries that showed that 23.1% of the respondents said they were reserved on its scientific basis. This can be linked to the fact that studies results differ depending on the species, the focus and the type of corridor studied. Despite this, corridors are seen as a solution to habitat fragmentation created by urbanization. The concept presents an appeal to the general public, specific stakeholders and has been adopted by European planning documents because it can be easily explained to lay people in a meaningful way and can have a visual identity through mapping. International conservationist organisations, have also integrated ecological corridor in their strategies. For instance, the International Union for the Conservation of Nature and Natural Resources (IUCN) has adopted in 1980 the concept of ecological corridor for its World Conservation Strategy. (Rientjes & Roumelioti, 2003; Van der Windt et al., 2008)

Canals are a distinctive variant of rivers. Generally less polluted than urban rivers, it presents a steady water flow, locks facilitating species movement and wetland-vegetation patches. (Forman, 2014, p.186) Canals are non-natural geographical features. Therefore, they have many functions such as the movement of commercial and recreational embarkations or the towpath for walkers. As a consequence, its ecological corridor characteristic can be seen as a side-effect. This is a characteristic to take into account when planning for biodiversity enhancement, as other interests and uses of the canal can be legitimate.

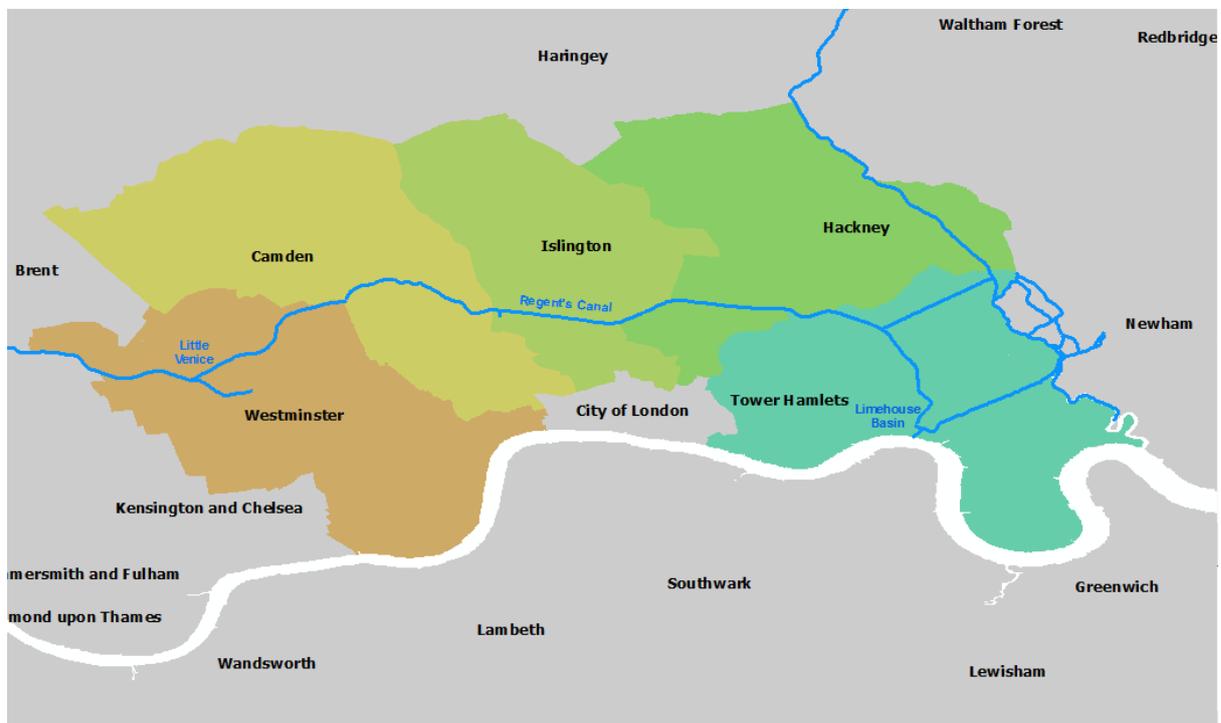
Canals are fully taken into account in the BAP framework. The London BAP comprises 11 Habitat Action Plans, among them the Standing Water that covers Ponds, Lakes and Canals. The Standing water habitat action plan explains that “home to fish, amphibians, birds and a host to other wildlife, standing water [...] is also enjoyed by recreational fishermen and walkers. The threat of development, natural infilling and climate change threaten the biodiversity and recreational value of this habitat”. Particular threats to the canals are “vandalism, pollution, development, and recreation”. (London Biodiversity Partnership website)

3.2 Regent's Canal

The Regent's Canal is a 13.8 kilometres long canal in north central London. It connects the Grand Union Canal (Paddington Arm) to the River Thames. (London Canal Museum website) Built in two stages, the canal first opened from Paddington to Camden in 1816 until its full completion in 1820. Used to carry goods, resources and materials, the canal was in function throughout the 19th and part of the 20th century before its use became obsolete with the development of railway and road infrastructures. The canal was nationalised in 1948, managed by British Waterways until the 2012 creation of the Canal and River Trust, a charitable trust to which were transferred the responsibilities of British Waterways.

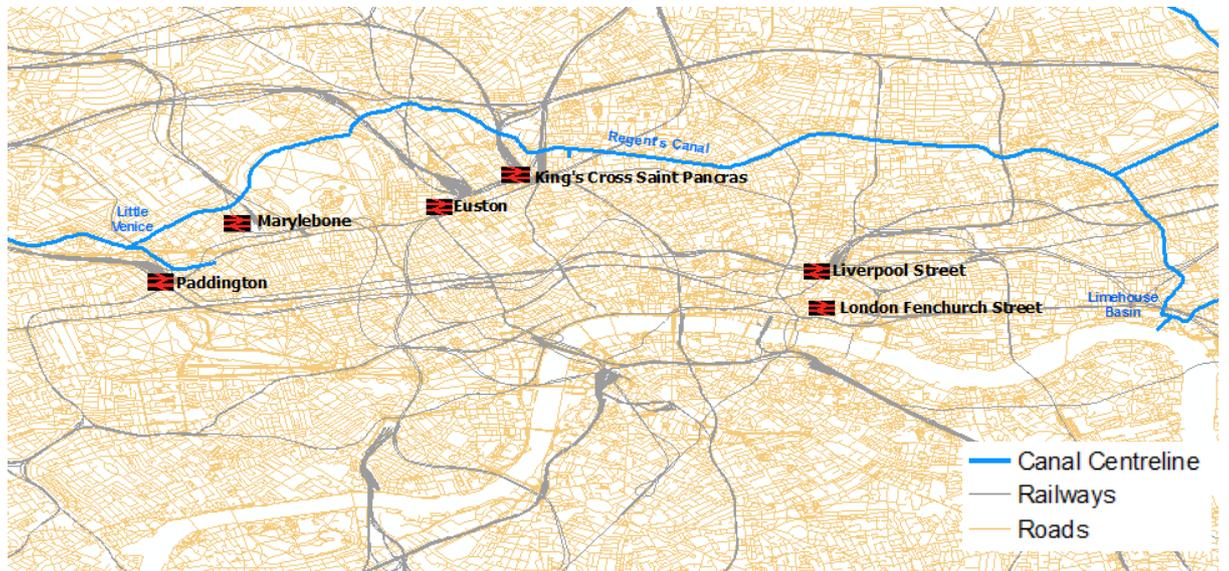
The canal runs through five different boroughs: Westminster, Camden, Islington, Hackney, and Tower Hamlets.

Map 1: The Regent's Canal running through 5 Boroughs' boundaries



The Regent's Canal presents the characteristics of a green corridor and is at the junction of other green corridors created by the rail tracks from some of the busiest train stations in the UK: Paddington, Marylebone, Euston, King's Cross St Pancras, Hoxton, Liverpool Street, Bethnal Green and London Fenchurch Street. (Office of Rail Regulation)

Map 2: Important rail tracks at the junction with Regent's Canal



The Regent's Canal is a Site of Metropolitan Importance for Nature Conservation. This status should protect the ecological interest of the canal from any risk that could reduce its ecological connectivity. In fact, the canal presents a rich diversity of species and appears as a suitable corridor for the enhancement of important habitats.

Map 3: Birds and plants recorded on the Regent's Canal (data issued from the Greenspace Information for Greater London CIC (GIGL))



The Regent's Canal is also experiencing important changes; among them the King's Cross redevelopment project. This project has started in 2008 and has the objective of having by 2020: "50 new buildings, 2,000 new homes, 20 new streets, 10 new public squares, 67 acres and 45,000 people who live, work and study in the area". (King's Cross website) If this development permits new opportunities in the area, its extent has the potential to create important pressures on the canal.

Another important change is the Mayor's objectives set in the London Plan (2011). Used for transportation and recreation needs, the Regent's Canal is part of the Blue Ribbon Network, outlined in the Plan. The Blue Ribbon Network is a policy framework applying to London's rivers to permit the consideration of different policy objectives when making land-use decisions related to rivers. These objectives are very broad: recreation, transportation, flood management and biodiversity enhancements and are more or less important depending on the section of the canal and the stakeholders involved.

3.3 Methodology

The study of local biodiversity enhancement through the coordination of research, planning and management has two objectives. The first one is to analyse the cooperation of different stakeholders working on biodiversity enhancement along the Regent's Canal. The second one is to understand the role of planning in the process leading to biodiversity enhancement. The research was conducted in London during the summer 2014. This analysis is based on two different methods that have been chosen because they are complementary: interviews and cross-document analysis.

Interviews were conducted in person and via email using different questionnaires depending on the stakeholder met (policy-makers, advisory organism, planners, and management actors). Direct interviews lasted between 60 and 90 minutes and email answers were 3 to 5 pages long. In total, the study shares the answers of 8 different interviewees. They are all closely linked to organisations involved in the London Biodiversity Partnership and the management of the Regent's Canal. The selection of these stakeholders was made with the objective of better understanding the planning system behind biodiversity enhancement in London and the management challenges on the canal. Another theme often developed during questionnaires was the collection and use of knowledge for planning and management.

Figure 3: Roles of the stakeholders interviewed

Role	Organisation
Biodiversity Officer	Tower Hamlets
Wildlife on your Waterways Intern & Wildlife on your Waterways Project Officer	London Wildlife Trust
Nature Conservation Officer	Camden
Urban Greening Team Leader	Greater London Authority
Strategic Planning Manger	Canal and River Trust
Chair	Friends of Regent's Canal
Sustainable Development Consultation Team	Natural England
Volunteer Coordinator	Canal and River Trust

The content of the interviews has been analysed by looking separately at each group of stakeholders, as they had the same set of questions. Then, the answers were broken into themes to permit a more coherent analysis. Because all these stakeholders work for a same global biodiversity goal, it seemed interesting to make them dialogue through the analysis. Different point of views emerged from this analysis, not always contradictory but opening new questions for future research.

The analysis is also based on the comparison of Biodiversity Action Plans (BAPs) across the 5 boroughs bordering Regent's Canal. The document analysis has two focuses. Firstly it compares the strategy (objectives, structure, and partners) of each BAP compared to the other BAPs. Secondly, it looks at the threats to the open standing waters expressed by the BAPs. These two focuses are established in comparison with documents such as the London Plan and the Standing Water Habitat Action Plan issued in 2008 by the London Biodiversity Partnership. The goal of this document analysis was to assess continuity in planning for biodiversity enhancement.

There are several limitations to this study. Firstly, the sample is small compared to the breadth of stakeholders involved in biodiversity enhancement around the canal (charities, public bodies, enterprises and individuals). Moreover, it would have been interesting to gather the point of view of other organisations that have an impact on the area but do not work for biodiversity enhancement. Secondly, another limitation is linked to the fact that data are self-reported. This second limitation can have different important biases such as selective memory, telescoping, exaggeration or attribution. This has probably biased its objectivity as open questions can lead to interpretation. Thirdly, the document analysis is not exhaustive. Many comparisons and interpretations could have been made with these documents. Therefore, the selection of criteria to examine imposes the study to be directed in a specific way, which compromises its objectivity.

4 FINDINGS

4.1 Planning

4.1.1 A partnership that wears away

The planning system in the UK ensures a continuity of the objectives from the national to the local level. The London Plan follows this continuity by respecting European directives such as the Strategic Environmental Directive. (Massini, 2014) Moreover, planning authorities have to consider the species and habitats listed in the Section 41 of the NERC Act (2006) and biodiversity in general according to ‘Biodiversity 2020’. (Tainton, 2014)

Policy documents such as boroughs’ core strategies or the London Plan are mandatory to follow for organisations working on Regent’s Canal. However, other documents are only considered as ‘guidance’ and not policy. This is the case of Biodiversity Action Plans, which are supposed to be coherent from the national to the local level. As a political and geographical entity, the London region benefits from a special configuration, different from the rest of the UK. Hence, London-wide objectives on biodiversity enhancement can be set and then be delegated to the boroughs. Therefore, the idea is to have an imbrication of the biodiversity strategy from Greater London to the boroughs.

BAP is a concept that appeals to all the stakeholders contacted. However, biodiversity is currently not the first priority for any administration in the UK. As the pressure on green spaces is increasing, the budget allocated to local authorities has significantly decreased. For example, Camden has experienced 50% cut from the Government over the past 5 years. (Birchall, 2014) This budget cut is also associated to a change in policy. Previously, the London Biodiversity Partnership was coordinating the London Biodiversity Action Plan with a steering group that oversaw the structure of plans. It permitted the governance between the GLA, the boroughs, Natural England, TfL, and charities such as the London Wildlife Trust. With the substitution of the UK BAP by the Biodiversity 2020, specific targets have been replaced by vague suggestion, instead of a coordinated strategy between the different administrative levels. (Ibid.)

Moreover, the “abolition” of the UK BAP removed the purpose of the London Biodiversity Partnership since there is no need to report the progress to an upper level anymore. (Ibid.) Since the economic recession, the London Biodiversity Partnership has suffered from important budget cuts which disabled many of its functions and purposes. (London Assembly, 2013, p. 5) Remained the London Boroughs Biodiversity Forum (LBBF): open to council officers only, the forum occurs every quarter. This strongly limits the notion of partnership.

These policy and financial changes are problematic as there is a need for management, which is costly in delivery and maintenance. “In urban environment, you cannot leave nature by itself, otherwise it is detrimental: invasive species would take the lead and green spaces would be used for anti-social behaviour.” (Benucci & Thompson, 2014)

4.1.2 The role of Biodiversity Action Plans in addressing Regent’s Canal

The London Biodiversity Partnership had issued a Standing Water Habitat Action Plan (HAP) in 2008. This HAP identified canals as “linkages for aquatic and terrestrial biodiversity between suitable habitat patches” (2). The plan has three main aims: creating a strategy to conservation of standing water, restoring and maintaining priority sites, increasing the knowledge and understanding by land managers and general public. (1) This document was to guide the different HAPs of London’s boroughs.

Regent’s Canal is running through five boroughs and has the characteristics of an ecological corridor. All of these boroughs have developed a BAP. However, when we look at the BAPs for each borough, the strategy does not seem as continuous as it should be. In fact, each borough seems to have a specific strategy. That is, each borough does not express its HAP with the same objectives or the same vocabulary. None of the BAPs indicated having a partnership including their neighbouring boroughs, with the exception of the Islington BAP that indicated having the borough of Camden in the list of their partners. This fits the lack of communication that has been expressed during the interviews.

However, if they are different, the BAPs are not completely discontinuous. HAPs for Westminster, Islington, Hackney and Tower Hamlets all have among their objectives these three targets: monitoring water quality and species and pursuing management, improving habitats and increasing public awareness. In that sense, the BAPs are following the London Biodiversity Partnership directions. On the other hand, Camden has developed a completely different strategy from the other boroughs by reorienting its targets towards access to nature, well-being and health. This is a strategy to make their BAP fit Camden’s overall strategy. In fact, the Camden BAP objectives are directed towards social and economic themes such as access to nature that we can find in many boroughs core strategies and the London Plan. (Birchall, 2014)

Figure 4: Factors affecting Regent’s Canal mentioned in Biodiversity Action Plans

Borough	Threats
Westminster	Nutrient enrichment, climate change, water level maintenance, colonisation, disease, recreational activity, habitat loss, public perception
Camden	Climate change, invasive and undesirable species
Islington	Climate change, development and tidying
Hackney	Water quality, recreation, invasive species, development
Tower Hamlets	Building pressure, invasive/non-native species, public perception, development

The threats affecting biodiversity described in each BAP are similar and interesting: Westminster and Hackney identify recreation as a pressure on the environment, while Islington, Hackney and Tower Hamlet see development as a potential threat. Finally, public perception and climate change are common challenges for the different BAPs.

In comparison, Camden’s BAP is more oriented towards people and takes many “challenges” as opportunities. The mention of threats is made in a more practical context, linked to specific actions. In Camden’s BAP, recreational activities are not seen as a threat but as an end to biodiversity enhancing.

Development of the built environment is explained as an opportunity to increase biodiversity habitats. Therefore, BAPs tend to follow a mix of the boroughs' planning strategy and London BAP. Hence, BAPs appear as an important step to integrate biodiversity (and Regent's Canal) in planning.

This integration is reinforced by the fact that Regent's Canal is a Site of Metropolitan Importance for Nature Conservation. This allegation permits the canal to have a direct inscription in the planning system. "These sites are of the highest priority for protection, including from development, but are afforded no legal guarantee. The identification and protection of such sites is necessary to support an important proportion of London's wildlife, and to provide occasions for residents to have contact with the environment."(Tainton, 2014)

4.2 Management

4.2.1 Is this even useful?

There is some confusion on which planning documents management organisations should refer to. On a daily basis, this is not what seems to matter. Planning is not the framework used by local management teams to enhance biodiversity in their areas. They reckon that objectives from national and local administrations have been developed, and they are aware of the protected species and habitats that exist. However, they do not seem to need to refer to a coordinated planning strategy to work. The qualities of a BAP are widely understood, however local actions do not revolve around them.

4.2.2 No obvious coordination on the day to day actions

If organisations do not systematically refer to BAPs for their strategy, they do not seem to use it either to coordinate their actions. In fact, the cooperation between management groups and between these groups and public authorities is not clear. Even if most of them tend towards the same goal of wildlife enhancement, a joint strategy linking each group one to another does not appear on daily management actions.

This lack of coordination is linked to the number of stakeholders working on the canal. "There are many organisations acting on Regent's Canal and it is hard to see who is in charge of what". (Benucci & Thompson, 2014) Each organisation seems to have specific targets and takes into account the other organisations on the side. This can be the source of conflicts of interests. (Shacklock, 2014)

In fact, groups more or less evolve around the main management organisation, the Canal and River Trust, which tends to contact other groups depending on the practical needs they have. (Benucci & Thompson, 2014) This situation limits the flexibility of authorities and of other charitable trusts. "The only control boroughs have is over developments or other changes which require planning permission. We have no control over the Canal & River Trust's day to day management of the canal, not over habitat enhancement projects (or habitat destruction, though I've not come across that) that do not require planning permission." (Archer, 2014)

4.2.3 An innovative management

With the transfer of responsibilities from British Waterways to the Canal and River Trust, new forms of management have appeared on the canal. The development of the Canal and River Trust's adoption scheme allows organisations to adopt a section of the canal they care about. This adoption scheme is not based on any planning document or legislation.

On the Regent's Canal, there are currently two community adoption programmes: the Lower Regent's Coalition (Johnson's Lock to Commercial Road Lock) and the London Wildlife Trust (Hawley Lock to Islington Tunnel). Their tasks are "decided by agreement between the group, taking into consideration the needs of the waterway, interests of the group, funding, skills of the group, requests from canal and towpath users". (Viddler, 2014)

For example, the London Wildlife Trust is responsible for litter and green space on their section ("the busiest section of the canal"). (Benucci & Thompson, 2014) The management of the canal is however quite new for the organisation, which experiences a refocus on canals since 2012 after a 20 years gap. Therefore, there is a need for new procedure and policy for the development of appropriate management.

4.3 Science

4.3.1 Desperately seeking information

In ecological planning, science is fundamental. Planning for wildlife enhancement is an initiative that requires sufficient ecological data so as to identify the sites of particular importance for biodiversity and to know the species present in the area under consideration. (Archer, 2014)

The problem is that information is lacking: "up to date information about plant and animal communities of the London Canal is currently incomplete." (London Biodiversity Partnership, 2008 5) The last global survey has been done by the London Wildlife Trust in the 1980s. Later followed "subsequent boroughs re-surveys by the London Ecology Unit and most recently by the GLA". (Ibid.) Furthermore, biodiversity living on the canal is special. "Finding how it is populated is difficult. Some species have been found in Regent's Canal that are common in certain rivers but not in canals." (Benucci & Thompson, 2014)

Each organisation works on getting this necessary knowledge. For instance, London Wildlife Trust proceeds to surveys, water testing, waterways clear ups and green space managements along the canal to get a grip on the actual environment condition of the canal and the biodiversity observed. However, these methods are not what we call "sound science": "water testing is tricky because simple testing might not be the best to evaluate the quality of the canal. [It allows to] evaluate nutrients and calcium carbonate but it is difficult to do much more than that". (Benucci & Thompson, 2014) Moreover, national bodies may use their expertise for lots of territories. The Regent's Canal being man-made, it may not be a priority for them. (Ibid.)

Therefore, many groups rely on other organisations' records (universities, GIGL, RSBP, LWT, Natural England, Canal and River Trust, Environment Agency and the boroughs' councils). Thus, there is a potential partnership in information gathering and sharing between the different management groups, public bodies and research units.

4.3.2 On evidence, planning and management

There is also a concern about the way information is passed on and used. "Many partner organisations may have policies and objectives which are based on a partial or selective understanding of the evidence base or on evidence from reports and documents which are an interpretation of the originally scientific evidence". (Massini, 2014) As a result, the quality of information can influence management actions. Moreover, the goal is also not to exclude potential stakeholders by using complex scientific notions. This can be a risk with the implementation of a Biodiversity Action Plan. That is why biodiversity matters are included in All London Green Grid. (Massini, 2014)

Another way to include local stakeholders is to value local expertise in assessing development impacts upon a landscape, specific sites and wildlife. (Tainton, 2014) There is an "idea of science feeding in policy and feeding back down again." (Birchall, 2014) However, meaningfully including science into action requires time. "Evidence takes time to find its way in policy" (Ibid.).

4.4 At stake: What theory does not tell.

4.4.1 It does not always go according to the plan

The Regent's Canal is subject to many changes. Among them, King's Cross development is significant and presents several challenges. Firstly, its planning grant was signed more than 10 years ago. This means that it was negotiated with the biodiversity situation from that time. However, in 10 years, the biodiversity on the canal has evolved and some aspects of it are not taken into consideration. (Birchall, 2014) The development has thus a potential danger for biodiversity. Secondly, the site and structure of the development can be problematic for wildlife. It appears that King's Cross brownfield site was good for wildlife and permitted a certain biodiversity to develop. (Benucci & Thompson, 2014) More than the emplacement, the way the developments are conducted raises questions. In fact, the new way of constructing offices uses "too much glass and lights on at night. This is a problem for night species such as bats that are visible to predators, cannot roost and suffer from a re-education of food available (insects no longer flying near water but near windows)." (Ibid.) Moreover, hard landscaping can interrupt movement for wildlife along the corridor. (Shacklock, 2014) "There is an obligation to mitigate construction". [...] Therefore there is a focus on enhancing the canal for supposedly biodiversity. 'Supposedly' because it is quite token. There is marginal planting in the canal but it is very difficult to attain targets established for mitigation."(Benucci & Thompson, 2014)

There is here an interesting dialogue between the management bodies, public authorities and BAPs. It is often stated in the BAPs that unsuitable development can be a threat for biodiversity. In theory, development that would endanger the ecological connectivity of the corridor should not be pursued.

The boroughs are supposed to ensure that the development contributes to biodiversity enhancement by including factors that would increase the ecological connectivity along the canal and ensures its financing. The problem is that we juggle here with two uncertainties: the behaviour of urban wildlife and the respect of development conditions imposed by planning. In reality, the guidance given by planning does not surpass all the interests involved.

4.4.2 Can we enhance biodiversity on the Regent's Canal?

Planning alone is not powerful enough to permit biodiversity enhancement in a local authority. Adding to this, the way funding is directed towards this or that action is mainly subjective. Budget cuts have made organisations rely more and more on volunteers to pursue their actions. This does not guarantee a constant and satisfying action. This is significant on the Regent's Canal where litter management relies mainly on charities since local authorities have the obligation to remove litter from roads but not from watercourse ("wind-blown litter"; Benucci & Thompson, 2014).

According to the Blue Ribbon Network framework, several functions of the Regent's Canal are important: among them, recreation, transportation, flood management, biodiversity habitats and heritage. (London Plan, 2011, p. 238) However, depending on which section of the canal and on who looks at it, all these aspects may not weigh the same. Therefore it depends on stakeholders, at the local level, to develop projects that reflect their vision of the canal's functions. (Massini, 2014)

The London Plan states that the objective is to increase the recreational and transport uses of the waterways. For authorities (Camden, Tower Hamlets, GLA), it is not incompatible with biodiversity enhancement on waterways. However, management organisations expressed the risk for wildlife. The canal is already very much used for transportation. This creates pollution and takes space. The increase in uses of the canal creates more leakages; hence more pressure to pump from water sources. Moreover, road discharge is another risk created by boat users. Adding to this, dredging the canal can damage habitats. It "makes all chemicals rise, which damage plants and fishes". (Benucci & Thompson, 2014) Finally, even though wildlife has adapted to the presence of boats on the canal, the rise in barge residences can reveal noxious. (Shacklock, 2014) There is "less space to put habitat improvements because of the increasing need for parking spaces for boats". (Benucci & Thompson, 2014)

4.4.3 An ambiguous human-wildlife relationship

Enhancing biodiversity in cities has its limits. Depending on whether we look at human wellbeing or biodiversity needs, two different conceptions of green space work can be developed. Humans would privilege the same nice plants everywhere, which is not suitable for wildlife. But in cities, it seems humans have the priority. "The needs of the public are a priority." (Benucci & Thompson, 2014)

The Regent's Canal is a man-made feature of London. As it previously served industrial purposes, its natural value is usually not taken into account by Londoners. Hence the development of pollution (around Camden market) or the feeding of animals, which is dangerous for their health and for the

water quality (“crayfish loves burgers”; *ibid*). Here lies the true tension between human and wildlife use. “There is a human element to the problematic of canals: the population around the canal is massive, which creates tensions linked to its urban use such as rubbish or anti-social behaviour.” (*Ibid.*)

Local management groups aim at raising public awareness on the wildlife aspect of the canal. The objective is to demonstrate that a healthy cohabitation between humans and wildlife can operate in a city. For this cohabitation to work, there is however a need for a careful management of the different uses of the canal. (Runeckles, 2014) This has led to the Wildlife on your Waterways project that “aims at raising awareness on this beneficial corridor and hotspot for biodiversity.” (Benucci & Thompson, 2014) This project functions as a partnership between LWT, Islington, and Camden, who meet every quarter. These meetings highlight conflicts of interest as individual projects do not always fit well together: “boats do not see water space loss as a problem”, and the councils focus on specific projects that would fit their own objectives (public access for Camden, for example). (*Ibid.*)

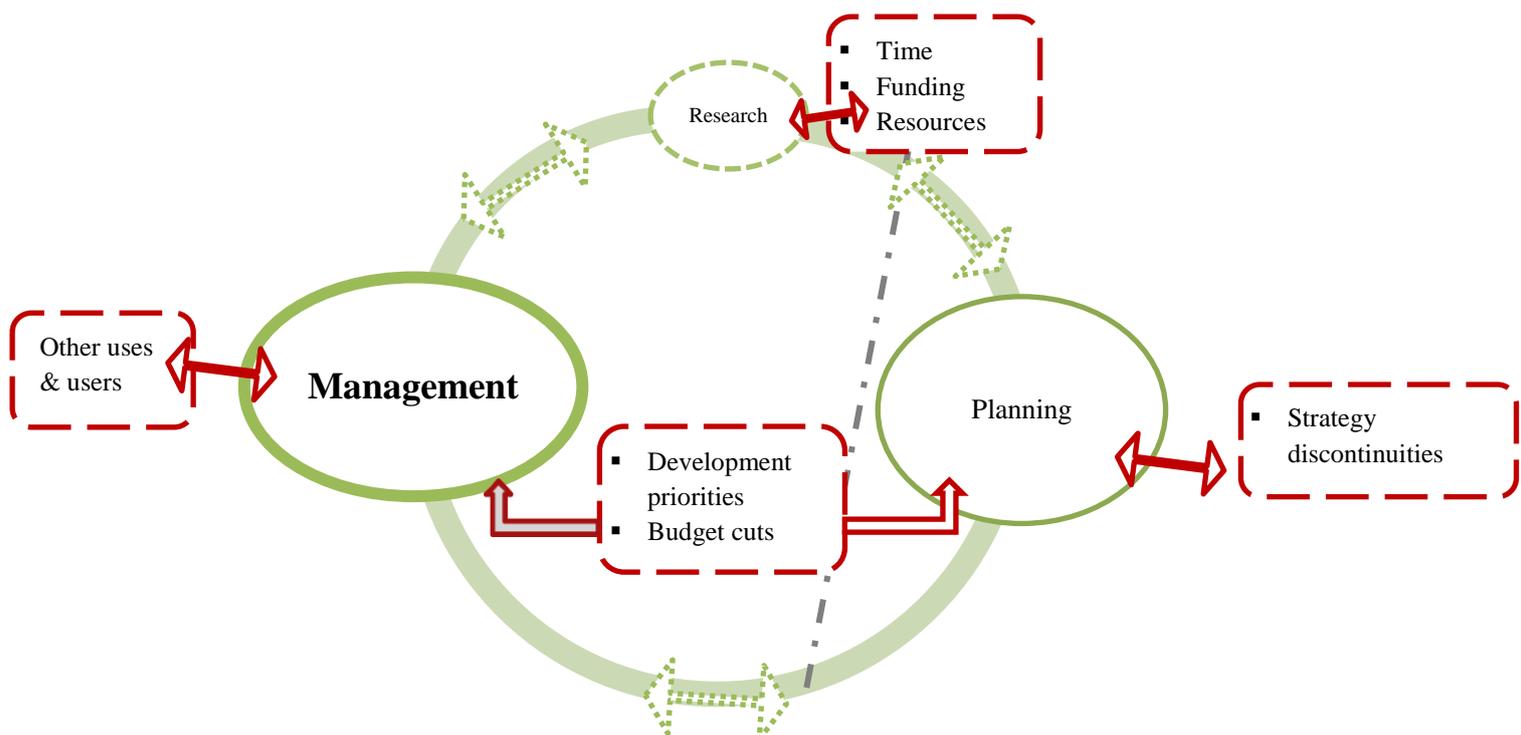
5 DISCUSSION AND CONCLUSION

In practice, the coordination between the three fundamental ingredients for a biodiversity enhancement strategy is not simple. Research appears to be missing partly due to a lack of time, techniques and resources. Furthermore, the sharing of information is not automatic, many organisations collecting data for their own use. Thus, there is a small representation of the role of research in the global landscape of wildlife enhancement. Planning documents are said to be based on sound science however, instead of purely explaining this science, they guide stakeholders towards management actions. Therefore there is no dialogue regarding the use and making of science between the different stakeholders.

The planning discipline suffers from the pre-eminence of other political objectives that foster developments. Moreover, with different approaches, a cross-administration strategy struggles to emerge. In fact, if authorities have developed a planning framework adapted to biodiversity enhancement, its influence is not dominant.

Management groups face internal and external coordination issues. Working in a constantly evolving environment, they need to take into account a diversity of interests and action groups while keeping an eye on the users and the changes modifying the urban landscapes. They are less influenced by the planning system than by their own framework that dictates their day-to-day actions. Both management and planning are facing directly the important budget cuts imposed by the economic recession. Overall, it seems that management is the key element to biodiversity enhancement today. Planning appears as set aside while research is yet restricted.

Figure 5: Elements interacting in the process of biodiversity enhancement: limitations to a coordinated strategy



Is there a future for biodiversity enhancement in London? If the findings appear somewhat pessimistic on what is currently happening on the Regent's Canal, all is not doomed. The London Biodiversity Partnership has initiated a movement towards biodiversity planning in the capital and its legacy is huge. Today, most of the BAPs stem from the London BAP, which –in this way- serves its original goal of coordinating different elements in London. Moreover, connecting with the former BAP framework, London experiences the development of the London Nature Partnership that focuses on landscape scales which goes beyond borough boundaries, thus preventing a discontinuity in biodiversity strategy.

On the concrete management side, local initiatives are being developed such as Camden Nature Watch and the Wildlife on your Waterways projects. These initiatives try to involve as many stakeholders as possible, including the public.

It remains to be seen if these initiatives can be pursued in the long-term and if Londoners can understand the potential and benefits of wildlife in their city.

6 SOURCES AND KEY REFERENCES

6.1 Books and academic papers:

- Arnould, P. et al. "La nature en ville: l'improbable biodiversité" *Géographie, économie, société* 1/2011 (Vol. 13), pp. 45-68.
- Benton-Short, L., Short, J. R. (2008) *Cities and nature*, New York: Routledge.
- Blanc, N. (2000) *Les animaux dans la ville*, Paris: Odile Jacob.
- Campbell (1996) "Green Cities, Growing Cities, Just Cities? Urban Planning and the Contradictions of the Sustainable Development", *Journal of the American Planning Association*, 62(3), pp. 296-312.
- Chiesura, A. (2004) "The role of urban parks for the sustainable city", *Landscape and Urban Planning* 68, pp. 129–138.
- Cranz, G., Boland, M. (2004) "Defining the Sustainable Park: A Fifth Model For Urban Parks." *Landscape Journal*, 23(2), pp. 102-120.
- Davis, M. (2002) *Dead cities: a natural history*, New York: The New Press.
- Davoudi, S. (2012) "Climate Risk and Security: New Meanings of the "Environment" in the English Planning System", *European Planning Studies*, 20 (1), pp. 49-69.
- Ditchkoff, S. S., Saalfeld, S. T., Gibson, C. J. (2006) "Animal behavior in urban ecosystems: Modifications due to human-induced stress", *Urban Ecosystems*, 9 (1), pp. 5-12.
- Evans, J. P. (2011), "Resilience, ecology and adaptation in the experimental city". *Transactions of the Institute of British Geographers*, 36 (2), pp. 223–237.
- Forman, R. T. T. (2014) *Urban ecology, science of cities*, Cambridge University Press.
- Forsyth, T. (2003) *Critical political ecology: the politics of environmental science*, London: Routledge.
- Freeman, C., Tranter, P. J. (2011) *Children and their urban environment: changing worlds*, London: Earthscan.
- Fuller R.A., Irvine K.N., Devine-Wright P., Warren P.H. et Gaston K.J. (2007) "Psychological benefits of greenspace increase with biodiversity", *Biology Letters*, 3, pp. 390-394.
- Gauthier, O. (2010) « Faire société avec la biodiversité, regard sur la biodiversité comme objet de politique publique », *Sciences Eaux & Territoires* 3, pp. 64-66.
- Gilbert, O. L. (1991) *The ecology of urban habitats*. London: Chapman & Hall.
- Hennink, M., Hutter, I., Bailey, A. (2011) *Qualitative Research Methods*, London: SAGE.
- Hudson, S. J. (2001) "Challenges for Environmental Education: Issues and Ideas for the 21st Century", *BioScience*, 51 (4), pp. 283-288.
- Innes, J. E. (1998) "Information in Communicative Planning", *Journal of the American Planning Association*, 64 (1), pp. 52-63.
- Jokimäki, J., Kaisanlahti-Jokimäki M-J., Suhonen, J., Clergeau, P., Pautasso, M., Fernández-Juricic, E., (2011) "Merging wildlife community ecology with animal behavioral ecology for a better urban landscape planning", *Landscape and Urban Planning*, 100 (4), pp. 383-385.
- Karlen, A. (1995) *Plague's Progress. A Social History of Man and Disease*, The Guernsey Press Co. Ltd

- Kartez, J. D., Castro, M. P. (2008) “Information into action: biodiversity data outreach and municipal land conservation”, *Journal of the American Planning Association*, 74 (4), pp. 467-480.
- Latour, B. (1987) *Science in Action: How to Follow Scientists and Engineers through Society*, Cambridge, Mass.: Harvard University Press.
- Leedy, D. L. (1978) *Planning for wildlife in cities and suburbs*, U.S. Fish and Wildlife Service.
- Louv, R. (2005) *Last child in the woods: saving our children from nature-deficit disorder*, Chapel Hill, NC: Algonquin Books of Chapel Hill.
- Miller, D., de Roo, G. (2004) *Integrating city planning and environmental improvement*, Aldershot: Ashgate Publishing Limited.
- Niemelä, J. (1999) “Ecology and Urban Planning”, *Biodiversity and Conservation* 8, pp. 119-131.
- Rees, P. (2002) *Urban environment and wildlife law*, Oxford: Blackwell Science Ltd.
- Rivkin, M. S. (1995) *The Great Outdoors: Restoring Children’s Right to Play Outside*. New York: National Association for the Education of Young Children.
- Saglie, I-L., Thoren, K., “Knowledge for biodiversity in urban planning. Case studies from Norway”
- Townsend, C.R., Begon, M., Harper, J.L. (2008) *Essentials of Ecology*, Oxford: Blackwell Publishing.
- Usher, M. B. (1986) “Wildlife Conservation Evaluation: attributes, criteria and value”, in *Wildlife Conservation Evaluation* (pp. 3-44) London: Chapman and Hall.
- Van Der Windt, H. J., Swart, J. A. A. (2008) “Ecological corridors, connection science and politics: the case of the Green River in the Netherlands”, *Journal of Applied Ecology* 45, pp. 124-132.
- Wheater, C. P. (1999) *Urban Habitats*, London, New York : Routledge.
- Zollinger, B., Daniels, S. (2005) “We all can just get along: the social constructions of prairie dog stakeholders and the use of a transactional management approach in devising a species conservation area”, in *Mad about Wildlife/looking at social conflict over Wildlife, Human and Animal Studies* (pp. 253 – 277) Boston: Brill.

6.2 Official documents:

- CABE and GLA (2009) *Open space strategies: Best practice guidance*, London: CABE and GLA
- Convention on Biological Diversity (2010) *COP 10 Decision X/2, Strategic Plan for Biodiversity 2011-2020*. Available from: <http://www.cbd.int/decision/cop/?id=12268> [3/07/2014]
- Convention on Biological Diversity (2012) *Cities and Biodiversity Outlook – Action and Policy*. Available from: <http://www.cbd.int/en/subnational/partners-and-initiatives/cbo> [14/08/2014]
- DEFRA (2007) *Conserving Biodiversity – The UK Approach*, London: DEFRA
- DEFRA (2010) *Wildlife Management in England: A policy making framework for resolving human-wildlife conflicts*, London: DEFRA.
- DEFRA (2011) *Biodiversity 2020: A strategy for England’s wildlife and ecosystem services*. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69446/pb13583-biodiversity-strategy-2020-111111.pdf [22/07/2014]

- DEFRA (2011) *The Natural Choice: securing the value of nature*. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/228842/8082.pdf [10/07/2014]
- DEFRA (2012) *An overview of the Local Nature Partnership role*, Available from: <http://www.archive.defra.gov.uk/environment/natural/documents/local-nature-partnerships-overview120402.pdf> [17/08/2014]
- DEFRA (2012) *Criteria for Local Authorities, Local Nature Partnerships and other to apply when identifying Nature Improvement Areas*. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69600/pb13824-nia-criteria.pdf [17/08/2014]
- DEFRA (2013) *Triennial Review of the Environment Agency and Natural England*. Available from: <https://www.gov.uk/government/publications/triennial-review-of-the-environment-agency-ea-and-natural-england-ne> [18/08/2014]
- European Commission (2011) *The EU Biodiversity Strategy to 2020*, Luxembourg: Publications Office of the European Union.
- Greater London Authority (2002) *Connecting with London's nature: the Mayor's Biodiversity Strategy*, London: GLA.
- Greater London Authority (2005) *Development plan policies for biodiversity: Best Practice Guidance of the London Plan (Spatial Development Strategy for Greater London)*, London: GLA.
- Greater London Authority (2011) *London Plan*. London: GLA.
- HMSO (1981) *Wildlife and Countryside Act*. Available from: <http://www.legislation.gov.uk/ukpga/1981/69> [25/07/2014]
- HMSO (1994) *Biodiversity: the UK Action Plan*, Available from: http://jncc.defra.gov.uk/PDF/UKBAP_Action-Plan-1994.pdf [19/03/2014]
- HMSO (1999) *Greater London Authority Act*, Available from: <http://www.legislation.gov.uk/ukpga/1999/29/contents> [7/07/2014]
- HMSO (2006) *Natural Environment and Rural Communities Act*. Available from: <http://www.legislation.gov.uk/ukpga/2006/16/contents> [5/05/2014]
- HMSO (2012) *Conservation of Habitats and Species Regulations*. Available from: <http://www.legislation.gov.uk/uksi/2012/1927/made> [19/08/2014]
- JNCC and DEFRA (on behalf of the Four Countries' Biodiversity Group) (2012) *UK Post-2010 Biodiversity Framework*. Available from: http://jncc.defra.gov.uk/pdf/UK_Post2010_Bio-Fwork.pdf [20/06/2014]
- London Assembly (2013) *Letter to Boris Johnson: "Biodiversity and green infrastructure in London"*. Available from: <http://www.london.gov.uk/sites/default/files/Biodiversity%20letter.pdf> [22/08/2014]
- London Biodiversity Partnership (2007) *The London Biodiversity Partnership BAP*. Available from: http://ukbars.defra.gov.uk/archive/plans/lbap_plans.asp?LBAP=%7B5215DDB3-A164-46E3-A8E3-C8858A6F54AC%7D&CO= [13/03/2014]

London Biodiversity Partnership (2008) *Standing Water Habitat Action Plan*. Available from: <http://www.lbp.org.uk/downloads/Publications/HabitatInfo/SWHAP-FINAL-17-03-08.pdf> [18/05/2014]

London Boroughs Biodiversity Forum (2010) *Terms of Reference*

London Borough of Camden (2013) *Camden Biodiversity Action Plan 2013-2018*, London: Camden.

London Borough of Hackney (2012) *Hackney Biodiversity Action Plan 2012-2017*, London: Hackney.

London Borough of Islington (2010) *Spaces for wildlife, places for people. Islington's Biodiversity Action Plan 2010-2013*, London: Islington.

London Borough of Tower Hamlets (2009) *Tower Hamlets Local Biodiversity Action Plan (LBAP) 2009-2014*, London: Tower Hamlets.

London Borough of Westminster (2008) *Westminster Biodiversity Action Plan*. Available from: <https://www.westminster.gov.uk/biodiversity-action-plan> [18/05/2014]

Natural England (2013) London Assembly Review of Green Infrastructure and Biodiversity. Available from: <http://www.naturalengland.org.uk/ourwork/planningdevelopment/greeninfrastructure/giandbiodiversityfeature.aspx> [21/08/2014]

ODPM (2006) *Planning for Biodiversity and Geological Conservation – A Guide to Good Practice*, London: ODPM.

Rientjes, S., Roumelioti, K. (2003) *Support for Ecological Networks in European Nature Conservation*, Tilburg: European Centre for Nature Conservation.

United Nations (1992) *Convention on Biological Diversity*. Available from: <http://english.rvo.nl/sites/default/files/2014/02/UN%20Convention%20on%20Biodiversity.pdf> [19/08/2014]

6.3 Websites

Biodiversity Planning Toolkit

<http://www.biodiversityplanningtoolkit.com/> [5/08/2014]

Canal and River Trust website

<https://canalrivertrust.org.uk/> [21/07/2014]

Convention on Biological Diversity website

<http://www.cbd.int/cop/> [3/08/2014]

European Commission website

<http://ec.europa.eu> [3/08/2014]

GiGL website

<http://www.gigl.org.uk/> [10/08/2014]

GLA website

<https://www.london.gov.uk/> [18/08/2014]

JNCC website

<http://jncc.defra.gov.uk> [12/08/2014]

King's Cross website

<http://www.kingscross.co.uk/> [2/07/2014]

London Biodiversity Partnership website

<http://www.lbp.org.uk/> [16/08/2014]

London Canal Museum website

<http://www.canalmuseum.org.uk/> [24/08/2014]

Natural England website

<http://www.naturalengland.org.uk> [16/08/2014]

Office of Rail Regulations website

<http://orr.gov.uk/> [29/06/2014]

Planning Practice Guidance website

<http://planningguidance.planningportal.gov.uk/> [07/04/2014]

UNESCO website

<http://www.unesco.org> [27/08/2014]

6.4 Organisms that issued data for the maps

Environment Agency's Geostore (Maps 1, 2 & 3) <http://www.geostore.com/>

Geofabrik (Maps 1, 2 & 3) <http://download.geofabrik.de>

Greenspace Information for Greater London CIC (GiGL) (Map 3) <http://www.gigl.org.uk/>
Shapefiles: "Regents Canal area, Buffer of 100m of Regents Canal , GiGL habitats, GiGL BAP condition and suitability mapping, GiGL plants recorded to a fine accuracy (of 1m, 10m or 100m), GiGL birds recorded to a fine accuracy" (2014)

London Data Store (Maps 1, 2 & 3) <http://data.london.gov.uk/>

6.5 Interviews

Archer, J. (2014, July 23rd) Biodiversity Officer, Tower Hamlets

Benucci, M. (Wildlife on your Waterways Intern) and Thompson M., (Wildlife on your Waterways Project Officer) (2014, July 7th), London Wildlife Trust

Birchall, C. (2014, August 4th). Nature Conservation Officer, Camden

Massini, P. (2014, July 10th) Urban Greening Team Leader, Greater London Authority

Runeckles, I. (2014, August 13th) Strategic Planning Manager, Canal and River Trust

Shacklock, I. (2014, July 10th) Friends of Regent's Canal

Tainton, S. (2014, July 21st) Sustainable Development Consultation Team, Natural England

Vidler, D. (2014, August 14th) Volunteer Coordinator, Canal and River Trust

7 APPENDIX 1: SAMPLE OF INTERVIEW QUESTIONS

7.1 Local authorities and governmental bodies

European and national influences

- Do you need to follow European instructions when creating planning guidance in London? If so, which ones are the most influential?
- What directions are given by the central government regarding biodiversity in London? Are there specific budget allocations linked to these directions?

London

- Did the biodiversity objectives of the GLA explicitly change with the 2011 version of the London Plan?
- Chapter 7 of the London Plan talks about the Blue Ribbon Network. Could you tell me more about this framework?

Biodiversity Action Plans

- What is the position of local Biodiversity Action Plans within the UK Biodiversity Action Plan framework? Are there other planning documents that impact biodiversity management at the local level in London?
- What is the difference between a Biodiversity Action Plan and a Habitat Action Plan?
- Is it mandatory for each borough to develop a local biodiversity action plan?
- How does the inclusion of scientific knowledge work when writing planning documents? Do you think that the notion of partnership helps the translation of science into management actions?
- Environmental issues being both local and global and concerning ecosystems and not only specific species, do you think the biodiversity action plans are enough to have a positive impact on biodiversity in London?

Regent's Canal

- In the London Plan, several attributes of the Regent's Canal are said to need enhancement: recreation, transportation, flood management, biodiversity. What is the main objective regarding the Regent's Canal for you?
- The Regent's Canal is passing through five different boroughs (Westminster, Camden, Islington, Hackney and Tower Hamlets). The London Plan encourages administrative entities to work together on biodiversity issues. What dialogue do you think exist between these boroughs?
- There are many associations and charities working on the Regent's Canal. Is it mandatory for them to follow planning documents released by the GLA and the borough they are working in?

7.2 Management groups on the Regent's Canal

About your organization

- Could you describe your action and your objectives?

Regent's canal

- Would you consider the Regent's Canal as a wildlife corridor?
- What is the diversity present on the canal and are there some parts that are richer in diversity than others? How is it evaluated?
- What are for you the main assets of the canal?
- What are for you the main threats to the canal?
- What are the different functions of the canal?
- The London Plan expresses the objective of increasing the use of the canal for recreation and transportation. Is this objective compatible with biodiversity protection?

Management and use of planning document

- Do you follow the Biodiversity Action Plan of the borough you work in when doing a conservation action or do you base your action on other guidance and regulations?
- Do you have the means to do it?
- Do you base your actions on scientific knowledge? If so, how?
- Do you feel like planning documents, such as Biodiversity Action Plans ease the translation of scientific knowledge into management action?

Cooperation between organizations and boroughs

- Do you work with other organisations to create coordinated management action?
- Did you participate in the redaction of planning documents such as Biodiversity Action Plans? If so, did you find the cooperation between the different members of the partnership useful?
- The Regent's Canal is passing through different boroughs (Westminster, Camden, Islington, Hackney and Tower Hamlets). Do you communicate with the different boroughs' administrations? Do you usually feel like your input is taken into account by policy-makers?

8 APPENDIX 2 : GLOSSARY

Aichi Biodiversity Targets (2010) Established at the 10th Conference of the Parties to the CBD in Nagoya, Japan, the 20 biodiversity targets constitute the Strategic Plan for Biodiversity 2011-2020. These targets are set to measure progress on biodiversity. Some targets and strategic goal are directed towards planning:

- Target 2: “By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems”.
- “Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building” (CBD, 2010)

All London Green Grid (ALGG, 2012) Policy framework supporting the London Plan policies such as green infrastructure, biodiversity, urban greening, and river corridors. It promotes the design and delivery of green infrastructure in London.

Blue Ribbon Network (BRN, 2011) Policy framework applying to London’s rivers to permit the consideration of different policy objectives when making land-use decisions related to rivers.

Biodiversity Action Plan (BAP) Local document addressing threatened species and habitats.

Biodiversity Action Reporting System (BARS) Web-based information system that describes action taken to achieve biodiversity objectives, to better inform biodiversity planning, meet reporting requirements and co-ordinate effort.

Biodiversity Planning Toolkit (2008) Website from the Association of the Local Government Ecologists (ALGE) informing local actors on biodiversity planning.

Biodiversity 2020: A strategy for England’s wildlife and ecosystem services (2011) Strategy stemming from the Natural Environment White Paper and showing the implementation of international and EU commitments. It is part of the Post-2010 Biodiversity Framework.

Camden Nature Watch Programme that involves residents in recording wildlife across Camden.

Canal and River Trust (CRT, 2012) Charitable trust that manages the waterways in England and Wales.

Cities and Biodiversity Outlook (CBO, 2010) Linked to the CBD, it is a global assessment of the links between biodiversity, ecosystem services and urbanization and the local practices for integrating biodiversity and sustainability issues into public policy.

Convention on Biological Diversity (CBD, 1992) Multilateral treaty signed at the Rio de Janeiro Earth Summit, with three main goals: the conservation of biodiversity, sustainable use its components, and fair and equitable sharing of benefits arising from genetic resources.

Conservation of Habitats and Species Regulations (2012) Regulations that implement the European Habitat directive into national legislation.

Department of Environment, Food & Rural Affairs (DEFRA) UK Government department responsible for environment, agriculture, and rural communities.

Environment Agency (EA, 1996) Non-departmental public body (NDPBs), sponsored by the UK Government's Department of Environment, Food and Rural Affairs (DEFRA) with responsibilities relating to the enhancement and protection of environment in Wales and England.

Environment Impact Assessment (EIA) process used to assess the environment consequences of a policy, plan, project, or programme before its implementation decision.

Environment White Paper / The Natural Choice: Securing the value of nature (2011) Second White Paper on the natural environment since 1990 that sets the recommendations for local measures (development of Nature Improvement Areas, biodiversity offsetting, Local Nature Partnerships), reconnection of people and nature. and capturing and improving the value of nature by integrating natural capital in a green economy.

EU Biodiversity Strategy to 2020 (2012) European strategy emphasising the economic value of environmental services and that sets targets to halt the loss of biodiversity through better management, control and legislations.

Friends of Regent's Canal Organisation promoting the benefits of the canal and monitoring developments around the canal.

Greenspace Information for Greater London (GiGL) Environmental record centre for Greater London.

Greater London Authority Act (1999) Act establishing the GLA, the London Assembly and the Mayor of London. It makes it a requirement of the Mayor to produce a Biodiversity Strategy.

Habitat Action Plan (HAP) Part of the Biodiversity Action Plan, it is focused on a specific habitat.

Joint Nature Conservation Committee (JNCC, 1990, 2006) Established in 1990 and reconstituted by the NERC Act in 2006, JNCC is a public body that advises the UK Government and devolved administrations on UK-wide and international nature conservation.

Local Biodiversity Action Plans (LBAPs) Plans issued at the local level with a partnership approach to translate national targets for species and habitats into local actions, develop wide-ranging programmes and partnerships in the long-term that permit to raise awareness and monitor actions.

Local Nature Partnerships (LNPs, 2011) Initiative coming from the Natural Environment White Paper (2011) that consists in a broad range partnership of people, local organisations and business to improve local nature environment. LNPs are performed at a large scale (landscape-scale) and identify Nature Improvement Areas.

London Biodiversity Partnership (LBP) Biodiversity Partnership that acted at the London-wide level by bringing together local organizations and stakeholders.

London Boroughs Biodiversity Forum (LBBF, 1999) Networking forum independent from the London Biodiversity Partnership, open to all boroughs' council officers

London Ecology Unit (LEU) Body advising London boroughs on nature conservation between 1986 and 2000.

London Wildlife Trust (LWT, 1981) Local nature conservation charity member of the Royal Society of Wildlife Trusts. It manages nature reserves and aims to protect wildlife in Greater London.

Man and Biosphere Programme (MAB, 1971) UNESCO Intergovernmental Scientific Programme that seeks to establish a scientific basis for the improvement of relationships between people and their environments. Its objectives are to reduce biodiversity loss through an interdisciplinary work on ecological, social and economic factors.

Natural England (NE, 2006)

Non-departmental public body of the UK Government ensuring that England's natural environment is protected and enhanced. NE and EA have different purposes and functions and are therefore two separate NDPBs.

Natural Environment and Rural Communities Act (NERC, 2006) Creating Natural England, the Act also places new duties upon all public authorities.

- Section 40: Duty to conserve biodiversity
- Section 41: Biodiversity lists and action (England) concerning the publication by the Secretary of State (after consultation of Natural England) of a list of the living organisms and types of habitats of principal importance for conservation.

Royal Society for the Protection of Birds (RSPB) Charity promoting conservation and protection of birds and their environment.

Site of Interest for Nature Conservation (SINC) Non-statutory designation used by Local authorities in England for territories of ecological value.

Site of Metropolitan Importance for Nature Conservation Highest SINC grade used for some sites in Greater London.

UK Biodiversity Action Plan (UK BAP, 1994) UK Government's response to the CBD describing the national biological resources and providing detailed plans for conservation of these resources. The production every five years of national reports showed the UK BAP contribution to the reduction of biodiversity loss.

UK Post-2010 Biodiversity Framework (2012) Replacement of the UK BAP resulting of the new strategic thinking after the CBD's Strategic Plan for Biodiversity 2011-2020 (2010, Nagoya) and the new EU Biodiversity Strategy (EUBS, 2011). The framework shows the work and strategies of the four countries to reach Aichi Biodiversity Targets.

Wildlife and Countryside Act (1981) UK Act that gives protection to native species, controls the release of non-native species, and enhances protection of SSSIs.

Wildlife on your Waterways (2012) Management project led by the London Wildlife Trust on Regent's Canal in partnership with stakeholders such as the CRT.