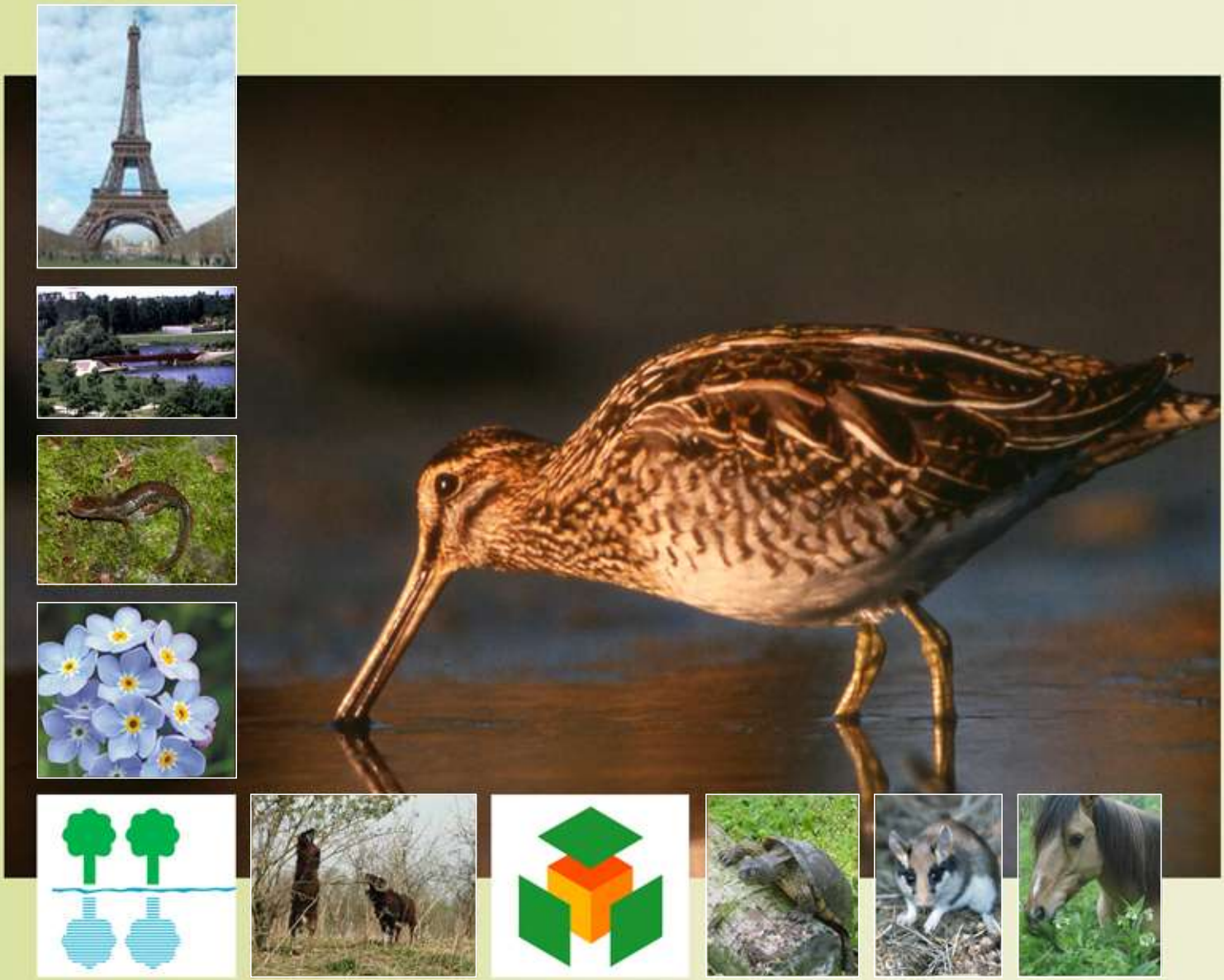
Les enjeux de la biodiversite dans les espaces periurbains

The challenges of biodiversity in periurban areas



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des Espaces Naturels et Ruraux
Métropolitains et Périurbains

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INTRODUCTION

Biodiversity in towns: unsuspected issues

Biodiversity continues to be associated with wild nature. And that damages the very objective that has made a success of the neologism "biodiversity": preserving the diversity of living things. It makes us forget that we humans are a result and part of this biodiversity – dependent on it – and that it is present everywhere, in us, on us, around us.

It is therefore in towns too: discovering it there, being concerned about it, is no less important than research and protection in national or regional parks and other areas where we can no longer be allowed to believe that man has not set foot. Because it is not only feet, and their wanted or unwanted auxiliaries (domestic and invasive species), but also considerable amounts of chemical waste spilled into the air, the water and the soil.

Because one of the major obstacles to progress in nature conservation is the recurring ignorance of all this; because in order to change things radically in terms of relations with biodiversity it is necessary to educate people and to get them to know and love it, urban biodiversity has become a big issue.

What better laboratory for education in the environment and biodiversity can be imagined than the town and its gardens and open spaces; the town and its houses with balconies full of flowers; the town and its sparrows, pigeons and other common "rats"? And that is without mentioning the need for this nature in towns for our quality of life, our health.

Yes, urban biodiversity is a major issue, because towns concern the majority of the human population – and that is why UNESCO, in its programme "Man and the biosphere" has been interested, since the beginning, more than three decades ago, in including towns in its famous "biosphere reserves", excellent areas for experimenting in sustainable development at regional level.

Robert Barbault,
Manager of the Department of Ecology and Biodiversity Management, Muséum National d'Histoire Naturelle, Paris

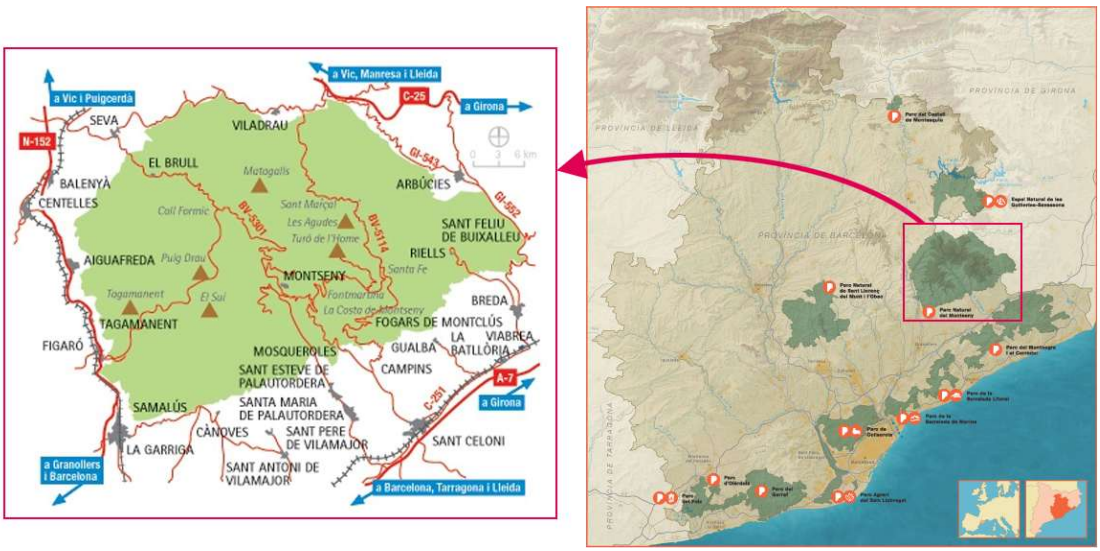
Monitoring Plan of Ecological Parameters in the Network of Protected Sites of the Barcelona Provincial Council: The Montseny brook newt, a new species for science.

Juana Barber, Manager of the Montseny Natural Park
Cinta Pérez, Biologist of the Montseny Natural Park

The network of natural parks of the Barcelona Provincial Council (*Diputación de Barcelona*) is made up of 12 natural sites with considerable landscape, ecological and cultural importance. They cover in total a surface area of 100,632 hectares. This represents 22% of the surface area of the heavily-populated province of Barcelona, where 70% of the Catalan population lives.

The project has been promoted by the Barcelona Provincial Council with the following objectives:

1.- To guarantee the territorial and environmental balance in the 99 municipalities of its geographical sphere of administration.
2.- To plan and manage the natural and agricultural sites by means of special plans, drawn up with the participation of all the agents involved.
3.- To protect the natural, agricultural, forest, cultural and landscape values of each park.
4.- To favour a balance between the preservation of the parks and the economic development of the local populations.
5.- To promote the public use of the natural heritage.



The Montseny Natural Park is the highest massif in the Catalan pre-coastal range. It has a surface area of 30,120 hectares divided between 18 municipalities which belong to 3 counties, Osona, La Selva and El Vallès Oriental. The natural limits of the park are the Riera de Arbúcies, the high courses of the Riera Major and the River Gurri, the River Congost and the Vallès Plain.

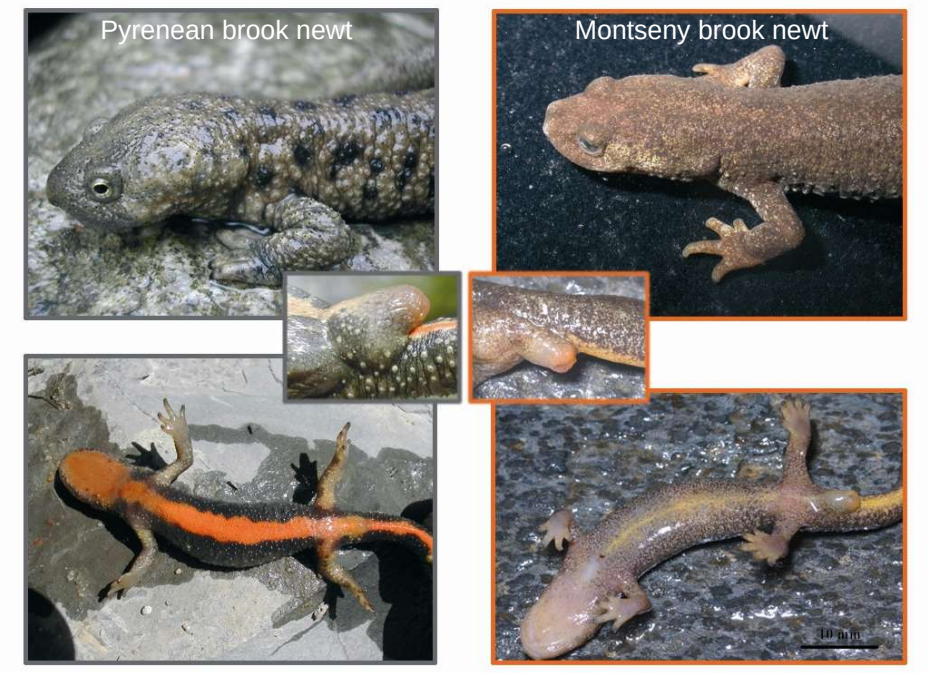
The park receives a large number of visitors because of its easy access, good communications with the metropolitan area of Barcelona, and because of its natural and cultural attractions. The area offers many possibilities for hiking, short walks and simply enjoying a well-conserved landscape shaped by human action over many centuries. Montseny also has a considerable network of public facilities and services aimed at visitors, which are designed to be compatible with conservation.

The monitoring and control plan of the ecological and sociocultural parameters of Montseny Natural Park, developed by the Technical Office of Natural Parks of the Barcelona Provincial Council in coordination with the rest of parks of the network, was set out the basic aim of understanding on a continual basis the state of the natural and sociocultural environment. It was therefore seen as a fundamental instrument capable of detecting changes, determining tendencies and diagnosing effects, with the aim of planning management actions correctly.

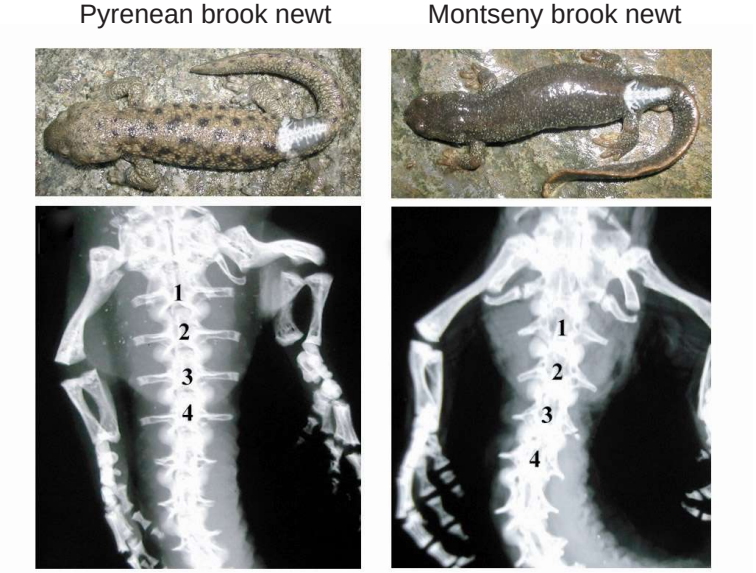
Over time the plan has become consolidated as a fundamental tool for providing rational elements to managerial criteria of the protected sites. Since 1991, the year in which the monitoring plans were begun, more than 200 studies and programmes have been carried out in all the parks.
As was anticipated in the first stage of implementation of the monitoring plans, numerous studies and work (mainly of a descriptive character) have been carried out (with limited means and resources) which have led to a better knowledge of natural systems.
In addition to the essential aspect of improving the knowledge, the reference and indicators for the evaluation of management, the Monitoring Plan of ecological parameters also set out a more ambitious agenda, which goes from the most general to the most specific, from drawing up integral management plans for the conservation of natural systems along with management manuals for habitats of most interest and vulnerability, developing plans of conservation for the most fragile and representative species and /or those included in different legal forms of protection such as the Natura 2000 Network.

Thanks to the drawing-up of these studies within the Monitoring Plan of the wildlife of Montseny Natural Park, a new species of vertebrate wildlife has been discovered in this site. The monitoring carried out over several years on the Pyrenean brook newt led to the discovery of morphological and osteological differences, and finally, to proving with genetic studies that the newt which lives in the waters of Montseny is a species of amphibian endemic to the Montseny massif: that is, the Montseny brook newt *(Calotriton arnoldi)*.

MORPHOLOGICAL AND OSTEOLOGICAL DIFFERENCES



Pyrenean brook newt Montseny brook newt



In addition to the enormous importance for science represented by the discovery of a new species of vertebrate endemic to Catalonia, and of an amphibian in the Iberian Peninsula, the presence of the Montseny brook newt, with its need for cold, clean and well oxygenated waters, represents an indicator of the quality of the waters here, and hence, demonstrates the state of conservation of the habitats in an area strongly influenced by

human activity and conserved by its management.
This good news represents for the managers of the Montseny Natural Park the very important challenge of understanding the current status of the species, which is already considered threatened, its phenology and its current and potential distribution, along with the demography of the population and the necessary collaboration with the Catalan Government, the administration in charge of the protection of the species.

To conclude, it should be stressed that the framework of natural parks is ideal for working in applied research: from a natural history point of view, because it is one of the reasons which justifies the protection of these areas rather than others, as they are areas with great natural importance; and from the social point of view, because there must be a response which predicts what could happen and responds to the changes which take place in the use of natural resources.

The conservation of biodiversity in the territories of the Agricultural Park South Milan through environmental conservation practices and faunal reintroductions

Bruna Brembilla President of the Parco Agricolo Sud Milano (Agricultural Park South Milan)

The conservation of the agricultural territory of a great periurban park, such as the Agricultural Park South Milan, entails multiple aspects that range from territorial planning to the management of the agricultural areas, whose fundamental theme remains the conservation of biodiversity. Within a periurban park, the idea of biodiversity shall also be extended to the landscape and the ecoregion, where it finds a wider setting.

The main - direct and indirect - reason for the decrease of biodiversity finds its roots in various reasons that shall be substantially correlated to the anthropic activities. Among them one finds the habitats destruction and fragmentation, subsequently to unsustainable economic and productive models and to an unprecedented demographic increment, besides the climatic changes, which altogether increasingly concur to a drastic extinction of species. (Fig. 1).

Fig. 1 – Example of territorial fragmentation
(Photo: Photographic Archive - Province of Milan)

Starting from such considerations, as of 1999 the Agricultural Park South Milan has launched a series of programs and plans aiming at identifying the high biodiversity elements it embodies, besides outlining the execution of the interventions focusing on the conservation of biodiversity, populations, and landscape.

While keeping the ecological principles as propaedeutic references, in particular those pertaining to landscape ecology and conservation biology, and having set the proposal of conservation methods within the agricultural landscape as an objective, the conservation priorities have been identified. Such priorities have been realized through some specific interventions on the reintroduction of autochthonous vegetable species and on the typical fauna of the Agricultural Park South Milan's territory.

The environmental interventions executed on the territory by the Park insofar particularly aim at reconnecting the fragmented natural areas, above all through the ex novo creation or the requalification of more or less complex environments, trying to provide environmental continuity within a wide agricultural matrix. The guarantee of continuity between natural areas does not limit itself exclusively to the Park's territory, as it goes beyond, connecting itself to the adjacent natural areas of the Ticino Valley and of the Adda Valley, but also to important

realities within the territory of the municipalities that are part of the Park, and, last but not least, to Milan's metropolitan area.

The Park's territorial reality embodies a multitude of highly important naturalistic areas that therefore allow us to face the issues of conservation and biodiversity, to work on the environments reconstruction and, at the same time, to create the ecological corridors needed for their connection. In order to do so, we have located all the main nuclei and prepared a technical working model that foresees the requalification of hedges and rows, as a fundamental reconstruction element of the Park's agrarian landscape, but also as a connecting element between the different areas to be forested or reforested. Such interventions carry an important relapse from a general environmental quality standpoint, while also interacting with the faunal component, generating attraction centers and thus ultimately increasing biodiversity.

All the involved areas rest on the Park's primary structure, which consists of a network made up of agricultural cultivations, ditches, canals and 300 active springs, besides the presence of about 70 artificial basins deriving from the extractive activities. The interventions have a remarkable impact on the biodiversity of the territory, which restore the ecological corridor function of fields, rows and waterways, with positive relapses also with regard to the landscape and leisure profiles (Fig. 2). We have contextually promoted faunal reintroduction interventions that have allowed the restoration of typical environments of the Park's territories, also through the use of restoration ecology techniques, trying to invert the biodiversity reduction trend.

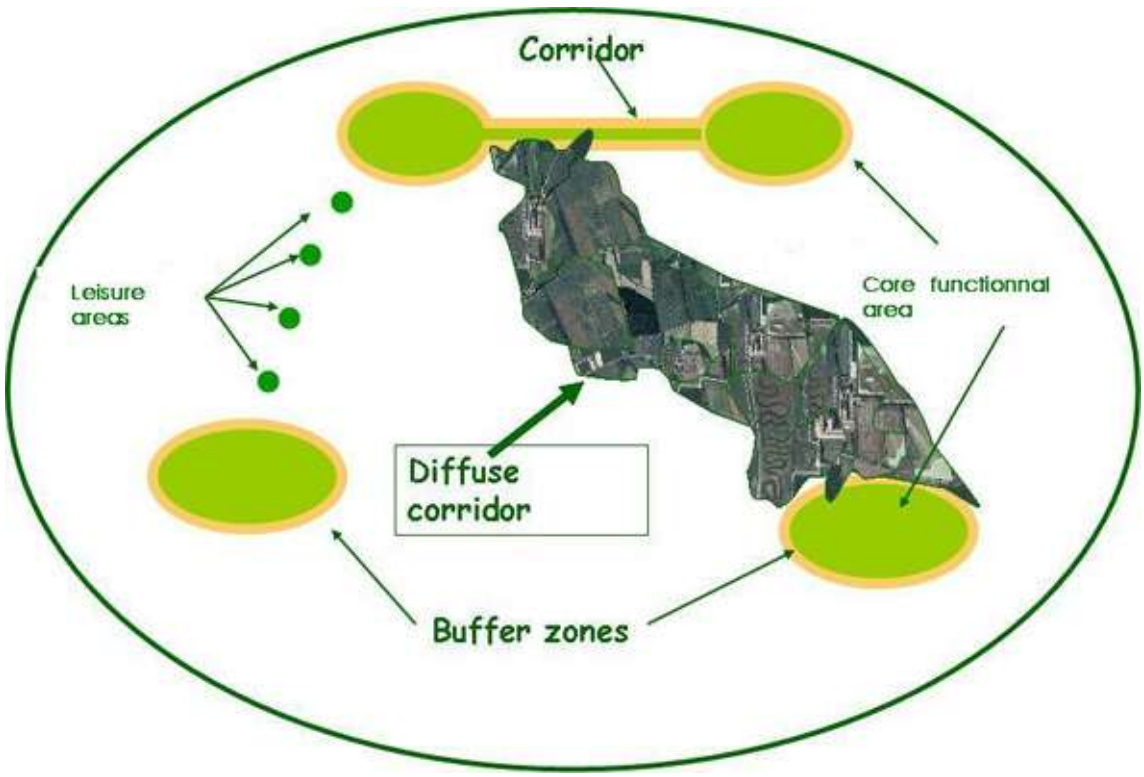


Fig. 2 – Example of ecological network for the agricultural landscapes

The reintroduction of species such as the Insubric Pelobates (*Pelobates fuscus insubricus*), the Lataste's Frog (*Rana latastei*), the Freshwater Prawn (*Austropotamobius pallipes*) and the marsh tortoise (*Emys orbicularis*), has allowed conjugating the purpose of a more complex ecological restoration project with the need to increase biodiversity.

Fauna reintroductions, in particular, represent a double occasion for environmental requalification, considering that, while they contribute to the territorial ecological equilibrium on one hand, on the other hand they may constitute a moment of renaturalization for degraded environments that, through targeted “habitat management” interventions, may become apt to host the species to be reintroduced, besides recuperating areas of the territory to be destined to conservation.

The choice of the species to be reintroduced shall always consider the objective reality of the territory avoiding to incur in costly failures, in terms of economic resources and animal species. In particular, the scarcity of natural spaces within the Agricultural Park South Milan, all of which are small-sized, remarkably limits the choice of the species to be reintroduced or transferred, in an environment that today differs a lot from the original one.

In light of such reasons, the projects undertaken by the Agricultural Park South Milan have insofar privileged the so-called minor fauna, such as Amphibians, looking at their bond with the aquatic environment the Park is particularly rich of. The offices’ attention has been particularly focused on the Insubric Pelobates, an endemic species from the Paduan Plains, and the Lataste’s Frog; throughout the last years, on the other hand, it has been possible to also activate a reintroduction project for the Marshy Tortoise and for the Freshwater Prawn, whose planning activities have been launched throughout the year 2002.

The agreed preference towards such species is justified by a series of considerations that favor the zoo-geographic interest and the rarity of the selected species, also on a continental scale (in some cases they are endemic taxa from the Paduan Plains), their documented recent presence within the Park’s territory, besides practical considerations, since they are species that do not require very wide natural areas.

In 1998, the reintroduction project for the Insubric Pelobates (Fig. 3) was launched via the triennial program by the Ministry for the Environment.

Fig. 3 – *Pelobates fuscus insubricus* – Cornalia 1873
(Photo by F. Barbieri)

Three different sites have been identified within the Agricultural Park South Milan showing common characteristics and that are substantially linked to the remarkable availability of good quality waters and sandy substrates, which are necessary to the survival of this fossorial species.

In its fundamental steps, the Insubric Pelobates reintroduction intervention has complied with the dictates proposed by the Conservation Committee of the Societas Herpetologica Italica, which has identified the guidelines for the correct planning and execution and also taking into account the guidelines provided by the World Conservation Union (IUCN).

The most interesting interventions carried out at the Bosco di Riazzolo - a woody area within a farmstead, have entailed the ex novo realization of 2 pools serving to host the species; each pool's structure has been created in a way to be able to fulfill the species' needs: the edges have thus been modeled with a smoothly degrading profile, in order to favor the animals' movements. At the same time, we have carried out planting interventions of the arboreal and shrub species, chosen among the plains' autochthonous species, aiming at guaranteeing the site's highest naturality (Fig. 4). The excavated material, which has consisted above all of sand and gravel, has been laid around the pools, so as to offer the Pelobates a soft substrate to sink into throughout great part of the year.

Fig. 4 – Habitat management interventions aiming at the transfer of the Insubric Pelobates

The start-up phases, relative to the actual transfer, have been taken care of by the University of Pavia, which has operated on the following phases in collaboration with the Park:

a) Sample of an Insubric Pelobates' eggs line in nature;
b) Eggs hatching at the University of Pavia's laboratories;
c) Sanitary control, aiming at identifying and/or avoiding eventual pathologies;
d) Release of half of the individuals obtained at the beginning of the metamorphosis into the already identified sites within each single Park;
e) Release of the residual half of the individuals into the eggs origin sites, guaranteeing the conservation of the original populations.

In the years that have followed the transfer, the offices have continued to take care and monitor the reintroduction sites in collaboration with the area owners, while a monitoring plan for the transferred individuals has only been active since 2004, through the research of the laid eggs, which still allows us evaluating the status of the species settlement.

In February 2001 two other reintroduction projects have been launched, involving the Marshy Tortoise (*Emys orbicularis*) and the Freshwater Prawn (*Austropotamobius pallipes*) (Fig. 5-6).


Fig. 5 and 6 – *Emys orbicularis L.* 1758 and *Austropotamobius pallipes Ler.* (Photo by C. Gaio)

Both projects move from the ascertainment that, upon being widely distributed within Lombardy's Plains, the species are now on the edge of extinction. Also at a continental level, both species are strongly decreasing, to the extent that they have been included in the Annex II of the Habitat 92/43/EEC Directive, which includes "species of community interest whose conservation requires the designation of special areas of conservation".

The cause behind such a drastic decline shall be looked, first of all, into the strong landscape transformations , which have quantitatively reduced the suitable areas for such species. Besides the territory degradation, one may identify the direct harvesting made by men and the diffusion of allochthonous species as aggravations, which mainly compete with the autochthonous species in the hoarding of the trophic resources.

The articulation of the Tortoise reintroduction project, just like that of the Prawn, has foreseen a surveying phase in which:

1) The effective absence of vital populations has been verified within the Agricultural Park South Milan's territory;
2) The causes for the species' decline in Northern Italy have been analyzed, while the species' ecology has been evaluated in their Paduan area;
3) The presence of both species in the Agricultural Park South Milan's territory has been evaluated;
4) A suitable site for the release of a first group of individuals has been located within the Agricultural Park South Milan's territory, represented by an area subject to naturalist management within an inert matter quarry for the Tortoise, and made up of two springs for the Prawn. For such purpose a fruitful relationship has been started with the land owners, which represents a concrete collaboration model between public institution and private subjects.

After the surveys one has therefore moved on to the operative phases, which may be summarized in the following way with regard to the Tortoise:

1) One first nucleus of Emys newborns has been bred at the University laboratories during the 2003/2004 winter season, in order to guarantee a high survival rate;
2) Ecologic recovery works have been planned and implemented, aiming at optimizing the release site characteristics;
3) A promotional campaign for the intervention has also been predisposed via the preparation of a folder;
4) In the spring of 2004 the first individuals have been released into the naturalistic area close to the quarry.

After the release, the project continues according to the following policies:

1) Monitoring of the released individuals;

2) Research and retrieval of other individuals so as to be able to increase the initial nucleus;
3) Controlled breeding of the young ones in laboratory, to limit losses in the most critical phase of the animals' life as much as possible, with regard to the Tortoise.

The core objective for both projects is tied to the reconstitution of a nuclei-source ensemble, whose main function is that of having individuals that may exchange genetic material and who may ensure the constitution of a numerically suitable population that is above of the minimum vital one, in a span of time of a few years.

The Tortoise intervention has also represented an interesting collaboration between the public and the private sector; the naturalistic area, in fact, has been created within an extractive quarry (Cava Sannovo), where today one finds a small species nursery, which obviously symbolizes the first consistent source for the reintroduction of the species in the main marshy environments of the Park. The project may be considered concluded when some Tortoise populations will have permanently installed themselves in nature without needing further human intervention. Since the first release in the spring of 2004, the number of the existing specimen in Cava Sannovo has progressively increased, reaching about twenty specimens today.

Aiming at continuing the project and, at the same time, at sharing it with the local people, we have one has thought about transforming the natural area of Cava Sannovo into a faunal area that may be visited by school groups and citizens. The faunal area, the first one for the Agricultural Park South Milan, will allow observing the small population of Marsh Tortoises therein settled in semi-freedom conditions.

Last but not least, there is the reintroduction project of a rare amphibian, the Lataste's Frog, threatened with extinction because of the alterations of its chosen habitat, made of small ponds within hydrophilous woods (Fig.7).

Fig. 7 – Boulenger Lataste's Frog, 1879. (Photo by F. Barbieri)

The project has foreseen different phases, ranging from the realization of a study aimed at the verification of the current status of the Lataste's frog, to the indication of the most adequate areas for the reintroduction of

the species, and to habitat management interventions to be performed so as to favor the success of the project. After the realization of the study, and with the indications it has provided, 3 translocation interventions of Lataste's Frog larvae have been performed during spring in the 3 subsequent years (2001-2002-2003), while environmental improvement interventions have been started and complete in some areas, essentially entailing the recovery of small humid areas.

The works have essentially consisted of the realization of ponds isolated from the pipeline network, so as to prevent the access of fishes that are predators of amphibians, above all of eggs and tadpoles, and whose presence may affect the good outcome of the interventions.

The project, which avails from the collaboration of the Animal Biology Department from the University of Pavia, leading structure in the Lombardy region for the for the reintroductions of amphibians, technically foresees that the eggs destined to the transfer interventions are taken in nature and induced to unfold in a protected environment within an ad hoc area predisposed by the University. When the tadpoles are close to metamorphosis and are thus ready to be brought into nature, half of them are taken back to the eggs sampling points, in order not to depauperate the wild populations, while the other half is taken to the release areas in the Park. The research has shown that the sites where the metamorphosis occurs are those that are then used by the adult amphibians for the eggs deposition. There is therefore a close connection between the metamorphosis sites and the reproduction ones.

The project continues and also the monitoring that will allow highlighting the intervention's results has started.

On the whole, the path undertaken by the Park insofar therefore aims at providing for an always better conservation of its territories but, at the same time, also at realizing interventions aimed at increasing biodiversity, which remains the main issue in the management of protected periurban territories. The conservation of biodiversity for such territories, in fact, represents one of the principal challenges for the next years, strongly setting itself against the protection concept that is historically applied in the so-called "remote areas".

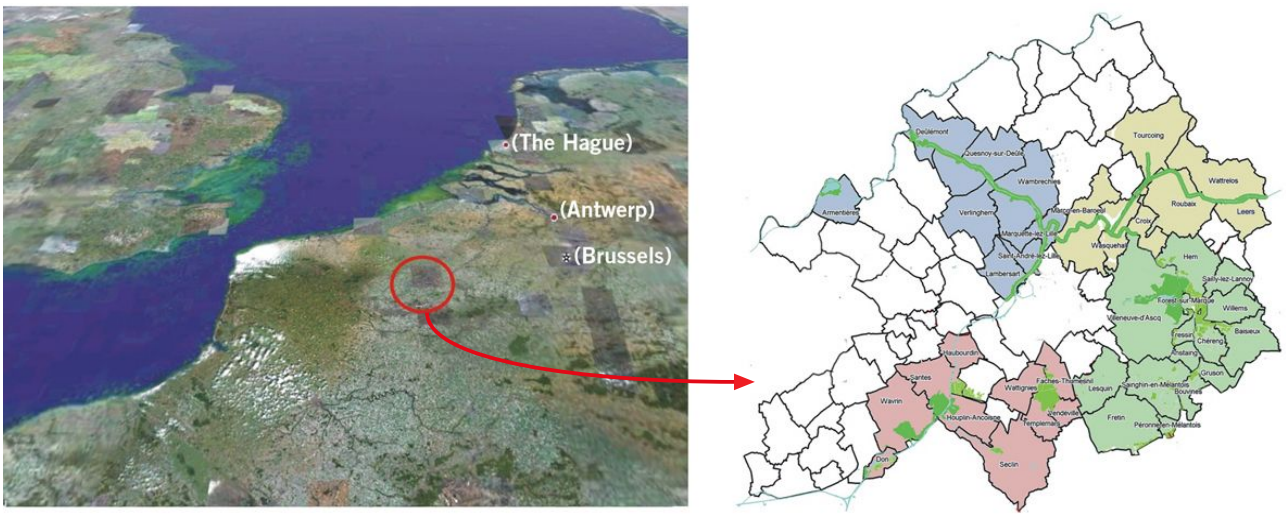
Our experience induces us to state that such a territory may definitely imply the cohabitation of different functions, ranging from agriculture to conservation and maintenance of biodiversity, besides leisure.

Lille Metropolitan Natural Area
Eco-pasture and a special local flora diversity programme in meadows and undergrowth

Quentin Spriet, area manager in charge of ecologically overseeing the Val de Lys Basse Deûle-Lille Metropolitan Natural Area

The Lille Metropolitan Natural Area

The Lille Metropolitan Natural Area mixed consortium, a public organisation, includes 40 municipal councils and Lille Urban Community Council. The consortium manages 1200 hectares of peri-urban natural areas. This territory includes old recreation areas, artificial bodies of water, canal towpaths, abandoned poplar plantations and other wooded areas.



Degraded habitats

The peri-urban natural environment has been severely broken up and degraded over the course of the last century in the face of galloping urban development. We often inherit many unmanaged or, by contrast, over-managed areas. In both cases, natural diversity has become impoverished and reduced. In town, urban open spaces - mown very short and sanitised - no longer offer ecological niches for invertebrate animals. On the periphery, spaces left wild become wooded and close up, while wetlands fill up and disappear.

Rediscovering biodiversity

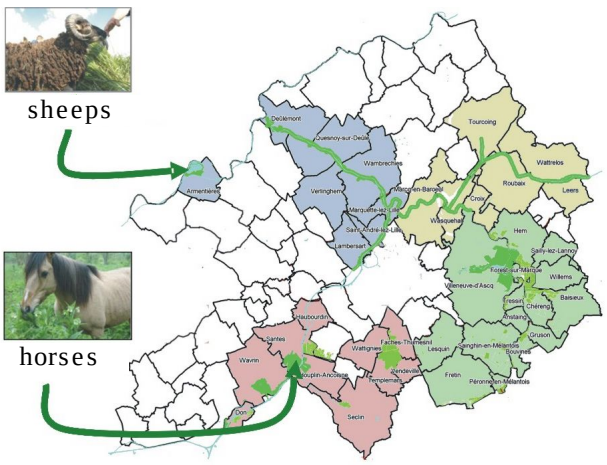
To restore biological diversity, the differentiated management of natural areas is linked with recreating the habitats plants and animals need. Managers have what amounts to a veritable green arsenal at their disposal:

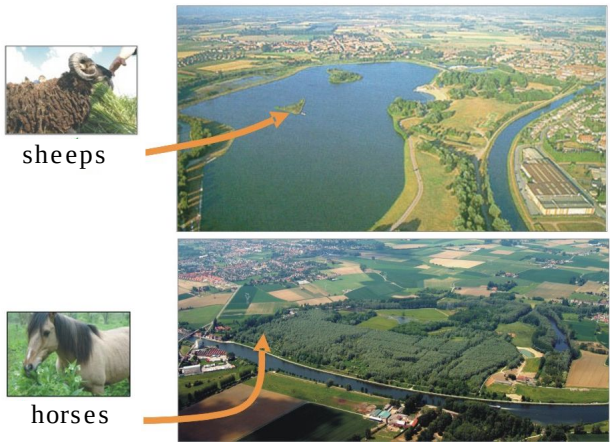
- Creation of wildflower meadows and general use of late mowing.
- Abandoning chemical plant health treatments.
- Planting native regional trees.
- Natural management of bodies of water and canal embankments, creation of new wetlands.
- Creation of biological corridors.

Grazing to prevent woodland.

Nowadays, some natural environments are abandoned or left to themselves. Considered unprofitable for agriculture or simply because they are in a protected area, old meadows spontaneously evolve towards scrubland and then woodland. It is sometimes a good idea to halt this plant dynamic.

Many studies have shown that extensive pasture is one of the most favourable maintenance methods compared to other possible techniques for creating biological wealth: shredding, mowing, burning… Herbivorous mammals have a gentle, progressive impact on the natural environment. The manager can also direct pasture to have an optimum effect on plant life.
The Lille Metropolitan Natural Area is currently running two eco-pasture experiments.





Horses in the clearings

On an old sludge deposit beside the canalised river Deûle, forty-year-old willow trees have invaded all the space. Chainsaws have cut some clearings and the horses maintain these new environments. A local breed, the Henson horse, has been chosen because of its rustic nature. Two mares have been spending the day there since June 2005. The horses graze on all invasive herbaceous plants such as bedstraws (*Rubiaceae*) and borages (*Boraginaceae*). They also feed on more irritating ones like nettles (*Urticaceae*) and daisies (*Asteraceae*). In winter, they also attack invading trees and shrubs like honeysuckles (*Caprifoliaceae*) and willows (*Salicaceae*).

Since the second spring - 2006 - we have seen the development of a more diversified flora, notably the return of geraniums (*Geranaceae*), forget-me-nots (*Boraginaceae*), irises (*Iridaceae*) and the parsley family (*Umbelliferae*). From the end of 2006, the establishment of monitoring by botanists and naturalists will allow measurement of the first ecological impacts of this operation.
the horses are subject to rigorous veterinary monitoring in order to strike the best balance between herd health and biodiversity.

Sheeps beside the water

Prés du Hem Park, a large artificial lake created in 1980, has been subject to a strong natural forestation dynamic. On an island of one hectare in the middle of the body of water, sheep are in charge of stopping the development of woody plants. Here too, a rustic breed, the Soay sheep, is adapted to the rough terrain and tough winter weather. This island, threatened by thick forestation and the disappearance of the herbaceous layer, is once again becoming attractive to grasses and flowers. The banks are once again decorated with reeds (*Typhaceae*) and true grasses (*Poaceae*).

Butterflies and birds

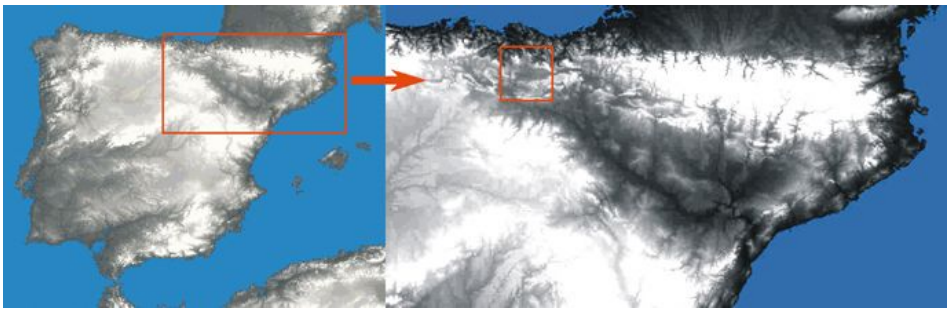
How can we assess the benefits of eco-pasture?
Academics and local researchers run botanical inventories and phyto-sociological studies. This is the scientific reference tool for measuring the effect of our management actions.
In addition, large insects, amphibians and birds are indicators of environmental quality. Researchers and volunteers from associations meet to draw up inventories of fauna and thereby measure the biodiversity of our peri-urban areas.

This is why our consortium is so keen to raise public awareness by making this information accessible and starting awareness-raising campaigns based on strong symbols like flowers, birds, amphibians and the return of butterflies.

The Vitoria-Gasteiz Green Belt: actions for the conservation of biodiversity

Luis Lobo Urrutia, Centro de estudios ambientales (Environment Studies Centre) de Vitoria-Gasteiz

Vitoria-Gasteiz is the capital of the Autonomous Community of the Basque Country in the north of Spain. It is a large municipality (covering just under 300 km^2) in which the Atlantic and Mediterranean bio-geographical regions meet. The landscape is occupied by a valley bottom, with a predominance of agricultural and urban uses, and a series of heavily forested mountainous ranges: holm oak woods in its northwest edge and woods of beech, gall-oak and common oak in the hills to the south. The town, of a medium size, occupies the centre of the area.



The Vitoria-Gasteiz Green Belt is a network of periurban parks surrounding the town. The network encompasses habitats such as agricultural mosaics, riverine woodland, isolated woods and extensive forest masses. Within this set of green spaces the wetlands of Salburua, located in the east of the green belt, represent the richest site in terms of biodiversity and because of this, the exhibition is focused on this site in particular.

Decades of degradation led to the practical disappearance of the lagoons and original plant formations of the area, notably in the latter case with the cutting down of the once extensive oak woods. Today, after the ecological recovery of part of the area resulting from ten years of conservation work (which has not finished yet), the restored area now covers more than 200 hectares, of which a third is covered by water. The close proximity of the site to the town on its eastern edge should be noted.

situation before 1857

period 1968 - 1995

Since the beginning of its restoration, the site's management has been supported by scientific studies and the monitoring of different environmental parameters (water, aquatic vegetation, fauna groups, etc.) in order to test the changes in the site over time and the efficiency of the measures adopted (see reports here www.vitoria-gasteiz.org/ceac on technical and research studies). Thanks to the contributions of these studies, Salburua is considered one of the most important wetlands at a regional level and has been declared a Ramsar Site and SAC (EC Special Area of Conservation). It is noted for its diverse vegetable formations such as common oak woods and formations of *Carex riparia* and the presence of a number of species of wildlife, among which the most threatened is the European mink (*Mustela lutreola*).

With respect to the site's management, the general criteria used are based on making full use of natural processes, with minimum human intervention and seeking to maximise biodiversity.

In the case of the lagoons, the natural flood cycles are respected, and so the wetland can almost completely dry out in dry summers. Different diagnoses and actions have been carried out to put a stop to both occasional and diffuse contamination sources, although the absence of municipal powers in agriculture can make it difficult to tackle this.

In terms of woodland, the site seeks to restore the original forests of the area, and so 30% of the surface area of the park has been replanted with autochthonous species, mainly in hedgerows, riverine vegetation and very particularly with the understorey of the oakwoods. With respect to the scant amount of mature forest masses currently existing, the general criterion applied is based on the abandonment of uses, thus allowing them to develop into mature forests. The progressive replacement of the poplar plantations is underway for species native to the area.

The grassland areas are managed to create varied ecological environments by means of different levels of cutting, from a single annual ground clearance in the autumn to areas with more intensive public use with 4-6 cuttings a year. Slow-growing autochthonous species, which do not require irrigation, are sown. Part of the marsh vegetation is managed using a herd of red deer, supported by more intensive work (clearance work, etc.) in specific areas. These animals have allowed the fencing of an extensive surface area (65 ha) where the public and their dogs are forbidden access. The creation of this reserve with public access has undoubtedly benefited the colonization of the site by species of wildlife which shy away from human presence. At the same time, the deer fulfil a significant role in attracting visitors. However, the experience of these years has shown that it may be necessary to manage the densities of herbivores more frequently and even to fence off areas from grazing in order to favour the development of undergrowth, a habitat with interesting flora and wildlife species such as agile frog (*Rana dalmatina*). The combination of deer with more manageable livestock has not been ruled out for the future.

The actions done in favour of the autochthonous wildlife of Salburua are very varied and seek to promote the presence of the widest possible range of groups or species: from the installation of bat boxes or the piling up of dead wood in order to favour wood-eating insects to the installation of artificial nests or floating islands with different nesting substrates. The population of European mink (*Mustela lutreola*), the most threatened species present in the site, could be reinforced in the future with individuals bred in captivity.

One of the critical factors of the management of the site is the control of exotic invasive species. Action is being taken against American mink (*Mustela vison*), exotic fish and red-necked slider terrapins (*Trachemys scripta*). One of the challenges of the future is to reduce the densities of red crab (*Procambarus clarki*). Apart from physical removals during particularly dry summers, other measures are considered such as the creation of small seasonal lagoons free of non-native fish and red crab.

The public is directed by means of the existing paths through the less sensitive areas of the wetland, with the aim of preventing visitors from passing through the "heart of the site". It should be taken into account that in 2005 the number of visits to the park was estimated at more than 300,000.

With respect to ecological connectivity, the problems are concentrated in areas where rivers and streams cross under roads, leading to frequent deaths of wildlife and because of urban expansion which is to be developed in the southwest area of the park, and which means the sinking of two streams along their urban stretch which are important as corridors. A study-diagnosis was carried out in 2005 on the situation leading to a series of actions to be carried out in the future.

The other problems resulting from this urbanisation are highly varied: friendly design of the town-park borders, light contamination at night, increase in public use, etc. Work is being done together with other municipal areas in order to find appropriate solutions.

Finally, the integration of all the above aspects in a management plan is another of the aspects to be dealt with in the immediate future.

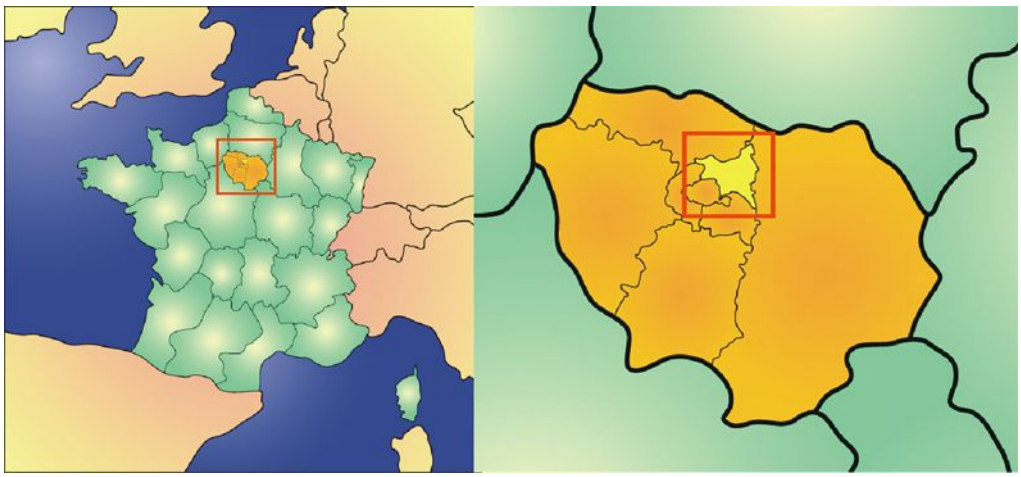
Biodiversity and the development of management in the parks of the département of Seine-Saint-Denis

Véronique Delmas (head of mission), Vincent Gibaud (assistant head of the Sausset Park Service)
and Guillaume Gaudry (assistant head of the urban parks service)

Why balanced management?

1 Location of the département of Seine-Saint-Denis

The *département* of Seine-Saint-Denis is a small administrative area (232 km²) located in the heart of the Ile-de-France region, within the area immediately surrounding Paris.



2 On the creation of the Département

- A highly urbanised area
- A very broken-up area
- A deficit of open and natural areas: 0.8m^2/inhabitant; 109 hectares for more than a million inhabitants

In the *département* of Seine-Saint-Denis, biodiversity has gradually been taken into account. In fact, since the creation of the *Département* in 1968, the official report on the alarming lack of open space led to a great policy to create large spaces in order to respond to the needs of the population in terms of leisure and recreation.

It is only through monitoring, through observations by nature protection associations, that awareness has been considerably raised of the fact that many plant and animal species have surprisingly come to establish themselves in these reconstituted open spaces in a dense urban environment.

3 The invention of an appropriate management system: balanced management

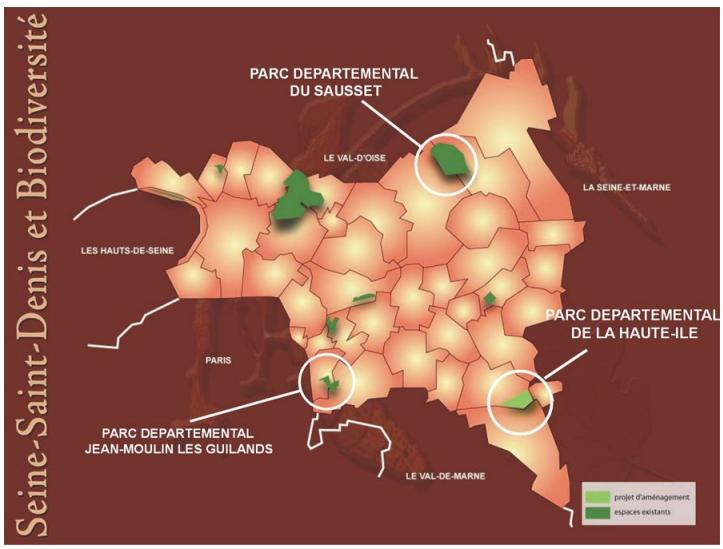
In order to take this natural wealth into account and, above all, to manage it better, ensuring the main objective of these parks (facilities for receiving the public) the concept of balanced management has been established since 1994. This so-called balanced management is the result of a consensus between the expectations of the different users and those of our association partners, who are activists promoting nature conservation and who have progressively encouraged more attention to be paid to natural ecosystems.

"Balanced" management is based on several tools: user committees, partnerships with nature conservation associations and a precursor tool intended to achieve better knowledge of our natural heritage in order to protect it better: the *département's* Urban Biodiversity Observatory

4 The three stages of development

We will now offer you an illustrated presentation on the development of balanced management through three parks typically corresponding to the successive phases of integrating biological requirements into park management.

In effect, the balanced management concept initially consisted of the adaptation of "landscaped" parks, like the one at Sausset, to "softer" and "differentiated" forms of leisure. This approach has then been developed by monitoring species during the re-landscaping, as at the Jean-Moulin les Guilands Park; to recently move to the full achievement of balanced management: the creation of the *département's* future La Haute-Ile Park. In fact, this new project has been constructed in order to bring together the optimum conditions with a view to developing ecosystems while ensuring that various public expectations (opinions notably expressed in users' committees) are met.



The *Département's* park at Sausset, birth of balanced management

1 Sausset: an innovative concept of open space in a highly urbanised area (1980). Very great support for the development of management methods and approaches in this kind of area.

- An area recently and rapidly devoured by the galloping urban development of the '70s.
- The will of a group to ensure the well-being of current and future populations.
- Competition for ideas won by Claire and Michel CORAJOUD in 1979. General idea of landscapers: bringing together disparate territory and not leading leisure to users. Means: reconciling the town and nature through the countryside: establishing a natural area away from urban pollution, with plants as the priority material (mostly indigenous plants) and with the land in place (agricultural land; plain of France; no embankments).
- Landscaping, taking into account the existing features.

2 From largely landscape-based approaches to the construction of the park to those of balanced management: the first trial and error efforts and the development of practices

How to reconcile public amenity (priority objective of the General Council) accompanied by the re-establishment of real ecosystems.
Examples of the development of maintenance methods:

- Meadows: from the half-mowing of the grass and reaping with the roll-out of flower meadows. Example of an obstacle: horticultural varieties in the half-mown grass.
- Forestation: from systematic maintenance of the undergrowth to clearing with management of dead wood and planning of nest boxes (sites not carefully enough thought out). Another obstacle: garden dormouse.

3 The revelation of a real wealth of existing heritage ('90s) and the establishment of partnerships allowing the necessary scientific and technical supervision

These initial works have made it possible to establish varied, interesting environments from a naturalist's point of view.

- Attention first attracted by the associations
- Faced with the lack of knowledge and specific skills, the need to establish partnerships quickly became clear.
- Achieving an inventory, recommendations and monitoring.

4 The sometimes difficult development of business practices.

- Difficulty in getting suitable material (scythes, for example, or exporting organic matter).
- Difficulty in changing too deep-rooted horticultural practices (planting in lines, chemical treatment).

5 Education necessary for the public to go alongside the change

A good indicator of response to user expectations: the opening of the Grove sector in 1995 has been followed by a 50% increase in visits. However, the change has led to misunderstandings; e.g.:

- notion of ownership of open spaces/choice of marking out treatment methods properly
- explanation of the interest of bare chalk soil, not mowing, etc.

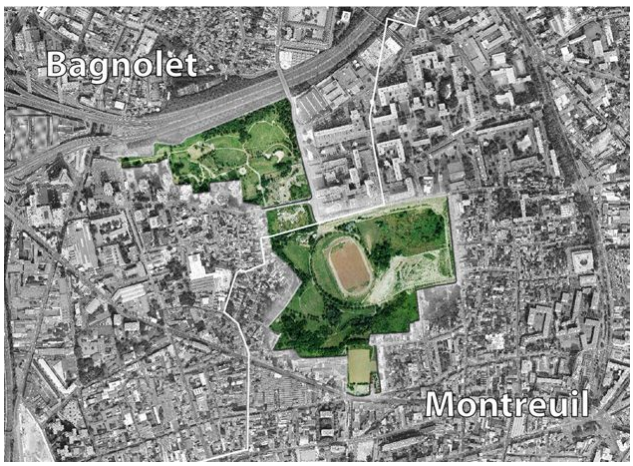
The *Département's* Jean Moulin-Les Guilands Park, an urban park as bridge with nature.

1 The urban and historical background to the project

- a very dense urban area with considerable pedestrian traffic
- marked topography, difficult access
- a park resulting from the reunification of two parks
- an important experience
- a series of undeveloped urban areas

2 The rehabilitation scheme

- a joint project
- a remarkable wealth of bird life
- concerns over disruption during the works
- a project approach: the committee of agents

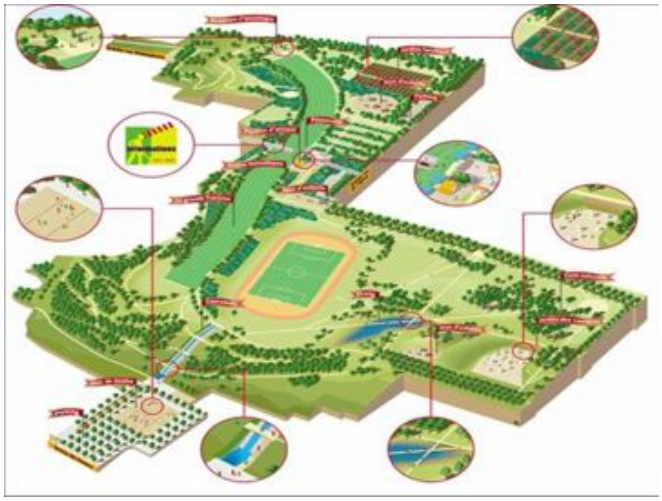


3 Monitoring the bird life

- a naturalists' association partner: CORIF
- a monitoring protocol: indicator species, listening, before/during/after
- exchanges: the committee of agents, ODBU

4 The adaptations of the project

- the elimination of a cross-park route
- the modification of the lake decking



5 The development of management

- the protection of the upper and lower undeveloped areas and doggy-parks.
- management of undeveloped land (clematis, shooting plants, herbaceous layer)
- protection of the lake

6 The necessary education

- the park centre and the explanation of the project
- the work of the wardens and technicians
- activities

7 The future of the park/the issues arising

- the traditional games area and ecological corridor between the two pieces of undeveloped land
- the development of ornithological monitoring protocols
- the development of lower levels of wooded areas

The *département's* Haute-Ile Park, a natural park

1 The urban and historical background to the project

- a preserved natural area
- the last non-urbanised meander of the Marne
- a first leisure-based project on the river bank
- very strong opposition to the project
- the reasons: archaeological assets and natural assets

2 Co-elaboration and the principles of the project

- the committee of agents (workshops, visits, conference)
- the steering committee
- a preserved central island (20ha)
- of ancient oak woodland (35,000m^3 rescued from rubble)

3 Monitoring the bird life

- a naturalists' association partner: CORIF
- a monitoring protocol: indicator species, listening, before/during/after
- exchanges: the committee of agents, ODBU

4 The adaptations awaiting works

- provision of clearings
- management of forestation and the central undeveloped area
- the management of the flagship sanctuary island
- bank work to construct new ecological environments (islands and Marne)

Conclusion

1 Constantly seeking a balance between the preservation of biodiversity and user satisfaction
The concept of conservation of biodiversity and user satisfaction in terms of management actions has developed considerably over time, because of:

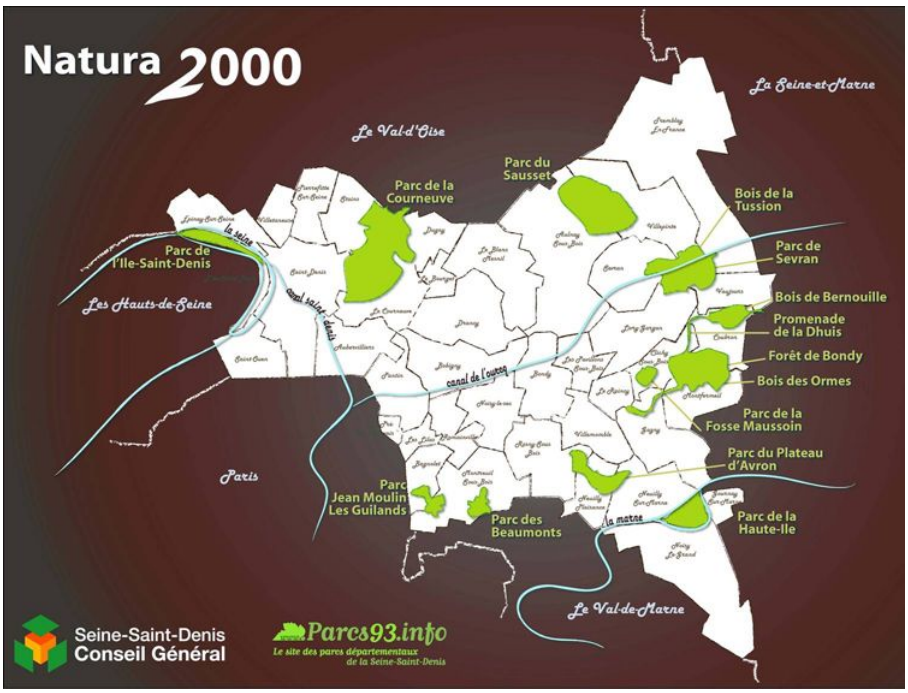
- changing public expectations
- created and modified environments and the species established there reproducing or no longer frequenting the sites

Consequently, the search for this balance is constant and necessarily still has to evolve to make continual adjustments.

2 Recognition of all work done in favour of biodiversity: the first French site in urban surroundings
So, all efforts undertaken over more than 10 years side by side with our association partners have led to the recognition of the biological wealth of Seine-Saint Denis through its recent classification as part of the European Natura 2000 network.

3 Natura 2000 in Seine-Saint-Denis:
Towards seeking biological connections, supported by:

- the parks on the Seine-Saint-Denis site
- the interstitial areas and areas outside the *départment's* boundary (the inter-municipal network and peripheral wild areas)



One of the biggest objectives of Natura 2000 in Seine-Saint-Denis, which is entirely innovative, is to develop, with the support of the *Départment's* Urban Biodiversity Observatory, our knowledge of the biological relationships between the different official parks on this site with others supported by small interstitial areas but also by parks outside the boundaries of the *département.*

Collserola Park: The study of biological diversity and its application to the park's management.

Francesc Llimona, Anna Tenés, Seán Cahill and Lluís Cabañeros (1) with the collaboration of Víctor Bonet-Arbolí and Guillem Molina-Vacas (2)
(1) Can Balasc Biological Station. Collserola Park Consortium
(2) Department of Animal Biology (vertebrates). Barcelona University

Barcelona's Collserola Park, a natural area with 8500 hectares under protection, suffers from very considerable anthropological pressures: urbanisation; heavy public use; and the presence of an extensive network of roads, forest tracks, and even a dual motorway and a railway line (forming a central axis which crosses and breaks up the park). This scenario, extensively covered in previous meetings of Fedenatur, represents a worrying point of departure common to most periurban sites. However, this study presents a new vision for Collserola Park, this time from the perspective of biodiversity and the importance of research in conserving the park's natural values.

Scientific name	Name	Annex II and IV Directive 92/43/EEC	Annex I Directive 79/409/EEC
Insectivores			
Atelerix algirus	Algerian hedgehog	*	
Amphibians			
Triturus marmoratus	Marbled newt	*	
Alytes obstetricans	Midwife toad	*	
Pelobates cultripes	Western spadefoot	*	
Bufo calamita	Natterjack toad	*	
Hyla meridionalis	Stripeless tree frog	*	
Insects			
Cerambyx cerdo		*	
Lucanus cervus	Stag beetle	*	
Bats			
Rhinolophus ferrumequinum	Greater horseshoe bat	*	
Miniopterus schreibersi	Schreiber's bat	*	
Birds			
Circaetus gallicus	Short-toed eagle		*
Falco peregrinus	Peregrine falcons		*
Bubo bubo	Eagle owl		*
Caprimulgus europaeus	European nightjar		*
Sylvia undata	Dartford Warbler		*
Lullula arborea	Woodlark		*

1) Biodiversity in Collserola Park

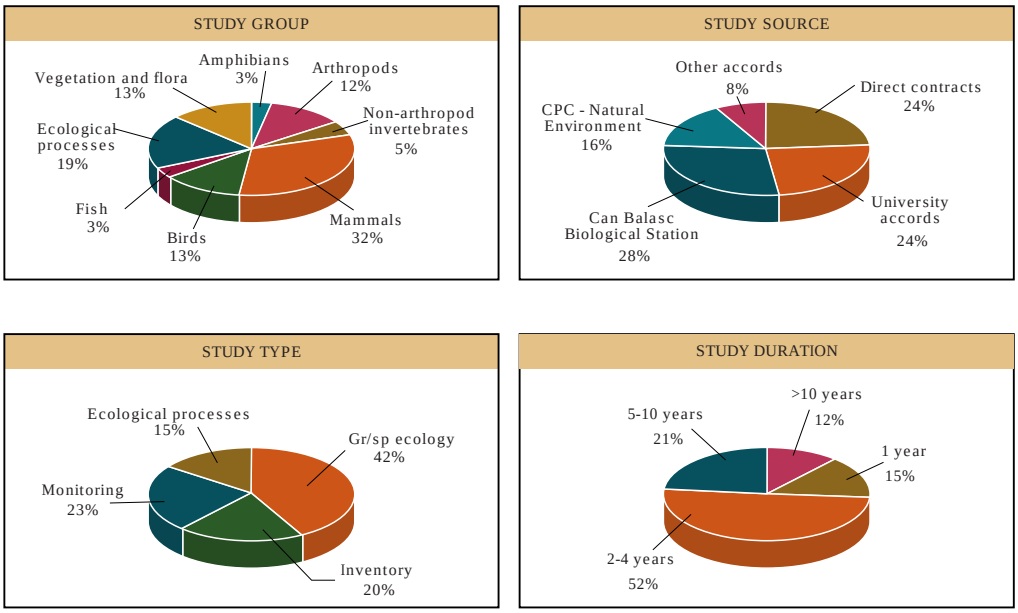
From a natural history and scientific point of view, Collserola Park is of undeniable interest. The perception of the park has evolved from valuing it in relative terms, -basically defined by its location in a heavily humanised area-, to the current situation with an objective assessment of the far from negligible natural values.
The basis of the park's biodiversity undoubtedly lies in the diversity of its landscape. Although woodland is predominant, the presence of different areas of landscape typical of Mediterranean mosaics should also be noted. Open landscapes in the periphery of the Park: farmland (6.4%), dry meadows of hyparrhenia grass *(Hyparrhenia hirta*) (3.2%), open scrub (14.6%) and maquis (5%), harmoniously complement the different types of woodland present: mixed forests with stands of pine and holm oak (60%), holm oak woods with deciduous oak (*Quercus cerrioides*) (2.5%), and riverine habitats (0.5%). This array of landscapes is the chief factor in the great diversity of species found in Collserola.

According to data from the different studies done within the park and the Biodiversity Databank of Catalonia (BioCat) the following species are known to be present in Collserola:
2850 species of plants: Cormophyta Flora (1438), Fungi (1114), Lichens (102) Bryophytes (60) and Algae (13); and 2615 fauna taxa: Molluscs (124), Insects (1956), other arthropods (232) and Vertebrates (303).

The presence in the Park of a number of species of special interest (see Table page 1) has led to Collserola's recent inclusion in the Natura 2000 Network.

2) Research in Collserola Park

The basis for studying the park's biodiversity has undoubtedly been the continued research over almost 20 years of management carried out by the Consortium. The Can Balasc Biological Station runs an extensive programme of its own studies; the chief aims of this research are: to gain knowledge of our natural heritage, their application to the management and conservation of the Park; and education and awareness campaigns on the values of Collserola among the general public.



The most commonly used methods are *stratified monitoring* of the different habitats found in the park which enable us to understand the value of each unit of landscape. The Park has traditionally used *relative indexes* which are comparable between habitats and between different years (monitoring) rather than static censuses of an absolute type which are particularly complex and of little use in these habitats. The most important studies

carried out include those on groups of invertebrates such as Orthoptera, Hemiptera, Molluscs and Rhopalocera (in the framework of the Butterfly Monitoring Scheme).
A number of *long-term monitoring schemes* are being carried out within the park including birds in spring and winter, and the control of animals run over on the park's roads (the latter scheme has been running for more than fifteen years).

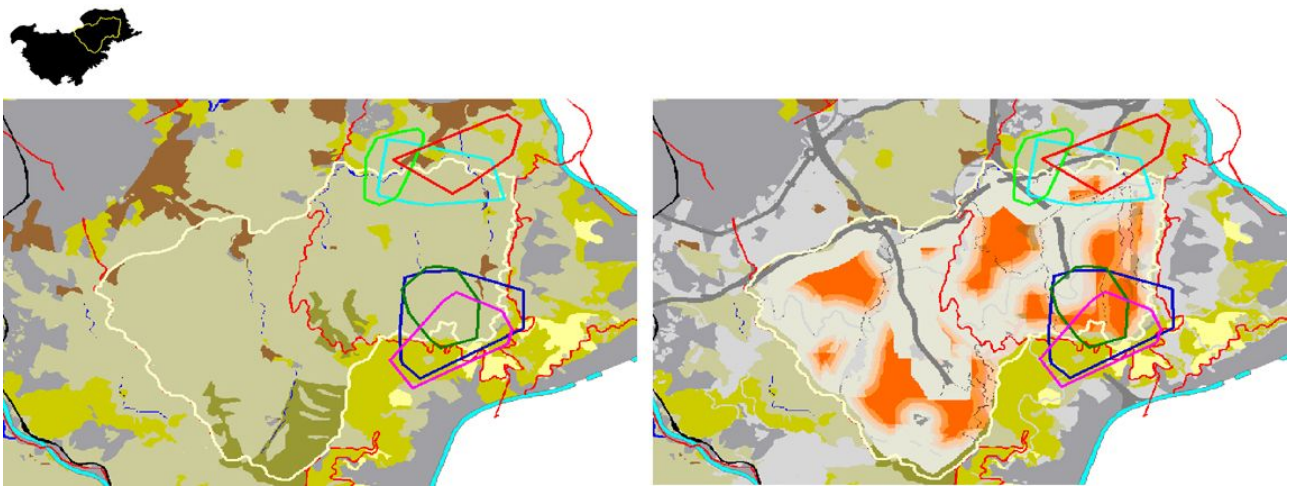
The methods such as radio-tracking have been used considerably in monitoring mammals and have enabled some very useful insights into the problems typical of a periurban area.

3) The application of research in the management of Collserola Park

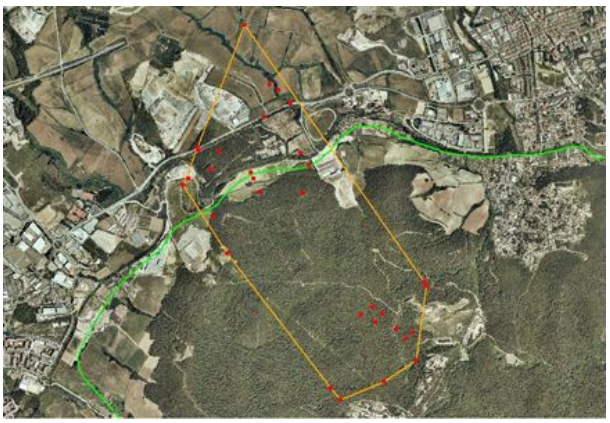
The main processes which have a direct impact on biodiversity in periurban areas are: a) the loss of habitats, particularly the Mediterranean farmland-woodland mosaic landscape on the park's edges, b) the fragmentation of land due to road infrastructures and urbanisation, c) the direct impact of infrastructures: road casualties d) isolation from other protected areas, e) the presence of exotic invasive species, and f) the high level of use by the general public leading to problems of habituation which in turn, lead to conflicts difficult to resolve.

Our studies illustrate the diversity of problems and the multitude of responses by wildlife. We have chosen a few examples of the different study cases which are linked to the park's management:

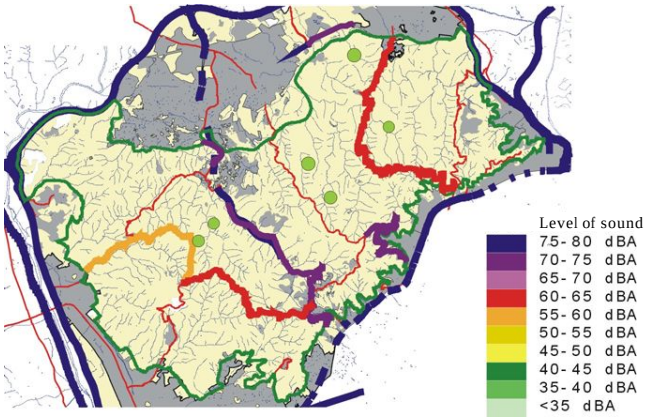
- The studies done on wild boar (*Sus scrofa*) have been directly applied in order to understand issues related to fragmentation and the acclimatisation of boars to humanised areas.
- The study on genets (*Genetta genetta*) has provided information in order to assess the impact of road infrastructures covered in the General Plan with a significant reduction in suitable habitat fragments.
- The research work by the University of Barcelona on badgers (*Meles meles*) has alerted us to the loss of habitat in the peripheral areas of the Park.
- The monitoring of a generalist species such as the fox (*Vulpes vulpes*), demonstrates the high level of isolation of the park from other Protected Natural Areas.
- The study of species sensitive to disturbance such as nesting birds of prey have improved dramatically since the start of work done on noise contamination in the park.



Range areas of six genets (*Genetta genetta*) followed by radiotracking (Camps, 2000) in relation to their current habitat in the eastern sector of Collserola Park (left), and a simulation of the loss of core habitat due to fragmentation (in red) under the possible future scenario forecast in the General Metropolitan Plan (right).

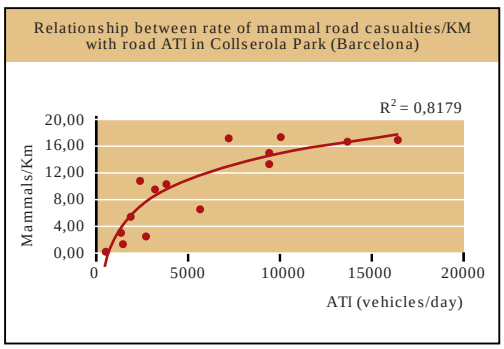


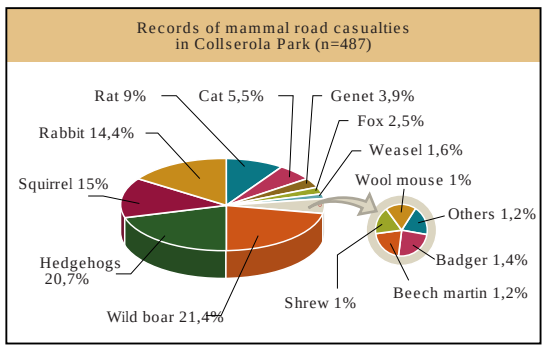
Badgers (Meles meles) detected inside and outside the Park showing the use of agricultural habitats in the periphery of the protected area (limit in green), along with the importance of streams as connectors. (Unpublished data by Guillem Molina-Vacas)



Location of some nests (green dots) of bird of prey (buzzard and goshawk) located in particularly quiet points of Collserola.

- The tracking of animal casualties on the park's roads is another of the longest-running schemes in Collserola. In the framework of a wider study project on the impact of road infrastructures on wildlife, the data of road casualties collected since 1991 have been analysed. 788 incidents of road casualties have been registered in the GIS-fauna of the park of which 425 correspond to mammals. (See chart). The analysis of the incidents shows a positive relationship between the number of road casualties/km and ATI (Average Traffic Intensity). The existence of black spots has been demonstrated and these differ according to the species. For example, in the case of the wild boar, these black spots are located in areas connecting the two large forested areas of the park.





- Another subject directly related to the biodiversity of periurban sites is the presence of exotic invasive species. In Collserola a quantitative study has shown the spectacular invasion process of the Red-billed leiothrix (*Leiothrix lutea)*, a bird originally from the East of Asia.
- From another perspective, the recent tracking of bats *(Miniopterus schreibersii*) has provided a very useful tool for finally incorporating Collserola in the Natura 2000 Network.

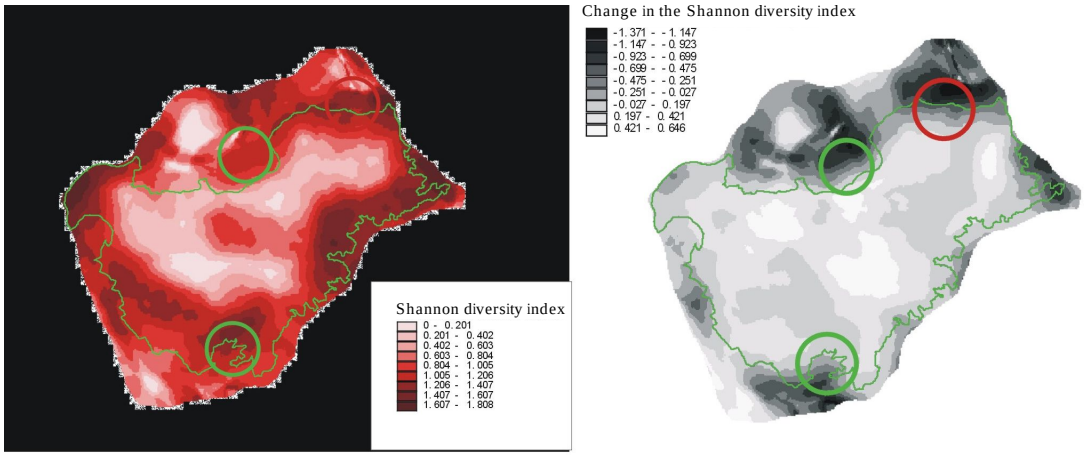
4) Comparing the current and forecast scenario according to urban planning.

This simulation exercise currently represents one of the most interesting lines of work carried out by the park's Technical Services. By using landscape ecology parameters and variables, different maps have been produced which illustrate the changes in terms of losses of quality habitat or the reduction in core areas both for particular species and for the future of the park's biodiversity.

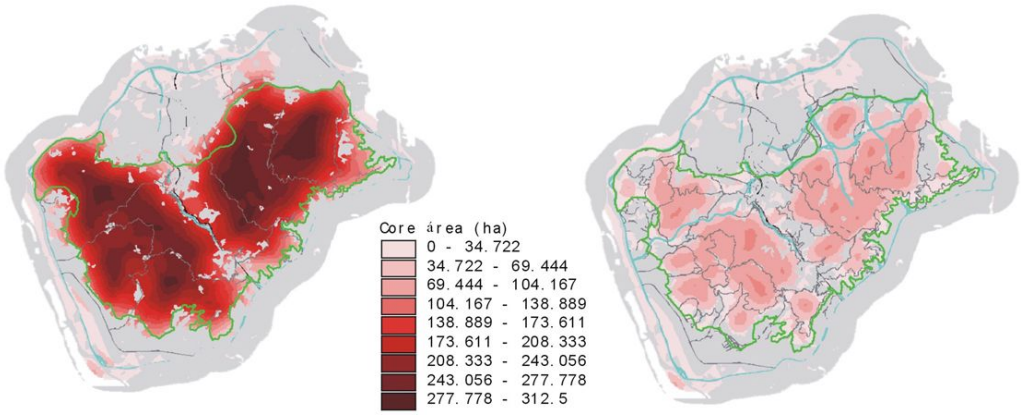
Studies using a comparative analysis between fragmentation parameters have shown the different degrees

of threats posed by the development of urban planning forecast for the future.
In this sense and by means of a simulation process, a warning is given of the consequences of developing projects still in effect in terms of:

a) The loss of environmental biodiversity, particularly significant in the park's periphery and which affects Mediterranean mosaic landscapes.
b) The effects of fragmentation which new road infrastructures would cause.



Simulation of the change in biodiversity, measured by the Shannon index, due to the development of still-operative projects. On the left, the distribution of the current values of the Shannon index, where the importance of the periphery of the park can be seen. On the right, the change in the Shannon index under the future scenario: the peripheral areas are the most affected.



Simulation of the change in fragmentation of the territory, measured with the size of the core areas, due to the development of projects still in effect. A core area is an area not affected by any infrastructure. The level of effect varies in function of the type of infrastructure and the type of habitat in which this is located, calculated following the work by Forman. On the left, the distribution of current core areas. On the right, core areas under the future scenario.

5) Looking towards the future with optimism

The recent achievements in terms of the conservation of the park, such as the possible inclusion in Natura 2000, the current work being done on the declaration of the future Natural Park and some modifications to the General Management Plan make us feel optimistic in terms of the consolidation of the protection of Collserola.

MANAGING A POPULATION OF WILD BOAR
Managers, hunters and the National Hunting and the Wild Fauna Office (ONCFS) co-operate to manage a population of wild boar…

Alain Morand, scientific director and curator of the St Quentin National Nature Reserve in Yvelines
Xavier Gruwier, technician of the St Quentin National Nature Reserve in Yvelines
Laurent Dufresne,ecoguardian of the St Quentin National Nature Reserve in Yvelines

Introduction

1 *Location of the Leisure Complex and Nature Reserve*

- On the western edge of Paris (30km) in the *département* of Yvelines (2285 Km2)
- A formerly forested and agricultural area now strongly urbanised
- A New Town = group of municipalities (around 150,000 inhabitants)
- A regional leisure centre (600ha) including a National Nature Reserve (90ha) inside the New Town
- Very broken-up territory (highly fragmented natural areas)

2 *The wild boar: a species whose population is growing (perhaps dramatically)*

In France

- Among large game species it is the one that arouses the greatest debate
- Number of individuals has increased tenfold in 30 years
- Serious economic, ecological, health and social problems

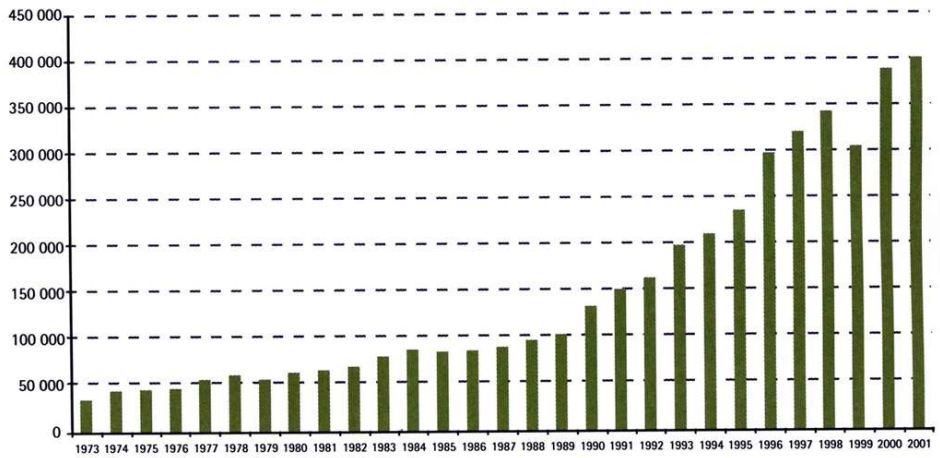


Figure 1 : National annual evolution of wild boar captures. Data provided by ONCFS-FDC (2002).

Concerning the Leisure Complex: three types of area juxtaposed (agricultural area, park/lake area (golf, water- and land-based leisure...), natural areas including a national nature reserve in the western part)

- Site favourable for development: reedbeds, scrubland, forests, sometimes maize fields
- Range of food resources, tranquillity and development
- Site no longer hunted since 1970
- Serious problems

	93-95	96-97	98-99	00-02	03	04	05	06
Golf	++	-	++	+	+	++	++	+
Reserve	++	-	-	-	+	++	++	++
Camp site	-	-	-	+	+	+	+	+
Agricultural land	++	-	+	+	+	++	+	++

Table 1. Nuisances inside the leisure complex
Legend : - without significant nuisances ; + medium nuisances ; ++ strong nuisances

3 *Obligation to regulate (and decision to eradicate) the wild boar population*

- 18 November 1992: decision by the Nature Reserve Consultative Committee – a body bringing together local representatives, decentralised State services, naturalists', leisure and sporting association representatives under the regional *Préfet*, meeting once a year – to eradicate wild boar
- From 1993 to 2003: different techniques have been used under the authority of the Lieutenants of Louveterie.

During the 2003 campaign, the existence of a doubt concerning the wish to regulate the population (trophy hunting) led us to suggest managing regulation by making traps, a method implemented and piloted internally. Administrative hunting in addition to the traps, piloted by the ONCFS, was ordered by the *Préfet* via the *Département's* Directorate of Agriculture and Forests, State Service (DDAF) to limit the risk of road collisions (following some very serious accidents in Le Yvelines) on the main roads around the Leisure Complex...

	93-95	96-97	98-99	00-02	03
Techniques used	Direct shoots (Hunters)		Traps and shoots		Shoots in the night (Hunters)
Results	60		10		1 wild boar (> 130 kg / 11th trophy hunting)

Table 2. Different operations to regulate the population carried out until 2003

4 *Two main techniques: advantages/disadvantages*

Without going into detail, we now offer you a presentation of these two means of managing the population: trapping and administrative hunting
Alongside these, the fences around the Leisure Complex covering part of the perimeter were maintained and even changed (there are sometimes and will always be movement in and out between BPAL and the exterior...). In addition, since 2004, the golf course, a concession holder from the centre, has put quite effective electric fences in place…

	Season 2004-2005	Season 2005-2006
Conception Construction	YES	NO
Organisation	YES	YES
Maintenance / Change	YES	YES
Feeding with grain	YES - Leisure complex (equip from the Natural Reserve) - Voluntaries (hunters)	YES - Leisure complex (equip from the Natural Reserve) - Voluntaries (hunters)
TOTAL time	60 days/person (i.e. 3 months Full Time Equivalent)	40 days/person (i.e. 2 months Full Time Equivalent)

Table 3. Allocation of time by activities

The trapping technique

Time and money for setting up the traps (Leisure Complex/Nature Reserve, volunteer hunters) in co-operation with the ONCFS... Then, it is a question of making them work, baiting the traps with maize and checking them to shoot the animals (the volunteer retired hunters, with whom we have co-operated in a very good atmosphere, have taken care of this).

	Human cost	Materials,…	Results (number of individuals)
Season 2004-2005	~ 3 months ETP	1500 € (to construct the traps) 600 kg de maïs	7 females 7 males 8 piglets
Season 2005-2006	~ 2 months ETP	1000 € (for improving the traps 1 tone of corn	10 females 7 males

Table 4. Results in terms of human and financial cost and number of captures

The balance over two seasons

From this picture, we can state that:
– The first season took up 3 months full-time equivalent person/days; the second, 2 months, 1/3 from the team and 2/3 from the volunteers from the association of local hunters...
– The number of captures was 22 wild boar in the first season and 17 in the second season of captures, a relative success which pleasantly surprised us (many people had told us we would get none or very few...).
- Some wild boar escaped, leading us to improve the effectiveness still further. Another problem detected was that adult wild boar are capable of getting over 1.70m without backward movement, supporting themselves however they can ...(4 wild boar escaped in this way this season, 2005-06)…

Administrative hunting

- 2004/2005 season (24 March 2005) and 2005/2006 season (7 December 2005)
- In several areas (nature reserve, agricultural land...)
- Under the responsibility of ONCFS in co-operation with our services, the organisation can be broken down into several stages:

1/ Preparation (when? how? where? who?) 2/ Location and establishment of a watchtower 3/ The hunt itself (this takes half a day or a full day). This involves agreement and organisation for making the hunting areas safe, which may involve the total closure of the Leisure Complex if this is judged necessary. The total human time corresponds to around 1.5 months...divided, of course, between about 15 wardens from the office and 5 or 6 people from our services mobilised for the occasion...

	Season 2004/05	**Season 2005/2006**
Preparation	ONCFS & Leisure complex (Natural Reserve)	ONCFS & Leisure complex (Natural Reserve)
Location	ONCFS & Leisure complex (Natural Reserve)	ONCFS
Establishment of a watchertower		ONCFS & Leisure complex (Natural Reserve)
The hunt itself	ONCFS & Leisure complex (Natural Reserve)	ONCFS & Leisure complex (Natural Reserve)
Making the areas safe	Leisure complex (Technical services Natural Reserve County Police)	Leisure complex (Technical services)
TOTAL	29 days / person	27.5 days / person

Table 5. Organisation of the administrative hunting during two seasons

	Saison 2004/05	Saison 2005/06
Human and material costs	~ 1.5 months Full Time Equivalent	~ 1.5 months Full Time Equivalent A watchtower
Number, gender and age of the hunted wild boars	8 adults (6 females, 2 males, 9 piglets)	3 adults (1 male, 1 female. 1 unknown)

Table 6. Results of the administrative hunting (season 2004/2005 - 2005/06)

Conclusion and prospects

	Traps	Administrative hunting
Effectiveness	+++	++
Limites / constraints	Malicious deterioation Habituation of the wild boars	Blessed animals Surface/accessibility (water level), facility to shoot
Equipe Natural Reserve	~ 30 days / person / season	~ 10 days / person / season
Material costs	++	0
Disturbance to the fauna	+	++ Choice of dogs
Period	+++ Automn-Winter (hunting season or special authorisation)	- Not always adapted to the faune/flora To be chosen in agreement
People safety	+	Public access closed / respect of instructions
Collaboration	++ (ONCFS, Hunters)	+ (ONCFS)

Table 7. Advantages and drawbacks of trapping and administrative hunting from the point of view of a manager of natural space during the sessons 2004/2005 and 2005/2006

- Balance of administrative hunts (season 2004/2005 - 2005/06)
- 1st hunt = 8 adults (6 females, 2 males + 9 young) = 17
- 2nd hunt = 3 adults (1 male /1 female / 1 unsexed) = 3

Conclusion

If, in conclusion, the advantages and disadvantages of techniques for regulating the wild boar population are compared:

- The trapping method was more effective to date if one looks only at the figures (39 wild boar as against 20)
- The trapping protocol has allowed us to move closer to the local hunters
- However, it takes time (an average of 25 p/d for the team; 15 p/d for volunteers) for our services as the bulk of the work was done (manufacture of traps), shifts – trapping and disposal of the animals... We have the good fortune to have the retired hunters who like doing this...
- A non-negligible cost (already ¤2500 internal to BPAL)
- Concerning hunting, there are imposed dates which perhaps are not always the best chosen ones etc.… (matters to be improved between services..) and many difficulties linked to the relatively large area, the fragmentation of the environments favourable to the species, etc.

Forgetting the term "eradication" (there will always be some of them, unless the area becomes a "blockhouse" (difficult to envisage and undesirable)) but using that of "regulation" (within the idea of reducing the size of

the population to an acceptable threshold from the point of view of the leisure complex, the fauna and flora of the nature reserve and minimising the risk of road accidents...)

Limiting entry into sensitive sectors (effective fencing...), alerting cars of the risk of "game" crossing etc...(work of the DDE, etc...).

It is a question of maintaining constant regulation pressure to prevent over-population...and continuing to associate different methods

- Traps
- Armed hunters on duty at night (non-negligible investment)
- Administrative hunting

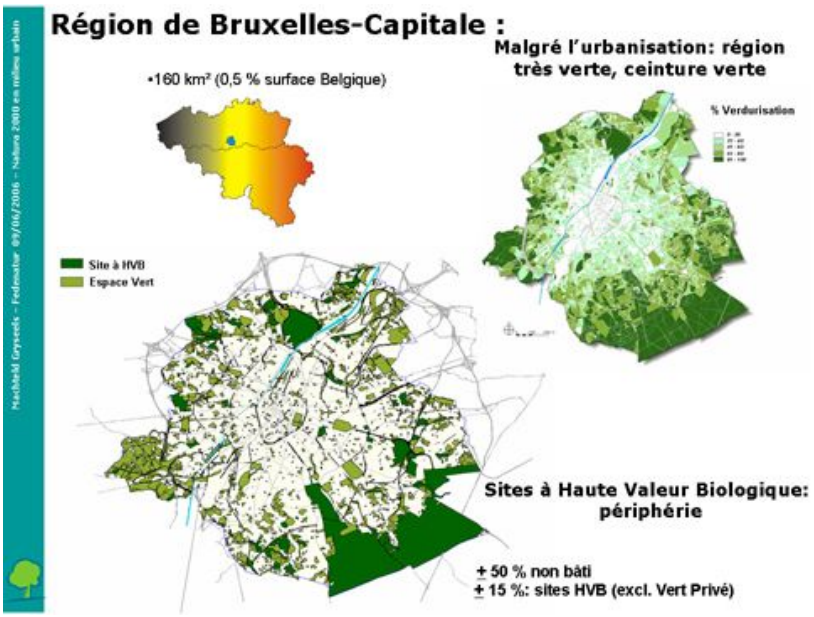
These techniques together, being carried out in agreement and with respect for safety regulations and for the fact that we are a small Natura 2000 site (national nature reserve) easily susceptible to becoming fragile as a result of any poorly organised operation.

NATURA 2000 IN THE CITY OF BRUSSELS REGION AND SOME OTHER EUROPEAN CITIES
Nature and biodiversity conservation in the urban context

Matcheld Gryseels, Institut Bruxellois pour la Gestion de l'Environnement (IBGE)

My paper consists of two parts. First of all I briefly present what Natura 2000 represents in the City of Brussels Region (RBC) and the important threats and management implications for nature and biodiversity conservation in the urban context. I then present the preliminary results of a study of this issue in other European cities.

The City of Brussels Region, lying in the centre of Belgium, has a surface area of around 160 km^2. Despite urban development, the region remains very green: almost 50% of its area is not built up. It is worth noting that the level of private gardens is high (not in the centre), as is the proportion of public open spaces. These are not just urban parks – about 15% of the Brussels area is covered with open spaces with a high biological value.



These are above all wooded areas, including the Soignes Forest, which is the site for which Brussels is a member of Fedenatur, and which now represents 10% of the region's surface, as well as some notable remains of marshy valleys.

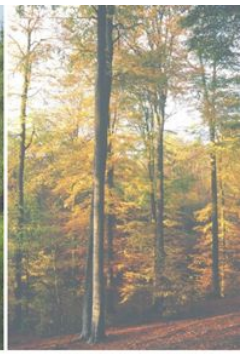
Despite its urban nature, the Habitat Directive therefore applies to Brussels, with the presence of 9 types of habitat from Appendix I (particularly forest habitat, although only a small area) and 8 species of fauna from Appendix II: 5 species of bats, the stag beetle, the bitterling and a small mollusc (which moreover has just been discovered).
Bats represent the most important group of species from Appendix IV. This natural wealth in RBC (17 species have been identified) comes from the large number of old trees in the forests and parks and the presence of numerous lakes in the adjacent landscaped parks. A LIFE-Nature project has identified the bats as the thread running through the selection of Special Conservation Areas.

However, the urban context has compelled us to interpret Appendix III broadly. In the selection of Special Protection Areas (SPAs) we have distinguished two types: nodal stations, essential for maintaining habitats and species (e.g. as rest, reproduction and feeding sites for the bats), and relay stations linking the nodal areas and consolidating the network.
The overall vision in designating Natura 2000 sites in Brussels is the significant area: we have distinguished three coherent sets of sites (SPAs), made up of node stations linked by relay stations, a total of 14% of the total surface area of Brussels:

SPA I: Soignes Forest, with its margins, wooded areas, landscaped parks and marshes in the neighbouring Woluwe Valley (the parks are essential as a foraging area for the bats);

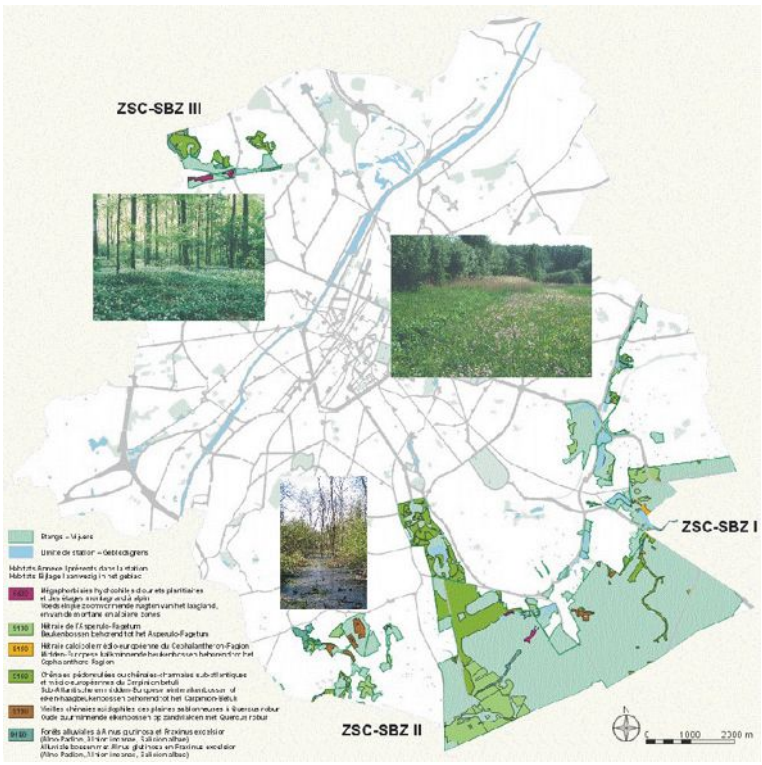
SPA II: Wooded and open areas to the south of the RBC. These consist of old forests and damp forests, as well as more open habitat.
SPA III: Wooded areas and wetlands in the Molenbeek Valley to the north-west of Brussels.

Vallée de la Woluwe (Hof-ter-Musschen)



Forêt de Soignes

The EC accepted this SPA proposition and has designated them Sites of Community Interest (SCIs). This means that now the real work must be done: official designation by the Brussels government as SCIs and drawing up a management plan based on objectives of conservation in a favourable state, followed by implementation, assessment and monitoring.



And, during the implementation, the typical problems of an urban region like Brussels have been encountered: The small area of many of the stations in the SPAs, fragmentation, the many effects of forest margins, pressure

for urban development, basically on buffer and marginal zones, which are not always protected, and, of course, a high level of recreational pressure.

Here are some examples of these difficulties:
- fragmentation of the Soignes Forest by roads and railways;
- pressure for urban development: marginal areas, essential as buffer zones but not always officially established as open space, are threatened by development schemes. In the few relevant impact studies carried out, it appears that it is very difficult to prove significant direct effects;
- and, as we are in an urban environment, recreational pressure is, of course, very high: there are so many visitors with different purposes: walkers, families, joggers, cyclists, mountain bikers, horse riders, dogs (a very big problem), youth associations seeking adventure sites (which are moreover becoming rarer in the urban environment – wasteland is increasingly built on and only the protected open spaces remain.) Despite all communication and education efforts, this pressure sometimes seems to become unmanageable... The damage is quite visible...

This leads me to a question regularly asked by urban planners and managers: does nature conservation in an urban environment make sense? Natura 2000 was not even designed for urban areas, was it? My answer? Nature conservation does make sense:

- not just for biodiversity in itself, although, we would be astonished to find the high level of biodiversity present in urban environments compared with the surrounding rural environment.
- But also, and above all, for increased sensitivity and awareness raising: let's not forget that most people live in an urban environment and it is in these environments that political decision-makers can be found. Contact with nature is therefore essential for raising awareness of the importance of biodiversity at a world level.
- And, of course, the presence of nature is essential for developing a high sustainable quality of life in towns.

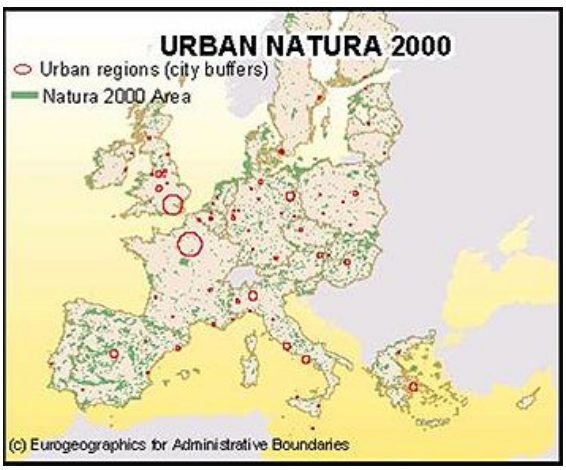
But the challenge is huge: how can we reconcile nature conservation with the public demand for "contact with nature" without degrading habitats and losing biodiversity?
It was when carrying out this exercise that the need was felt in Brussels to get a view of this problem in other European towns and urban regions.
This is why the Ecosystems research bureau, which has already contacted you in this context, has been commissioned to carry out a study.
The objectives of this study are:
- to analyse management aspects concerning Natura 2000 and nature in general in urban environments
- to make recommendations for the RBC
- to come up with ideas to integrate the requirements of Natura 2000 into the urban political context.

The bureau is completing its report at the end of June, but here I present you the first results of this study, which have already been presented during Greenweek, organised by the EC, which took place in Brussels last week on this year's theme of "biodiversity".
The study gives a view of the responses of the cities contacted to the following questions:

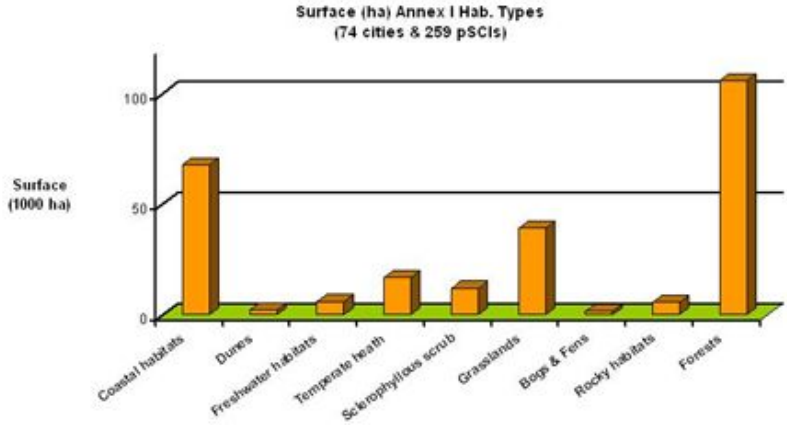
1) What is the contribution of urban areas to biodiversity?
2) What are the pressures on this urban biodiversity?
3) What is the reaction of cities to these pressures?

The survey is still going on, but the cities that have already answered and have taken part in this first analysis were Berlin, Hamburg, Vienna, London, Edinburgh, Amsterdam, Helsinki, Prague, Bratislava, Ljubljana, Barcelona, Valencia, (Paris)…

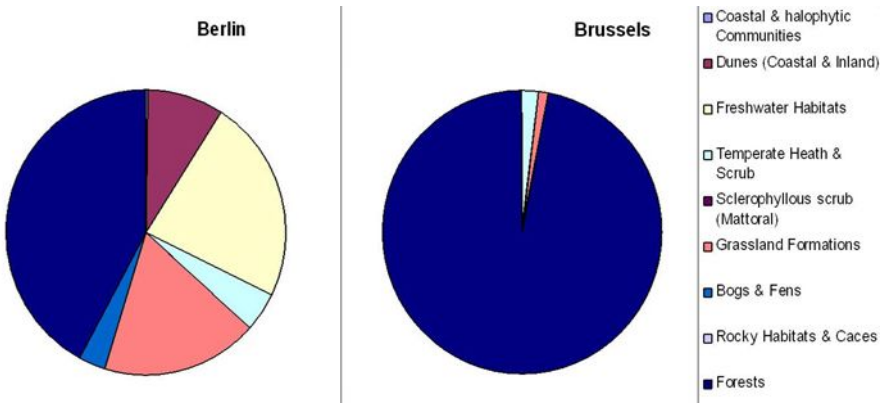
Let's talk first about the contribution of urban areas to biodiversity, particularly Natura 2000.
There are 300 Natura 2000 sites in or near to cities.
The map shows the Natura 2000 sites in Europe and the urban areas.



Concerning large urban areas: there are 74 cities with more than 500,000 inhabitants: 40 with Natura 2000 sites in or near the city.
Concerning capitals: 13 capitals have at least one Natura 2000 site, 7 capitals have Natura 2000 sites nearby (e.g. Amsterdam) and 5 capitals have no Natura 2000 sites



This diagram illustrates the division of types of habitat: around 100 types of habitat are present; note the high level of forest.



This diagram illustrates the comparison of Natura 2000 habitats between Brussels and Berlin: you will see the importance of Soignes Forest in Brussels…

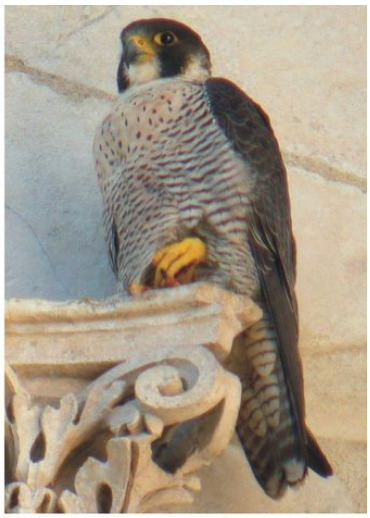
Many species included in the appendices are also present on urban Natura 2000 sites:

- 230 birds
- 20 mammals
- 39 fish
- 35 invertebrates
- 35 plants.

Some notable species come up more than others and can serve as emblematic species:

- *Lucanus cervus* (the stag beetle) > 50 sites (Brussels, London)
- *Myotis myotis* (the greater mouse-eared bat) > 60 sites
- *Rinolopholus hipposideros* (the lesser horseshoe bat) > 50 sites
- *Circus aeruginosus* (the marsh harrier) > 50 sites

Stag beetle



Pelegrin falcon

Cities and urban regions have also sometimes made a special contribution to the Natura 2000 network: for example, the contribution of old landscaped parks is notable as cultural landscape. They are important for their old trees (insects, bats) and the long-term management of meadows and grassland, which are generally not treated with pesticides, herbicides or artificial fertilisers.
There are some good examples in Brussels (Cambre Woodland, Woluwe Park) and in Berlin (Pfaueninsel).
In cities, there are old buildings which can be very important refuges for bats, such as the Tournay-Solvay Park in Brussels and the Spandau fortress in Berlin (which houses an impressive colony of bats).

Tournay - Solvay (Bruxelles)

Pfaueninsel (Berlin)

But cities and urban areas also contribute to general biodiversity. They are often more diverse than rural areas. In fact, a great diversity of biotopes is generally found in them:

- natural biotopes (forests, dunes, …)
- semi-natural biotopes (meadows, marshland, …)
- "cultural" biotopes (parks, gardens, walls, wasteland…)

A high level of diversity of biotopes results in a high level of species diversity.
For example, the majority of cities show between 800-1500 plant species
(RBC: 750 sp, Belgium: 1500 sp.); and some special, rather uncommon species are often found there, such as the peregrine falcon, the stag beetle, bats….
In general, a great difference in the quality of biotopes is found in cities: from very high to very low.

But urban biodiversity is under pressure!
There are general pressures present in urban and rural environments: drying out, eutrophication, fragmentation, pollution, lack of proper management.... But certain pressures are specific to or more pronounced in the urban environment: fragmentation and breaking up, disturbance (vandalism...), light and noise pollution…
The city is also a dynamic place:

- with dynamic transport which causes more traffic and therefore greater fragmentation, breaking up sites
- with demographic changes (representation of certain age bands, population of diverse origin...)
- the economic drivers are also changing: e.g. there was once strong demand for railway stations, now there is a great demand for the construction of social housing…

How do cities react to these pressures?
The approaches are very different:
There are differences in structure and responsibilities. (Is it one city or a region like Brussels? Distribution of powers at local, regional, national level…). There is the historical context. There is the difference in the operation of administrations: are they weak or strong? For example, Berlin has a very strong administration...
Concerning collaboration, e.g. the partnership system is greatly used by British cities.
There are also different ways of communicating.

The lack of information is not generally a problem.
In general, there is a good knowledge of the species and biotopes present in the urban environment (atlases, red lists, although they are not always up to date); but the "favourable state of conservation" demanded in the Habitat Directive is still little developed.
Cities are clearly an opportunity for data collection, with the use of experts in the urban environment (universities, experts...) and the use of current volunteers.

Concerning protected areas as "natural sites", cities are quite active: there are a lot of initiatives concerning the protection, restoration and management of new "protected" sites, as well as several compensation systems if an open space is lost (e.g. Berlin). Remaining problems often include the lack of a management plan as well as the management of urban problems.

The study reveals opportunities with the better use of existing networks (Eurosite, Fedenatur, Purple...) and the participation of users in the monitoring and management of urban problems.

Concerning unprotected areas as "natural sites", cities are less active. Above all, action concerns "ad hoc" activities: several cities are working with the concept of green and blue grids of ecological corridors, some cities are more advanced than others in the greening of buildings (green roofs & façades, green islands).
But bigger problems remain:
How can open spaces whose "biological value" is low (e.g. wasteland? definition?) but which are important as buffer zones be protected.
The conservation of non-wooded areas still remains more difficult.
Urban policy does not respect the (potential) "nature" and "recreational" value of these areas, which leads to the increase of recreational pressure on protected areas…
The study reveals some opportunities: in creating constructive and positive relationships with other users of open spaces and in the use of opportunities to integrate nature into the urban environment.

Conclusions: Nature and Natura 2000 in cities and urban areas
Positive aspects

- Urban areas: important contribution to European biodiversity
- Living in harmony with nature in the urban environment too: possible
- Lots of examples of an "ad hoc" approach
- Positive experiences of collaboration (private-public) networks and partnerships between administrations

Negative aspects

- General lack of strategy:
  - Lack of vision of many authorities
  - Lack of planning -> creation of conflicts

Solutions

- Development of an urban strategy for biodiversity
- Use of networks: exchange of expertise, anticipation of problems…
- EU-urban strategy

The safeguard of biodiversity in the proposed Sites of Community Importance

Alberto Girani – Manager of Portofino Park (Parco di Portofino)

On the 24th of May 1909 in Sweden, the homeland of Linnaeus, the first European park was established, inaugurating a form of biodiversity safeguard destined to having a significant follow-up in all of the Old Continent's nations.

Sweden also sees an important moment for the safeguard of nature with the United Nations Conference on the Human Environment, held in Stockholm in 1972.

113 nations gather and draft an action plan with 109 recommendations. Moreover, they adopt a Declaration endorsing 26 principles on human rights and responsibilities with regard to the environment, among which:

- Freedom, equality and right to adequate life standards
- Natural resources shall be protected, preserved, adequately rationalized for the benefit of future generations
- The conservation of nature shall have an important role within the legislative and economic processes of the States.

Via this Conference, Europe develops new conceptions for the safeguarding of biodiversity, which align to, intersect to and overlap with the policies about parks at a national level first, and at a regional one later.

The first one is specific and focus on the conservation of wild birds, which almost simultaneously sees the Bonn Convention about the conservation of the migratory species belonging to the wild fauna, with annexes, adopted on the 23rd of June 1979 and la COUNCIL DIRECTIVE (79/409/EEC) dated 2nd of April 1979.

The second one, which is more general, issued by the Bern Convention and relative to the wildlife and the natural environment conservation in Europe, adopted on the 19th of September 1979 after a long period of research – mainly bibliographic (Corine biotops) - and resistance, leads to the to the COUNCIL DIRECTIVE 92/43/EEC dated 21st of May 1992, concerning the conservation of the natural and semi-natural habitat and of the wild flora and fauna.

The '90s embody a powerful development of European Parks, subsequent to a wide comparison between nations and resulting into national and regional legislations, which benefits from the previously matured experiences, product of important – though suffered - socio-political dialectics, which manages to define the powers, the functional methods and the financial sources beyond the Parks' borders: that is, on the whole, the role of such subjects that have represented the actual sustainable development laboratories in a stable and diffused manner for over a decade, ratified at the Rio de Janeiro Conference on Biodiversity held on the 5th of June 1992.

Fig. 1

While the Parks are an existing and ineliminable reality of the European culture (although the European Community does not recognize their role, consistency and true existence, in contrast with the single nations) the SCI (Sites of Community Importance) and the SPAs (Special Protection Areas), are still extraneous entities for the citizens, limited to a restricted sector made of more informed specialists and administrators; the project for the institution of a European Network of Special Conservation Areas, in fact, develops outside of an explicit social confrontation, also due to the poor definition of those that will be the overall functions of such areas.

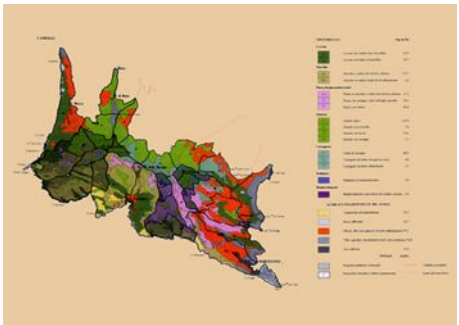


Fig. 2

Based on a Regional Law (29/2001), the Park of Portofino is substantially the manager of three Sites of Community Importance, as it is the subject in charge of the elaboration of the planning objectives elaboration and management, as well as of the execution of the verification of the incidence assessment on the pSci plans and projects: - Park of Portofino pSCI IT1332603- Rio Tuia – Montallegro pSCI IT1332622- Pineta – Lecceta di Chiavari pSCI IT1332614

Based on its direct experience in terms of Sci management and of participation to the biodiversity safeguard debate, one believes that the "Sci" device produces some questions:

1. It is a project dropped from the top, without the participation of the concerned populations, far from common sense.
2. The *Rete Natura 2000* is a network of "islands" solely centered on biodiversity; not an ecological network, but a static one, in comparison with the natural and human dynamism.
3. It is difficult to have the citizens identify themselves with this new entity, as well as to define and execute non-extemporary or occasional specific actions. For the time being, the pSci do not hence appear as efficacious tools for the safeguarding activity, nor as sustainable development opportunities.
4. The Liguria Region has evidenced difficulties at investing funds (which, upon being retrieved via the measures of the Objective 2, have not involved all of the Ligurian pSci) on the pSci and at evaluating such investments' outcomes.
5. The Italian State, the Liguria Region and, consequently, us delegates to such tasks on 3 pSci, have difficulties at understanding what are the rules to manage the pSci: should they be simple and comprehensible for every citizen or complex, destined to experts and to be implemented by "strong" powers?
6. When the incidence assessment shall be made is not clear yet and, even before, the incidence reactions, expensive tools and insofar not uniformly applied within the Ligurian Network and often limited to a paper exercise, with scarce or null relapse on reality.
7. The few infraction procedures launched within the Ligurian context have demonstrated themselves just as political dialectics tools, torn off the safeguard of biodiversity.
8. There are very different standpoints on the conservation measures and on when and how the Management Plans shall be made, while one is not managing to glimpse with what tools and after what debate and experimentation they may be brought to a synthesis.
9. There are very different standpoints about the sites management, whether it should be a sophisticated management and consequently implemented with qualified personnel and high costs, or whether the management shall be simplified and economical, with less qualified personnel or one that is already available within the Entities and, also in this case, besides the methods via which the standpoints will come to a synthesis, we believe it is important that the type of management and objectives shall be coherent with the governmental investments.

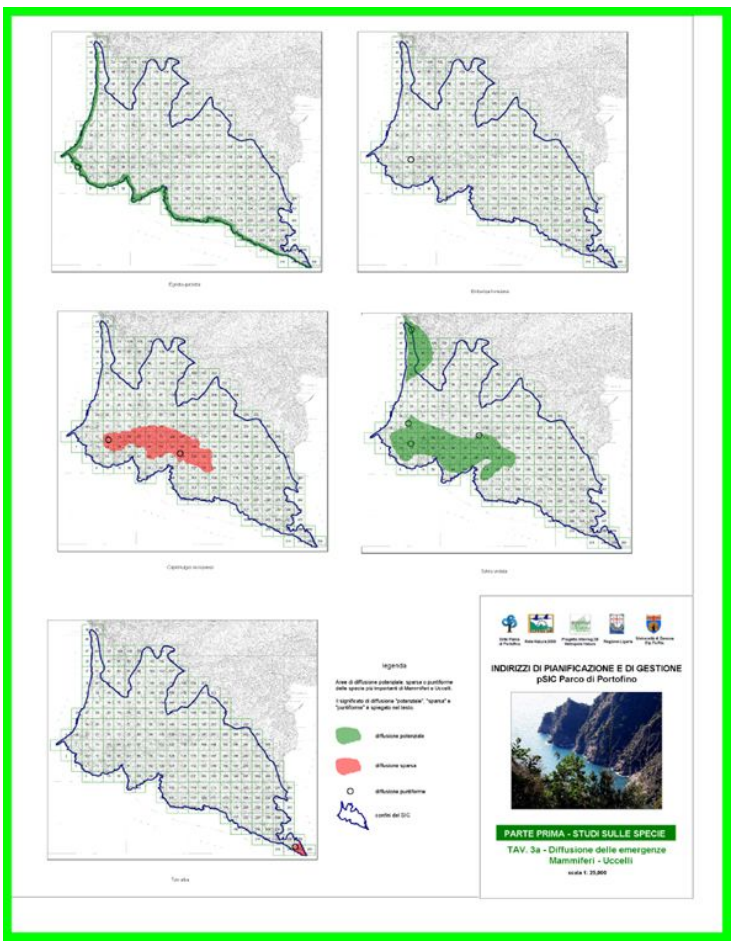


Fig 3 Exemple of the distribution map of the species.

Fig. 4 *Aquilegia atrata*

Fig. 5 *Tylo alba*

Within this context our actions have anyhow developed and our evaluations have concretized into:

1. The research conducted in compliance with the criteria provided for by the EEC and carried out by the University of Genoa (Department for the Study of the Territory and its Resources) and with the support of numerous internships, which have shown to be a good data collection event, while being an opportunity for the information and training of the future professionals on the Sci issue. Throughout two years of activity an investment equal to ¤ 50.000 has been carried out.
2. The formulation of the management rules, which modify the current rules, address the Institution's actions. One aims at reaching the Management Plan for the pSci IT1332603 "Park of Portofino" and the conservation measures in the others Sci, in order to eliminate expensive incidence relations and evaluations.
3. The execution of incidence evaluations (about 10 per year at the moment), is destined to increase with the application of the new regional rules. We notice that cognitive integrations with the reports presented by private individuals (or by other Public Institutions) are necessary in some 30% of the cases and that compensative actions to the intervention, for the preservation of biodiversity, are foreseen in some 60% of cases. The overall cost of the incidence assessments, including the private subject and the Park's costs, equals to about ¤ 15.000 per year.
4. The execution of the controls only over the Sic Park of Portofino pSCI IT1332603, with the Park's vigilance personnel subject of a progressive training and subject of direct fauna control actions. The lack of personnel does not allow us intervening on the other SCI.

Site	SCI Park of Portofino	SCI Rio Tuja Montallegro	SCI Pineta Lecceta Chiavari
Flora (Ann. 2)	71 species (0)	26 species (0)	7 species (0)
Fauna (Ann. 2 92/43) [Ann. 1 79/409]	76 species (6) [16]	42 species (3) [10]	29 species (2) [14]
Habitat (Ann. 1)	18 (6)	11 (3)	8 (2)

5. The execution of punctual investigations on biodiversity-related issues, such as the monitoring of species to be controlled (wild boar, annual expenses over ¤ 5.000) or "*una tantum*" projects such as the Census Project of the Park's Caverns and the study on the relative hypogeal fauna with an ¤ 8.000 investment; scholars who are friends of the Park increase the knowledge about animal and vegetable species and habitats via their signalings.

6. The formulation of a hypothesis for an optimal monitoring system on the species and the habitat, whose code is listed on the table. It is an expensive and currently unfeasible project. The three-years investment equals to ¤ 60.000 to:
   a. Widespread the SCI contents and concept in the schools within the territory, and launch a knowledge section on the website, about the SCI and biodiversity;
   b. Widespread to adults via brochures and contacts at information points and events (also important ones such as *Euroflora* with 100.000 people contacted)
   c. Equip the very recently opened thematic library.

Examples of activities linked to the knowledge of the SCI:

1 Divulgation to students on the site
2 Exhibition with the works produced by the classes
3 "Caverns" project
4 SCI's library
5. Participation to Euroflora 2006 – 500.000 visits with 100.00 contacts

We believe that it is important to continue with the launched experiences, conjugating the Park's life with that of the SCI, aiming at attaining results that are visible and appreciated at a social level; we intend to undertake with a direct management that is proportional to the dedicated financing and transferred by Region and State, by now inexistent for past three years.

Natura 2000 in the large Miribel-Jonage Park

Jean-Louis Michelot (Ecosphère) and **Murielle Champion** (SEGAPAL)

1. The context

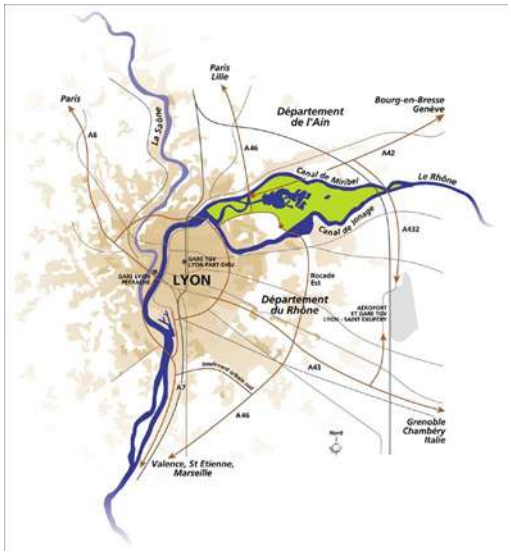
In April 2006, the French Natura 2000 network is made up of:

- 1300 SCI (Sites of Community Interest under the "habitat" directive), 4 million hectares.
- 367 SPAs (Special Protection Areas under the "birds" directive), 4.5 million hectares.
- for a total of 6.5 million hectares, or 12% of national territory.

Among these sites, the Miribel-Jonage is designated under the habitat directive and covers around 3000 hectares.

In France, implementation of Natura 2000 is based on two principles:

- drawing up a document of objectives ("docob"), a 6-year management plan.
- priority for agreement on all other approaches (regulatory...).

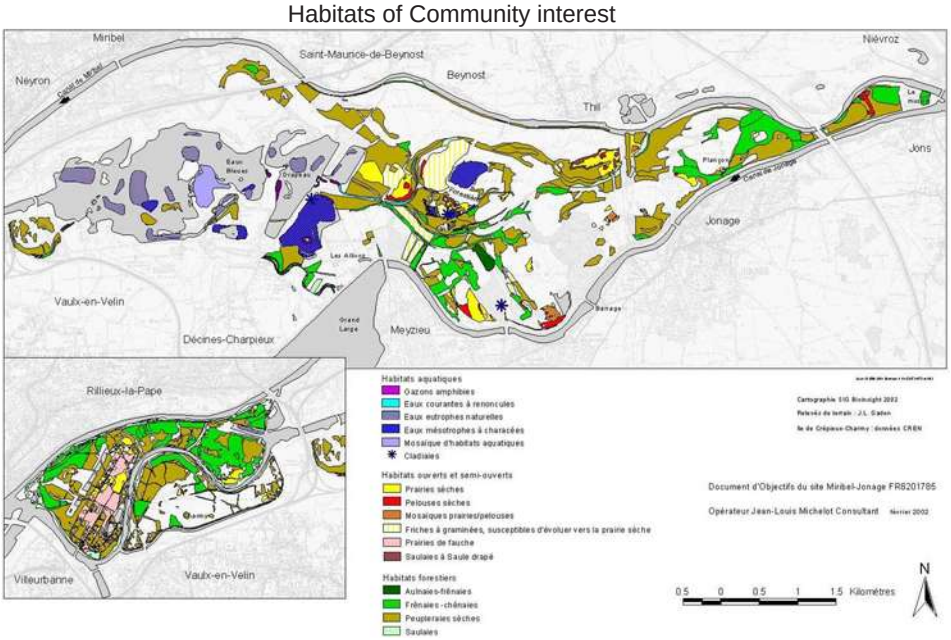


Depending on the sites, objective documents are drawn up led by the State, by associations, institutions or research bureaus (case with Miribel-Jonage). After drawing up the diagnosis and suggesting the objectives, the agents are currently working on the actions to be carried out.

2. The site

The site includes 13 habitats of European interest covering 840ha; that is, 30% of the surface of the site.

Habitats of Community interest



• *Aquatic environments and wetlands:*
- Amphibious grassland
- Running water with buttercups
- Natural eutrophic water
- Mesotrophic water with charophyte beds
- Cladium beds

• Amphibious grassland

• Running water with buttercups

Dry lawn

• *Open and semi-open environments: 5 habitats*
- Dry meadows
- Dry lawn
- Plantations of hoary willow
- Mown meadows
- Megaphorbic meadows

• *Forest environments*
- Gallery forests of white willow
- Residual alluvial forests
- Ash/oak woods

…and 10 animal species

• *Two insects:*
Southern damselfly (*Coenagrion mercuriale*)[1]
Stag beetle (*Lucanus cervus*)

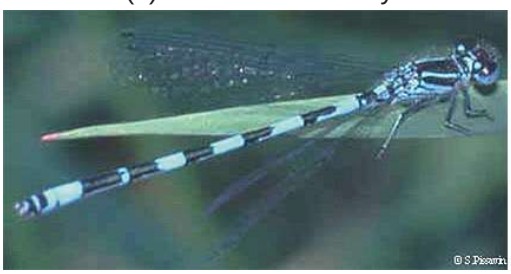
Forests of “hard” wood

Forests of “soft” wood

• Six fish:
  - Brook lamprey (*Lampetra planeri*)
  - Bullhead (*Cottus gobio*)
  - Apron (*Zingel asper*)
  - Sofie (*Chondrostoma toxostoma*)
  - Bitterling (*Rodheus amarus*)
  - Blageon (*Leuciscus soufia*)[2]

• Two mammals:
  - Beaver (*Castor fiber*)[3]
  - Geoffroy's bat (*Myotis emarginatus*)

(1) Southern damselfly



(2) Blageon

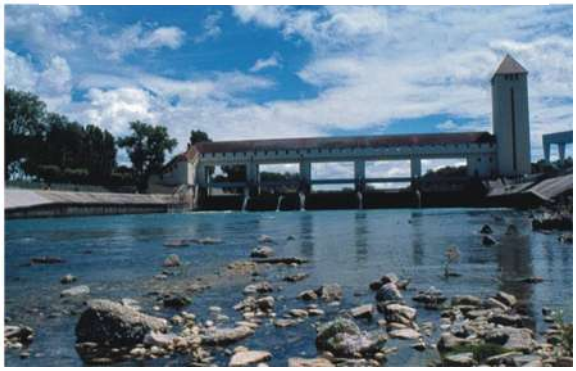
(3) Beaver

The state of conservation of the species and habitats is mixed. More than half the areas of habitats correspond to environments influenced by the degradation of the river system (black poplar woods). Certain species (apron, sofie) are perhaps no longer present today; certain habitats only occupy very small areas. The habitats are degraded by changes to the river (absence of regeneration, sinking of the water table...), scrub invading orchid meadows and pressure from leisure (particularly mechanised sports).

The diagnosis also addresses the socio-economic balance of the site, marked by the importance of human activities: production of drinking water, leisure, hydro-electricity, agriculture, etc.

Leisure

Hydraulic disturbance



3. The objectives

The objective document must offer "sustainable development objectives intended to ensure the conservation and, if necessary, the restoration of natural habitats and species", with respect for "safeguarding economic, social and cultural activities carried out on the site"

(Decree of 20 December 2001)

The objectives proposed are as follows:

- quantitative objectives: conserving the areas of habitats and the populations of species
  - limiting land clearance as far as possible
  - making certain degraded areas more natural

- qualitative objectives: preserving or improving the state of conservation of habitats
  - restoring the river system (raising water tables…)
  - controlling the vegetation dynamic (scrub clearance…)
  - controlling the effects of leisure on natural environments

- additional objectives: providing the means for the project to succeed:
  - providing the site with a manager
  - putting a monitoring and assessment system in place

4. The action strategy

Certain Natura 2000 sites are located in regions where there are no agents or policies concerning nature conservation or very few of them. The docob is the founding document for this kind of policy.

The situation is very different in Miribel-Jonage. This site is covered by many public policies with numerous motivated and competent agents. In these conditions, Natura 2000 must be considered as an element of this puzzle, making it possible to have habitats and species taken into account to a greater extent in current political measures. Concerning agreement, it is not a question of creating new structures but rather of putting Natura 2000 into the many existing structures (water navigation committees, leisure, economy, drinking water catchment areas...).

5. The actions

The implementation of the docob proposals is based on various regulatory, financial or administrative tools.

- **Natura 2000 contracts**
  These contracts are signed between an owner and the French State to carry out docob actions, with State/European finance. This is an useful tool which should make it possible to finance certain actions such as the maintenance of orchid meadows. The usefulness in this tool is, however, limited because of its administrative slowness and the lack of effective means.

- **Assessment of effects**
  Schemes with an effect on habitats and species must be subject to an assessment of effects and may require approval from the European Commission if the application is rejected by the administration. At Miribel-Jonage, this device obliges backers of schemes to take habitats and speeches into account; very destructive projects can be challenged.

- **The conditionality of agricultural aid**
  Agricultural aid is conditioned by respect for Natura 2000 and, in particularly, non-clearance of habitat areas or species habitats. This measure does not seem to have any effect on agricultural practices on the site, as clearances are almost non-existent.

- **Tax relief**
  The Rural Areas Development Act establishes the reduction of certain taxes for habitat areas, provided the owner signs a "Natura 2000 charter". This measure could be useful to some extent for the Miribel-Jonage Park.

- **Making public policies coherent**
  Natura 2000 must also, and above all, be taken into account by the public policies affecting the area. This achievement of coherence, based on agreement and not on constraint, could potentially involve many subjects, for example:
    - flow management on the River Rhône
    - park projects (returning water to river branches, rehabilitation of a marsh…)
    - management of the Crépieux-Charmy nature reserve
    - etc.

- **The creation of a Special Protection Area**
  The Miribel-Jonage site, famous for its ornithological interest, would deserve to be classified as a Special Protection Area under the European birds directive. This measure would give the project greater coherence, making it possible to take into account measures intended for birds (management of bird plans...).

- **Monitoring and assessment**
  The site must be subject to monitoring intended to measure the development of the state of conservation of the habitats and species and to assess the effectiveness of the measures implemented.

- **Leadership and implementation**
  The success of the project will depend on the designation of a body in charge of co-ordinating the actions established in the docob. This leader might legitimately be SEGAPAL, manager of the Miribel-Jonage park, provided sufficient operational means are available.

6. Natura 2000 as seen by the park agents

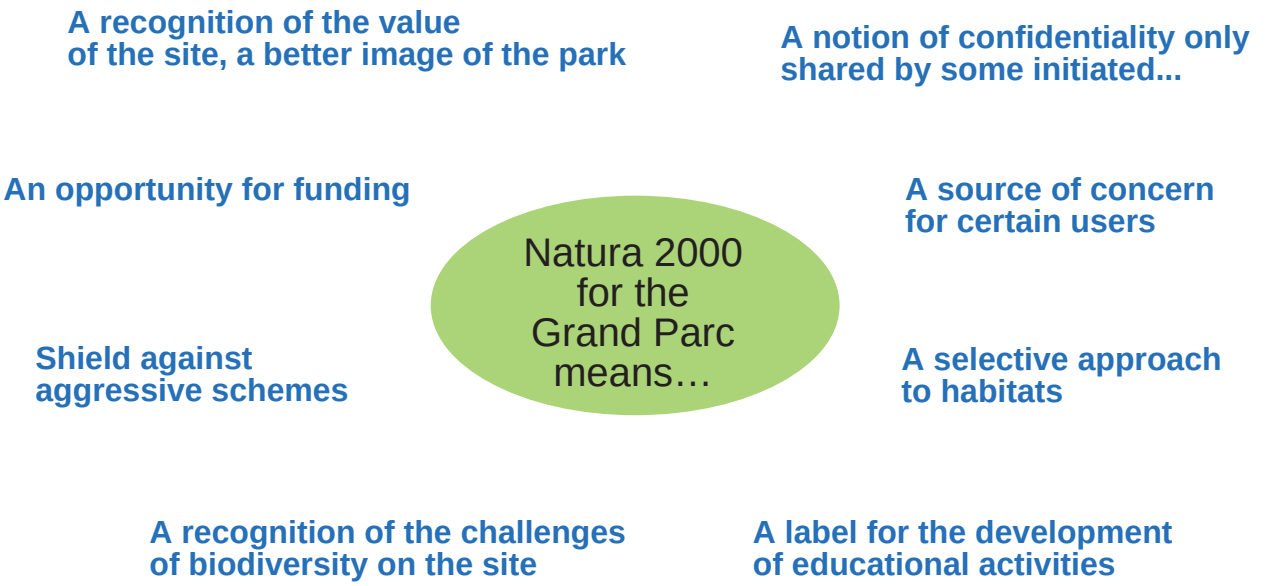
Natura 2000 has been the subject of a many controversies in France, largely brought about by certain agents involved in agriculture, hunting, elected rural representatives etc.
In Miribel-Jonage, the designation of the site has been subject to relatively few hostile reactions except for that

of the Lyon urban community, which fears that the measure does not further extend the administrative management of its projects in the drinking water catchment areas (creation of filtration basins...).

Today, Natura 2000 is not the subject of controversy on the site, although neither is it the subject of particular enthusiasm.

This designation affects the local agents (elected representatives and officers) in three principal ways.:

- a recognition of the value of the site, which may be of interest in terms of image or education.
- a possible tool for implementing the plans for the park: shield against aggressive schemes, aid for mobilising finance…
- a political measure from on high (State) which is a potential restriction and a source of concern for certain users.



NATURA 2000 is a biodiversity managing tool for the site, which contributes to a general recognition of the value of the site

Summary:
The commitment to biodiversity in peri-urban areas

Jean-Louis Michelot, Ecosphère

The issue of biodiversity is at the heart of the concerns of FEDERNATUR and those involved in it. It is a complex subject, constantly evolving and taking into account in different ways by the parks in the network. The papers from this conference, completed by an analysis of the different peri-urban natural areas, whether or not they belong to FEDENATUR, making it possible to make a series of notes on the issue of biodiversity in areas with urban influence. Some propositions may be deduced in order to gain a better understanding of this important issue.

What is biodiversity?

It is useful to recall that the concept of biodiversity includes the entire diversity of the living world: diversity of species, ecosystems and genes.
The parks belonging to FEDENATUR are generally interested in all these dimensions; they have undertaken important work mapping habitats and making green inventories; this has been seen in various displays.
In practice, it can be stated that many managers of areas reduce biodiversity to the number of species belonging to certain groups (higher plants, vertebrate animals) and concentrate their efforts on some rare, emblematic species.
It would undoubtedly be desirable also to take an interest in biodiversity as a whole and in broadening the spectrum of the groups studied (insects, lichens, mosses...).

Certain facets of biodiversity are worth reflecting on.

In the peri-urban environment, species of foreign origin are often very numerous and their place in the biodiversity must be questioned. Certain species are unanimously perceived as undesirable because of the very strong competition to indigenous species they provide (Tree of heaven *Ailanthus altissima,* or Japanese knotweed *Reynoutria japonica*…) or because of public health problems (Annual ragweed *Ambrosia artemisiifolia*). Others are perceived more neutrally, even positively by hunters (the pheasant), fishermen (zander *Stizostedion lucioperca,* black bass *Microopterus salmoides*…), nature lovers (red-eared slider turtle *Trachemys scripta elegans* in Miribel-Jonage), and even some botanists. It would certainly be worthwhile to approach this issue systematically, calmly and realistically, distinguishing the real problem species from all those occupying only a modest place in our ecosystems.

The genetic diversity of wild species is rarely taken directly into account, but this issue is linked to that of the isolation of natural areas within the urban fabric, making it necessary to improve the green connections between sites. This issue is increasingly becoming the subject of action by site managers.

Cultivated plants and domestic animals form part of biodiversity and many varieties are threatened by the standardisation of agricultural activities. This issue is taken into account by some parks (Arche de la Nature in Le Mans, for example), which undertake operations to preserve threatened varieties or manage their areas with the help of rustic rare breeds (Bretonne Pie-Noire cattle at Miribel-Jonage). This approach could undoubtedly be developed in peri-urban parks, which have the advantage from this point of view of being able to play host to agriculture that is not solely based on economic motives.

What is the specific nature of peri-urban biodiversity?

It might be a useful exercise to consider the very relevance of the subject of this seminar. Does "peri-urban biodiversity" have real specific features?
One might think that only fragments of nature subsist near cities, playing host only to rare species that are very tolerant of human activities. In fact, analysis shows a great variety of situations. Some cities, surrounded by fertile plains, have no more than a very few really natural areas. In France, we speak of "nature ordinaire"

(everyday nature) to classify these non-urbanised areas – fields, hedges, copses or gardens – which generally do not play host to rare species but play a big part in the balance of the urban area. Certain parks that are members of FEDENATUR, located in a highly artificialised setting, carry out considerable work to develop and diversify the nature they have, replacing intensive agricultural areas or industrial wasteland (Lille, Le Mans, northern park in Milan).
Other parks show a very different situation. Some peri-urban areas show very strong natural constraints (relief, liability to flooding...) which have prevented intensive economic exploitation. These ignored areas have been able to preserve their natural state to a high degree, allowing them to play host to rich, complex ecosystems and often acting as home to rare species (Portofino, Collserola, Conero…). In other cases, human activity has generated new environments which can be colonised by a remarkable and diversified flora and fauna: Saint-Quentin lake at Yvelines, bodies of water at Miribel-Jonage, Salburua lagoon in Vitoria…
These peri-urban natural areas, then, often are quite extraordinary in nature; Collserola park plays host to no less than 2,650 species of plant and 2,615 species of animals and the Montseny park in Barcelona is even home to an endemic newt species! A study currently being carried out (see Matcheld Gryseels' paper on Brussels) shows, moreover, that no less than 300 European Natura 2000 sites are in peri-urban areas.

So the disdain for urban and peri-urban areas often shown by certain agents in nature conservation makes no sense. In certain regions with intensive agriculture, such as La Beauce in France, the Po plain in Italy or around Brussels, the peri-urban area, with its gardens, parks, bodies of water… undoubtedly plays host to much greater biological diversity than the surrounding rural areas.

Overall, then, peri-urban diversity is by no means dull. Its original features come more from its breadth and from the many of pressures it is subject to: urban development and infrastructures destroying natural areas and causing a high level of fragmentation of habitats, frequent visits, various types of pollution (chemical, light, sound…), high temperatures…
Undeveloped areas in urban regions are rare and disputed by many agents: leisure, economic production, education, conservation… The place of biodiversity in the management of space is therefore necessarily quite different from that in less constrained areas.

Why protect biodiversity?

The need to preserve natural heritage has not yet imposed itself as a commonplace in our societies, as is largely the case when it comes to cultural heritage. In peri-urban areas, this protection is even less easy to impose, as the space is disputed by many other, sometimes antagonistic, activities. Some managers of natural areas still only see in biodiversity an obstacle to development because of the regulatory constraints it can impose (protected species, Natura 2000…).
Nowadays, it is becoming essential to develop a broad view of peri-urban natural areas, placing a higher value on biodiversity. Biological diversity must be protected for its intrinsic interest, as an element of heritage we must leave to our children. It must also be considered in terms of other functions it performs for society: leisure (hunting, fishing, observation), regulation of bio-geo-chemical cycles (denitification, storage of nutrients and pollutants…). Animal and plant species can also be considered as indicators of the good health of the area or as symbols making it possible to bring society closer to nature conservation. One might think that social demand today follows these general conditions, preferring diversified natural areas to the leisure parks of previous decades.

This broad view of the role of biodiversity is particularly relevant in the areas under pressure that make up peri-urban areas, but it is developed much more widely today. One might think, for example, of the work of the United Nations' Millennium Ecosystem Assessment, which values the link between ecosystems and human well-being.

Protection from biodiversity?

If it is appropriate to evaluate the positive functions of biodiversity, it is also appropriate not to hide the negative dimensions. Peri-urban natural areas are sensitive from this point of view for different reasons. The human

concentration exacerbates public health issues (real or imagined) and the economic stakes involved; the artificialisation of ecosystems can cause dysfunctions with regard to actual consequences. In other words, the urban population, no longer used to living with nature, does not always accept the inconveniences that visiting it can cause.

Among health-related issues, one might mention leptospirosis, transmitted by rodents; a bilharzia transmitted by the "duck itch parasite" via water birds, bird flu, allergies caused by annual ragweed, malaria…
Nature also has plenty of other dangers: falling trees in strong winds, fires, floods…
Natural areas also raise questions of comfort for users: presence of mosquitoes, stinging plants…

The proliferation of wild boar in areas without hunting can be the cause of considerable economic problems (degradation of fields, golf causes...) and also real disruption to ecosystems (pressure on certain herbaceous plant groups).

It is right not to deny these negative aspects of biodiversity and to seek to find a balance between the protection of property and people and the conservation of biodiversity. Managers must contribute to finding technical solutions to respond to what is at stake here (capture of wild boar, biological battle against mosquitoes rather than a chemical battle...). It is also, and perhaps above all, necessary to undertake actions to raise the awareness of the public and agents involved in health or the economy concerning the knowledge and prevention of risks associated with nature. Accidents involving bears in parks in North America have not been limited by destroying bears but by improving waste management!

How should parks be used in terms of biodiversity?

Parks belonging to FEDENATUR can play varied and important roles in this area.
They are places where biodiversity can be conserved; their landscaping and management plans are generally designed to prevent any disappearance of species: limits on clearance, maintenance of natural environments…
In the majority of cases, parks go further, undertaking actions to restore degraded ecosystems, of which there are many near cities: quarries, industrial wasteland…
The work is sometimes so far-reaching that one can really talk about regreening. In this case, managers are faced with the question of the objectives set: What kind of plant formation do they want to create? Which species should be encouraged? Why?
In the same spirit, we have seen that the southern park in Milan, and undoubtedly other parks in the network, are carrying out actions to reintroduce disappeared species.

Parks generally work to improve knowledge of biodiversity, with inventories of the species and habitats present. Monitoring is often carried out, making it possible to perceive the development in progress and evaluate the success of the actions undertaken.

Some parks benefit from their proximity to the city, from the presence of infrastructures and natural environments to become places for ecological research in particular through action in co-operation with universities. This policy, undertaken, for example in Collserola, may result in better knowledge of the area, which is useful in terms of environmental management (green connections, maintenance of vegetation…).

The most widespread action concerning biodiversity in parks – undoubtedly even more common than real conservation – concerns increasing its value for the public through leisure (contemplation) and education: observatories, discovery trails, guided tours…

Because of their nature, peri-urban parks can become particularly interesting demonstration sites as they involve showing the public that a hedge can be something other than a barrier of "vegetable concrete" or to present professionals – farmers or foresters, for example – with alternative practices respecting both ecology and economy. Such approaches exist within FEDENATUR, but they still seem to be intermittent. They undoubtedly represent an important commitment, because peri-urban biodiversity is not only present in the parks; it can be considered as covering considerable areas: private gardens, agricultural areas, roadside verges, drinking water catchment areas…

What commitments for peri-urban natural parks?

Biodiversity is now taken into account by most peri-urban natural parks, whether or not they belong to FEDENATUR. But it must increasingly be placed at the centre of park projects and considered as an asset rather than a constraint.
Parks must invent landscaping and management principles that find a balance between biodiversity and other uses of space. It seems, in fact, that most peri-urban parks are not "reserves" whose only purpose is biodiversity, but areas with multiple uses. Specific management methods must be found by paying attention to this balance; in this way, "differentiated management" (at Seine Saint Denis, they talk about "balanced management") of spaces is an approach intended to define management rules for each plot of land with a view to improving its characteristics. A meadow, then, can be maintained in a very extensive way if it represents a stronghold for insects and is not much frequented by the public; by contrast, it must be mown often if it is in a highly frequented area; all intermediary positions between these two extremes are possible.
This new approach involves a commitment by park management or service provider staff, whose motivation and competence must be at the crossroads between the naturalist approach and the "parks and gardens" approach.

The management of peri-urban natural parks has been improved during recent decades to increasingly integrate the all problems. Two dimensions currently seem particularly important.

- The park is no longer considered as a closed space, but as an element in an ecological, social and landscape network which should be improved both within the park and outside (opening of routes for fauna, continuity of natural environments between connected "nodes"...).
- The social dimension of site management is increasingly taken into account, to the point where residents and users are made agents involved in designing and implementing projects for the area.

What is Fedenatur's commitment?

Biodiversity has been one of the bases of FEDENATUR since it was established. It therefore seems legitimate to develop exchanges and actions on the issue.
One can imagine making membership of the federation conditional on making at least minimal ecological inventories and defining and establishing objectives concerning conservation and the restoration of natural habitats.
FEDENATUR must pursue its activity of promoting peri-urban parks, demonstrating at national and European events that they play host to biodiversity of very great value and make a full contribution to the well-being of human populations.
Finally, it would be desirable to pursue and structure the collective experiences of members, to identify and publicise innovative solutions concerning the management of spaces and species.

If today biodiversity is a well-known and widely recognised commitment, considerable work remains to be done to achieve better knowledge of this heritage and the way it works, and to integrate it fully and dynamically into the landscaping and management of parks. This concern must be considered as an element of sustainable development which should not under any circumstances be perceived in a uniquely local or thematic way. It would not make sense to protect a few rare species in a nature reserve in a peri-urban park if the activities of that park continued to put too much pressure on world biodiversity (use of tropical timber, materials consuming too much energy, etc....).