

# METHODS OF APPROACHING NATURAL PROTECTED AREAS FROM THE TOWNS OF EUROPE

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**Abstract.** Natural Protected Areas in the Urban Environment are increasingly subject to the pressures caused by urban phenomena - the most obvious being the expansion of the built tissue, caused by various pressures, including real estate. In the current context of climate change, Natural Protected Areas are among the main victims of this phenomenon. Those in cities are even more affected, given the weak or non-existent connection to an integrated green system network and an ecological infrastructure network. The paper presents the most important aspects of the European legislation regarding the Natural Protected Areas of the Cities, the way in which the responsible or managing authorities are established, the approach in the urban context, the type of management and the way of monitoring the biodiversity, the activities and the types of key-visitors.

**Key words:** general urban integrated principles, decomposition matrix method, diagraphic representation method, ecosystem services

## 1. Introduction

Natural Protected Areas are among the most vulnerable targets of the effects of climate change, as they are decisive components of the conservation toolbox (Qin *et al.*, 2019).

Natural Protected Areas in the urban environment are even more exposed to extreme pressures. The relationship between urbanization and urban protected areas is in obvious conflict, with urban development having a

strong impact on natural protected areas. (Merciu *et al.*, 2017). There are opinions that the urban environment cannot be and should not be preserved in the long run, especially because of the major effects that human activities have on the environment. Although the dynamism of cities is undeniable, the importance of conservation should not be neglected (Soanes *et al.*, 2019). However, the conservation of the city's biodiversity is an important means of raising public awareness, and for this

reason, the natural areas of cities also have a social value. Urban environments are certainly one of the most suitable targets to draw people's attention to the importance of conservation, while taking advantage of opportunities to conserve endangered species and habitats (Soanes and Lentini, 2019). Urban areas can be approached as a new realm for ecological and socio-ecological research and it is very possible that they will be a key component of future wildlife conservation efforts (Magle *et al.*, 2019). Urban ecosystems have increasingly attracted the attention of researchers and have been increasingly recognized as one of the latest challenges in the science of ecology (Zhou *et al.*, 2019).

The diversity of their morphology and context make it impossible to approach a general-valid management strategy. Within the same protected area there may be areas to be treated differently depending on, for example, land use. An area with agricultural land will be treated differently from a forest, but regardless of the case, one of the most important factors remains the involvement of the public - Awareness-raising and information actions on, for example, the multifunctionality of forests, can lead the population to gain greater knowledge about the role and importance of all components of forest-specific ecosystems (Pastorella *et al.*, 2016). Everyone should get involved in this process (Mack, 2019), but in order to get involved properly, people need the right information. Access to this scientific information offers the public the opportunity to rely on scientific research and to get involved in policy debates, as informed citizens (Carroll *et al.*, 2017). Ways of involving the

public in the conservation process differ from actions with a direct impact on natural protected areas - participation in the decision-making process, to actions with indirect impact - the realization of small projects at home, such as arranging a garden for pollinators. A very suitable space for such projects is the personal garden - it can provide both nectar and pollen for insects and provide reproductive resources, such as nesting sites and caterpillar host plants (Majewska and Altizer, 2018). In a strategy that includes public involvement, one of the main objectives is to model behavior so that it is or becomes beneficial to the conservation process. Successful projects in terms of conservation practice are urgently needed, and modeling or directing people's behavior towards responsible actions is a decisive step in this direction (Nilsson *et al.*, 2019). From a social point of view, the development of a more efficient conservation is based on the elucidation of the power that the positive or negative social impacts have on the conservation of the protected areas (Oldekop *et al.*, 2016). Educating and raising awareness of the local population has the potential to have a strong impact on the sustainable development of an area (Petrișor *et al.*, 2016). However, population monitoring for the good management of conservation projects is rarely applied (Kaplan-Hallam and Bennett, 2018).

Current management methods differ depending on each area, but have the potential to develop further in the future through continuous training of specialists and technology. Work is currently underway to develop software to support the biodiversity

conservation process - a very useful software is the automatic identification of animal species in the images, but at least for now, the data provided needs manual additions. - as is the case with many new technological developments, in order to implement this semi-automatic method, the initial work and training of the staff that will use the software is needed. It will be necessary to develop a special algorithm adapted for a certain area, so that it recognizes the species that live in this territory, and then it will be necessary the intervention of the personnel to verify the accuracy of the data obtained by the software (Eikelboom *et al.*, 2019). Biodiversity conservation can strongly influence the increase of ecosystem services. Ecosystem services are the direct and indirect factors of ecosystems that influence human well-being (Watson *et al.*, 2019). The way of conserving biodiversity and capitalizing on ecosystem services are even more important in the case of a natural protected area, given its ecological value. Although the huge benefits of biodiversity and ecosystem services on human well-being are known, human impacts have degraded both (Kaim *et al.*, 2017), therefore, the need to adopt a suitable management becomes obvious. Climate change will have dramatic effects on society and ecosystems around the world. Therefore, resource managers will have the responsibility to apply place-based solutions in order to minimize the associated biodiversity loss (Morelli *et al.*, 2020).

Biodiversity conservation strategies have the potential to encourage a certain type of management, or at least the management of valuable areas in terms of biological diversity, including

natural protected areas. The Strategic Plan for Biodiversity 2011-2020 of the Convention on Biological Diversity (CBD) has not achieved its goal of halting biodiversity loss (Muller *et al.*, 2020). The new convention will certainly have to take into account the methods that have emerged over the last decade, so as to adapt the discourse of the changes that have been felt worldwide. At the same time, it will be necessary to analyze the reasons why the convention did not reach the objectives pursued, in order to be able to adapt them. Global-change-ready will need to be prepared for the transformation of ecosystems that take place in response to changes in ecosystem determinants (Colloff *et al.*, 2017). Such an example was identified in Romania when the establishment of Natura 2000 sites had a totally unexpected impact on the already existing network. The impact was negative, due to the limited resources allocated to the conservation of natural protected areas (Ioja *et al.*, 2010).

Such an approach to failure management can be a new step in the evolution of conservation effectiveness (Catalano *et al.*, 2018). For the studies developed by ecologists and the methods adopted by them to have the desired impact on the management of environmental policy, a partnership between ecologists and users of ecological research is absolutely necessary (Enquist *et al.*, 2017). In order to have a better chance of success, environmentalists organize themselves into networks and get involved in interdisciplinary teams to address more complex topics and more synthetic scientific challenges (Dietze and Lynch, 2019).

Specialists who can contribute to the conservation of natural protected areas in urban areas come from a multitude of fields related to ecology - biologists, geographers, sociologists, urban planners and, last but not least, landscape designers - they have the potential to be the link between all the other fields. Landscape architecture is a design profession that has implications for both the natural world and the built environment and which, for this reason, can create a wide variety of places and can have a major impact in mitigating environmental problems caused by human actions (Grose and Frisby, 2019).

As the analysis of the literature shows, the subject of natural protected areas in urban areas is increasingly addressed and debated. However, in Romania many of the areas in this category are approached like any other areas that are not in a direct spatial relationship with an urban fabric, especially due to the lack of a tool to guide how to approach these types of areas. The efforts of those who have studied this topic could have a significant impact if it materialized in the form of a guide on the constraints and opportunities that the management of such an area faces.

The research objectives of the paper are to identify the "recipe" for implementing strategies to protect natural protected areas in cities, if the paper will demonstrate that it exists, or at least of the aspects that are considered to be the most important or that has the strongest impact in this process.

By identifying these aspects, the study of the paper aims to obtain a comprehensive picture of ways to

manage natural protected areas in European cities and to extract the main idea and working methods used in their management. Therefore, the novelty brought by this study consists in the analysis and obtaining an image of the current situation representative for the conservation strategies of these areas exposed to the pressure of the cities.

## 2. Materials and methods

The research method that has been used is the method of creative heuristic research, the Decomposition Matrix Method. Three case studies were selected for analysis, namely three Natural Protected Areas located in or near the urban tissue. The situations presented are in Europe - in cities in the UK, France and Spain, which have been selected so as to present specific, particular situations, both as a mode of localization at the city level and as a scale: macro- and/ or mezzo-territorial.

We opted for the analysis on real situations, one of the main selection criteria being the popularity of natural protected areas. With the involvement of the population in the conservation process, the degree of visiting natural protected areas may increase, which is, on the one hand, a positive aspect (it may be an indication that people are informed), but may also involve new measures, which are necessary in protecting the area (for example, directing flows only to certain parts of the protected area).

Another important criterion was the type of natural protected area - three different types of areas were chosen, in order to obtain a more comprehensive picture of the measures applied in the protected areas. The study included a wetland and

two Natura 2000 sites, different in typology: an SCI and SPA site and a SPA multi-site.

The European Commission adopted on 20 May 2020 a proposal for an EU Biodiversity Strategy for 2030. The main objective of the strategy is for "Europe's biodiversity to be recovered by 2030, for the benefit of people, the climate and the planet" (Council of the European Union, 2020).

The strategy proposes several actions to be taken by 2030, from the creation of protected areas for at least 30% of land and sea in Europe, based on existing Natura 2000 sites, to the restoration of degraded ecosystems in the EU by 2030 through a series of concrete commitments and actions, including a 50% reduction in pesticide use and related risk by 2030 and the planting of 3 billion trees. It is also proposed to take a leading role, through the power of example, worldwide, towards an ambitious global framework for biodiversity, as well as the release of important funds for biodiversity (EUR 20 billion per year), through EU funds and through mobilization of national and private funding sources.

The strategy is the basis for the EU's contribution to the future United Nations Global Framework for Biodiversity, to be discussed at the Conference of the Parties to the Convention on Biological Diversity, to be held in 2021.

Also presented by the Commission as a complementary policy to the Biodiversity Strategy, the "Farm to Consumer" Strategy paves the way for a more sustainable food system. The two strategies have many common goals and targets, for example in reducing the use

of pesticides and fertilizers, restoring agricultural land and water management.

Thus, the actions proposed by the two EU strategies must be integrated into the methods of addressing natural protected areas in European cities, becoming mandatory in future stages of development, the development of a set of general integrated urban principles, possibly to be applied in cities from Romania.

After selecting the case studies, they were analyzed from the following points of view: management / planning of the spatial relationship with the urban fabric, management - organizational structure responsible for the area management, legislative basis on which the protection of the protected area is based (local, zonal, territorial, national or international), planning tools (management plan), marketing strategy and ways of informing, but also involving the population. Each of the factors listed were considered important in the conservation process of a natural area. Starting from each of these criteria in the analysis of each area, the aim was to identify those that were the most exploited or that were considered to be the most important.

After the individual analysis of the case studies, a comparative analysis of them was performed, in order to analyze, first of all, whether the strategies of the three areas focused on the same criteria, so if there is a criterion that deserves to be used, regardless of the characteristics of the area, or if they differ.

The purpose of this selection was to obtain, in the end, a comprehensive picture of the situation at European

level, in order to formulate a set of General Urban Integrated Principles, which may also be applicable in Romania.

### 3. Case studies

The case studies were chosen so as to present a more exhaustive picture of the approach of the natural protected areas in the urban environment or in its proximity. The characteristics of the three examples are different for each case. The L'Albufera Natural Park is partially superimposed on the administrative area of Valencia, but is located in an area with a low construction density. London Wetland Center is in a densely built fabric and is the only example site that is managed by a private company. The Seine-Saint-Denis site is also located in a densely built-up area, but it is a multi-site (a site made up of several areas scattered throughout the territory).

The L'albufera Natural Park is located in the southern part of Valencia and about a third of its surface is superimposed on the administrative territory of the city (Fig. 1).

There are two main authorities responsible for the management of the Park: the Technical Management Office of the Albufera Natural Park (subordinated to the Regional Government of Valencia) and the Devesa-Albufera Service (subordinated to the Local Council of Valencia).

The London Wetland Center is run by the private company The Wildfowl and Wetlands Trust (WWT), along with eight other wetlands in the UK. It is located in the west of central London and comprises four former Victorian water storage basins (Fig. 2).

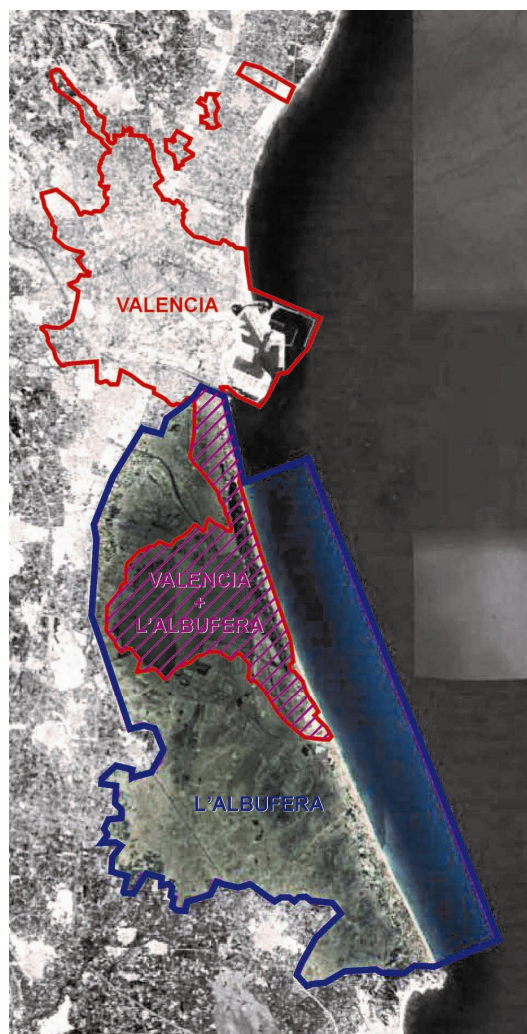


Fig. 1. The administrative territory of the city of Valencia, the boundary of the L'albufera Natural Park and the overlapping area between the two.

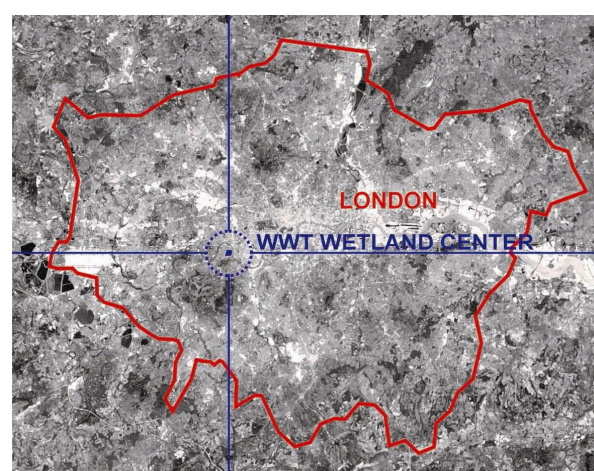


Fig. 2. Framing of the London Wetland Center natural protected area in the administrative territory of London.

L'albufera is part of the network of Natura 2000 natural protected areas,

being both a Site of Community Importance (SCI) and a Special Protection Area for Avifauna (SPA).

The Seine-Saint Denis site is located in the department of the same name, in the Ile-de-France region - the urban agglomeration around Paris (Fig. 3). It is part of the Natura 2000 network of SPA sites and is the only multi-site (site made up of several spaces scattered throughout the territory) in the European Union, located entirely in a high-density area.

The diversity of habitats characteristic of the site is attractive to birds that winter here or stop during the migration period.

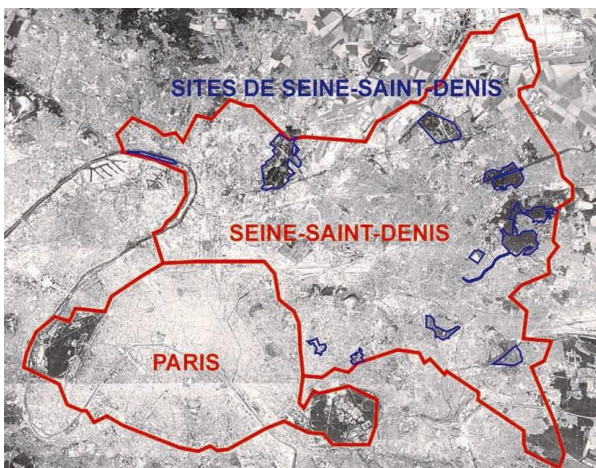


Fig. 3. Location of the natural protected area in the administrative territory of the department of Seine-Saint-Denis.

#### 4. Results and discussions

For a detailed analysis of the case studies, we started from the individual analysis of each selected natural protected area. The analysis took into account the six criteria listed above: management / planning of the spatial relationship with the urban fabric, management - the organizational structure responsible for managing the area, the legislative basis on which the protection of the protected area is

based, planning tools, marketing strategy and information and population involvement.

After the individual analysis, a comparative analysis of the case studies was performed, also in terms of the six criteria, based on which the set of principles applicable to the natural protected areas of Romanian cities was extracted.

##### 4.1. L'albufera Natural Park, Valencia

The 3 "pillars" of the legislation concerning L'albufera Park contain the following chapters and subchapters:

- I. General rules (1. Community, 2. Park-specific rules),
- II. Protection of natural and cultural heritage (3. Fauna and flora, 4. Forests, 5. Water, 6. Coastal area and beaches, 7. Soil, 8. Landscape, 9. Cultural heritage),
- III. People's activities (10. Agriculture, 11. Hunting, 12. Fishing, 13. Urban planning and industrial activities, 14. Public use: camping and recreational activities, 15. Infrastructure, 16. Research).

Legislative acts affecting the Park are international, European, national or local. The legislative basis of the Management Plan is therefore very complex and specific. There are a multitude of legislative acts targeting either Spain or strictly the city of Valencia or L'Albufera Park, on different levels (Decree 213/ 2009, of 20 November, of the Consell, by which approve measures to control invasive alien species in the Valencian Region, Resolution of 4 June 2006 of the Minister of Land and Housing for the Prevention Plan approved forest fires in the Natural Park Albufera etc.). Although the control of invasive species can be regulated by legislation, in general the solution of this problem is treated

superficially - "In the context of globalization, the biological invasions affect all the countries" (Tomescu *et al.*, 2018).

The Park Regulation follows exactly the 16 subchapters previously reached by the legislative acts.

The management of the Park is done with the help of two main tools: the Natural Resources Management Plan (NRMP) and the Master Plan for Use and Management (MPUM).

NRMP regulates a much larger area than the park, encompassing the entire L'Albufera river basin. The purpose for which it was adopted is to remove/reduce the following territorial problems: the disappearance of the wetland, urban pressure, disruption of the water regime with irreversible damage to the lake and springs, industrial pressure from the north, generated by the expansion of the port of Valencia, excessive hunting and dysfunctions in peripheral areas. The NRPM regulates the use of natural resources and the protection perimeter of Lake Albufera.

MPUM comprises a set of regulations of a general nature (applicable throughout the natural protected area) and a set of particular regulations, for which the zoning of the park is taken into account, being established a set of rules characteristic of each area. There are seven categories of areas:

1. R - Reserve areas
2. UR - Areas of restricted use
3. AP - Preferred areas of action
4. ES - Equipment and service areas
5. A - Areas of agricultural use
6. E - Built-up areas
7. AE - Areas of action in the area of urban centers

The last two categories are closely related, the AE areas operating as a nucleus for the most important areas. According to the plans annexed to Decree 259/2004, there are two AE areas in L'albufera Park: one of them is located in its northern part, close to the built urban fabric of Valencia and consists of collective housing with related functions, and the the second is the port.

The two plans were adopted by Decree 1997/ 1995 for the adoption of the NRMP, respectively by Decree 259/ 2004 for the approval of the MPUM.

In the management of the park, a special emphasis is placed on the free access of the public to information and on its participation in the decision-making process of the Park (Convention on access to public information, public participation and access to justice in environmental matters held in Aarhus in 1998; Law 11/ 2008 of 3 July 2008, the Government, Citizen Participation Valencia). L'Albufera's website offers a wealth of information of public interest: maps with thematic routes through the Park, the legislative basis on which its management is based, the two management plans of the Park, the table of plant essences found in the park, events organized in/ on the theme of the Park, etc. Access to all this information is proof of the interest given to the involvement of the community and, at the same time, a way of marketing the Park.

The planning of green infrastructure networks is also regulated by law. According to Law 4/ 2004 on spatial planning and landscape protection,



Chapter II, Article 20, Paragraph 7, "Urban and territorial plans shall ensure green corridors that fulfill biological and territorial link functions, whose axes shall consist of rivers or other landmarks, identifiable geographical areas on the territory, contributing to the structuring of the natural spaces of Valencia".

Green infrastructure plans are drawn up at local, municipal and regional level. For the region of Valencia, the Territorial Action Plan (TAP) was drawn up for the dynamization of the activities in the region of Valencia, adopted by decree 219/ 2018, which regulates the green infrastructure at regional level. In this plan, the protected areas are marked on different scales. L'Albufera Park is classified as a protected area of category I and is related to the green infrastructure network through ecological and functional corridors (regional scale), connection vectors (local scale) and through "windows" opened to the sea (cone-like perspective openings).

Similar to Valencia, Mallorca has its own L'Albufera natural park. The morphology of the two parks and the framing in the Natura 2000 network are similar: the wetland is separated from the Mediterranean Sea by a built-up area arranged as a strip along the shore, and both natural parks are both SCI and SPA sites. However, Valencia's L'Albufera Park is much more "friendly" to the population, thanks to the information made available to the public, events and much more developed marketing. „A shift toward increased participation by local communities in PA governance seeks to deliver benefits for human well-being and biodiversity." (Ward *et al.*, 2018).

The role of the population has been highlighted since 1993, by decree 71 of the Government of Valencia: "The circumstance of the neighborhood with the metropolitan area of Valencia gives it special environmental characteristics, adding, at the same time, an important social function."

#### 4.2. London Wetland Center, London

Compared to the first case study, the way the wetland in London is presented and managed is very different.

Legislation affecting the natural protected area (including the Management Plan) is not mentioned on the website. The only piece of legislation that is mentioned is the Ramsar Convention, ratified by the United Kingdom in 1976. The site does not present a plan with the zoning of the natural protected area, the only map being the tourist one, in which the spaces and the possible activities are presented.

WWT Centers are managed by a Board of Directors, which is responsible for setting WWT policies and strategic objectives. Board members are volunteers with no financial income. The management of the centers is performed by the Management Board, composed of paid members. The Management Board is headed by an Executive Director, who reports directly to the Chairman of the Board of Directors.

The WWT Strategy 2017-2022 aims to achieve six main objectives:

1. Wetlands in the United Kingdom and their wildlife are evolving;
2. Everyone in the United Kingdom has access to wetlands and has the

opportunity to support their conservation;

3. Wetlands in the United Kingdom are recognized as an integral part of natural infrastructure;

4. Decision makers globally understand the threats to wetlands and take drastic measures to eliminate them;

5. Wetlands are managed in such a way as to enhance and improve the lives of people around the world;

6. The risks decrease for wetlands and no species disappear.

The six objectives are summarized in a document available on the site, in the form of a text, without mentioning a precise location of them.

The management and marketing of the natural protected area are correlated through specialists, who identify the valuable aspects of the area, and through managers who highlight these aspects, in order to attract profit.

The marketing strategy is much more profit-oriented. The gain will be reinvested in the management of the area. Access to the area is possible by purchasing a ticket or a season ticket, and only between 9:30 - 16:30 (November - February) or 9:30 - 17:30 (March - October).

There are many ways to encourage public financial involvement to maximize profits:

- by purchasing a membership (valid for one month or one year),
- making a donation for wetlands in the WWT network (single donation or regular donation),
- making a donation for an endangered species (which are listed on the donation site),

- "adopting" a wetland or an animal. For example, if you choose to adopt a flamingo: make a single donation of at least £ 36 or a regular donation of at least £3. In return for this donation, the adopter receives a toy of the adopted species, an information package that includes a magazine with information about the flamingo, a poster, a sticker, a personalized certificate of adoption and a ticket with access to any WWT center in the UK, and the two journals published in spring and autumn, which provide information on the adopted species. In the case of the adoption of a wetland, a portion of about 500 square meters is chosen, for which the adopter must do a donation of 5 pounds per month, or 60 pounds per year.
- purchasing a gift in memory of a loved one (by making a donation that symbolizes that the loved one's passion for wildlife will continue by encouraging WWT actions). Also, some WWT centers (including the one in London) have commemorative books in which a short description can be inserted along with an illustration of a British animal or flower, in exchange for a donation of 300 pounds.
- leaving a gift by will (part of the estate, a sum of money or an item),
- forming a corporate partnership (corporations that have concluded such partnerships are listed on the site).
- by doing a corporate volunteering - Volunteering is among the ways to increase profit, as for each volunteer a fee of 25-60 pounds without VAT is purchased. This fee is justified by ensuring the cost for WWT staff

involved in coordinating the volunteers.

- becoming a “protector” or “owner” - The owners' group consists of dedicated supporters, who have advantages such as: invitations to WWT events (including the Annual General Meeting), the owner's annual newsletter, news about current and future projects, Waterlife magazine. The minimum fee to become an owner is £500.
- raising funds (ideas and links for fundraising actions are presented on the London Wetland Center website)
- donating from outside the UK (donations can be made online, by bank transfer or by check).

There is, therefore, a whole range of ways of financial involvement and profit growth for WWT centers and, implicitly, for the one in London.

In terms of green infrastructure, London has a planning guide called The All London Green Grid (ALGG). This grid divides London into 12 zones with distinct characteristics. This guide also monitors its biodiversity and conservation. “Metrics that allow the impact of human activities on biodiversity to be monitored and reported are essential tools in global conservation efforts.” (Duran *et al.*, 2020).

London Wetland Center is part of the Arcadian Thames area, but it belongs to the category of private spaces/ spaces with minimal impact on the green grid, so its role is not really capitalized through the guide.

Although the Wetland Center London website does not provide information on legislation affecting the protected

area, including the Wetland Management Plan, but only a brief overview of the strategy, wetland management is considered a real success and is an example for other similar cases.

### 3.2. Sites de Seine-Saint-Denis, Ile-de-France

Unlike the first two examples, the Seine-Saint-Denis site does not have a website dedicated to presentation and marketing, so public access to information is not as easy. However, there is a website of the Ile-de-France prefecture that provides information about the site and a website that provides information about the parks of Seine-Saint-Denis (including some areas of the Natura 2000 site).

From a legislative point of view, France adopted a law in 2007 that brought major changes to urban planning - the “Law of Solidarity and Urban Renewal” (“Loi Solidarité et Renouvellement Urbain”). This law imposes minimum requirements for sustainable development, which any urban investment must comply with.

The Natura 2000 site is managed by a local coordination committee, established by prefectural decree 2015-0556. The committee is responsible for implementing the site management plan. The Steering Committee is composed of representatives of the state and local public institutions, representatives of the properties included in the site, representatives of public works concessionaires and infrastructure managers, representatives of professional organizations and public bodies working in the agricultural field, representatives of organizations responsible for the conservation of

natural heritage and of associations authorized to protect the environment.

The committee may request the collaboration of other persons who have the ability to assist them and may participate in the sessions of the committee.

The tool through which the site is managed is the DOCOB document (Document d'objectifs) and comprises seven parts: 1. Overview, 2. Protection of natural heritage and land use, 3. Ecological diagnosis, 4. Operation of SPA parks, 5. Challenges of the Natura 2000 site, 6. Sustainable development objectives, 7. Action program.

The DOCOB works together with 11 other notebooks prepared individually for each park or forest included in the Seine-Saint-Denis site.

Each notebook consists of three parts: an ecological diagnosis, a socio-economic diagnosis and a summary of threats. The notebook is mainly made up of drawings that show the exact location of the analysis or proposals. From this point of view, compared to the other two case studies, the Seine-Saint-Denis site provides information on park management that is much more transparent and accessible to the public, although unlike the others it does not have a dedicated website.

The ecological diagnosis of the notebooks provides information on the inventoried perimeters and the protection of the heritage, the use of the lands, the inventory of the birds and their habitats.

The socio-economic diagnosis includes the presentation of the site (this chapter analyzes the relationship between SPA areas and urban planning), urban infrastructure, how the park/forest works and the average attendance of spaces.

The last chapter of the notebooks, "problem synthesis" presents the priority issues according to species and habitats, ecological problems, synthesis of ecological problems and the relationship between ecological problems and the degree of attendance of spaces.

The relationship between the Natura 2000 site and the built urban fabric is treated much more carefully and in more detail compared to the other two examples. The booklet contains an urban planning table for the Natura 2000 site and for the areas in its vicinity, in which regulations are given according to areas, such as: functional area, specific land use, land use percentage (COS), maximum allowable height of constructions, the ratio between free space and planted space. The notebook also provides the exact inventory and location of urban projects in and around the Seine-Saint-Denis site.

Access to the parks is free. In cases where financial capital was needed, occasional donations were made for those actions. The public is encouraged to actively participate in the management of the park and even has the opportunity to vote on the projects that will be funded. There is also an interactive map on the prefecture's website showing a diagram of the green infrastructure network, called the "regional ecological coherence scheme".

This scheme shows the connection corridors (classified according to the type of vegetation - trees/ herbaceous plants, corridors along the running waters, the links of interest in urban areas), wetlands, agricultural areas and biodiversity reserves.

At a first overview, comparing the three case studies, it is obvious that they approached the management of the natural protected area differently, each focusing on a different direction:

1. L'Albufera focuses on public access to information, its involvement in the decision-making process and the regulation of green infrastructure network planning.
2. London Wetland Center has developed ways to make a profit for further investment in the protected area.
3. For the Seine-Saint-Denis site, a very detailed analysis and regulation of the relationship between the site and the urban fabric was implemented, given its location in an urban fabric with a high density of construction.

**Table 1.** Management / planning of the spatial relationship with the urban fabric.

L'albufera Natural Park	3 points (in the management plan there are two categories dedicated to the built-up areas inside the area, but the spatial relationship between the park and the fabric of Valencia is not really approached, at the overall level, but the approach remains local)
London Wetland Center	1 point (the wetland is not taken into account by London planning tools - The All London Green Grid)
Sites de Seine-Saint-Denis	5 points (planning tools have a high degree of detail and approach to the relationship between the tissue of the natural area and the tissue built nearby)

**Table 2.** Legislative basis.

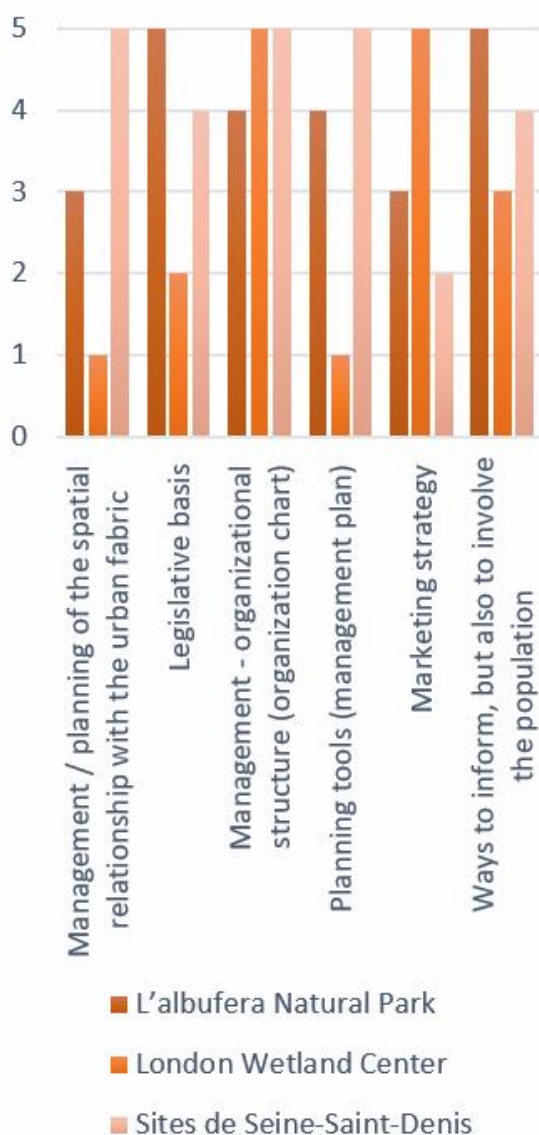
L'albufera Natural Park	5 points (legislation with an impact on the natural protected area is very complex - legislation has even been adopted on the scale of the city of Valencia with specific topics - for example, green infrastructure networks)
London Wetland Center	2 points (the only legislative instrument identified, with incidence on the protected area is the Ramsar Convention - there are no legislative acts with national, regional, zonal or local incidence)
Sites de Seine-Saint-Denis	4 points (although there are no legislative instruments with local applicability, the law adopted in 2007 with a special emphasis on sustainable urban development, encourages a complex general approach, and not one applied locally, only in the vicinity of natural protected areas)

**Table 3.** Management - organizational structure (organization chart).

L'albufera Natural Park	4 points (there are two managing authorities - one regional and one local)
London Wetland Center	5 points (the organization chart of the company in charge of area management is easily accessible on the website; the responsible authority manages multiple wetlands at national level, but also abroad and has an overview and experience in the field)
Sites de Seine-Saint-Denis	5 points (the authority responsible for the management of natural the protected area has a complex organizational structure, composed of representatives of various state institutions or key organizations in the conservation process and landowners included in the natural area - therefore, it may take into account a multitude of factors, constraints and opportunities in the decision-making process)

**Table 4.** Planning tools (management plan).

L'albufera Natural Park	4 points (two instruments are adopted that work in parallel - Natural Resources Management Plan (NRMP) and the Master Plan for Use and Management (MPUM))
London Wetland Center	1 point (the planning tool used in wetland management was not identified)
Sites de Seine-Saint-Denis	5 points (there are 12 planning tools - 1 general management plan, which works in parallel with the other 11 plans, made individually, for each site; the degree of analysis and detailing is high, compared to the other two case studies)



**Fig. 4.** Scores given to the criteria, for each natural protected area.

The score grid is interpreted as follows:  
 1 point - unaddressed criterion (non-existent in strategy);  
 2 points - criterion approached to a small extent, insignificant  
 3 points - criterion approached, but not valued;  
 4 points - criterion approached to an increased extent;  
 5 points - the main criterion on which the strategy is based.

Comparing the scores given after the analysis, we notice the diversity of ways of approaching the criteria used in the analysis (Fig. 4). No criteria have been identified to be especially addressed in any of the analyzed areas - each strategy has its own set directions, depending on the criteria considered important.

**Table 5.** Marketing strategy.

L'albufera Natural Park	3 points (there is a website dedicated to the natural protected area, which provides important information, but not all information on important issues is presented here - for example, the organization chart of the responsible authority is not available)
London Wetland Center	5 points (the possibilities of capital accumulation for the subsequent investment in the management of the areas are very varied, from visiting subscriptions, to the possibility of offering the inheritance to the authority responsible for the management of the park)
Sites de Seine-Saint-Denis	2 points (the fact that the natural area does not have a dedicated website, has consequences in the marketing of the area, because the information is more difficult to access)

**Table 6.** Ways to inform and involve the community.

L'albufera Natural Park	5 points (on the website of the area there is information available on the possibilities of involvement in the conservation process, in the form of a calendar of events)
London Wetland Center	3 points (the population can be involved in wetland conservation activities, but for most of them a fee is charged; no information is available on the site about the planning tools used)
Sites de Seine-Saint-Denis	4 points (important information is available online, on the website of the Ile-de-France prefecture; occasionally, events are organized in which the public can be involved even financially, in the conservation activities of the area; people have the opportunity to vote the projects they wish to be implemented)

Analyzing individually each of the criteria used in the analysis, listed at the beginning of the paper, we can see how different are the approaches applied in the conservation strategies of the three natural protected areas. The following tables show the criteria and the extent to which they were taken into account in the conservation process, expressed by a score, followed by the motivation for awarding that score (Tables 1-6).

Based on these very distinct examples, but which have the same theme - Natural Protected Areas in the urban environment, a set of principles is outlined:

1. Adopt a set of legislation, both general and specific, covering the natural protected area and the surrounding urban fabric.

2. Regulating by legislative acts of the obligation and the way of planning the green infrastructure network.
3. Adopting profit-making methods for its subsequent investment in the maintenance of the natural protected area.
4. Encouraging public participation in the decision-making process and in activities and events taking place in the natural protected area.
5. Creating a platform or a web page for marketing and ensuring access to public information.
6. Implementing a management plan with a part dedicated to treating the relationship between the urban fabric and the natural protected area.
7. Locating the analyzes and proposals in the territory and making them available to the public.
8. Taking over responsibility for the natural protected area by a committee composed of representatives of as many groups as possible involved in the planning process.

## 5. Conclusions

Analyzing in parallel these different cases, but largely subject to the same legislation at EU level, it was noticed that the situations are influenced both by the local particularities, by the territorial scale, but also by the management modalities chosen. The Natural Protected Areas of the Urban Environment need a strict regulation, correlated with the particular situation but also with the local specificity, not only strictly on the surface of the city, but also in its proximity - in the area of the boundary with the urban tissue, to the outlying areas, in the mezzo- and macro-territories and Landscape, respectively in metropolitan areas or urban agglomerations.

As it results from the comparative analysis of the three case studies, there is no universal-valid approach for the management of natural protected areas in cities or a common criterion used above all.

In the current pandemic context, the emphasis is on the correlation and integrated planning of protected areas, with systems of landscaped green spaces (including heritage value), as well as with other typologies of complex landscapes and anthropogenic green spaces, by implementing a strategy and of an integrated salutogenic management plan. It is needed as an important tool that can be used to limit the spread of viruses and improve the immune response to diseases in general and to viruses such as SARS-Cov-2 in particular (Buzdugan *et al.*, 2020).

The six criteria used for the analysis of the case studies are approached differently and to different extent, which gives the originality of each strategy. However, based on the individual analyzes and, finally, the comparative analysis, it was possible to extract the principles considered important / basic in the management of a natural protected area located in an urban environment.

The extracted principles are generally valid. In their formulation, the aim was to identify those that can be applied at the level of natural protected areas in Romania. Given the importance of the criteria used in the analysis, at least one principle regarding each criterion resulted.

Very few of the natural protected areas in Romania meet at least one of the

principles extracted. Probably the most obvious problem in their current management is that there is only one authority responsible for the management of the areas - the National Agency for Natural Protected Areas. Therefore, the last principle extracted, related to the importance of taking over responsibility by an entity with representatives from as many groups involved as possible, can be an important starting point in changing the way of approaching natural protected areas in the urban environment.

## REFERENCES

- Buzdugan R., Toader Y., Ng S. L., Crăciun C., Schwartz G., Cherteș A., Buzdugan M., Simionescu D., Simionescu M., Cadariu A., Simionescu V. (2020), *Safe Spaces* [in Romanian], <http://www.vsa.ro/PDF-Flip/index.html>
- Carroll C., Harti B., Goldman G., Rohlf D., Treves A., Kerr J., Ritchie E., Kingsford R., Gibbs K., Maron M., Watson L. (2017), *Defending the scientific integrity of conservation-policy processes*, *Conservation Biology* **31(5)**: 967-975.
- Catalano A., Redford K., Margoluis R., Knight A. (2018), *Black swans, cognition, and the power of learning from failure*, *Conservation Biology* **32(3)**: 584-596.
- Colloff M., Lavorel S., Kerkhoff L., Wyborn C., Fazey I., Gorddard R., Mace G., Foden W., Dunlop M., Prentice I., Crowley J., Leadley P., Degeorges P. (2017), *Transforming conservation science and practice for a postnormal world*, *Conservation Biology* **31(5)**: 1008-1017.
- Council of the European Union (2020), *Biodiversity: how the EU protects nature* [in Romanian], <https://www.consilium.europa.eu/ro/policies/biodiversity/>
- Dietze M., Lynch H. (2019), *Forecasting a bright future for ecology*, *Frontiers in Ecology and the Environment* **17(1)**: 3.



- Duran A., Green J., West C., Visconti P., Burgess N., Virah-Sawmy M., Balmford A. (2020), *A practical approach to measuring the biodiversity impacts of land conversion*, *Methods in Ecology and Evolution* **11(8)**: 910-921.
- Enquist C., Jackson S., Garfin G., Davis F., Gerber L., Littell J., Tank J., Terando A., Wall T., Halpern B., Hiers J., Morelli T., McNie E., Stephenson N., Williamson M., Woodhouse C., Yung L., Brunson M., Hall K., Hallett L., Lawson D., Moritz M., Nydick K., Pairis A., Ray A., Regan C., Safford H., Schwartz M., Shaw M. (2017), *Foundations of translational ecology*, *Frontiers in Ecology and the Environment* **15(10)**: 541-550.
- Eikelboom A., Wind J, Ven E., Kenana L., Schroder B., Knecht H., Langevelde F., Prins H. (2019), *Improving the precision and accuracy of animal population estimates with aerial image object detection*, *Methods in Ecology and Evolution* **10(11)**: 1875-1887.
- Grose M., Frisby M. (2019), *Mixing ecological science into landscape architecture*, *Frontiers in Ecology and the Environment* **17(5)**: 296-297.
- Iojă C., Pătroescu M., Rozyłowicz L, Popescu V., Vergheleț M., Zotta M., Felciuc M. (2010), *The efficacy of Romania's protected areas network in conserving biodiversity*, *Biological Conservation* **143(11)**: 2468-2476.
- Kaim A., Watts M., Possingham H. (2017), *On which targets should we compromise in conservation prioritization problems?*, *Methods in Ecology and Evolution* **8(12)**: 1858-1865.
- Kaplan-Hallam M., Bennett N. (2018), *Adaptive social impact management for conservation and environmental management*, *Conservation Biology* **32(2)**: 304-314.
- Mack R. (2019), *Taking personal environmental action in a post-truth world*, *Frontiers in Ecology and the Environment* **17(8)**: 423.
- Magle S., Fidino M., Lehrer E., Gallo T., Mulligan M., Rios M., Ahlers A., Angstmann J., Belaire A., Dugelby B., Gramza A., Hartley L., MacDougall B., Ryan T., Salsbury C., Sander H., Schell C., Simon K., Onge S., Drake D. (2019), *Advancing urban wildlife research through a multi-city collaboration*, *Frontiers in Ecology and the Environment* **17(4)**: 232-239.
- Majewska A., Altizer S. (2018), *Planting gardens to support insect pollinators*, *Conservation Biology* **34(1)**: 15-25.
- Merciu F., Sârdoev I., Merciu G., Zamfir D., Schvab A., Stoica I., Paraschiv M., Saghin I., Cercleux A, Văidianu N., Ianoș I. (2017), *The "Văcărești Lake" Protected Area, a neverending debatable issue?*, *Carpathian Journal of Earth and Environmental Sciences* **12(2)**: 463-472.
- Morelli T., Barrows C., Ramirez A., Cartwright J., Ackerly D., Eaves T., Ebersole J., Krawchuk M., Letcher B., Mahalovich M., Meigs G., Michalak J., Millar C., Quinones R., Stralberg D., Thorne J. (2020), *Climate-change refugia: biodiversity in the slow lane*, *Frontiers in Ecology and the Environment* **18(5)**: 228-234.
- Muller A., Schneider U., Jantke K. (2020), *Evaluating and expanding the European Union's protected-area network toward potential post-2020 coverage targets*, *Conservation Biology* **34(3)**: 654-665.
- Nilsson D., Fielding K., Dean A. (2019), *Achieving conservation impact by shifting focus from human attitudes to behaviors*, *Conservation Biology* **34(1)**: 93-102.
- Oldekop J., Holmes G., Harris W., Evans K. (2016), *A global assessment of the social and conservation outcomes of protected areas*, *Conservation Biology* **30(1)**: 133-141.
- Pastorella F., Avdagic A., Cabaravdic A., Mrakovic A., Osmanovic M., Palleto A (2016), *Tourists' perception of deadwood in mountain forests*, *Annals of Forest Research* **59(2)**: 311-326.
- Petrișor A.-I., Petre R., Meită V. (2016), *Difficulties in achieving social sustainability in a biosphere reserve*, *International Journal of Conservation Science* **7(1)**: 123-136.
- Prefet de la Seine-Saint-Denis (2016), *Goal document - DOCOB [Document d'objectifs - DOCOB]*, <http://www.seine-saint-denis.gouv.fr/Politiquespubliques/Environnement-paysage-risques-naturels-et-technologiques-bruit-nuisances-publicite/Natura-2000-un-reseau-pour>

- la-biodiversite/Documents-d-objectifs-  
DOCOB
- Qin S., Kroner R., Cook C., Tesfaw A.,  
Braybrook R., Rodriguez C., Poelking  
C., Mascia M. (2019), *Protected area  
downgrading, downsizing, and  
degazettement as a threat to iconic  
protected areas*, *Conservation Biology*  
**33(6)**: 1275-1285.
- Soanes K., Lentini P. (2019), *When cities are the  
last chance for saving species*, *Frontiers in  
Ecology and the Environment* **17(4)**:  
225-231.
- Soanes K., Sievers M., Chee Y., Williams  
N., Bhardwaj M., Marshall A., Parris  
K. (2019), *Correcting common  
misconceptions to inspire conservation  
action in urban environments*,  
*Conservation Biology* **33(2)**: 300-  
306.
- Tomescu R., Olenici N., Nețoiu C., Bălăcenoiu  
F., Buzatu A. (2018), *Invasion of the oak  
lace bug *Corythucha arcuata* (Say.) in  
Romania: a first extended reporting*,  
*Annals of Forest Research* **61(2)**: 161-  
170.
- Ward C., Holmes G., Stringer L. (2018),  
*Perceived barriers to and drivers of  
community participation in protected-area  
governance*, *Conservation Biology* **32(2)**:  
437-446.
- Watson K., Galford G., Sontter L., Koh I.,  
Ricketts T. (2019), *Effects of human  
demand on conservation planning for  
biodiversity and ecosystem services*,  
*Conservation Biology* **33(4)**: 942-952.
- Zhou W., Fisher B., Pickett S. (2019), *Cities  
are hungry for actionable ecological  
knowledge*, *Frontiers in Ecology and  
the Environment* **17(3)**: 135.

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