

Barcelona Nature Plan

2021-2030



Preface

The last year has been strange for all of us. The Covid-19 health emergency has put us through some very difficult times and aggravated already existing problems, such as the climate emergency.

Yet the pandemic has also given us an opportunity to see that we can live in a healthier and more sustainable way. Pollution levels recorded during lockdown were at an all time low. We have seen that we can live in a more leisurely city, with greener and more equitable public spaces, where we can play and raise our children and where our senior citizens can enjoy life in the streets and squares. A city for living in.

The effects of climate change and the loss of biodiversity are directly related. Which is why many cities are working to tackle the challenge posed by the climate emergency, to fight against the loss of biodiversity and protect nature.

Biodiversity is much more than a list of plants and animals. It embraces all the Earth's living beings, which are all part of our web of life. More than a million species may end up disappearing over the coming decades. While that may occur a long way from here, if a species disappears it affects us all.

The right to health is one of the great challenges of urban life. And from our city we need to be vigilant and to help guarantee that right. Experience and scientific evidence show us that contact with nature brings us health and that green infrastructure is a resource for public health. Health professionals even prescribe contact with nature.

Natural features of our city such as the trees on our streets offer us shade and help to regulate the temperature, during the hot weather above all. These trees also absorb pollutant particles, helping to clean the air, and dampen the noise on our wide avenues.

We are taking action in a number of ways in Barcelona. Firstly, we are promoting the naturalisation of green spaces. This is leading to the appearance of new landscapes and spaces such as naturalised ponds. We are launching public projects to add nature to green roofs and walls. We are fostering innovative models such as sustainable drainage systems and soil permeabilisation, to better adapt ourselves to the effects of climate change. And we are ensuring biodiversity is protected by creating fauna shelters and developing fauna protection projects.

At the same time, we are promoting outdoor activities around environmental education and citizen science, as well as working to increase our community allotments along with citizen and association volunteering and participation in the city's green infrastructure. That also means fostering better understanding of biodiversity, promoting new concepts and policies, among other tools.

Barcelona is working to give nature a central role in the future city model, so it enjoys maximum prominence in a new urban model, with special emphasis on the neighbourhoods and areas that lack it most. City nature connected to metropolitan nature, managed ecologically and in coordination with city residents.

It is with this vision that we present the Barcelona Nature Plan 2021-2030 to you, a plan intended to be the roadmap for developing a series of projects to improve the city and its commitment to life on our planet.

Introduction

The world's cities face big challenges in the future, and one of the most important is to ensure the best living conditions for everyone in the context of a global ecological crisis. The situation created by the climate emergency, combined with the effects of the Covid-19 pandemic, has put the focus on the nature surrounding us. In a way **it has become more obvious than ever that pandemics and the climate and biodiversity crises are inter-related issues, and that the health of our citizens and the health of our planet go hand in hand.**

The Earth is our natural environment, our habitat. It provides us with soil, water, air, flora and fauna, food and weather conditions. Cities, initially conceived as a good shelter and way of life for humans, are largely changing the conditions of the environment: air and soil pollution, exhaustion of natural resources such as wood, minerals, food, etc. An unsustainable footprint for us and for future generations.

Despite that, nature continues to be present in our city. We have a geological substratum, soil, fresh and marine water, air, plants and animals, among other things, while the urban ecosystem operates with its characteristic matter and energy flows, and an unusual web of living beings.

Which is why **the way we act as cities must necessarily take the conservation of life in our environment into consideration.** As already pointed out by the World Health Organisation (WHO), “health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” and scientific evidence tells us that contact with nature improves our health, which is influenced by the quality of the environment.

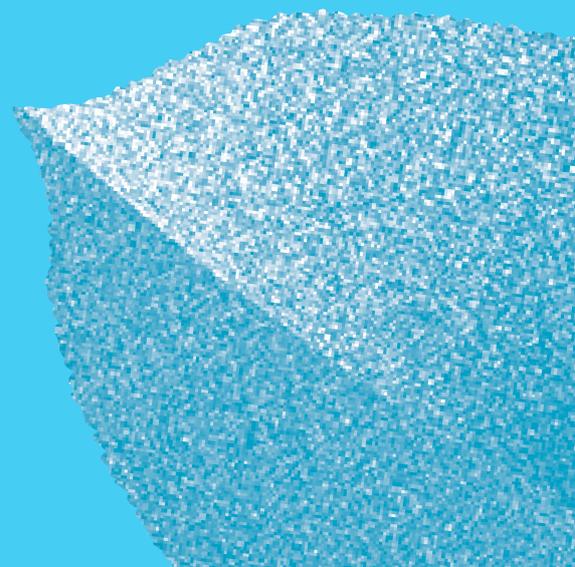
Greenery and biodiversity contribute towards mental health and well-being in society in general, thanks to the ecosystem services they provide. We need nature to live in but it is valuable in itself. Hence the importance of ecological, environmental and food policies, as well as those on the climate emergency, the ecological transition, public health and so on. Because they point to something that is crucial. It is why we talk about planetary health, which has been defined as achieving the maximum level of health, well-being and fairness all around the world, respecting the limits of the Earth's natural systems where humanity can prosper.

Barcelona ensures the value of urban nature and the Earth's nature too. **The Barcelona Nature Plan 2030 is a strategic, participatory tool that defines and sets out the goals and commitments of the municipal government to increasing the city's green infrastructure, to conserving biodiversity and to how city residents can find out about, enjoy and improve urban nature and take care of it.**

It is a step forward in strengthening the city's contribution to the challenges posed by citizen health and well-being and conserving the web of life on Earth, a goal that is included in the Climate Emergency Declaration, the Urban Agriculture Strategy and the Special Protection Plan for the Natural Environment and Landscape of Parc Natural de la Serra de Collserola. To use a Catalan metaphor, this is about rowing from many sides to reach port successfully.

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Executive Summary

In 2013 Barcelona launched the Green Infrastructure and Biodiversity Plan 2020, which has been the roadmap in recent years. Then, in 2017, the City Council approved a government measure entitled the Urban Green Infrastructure Promotion Programme, which set out the plan's commitments. The need to update, confirm and reinforce the commitments together with the current situation has made it all the more necessary for a new plan to be drafted which sets out the main greenery and biodiversity lines of action over the coming years. This new plan is called a Nature Plan to give the concept more communicative power and express the relationship between urban nature and the Earth's nature, as well as Barcelona's commitment to global ecological challenges.

The Covid-19 situation and climate emergency have put the focus on the **importance of nature in cities, as support for people's physical and emotional health**. It has demonstrated the value of free, clean air, of silence and vegetation. And city residents have discovered that the city has an extremely rich range of flora and fauna they can enjoy. That has been accompanied by increased awareness of the **need to preserve nature**, as there is no doubt that its alteration is harming humanity.

In this context cities have to play an active and committed role in relation not just to people's health but also conserving the Earth's biodiversity. Moreover, it is an internationally acknowledged fact that the functions and benefits of **urban greenery make enhancing it one of the main strategies for adapting cities to tackle climate change**. Consequently, one of the main measures in Barcelona's Climate Emergency Declaration, issued on 15 January 2020, has to do with conservation and increasing urban green infrastructure.

The **Barcelona Nature Plan 2021-2030** consists of a strategy for the next 10 years, divided up into three lines and two cross-cutting areas with a total of 20 actions and 100 projects, with the first **Action Programme from 2021 to 2025** under which 10 priority or *lead* projects will be implemented.

Line 1: More greenery and biodiversity.	Area 1: Knowledge.	Area 2: Governance.
Line 2: Conserving and improving greenery and biodiversity.		
Line 3: With and for city residents.		

The **Barcelona Nature Plan 2030** is a **strategic participatory tool** that has the **vision** of a city in 2050 with a **functional and ecological green infrastructure, fairly spread and accessible greenery that is connected to the urban fabric and with a green metropolitan network**, in order to maximise **social and environmental services**, above all those of health and adapting to climate change. This urban nature network is appreciated and conserved as a natural heritage of the Earth and as a benefit for people, present and future generations, who can enjoy the **connection with nature and are involved in the creation of green spaces and in the conservation and improvement of biodiversity**.

An essential part in drafting the Nature Plan was the **participatory process**. This was carried out in several stages and served to share the diagnosis, agree on long-term goals and challenges and gather proposals on biodiversity and greenery for drawing up the action plan. The stages were divided up as follows: **internal work** resulting from the experience of implementing the previous plan; **co-designing the new plan** with various City Council's services; conducting a **technical comparison** of actions and projects with external experts from organisations involved; and **citizen participation** to enrich the entire plan.

The Nature Plan's general goals are as follows:

To increase the city's green infrastructure and thereby maximise its services, above all those of adapting to climate change, and improve the access of all citizens to urban nature.

To deploy and consolidate ecological management and naturalisation in nature management, at the service of citizen health and the conservation of biodiversity on Earth.

To conserve and promote biodiversity, protecting species and improving their habitats and connectivity.

To develop knowledge, enjoyment and care of urban nature and to facilitate and promote citizen involvement in its conservation and improvement.

For the purposes of achieving these goals, the Barcelona Nature Plan has established the following **quantitative targets** for 2030:

To increase the area by 160 hectares from 2015 and honour the 2015 Climate Commitment: 1 m² more greenery per resident (equivalent to 40 new hectares during this term of office).

Forty new projects under the programme "All hands to greenery".

To create 10 biodiversity shelters.

To increase the naturalised area by 100 hectares.

To double the number of participants in nature activities.

The Nature Plan can be summarised through **twenty actions**:

Action 1 To deploy the Greenery Model to increase and connect the urban green infrastructure.

Action 2 To deploy the Greenery and Biodiversity Charter.

Action 3 To promote the creation of new green spaces and the renovation of existing ones, in line with the criteria of the Greenery Model and Greenery Charter.

Action 4 To conserve and improve terrestrial habitats and species.

Action 5 To conserve and improve aquatic habitats and species in fresh and marine water.

Action 6 To deploy the ecological and naturalisation management project.

Action 7 To conserve and improving greenery and biodiversity in heritage green spaces.

Action 8 To play an active part from Barcelona in rolling out the Collserola PEPNat, to strengthen its values as a protected nature space and to nourish Barcelona as a city of nature.

Action 9 To foster an active role for citizens in promoting and conserving urban nature in public areas.

Action 10 To activate citizen involvement in conserving, protecting and improving greenery and biodiversity in private areas.

Action 11 To disseminate knowledge on urban nature and the value of its conservation.

Action 12 To communicate the value of urban nature to city residents.

Action 13 To foster the incorporation of the values of biodiversity among professionals.

Action 14 To create the Barcelona Biodiversity Observatory, equipped with the knowledge of citizen science.

Action 15 To establish synergies with research centres to strengthen knowledge transfer.

Action 16 To have the challenges of biodiversity taken into account in municipal regulations and technical documents.

Action 17 To explore complementary funding systems such as green taxation and sponsorship and to apply them.

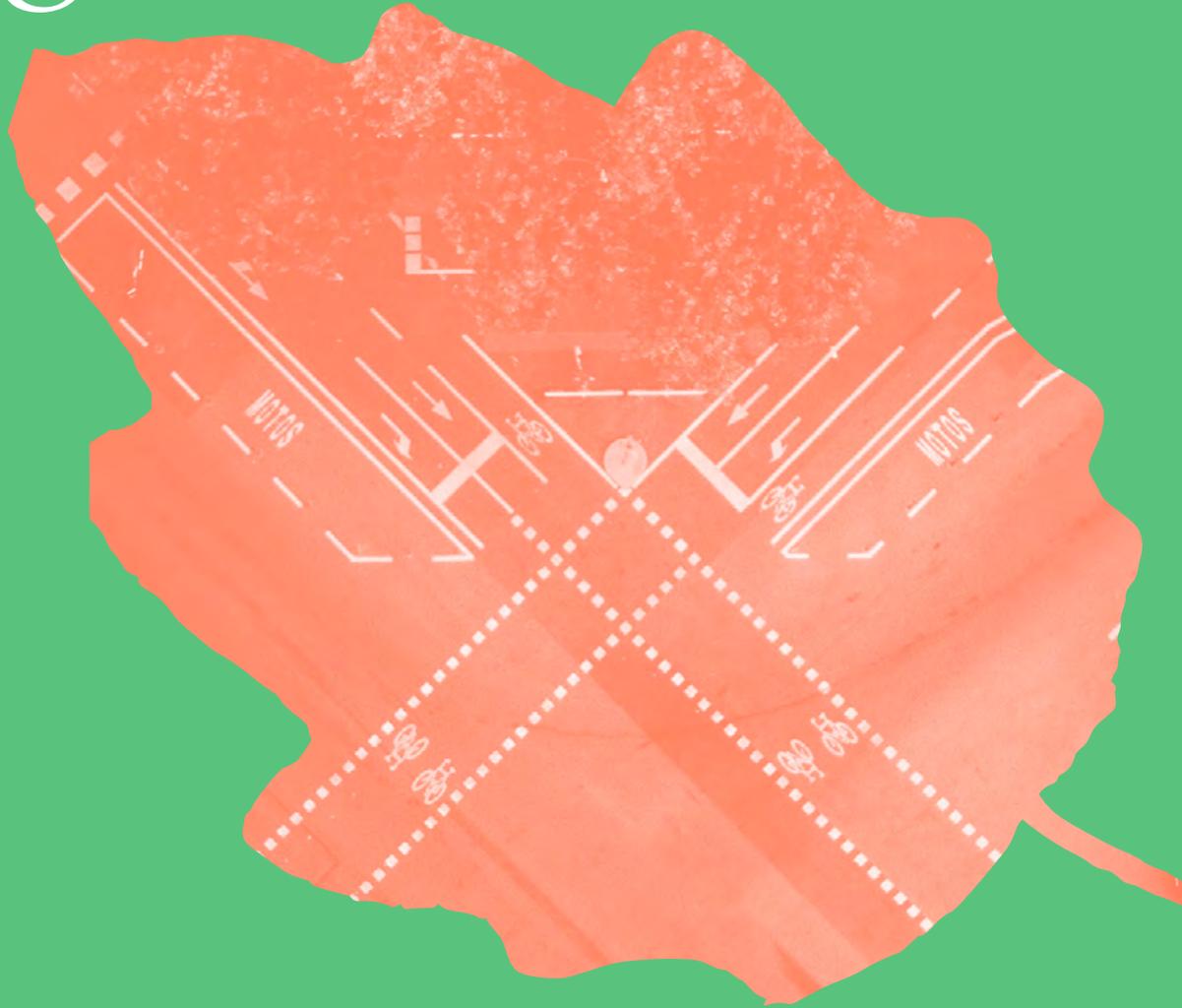
Action 18 To carry out cross-cutting work throughout the municipal and metropolitan area.

Action 19 To strengthen the city's leadership in biodiversity and take part in international initiatives.

Action 20 To network with associations and organisations for biodiversity.

BLOCK 1

Where are we coming from?



The Green Infrastructure and Biodiversity Plan 2013-2020

1.



The state of greenery and biodiversity and their development

1.1. Current situation



BIRD'S-EYE-VIEW OF THE CITY'S PLANT COVER

Barcelona has 3,659 hectares of plant cover identified from the sky (2019) by means of the NDVI (*Normalised Difference Vegetation Index*). This index shows the quantity, quality and development of plants through a generated image of plant cover seen from the sky. 1,582 hectares of this area correspond to the Collserola mountain range (43%).

Greenery density (7 m²/resid)

	Greenery Collserola	1,582 ha	16%
	Greenery rest of municipality	2,077 ha	20%
	Urbanised	6,515 ha	64%

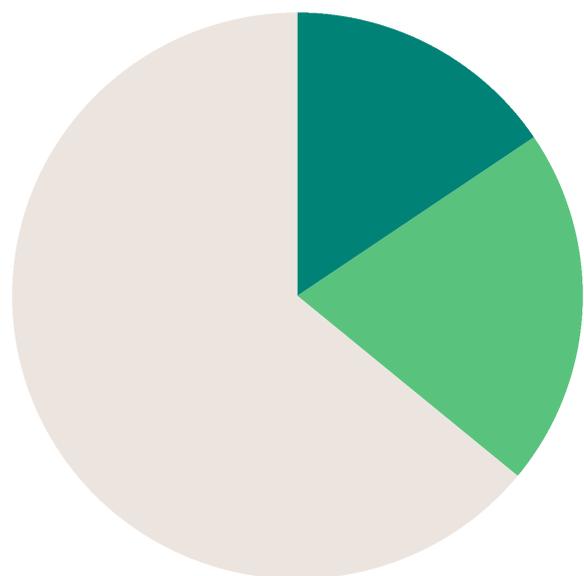
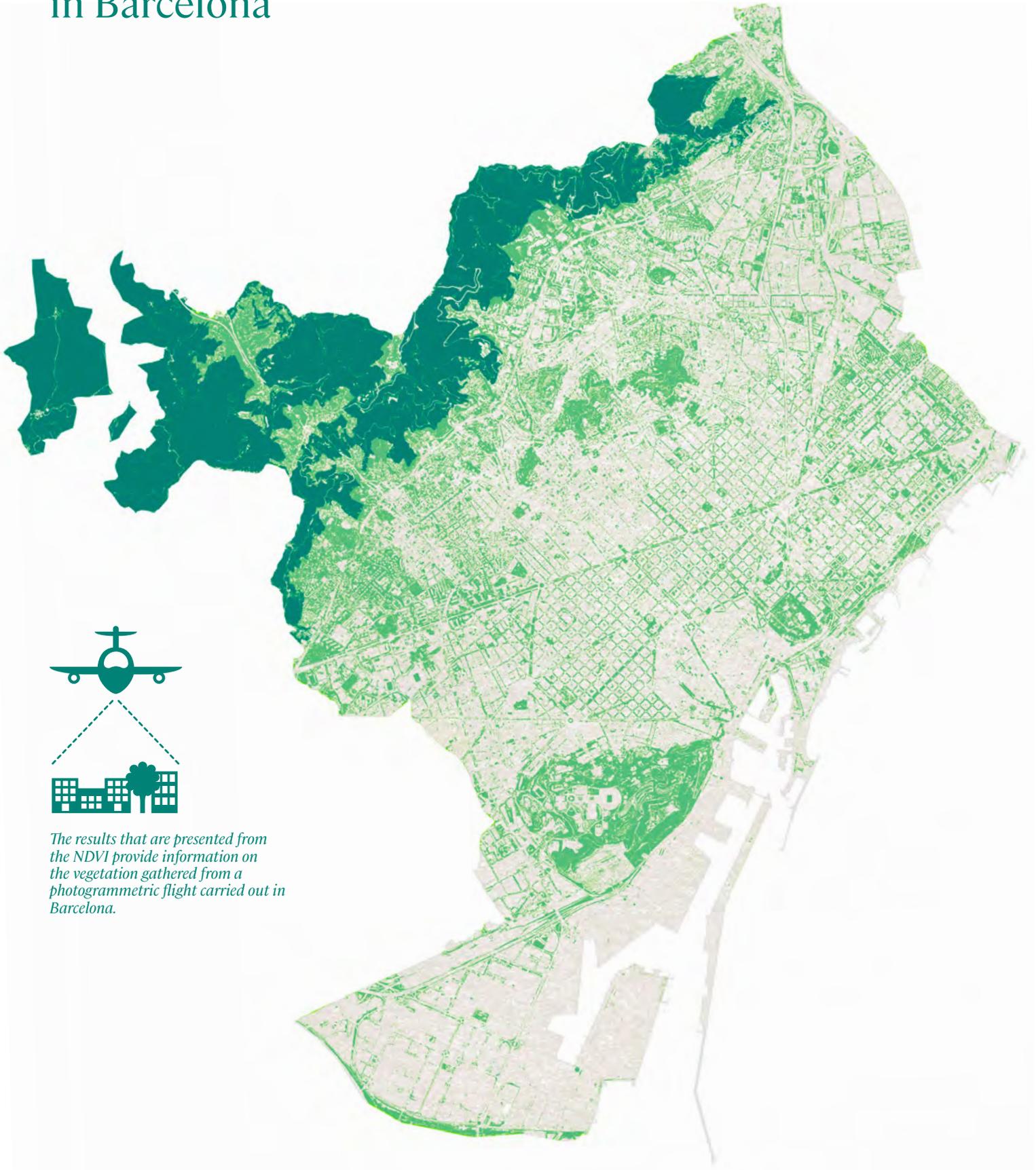


Chart 1. Distribution of plant cover compared to the rest of the city. Hectares and percentage.

Source: Barcelona Regional.

Area of plant cover in Barcelona



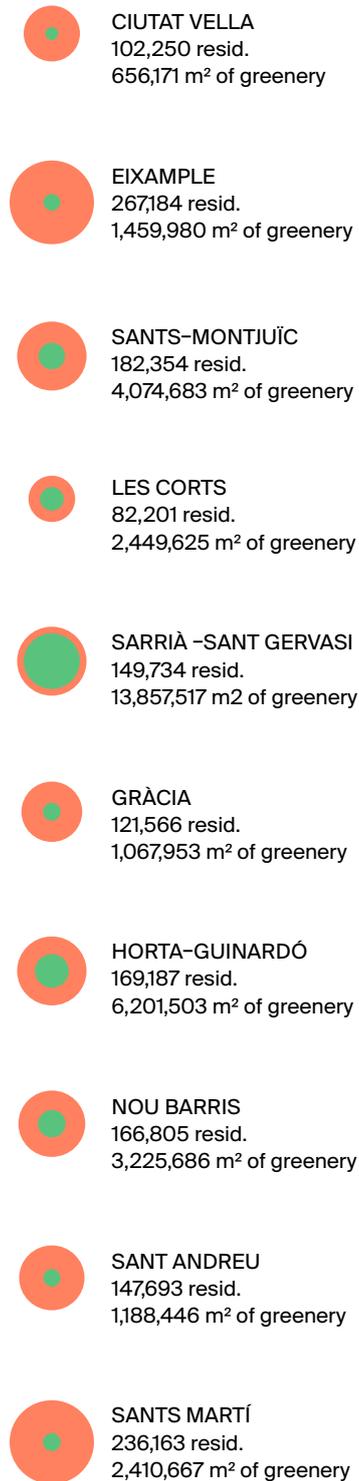
The results that are presented from the NDVI provide information on the vegetation gathered from a photogrammetric flight carried out in Barcelona.

Figure 1. Area of plant cover identified from the sky (NDVI).

Source: Barcelona Regional.

1. THE STATE OF GREENERY AND BIODIVERSITY AND THEIR DEVELOPMENT

AREA OF PLANT COVER PER RESIDENT AND BY DISTRICT



Greenery density (7 m²/resident)

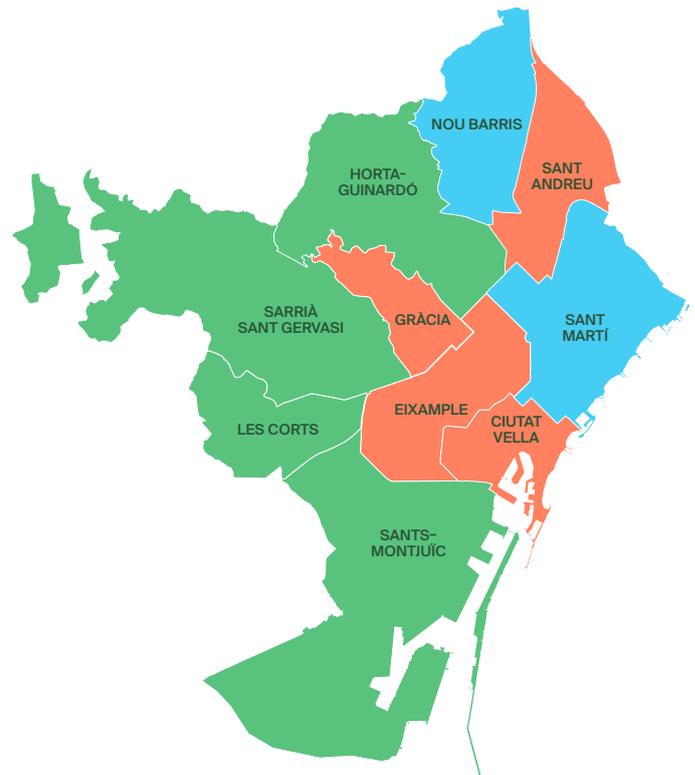
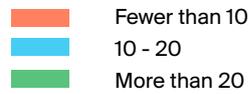


Figure 2. Area of plant cover identified from the sky per resident and by district (including Collserola).

Source: Barcelona Regional.

1. THE STATE OF GREENERY AND BIODIVERSITY AND THEIR DEVELOPMENT

AREA OF PLANT COVER PER RESIDENT AND BY NEIGHBOURHOOD.

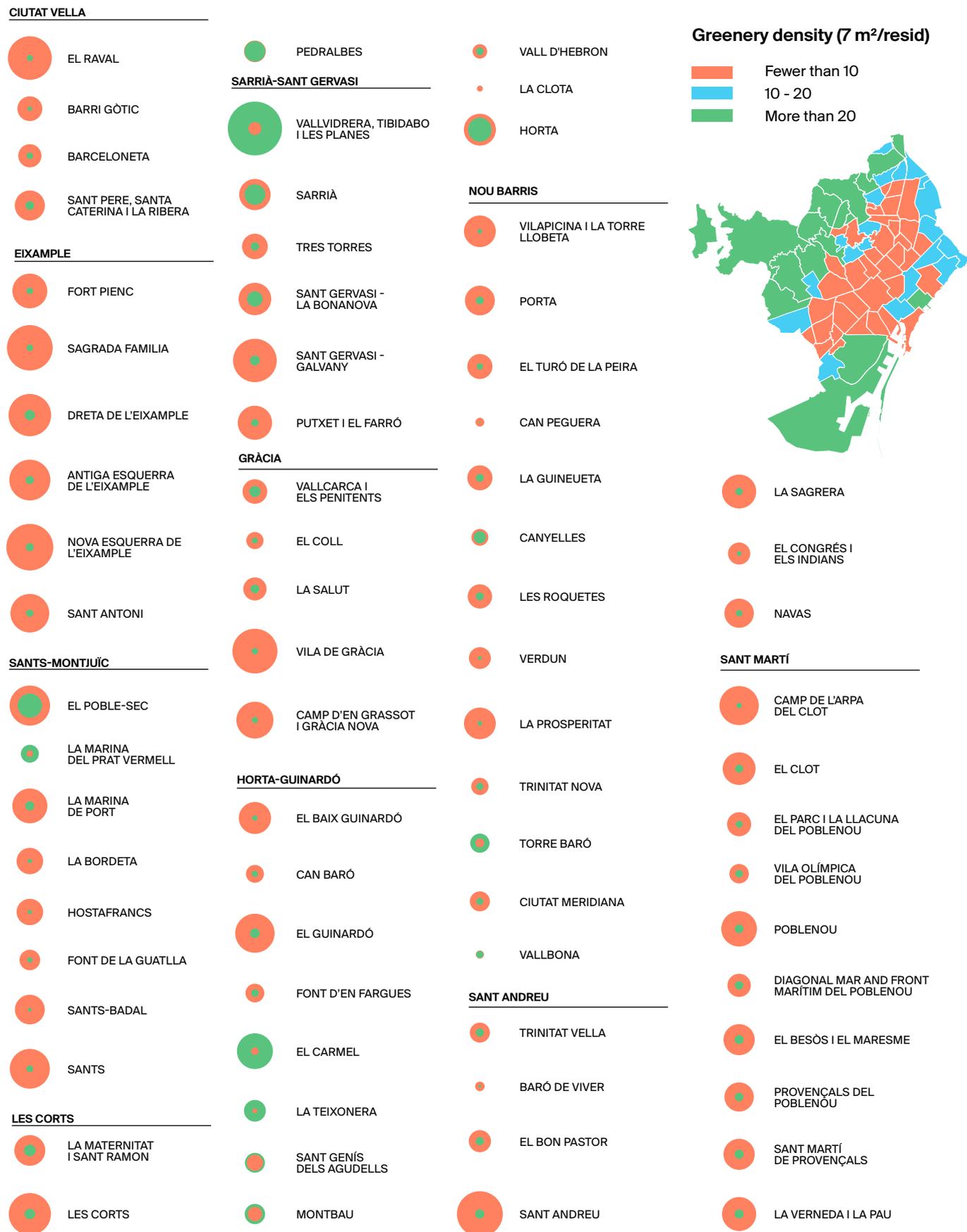


Figure 3. Area of plant cover identified from the sky per resident and by neighbourhood (including Collserola).

Source: Barcelona Regional.

1. THE STATE OF GREENERY AND BIODIVERSITY AND THEIR DEVELOPMENT

GREEN AREA

The public green area in Barcelona is 2,870 hectares, of which 41% corresponds to strictly urban greenery (1,171 hectares) and 59% to forest greenery of the Parc Natural de la Serra de Collserola (in fact, 1,699 hectares of the Park's 8,465 hectares are within the boundaries of the Barcelona municipality,).

The ratio of public greenery per resident in 2020 was 7m² of urban greenery per resident or 17.22 m² per resident if the Collserola forest greenery is taken into account. These public green spaces are classed as heritage, urban and biodiversity spaces.

DISTRICTS	URBAN GREENERY (HA)	COLLSEROLA FOREST GREENERY (HA)	TOTAL GREENERY (HA)	M ² URBAN FABRIC GREENERY/ RESID.	M ² GREENERY WITH COLLSEROLA/ RESID	RESIDENTS 2020
Ciutat Vella	63.4		63.4	5.85	5.85	108,331
Eixample	54.3		54.3	2.01	2.01	270,694
Sants-Montjuïc	327.9		327.9	17.48	17.48	187,584
Les Corts	80.6	46	126.6	9.75	15.32	82,635
Sarrià-Sant Gervasi	93.9	1,063	1,156.9	6.21	76.54	151,157
Gràcia	43.2	13	56.2	3.49	4.54	123,651
Horta-Guinardó	141	394	535	8.07	30.61	174,799
Nou Barris	119	183	302	6.84	17.35	174,012
Sant Andreu	63.8		63.8	4.20	4.20	151,976
Sant Martí	184.1		184.1	7.62	7.62	241,691
Total	1,171	1,699	2,870	7.03	17.22	1,666,530

Table 1. Ratio of greenery per resident and by district, in area.

Source: Parks and Gardens, Municipal Institute.

1. THE STATE OF GREENERY AND BIODIVERSITY AND THEIR DEVELOPMENT

Besides the green area referred to in Table 1, the green infrastructure also includes (data from 2020):



The River Besòs, the River Llobregat and the sea, within the boundaries or next to the municipal boundaries: 4,780 metres of beaches and 83 hectares of sea reefs.



453 urban allotments (including school allotments).



10 cemeteries.



Private greenery.



242.789 trees in the urban fabric and parks and gardens.



Figure 4. Example of street-lining trees in Barcelona's Eixample.

Source: Barcelona Biodiversity Atlas. Barcelona City Council (2021).

In addition, Barcelona has greenery and biodiversity spaces of special interest, located mainly on Montjuïc, in the Collserola foothills, on the Tres Turons (hills) and in Parc de la Ciutadella.

Urban biodiversity

Barcelona's vegetation is rich and constantly evolving. **Improving greenery management enables greater quantity and quality, as well as a richer range of flora and abundant fauna.** According to data from 2020, the inventory of flora in the urban fabric is as follows:

One of the goals of creating new habitats and improving their management is to increase the number vertebrate and invertebrate animal species and the number of specimens of each species. One of the results of rolling out the Green Infrastructure and Biodiversity Plan 2013-2020 has been to improve our knowledge of the fauna. The invertebrate and vertebrate animal species detected in the urban fabric up to 2020 were as follows:

URBAN FLORA SPECIES

ORNAMENTAL FLORA (INCLUDES TREES)

Total	1,191
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URBAN HERBS

Total	+200
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LICHENS

Total	113
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ORCHIDS

Total	8
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NATIVE FAUNA SPECIES DETECTED IN THE URBAN FABRIC

BIRDS

Nesting	74
Total within municipal boundaries	156
Protected	123

BUTTERFLIES

Total	44
Protected	1

MAMMALS

Bats	9
Other	10
Total	19
Protected	11

REPTILES

Total	10
Protected	10

AMPHIBIANS

Total	3
Protected	2

DRAGONFLIES

Total	16
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SEA SLUGS

Total	73
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OTHER

Spiders	48
Beetles	61
Flies	27
Snails	32
Bees / wasps	
ants	23
Grasshoppers	9

1. THE STATE OF GREENERY AND BIODIVERSITY AND THEIR DEVELOPMENT

	TOTAL NATIVE SPECIES. BARCELONA + PARC NATURAL DE COLLSEROLA	TOTAL SPECIES INTRODUCED. BARCELONA + PARC NATURAL DE COLLSEROLA	TOTAL NUMBER OF PROTECTED SPECIES. BARCELONA URBAN FABRIC*	TOTAL NUMBER OF PROTECTED SPECIES. PARC NATURAL DE COLLSEROLA*
Mammals	32	1	11	12
Birds	186	13	123	151
Reptiles	17	5	10	16
Amphibians	10	0	2	9
Fish	4	7	0	0
Butterflies	71	1	1	1

Table 2. Native fauna species, introduced and protected, Barcelona and Collserola.

*Protected fauna species, in the urban fabric and in Parc Natural de Collserola, in accordance with LEGISLATIVE DECREE 2/2008, of 15 April, approving the consolidated text of the Animal Protection Act.

Sources:

Inventari dels mamífers, aus, rèptils, amfibis i peixos dels parcs de Barcelona. [Inventory of mammals, birds, reptiles and fish in Barcelona's parks]. 2008. Galanthus.

Seguiment quiròpters Foixarda, 2014. [Monitoring La Foixarda's chiroptera]. J.Serra.

Seguiment torres niu de ratpenats horts urbans de Barcelona, 2017. [Monitoring bat nest towers in Barcelona's urban allotments]. Galanthus.

Catàleg de vertebrats del Parc de Collserola, 2020. [Catalogue of Parce de Collserola's vertebrates].

Seguiment Ocells comuns de Catalunya, 2005-2020. [Monitoring Catalonia's common birds, 2005-2020]. UB/ICO.

Seguiment Ocells del Sot del Migdia, 2015. [Monitoring Sot del Migdia's Birds, 2015]. M.Garcia.

Atlas dels ocells nidificants de Barcelona. [Atlas of Barcelona's Nesting Birds]. 2017 ICO/UB/Zoo.

Bioblitz, 2010-2020.

Informes anuals gestió de basses naturalitzades. [Annual reports on naturalised ponds]. Galanthus.

Catalan Butterfly Monitoring Scheme (cBMS), 2013-2020.

Urban Butterfly Monitoring Scheme (uBMS), 2018-2020.

1.2. Development of the indicators

This section presents the results of monitoring developments in city's greenery and biodiversity using four indicators: change in the green area per resident, and the numbers of orchids, birds and butterflies.



MORE GREENERY, AND GREENERY PER RESIDENT STABLE

The green area per resident indicator expresses the area of green spaces owned and managed by Barcelona City Council per resident. It includes the forest space of Parc de Collserola within the municipal boundaries. **This indicator has remained stable since 2010, around 17m²/resid.** This is explained by the steady increase in Barcelona’s population which means that, despite the slight increase in the total green area, the proportion per resident is the same.

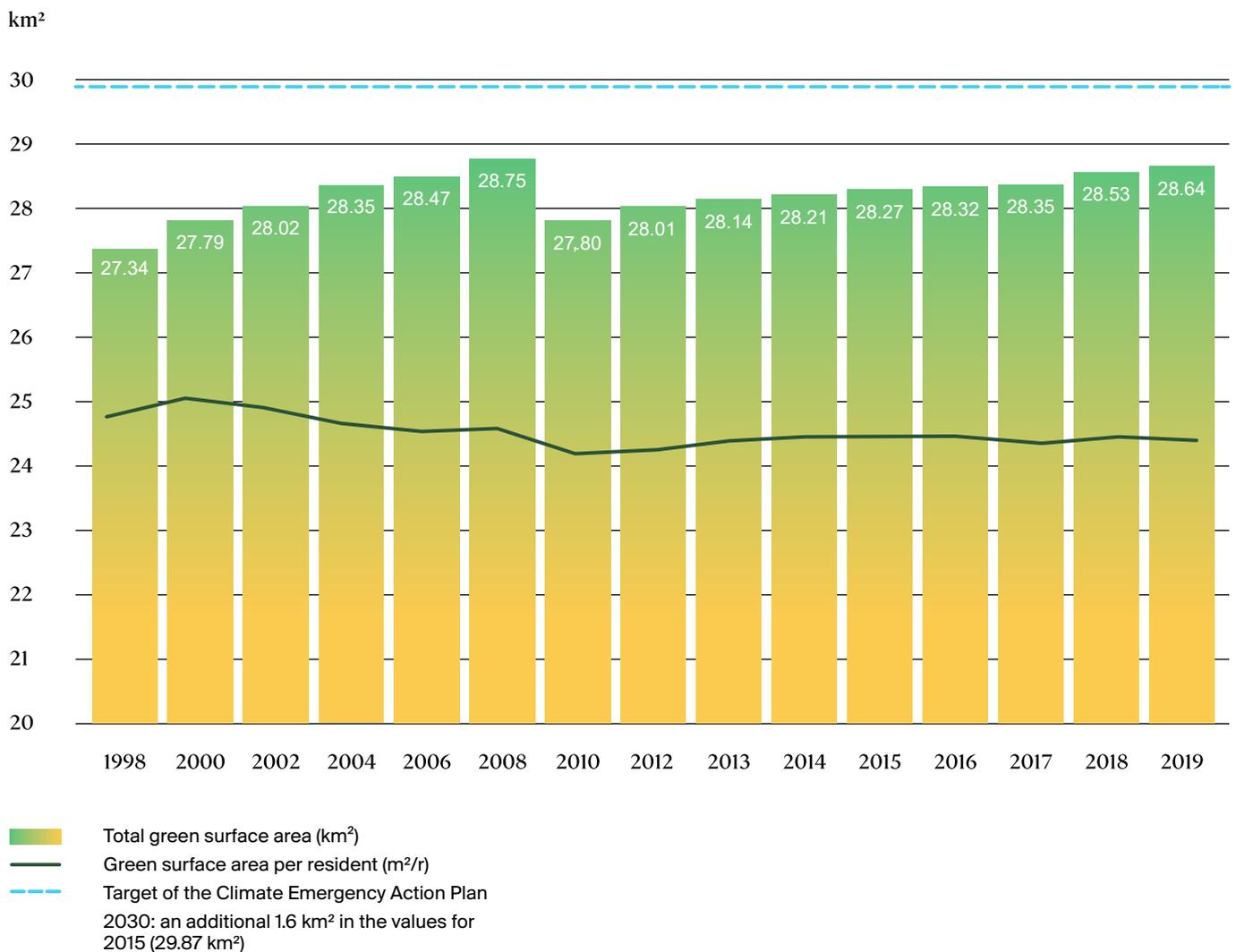


Chart 2. Green area development (1998-2019).

Source: Barcelona Sustainability Indicators. Report for 2019.

ORCHIDS RESPOND TO GOOD MANAGEMENT

Data on the presence of native orchids in the city's historical gardens, such as Parc del Laberint d'Horta and Jardins de Mossèn Cinto Verdager have been available since 2003. In all, nine new species have been found in the city over the monitoring years, eight of them in historical gardens. **These native species are an important natural heritage of Barcelona** and management of the fields and grass where they are found needs to be adapted to the guidelines established in the internal biodiversity protocols.

Chart 3 shows the development of the three most abundant species of orchid found in Barcelona. It can be seen that **some species have become more abundant over the years thanks to good management**. Up to now, eight species of orchid have been detected in Barcelona. The total number of species in the spaces affected by wild boars has dropped over time; four species have been lost there.

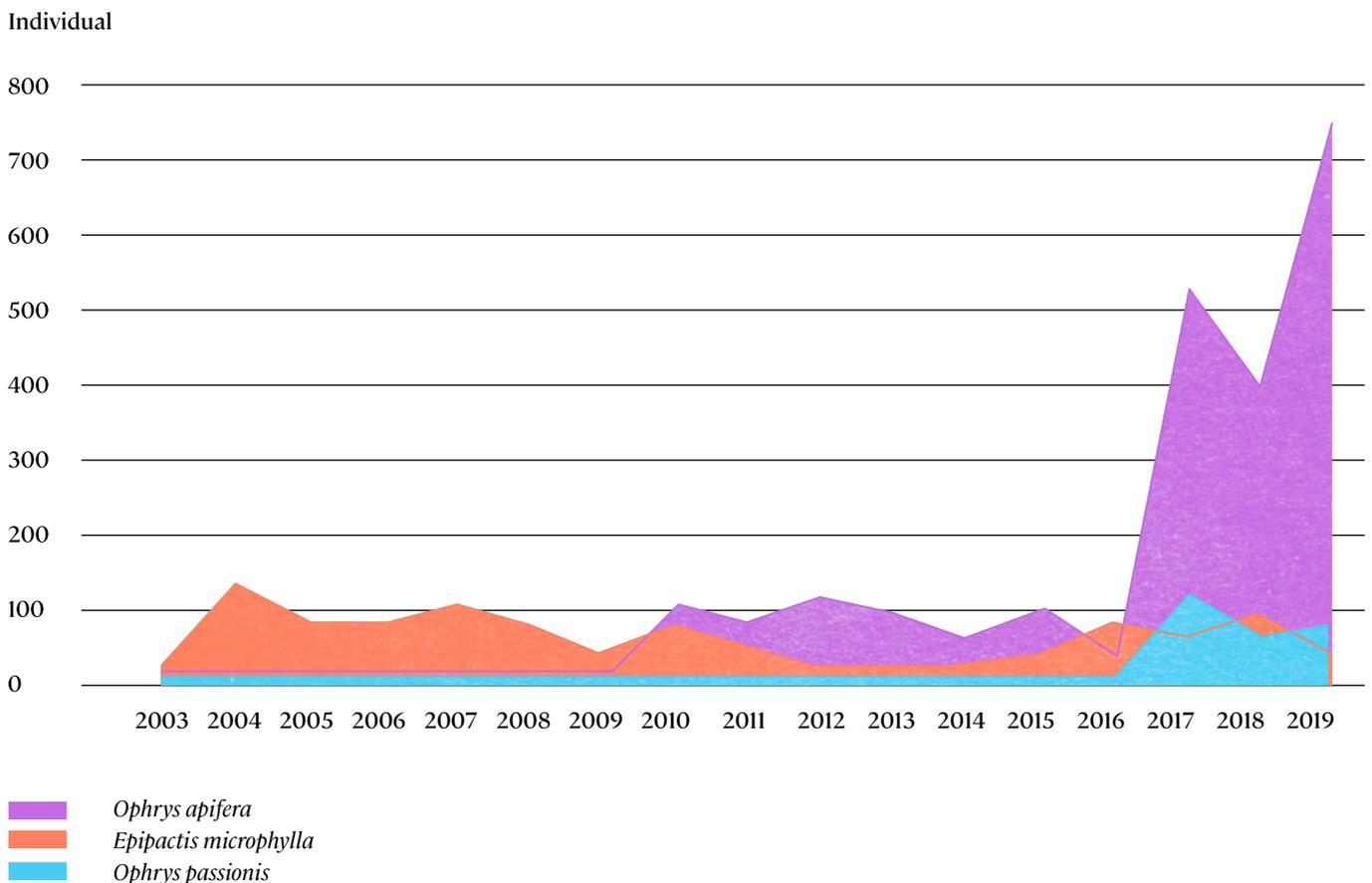


Chart 3. Development in abundance of the most frequent species of orchid detected in Barcelona.

Source: Barcelona Parks and Gardens, Municipal Institute (2020).

FEWER NATIVE AND MORE FERAL BIRD POPULATIONS

Systematic monitoring of Barcelona’s birds began in 2005 and a list is currently available of common species that is part of the “Common birds of Catalonia Monitoring” (SOCC) project. This comprehensive indicator includes the urban fabric and the Barcelona side of the Collserola range, and their wealth and abundance. The population index of Barcelona’s common species of birds shows that **there is an overall drop in native species populations and rise in feral species populations, although each species and each environment shows a different response.**

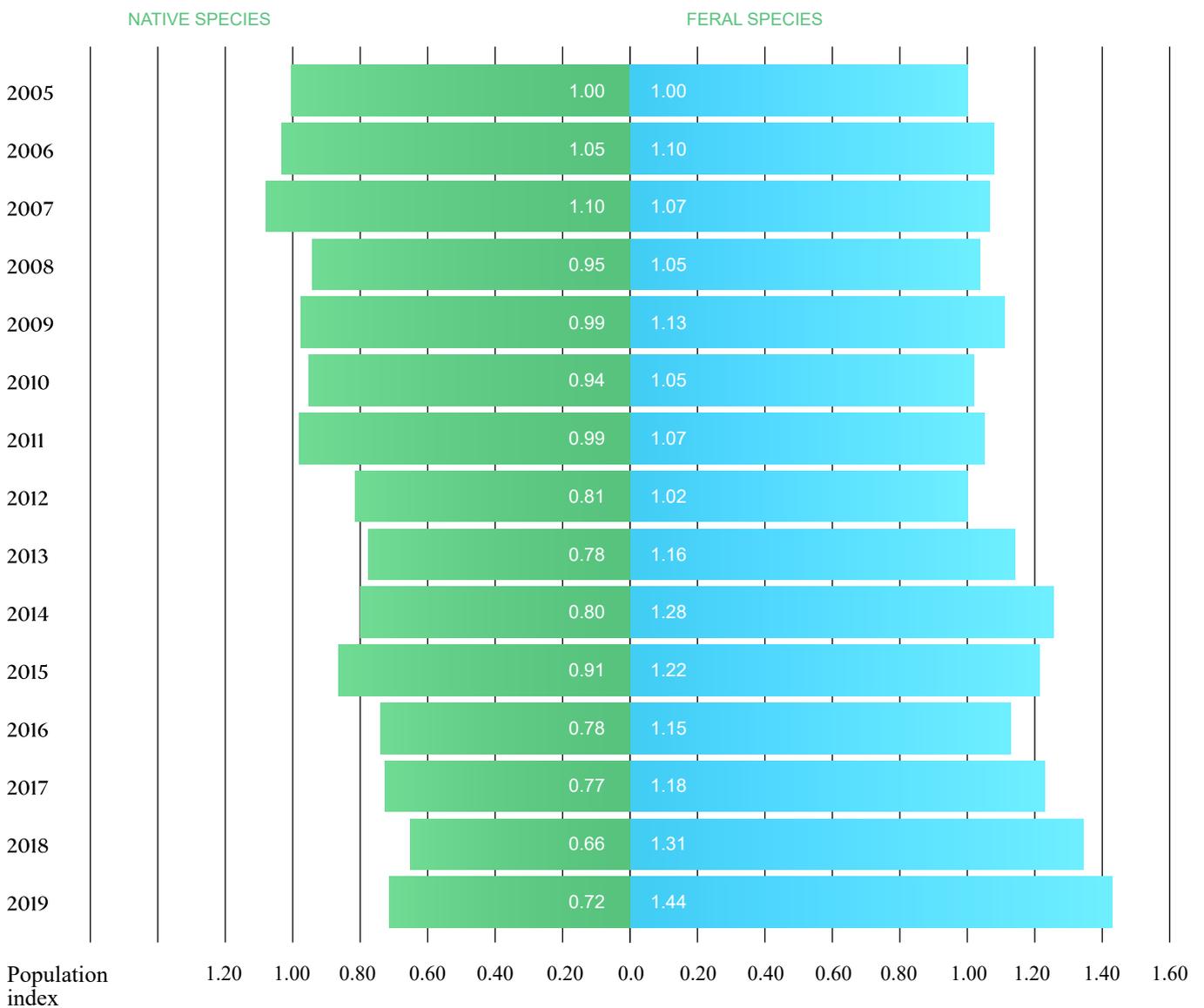


Chart 4. Development of the population index for native and feral species (2005-2019). This indicator shows the development in the populations of native and feral species (alien species and semi-domestic pigeons) of Barcelona’s birds in the year in question, compared to the populations registered in the first year that the monitoring process began (2005).

Source: Barcelona Sustainability Indicators. Report for 2019.

MORE SPECIES OF BUTTERFLIES

The number of species of butterflies detected in the urban fabric has been on the rise over the last few years, reaching 44 in 2020. Systematic monitoring of Barcelona's butterflies began in 2013 and a list is currently available of the common species as part of the *Catalan Butterfly Monitoring Scheme* (cBMS) and which has been steadily growing thanks to the sampling efforts of the Citizen Observatory of Diurnal Butterflies (uBMS). The naturalisation actions being carried out in green spaces must enable the species with more specific ecological requirements that are found in the city's natural spaces to progressively colonise the urban fabric.

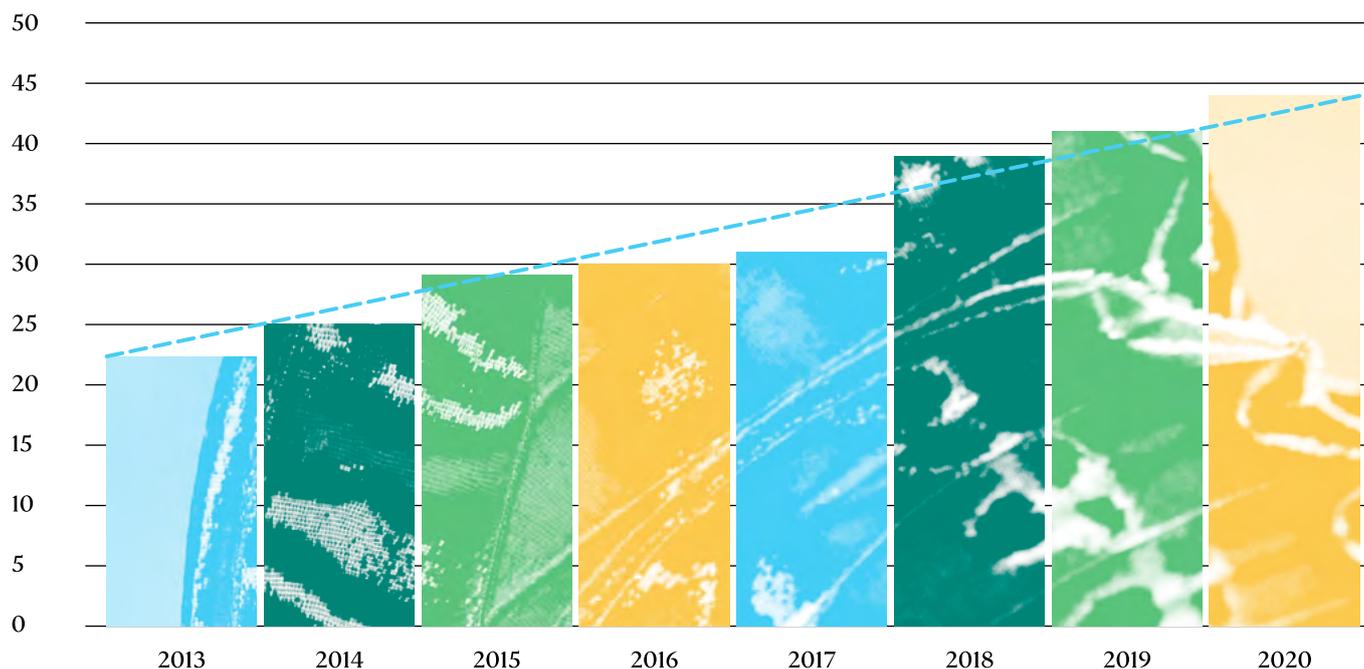


Chart 5. Development in the number of diurnal butterfly species detected in Barcelona.

Barcelona Parks and Gardens, Municipal Institute (2020).

1. THE STATE OF GREENERY AND BIODIVERSITY AND THEIR DEVELOPMENT

DEVELOPMENT IN THE NATIVE FAUNA

	NATIVE SPECIES (URBAN FABRIC)		NATIVE SPECIES PARC NATURAL DE COLLSEROLA	
	2013	2020	2013	2020
Mammals	15	19	26	29
Birds	66	156 (74 nesting)	178	184
Reptiles	8	10	16	16
Amphibians	3	3	10	10
Fish	0	0	4	4
Butterflies	22	44	55	69

Table 3. Native species (in the urban fabric) and in Collserola.

Sources:

Inventari dels mamífers, aus, rèptils, amfibis i peixos dels parcs de Barcelona. 2008. Galanthis.

Seguiment quiròpters Foixarda, 2014. J. Serra.

Seguiment torres niu de ratpenats horts urbans de Barcelona, 2017. Galanthis.

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Atles dels ocells nidificants de Barcelona. 2017 ICO/UB/Zoo.

Bioblitz, 2010-2020.

Informes anuals gestió de basses naturalitzades. Galanthis.

Catalan Butterfly Monitoring Scheme (cBMS), 2013-2020.

Urban Butterfly Monitoring Scheme (uBMS), 2018-2020.

1.3. Who promotes and manages the city's nature?



Barcelona City Council and other public bodies.

Area of Urban Ecology, especially:

Parks and Gardens, Municipal Institute BCASA (Barcelona Cicle de l'Aigua, SA)
Urban Planning

Municipal Institute of Urban Landscape and Quality of Life
Department of Communication and Participation
Department of Sustainability Strategy and Culture

Department of Animal Rights

Districts

Museu de Ciències Naturals de Barcelona - Jardí Botànic
Institut Botànic

BSM (Barcelona de Serveis Municipals, SA) - Zoo

ASPB Barcelona Public Health Agency)

Parc Natural de la Serra de Collserola

Besòs Consortium

Barcelona Regional

AMB (Barcelona Metropolitan Area)

Barcelona Provincial Council

Government of Catalonia

Individuals and organisations (private greenery).

*Planting a meadow of flowers on C/
Ferrocarriils Catalans.*



2.



Assessment of the Green Infrastruc- ture and Biodiversity Plan 2013–2020

The Green Infrastructure and Biodiversity Plan 2013-2020 was presented by the Municipal Government to the Commission for Urban Habitat and Environment at its meeting of 24 January 2013. The plan consists of 10 strategic lines and 68 individual actions. **During its roll-out and coinciding with the municipal term of office 2015-2019, new technical concepts and challenges were considered and the political focus intensified on several lines of work.** The urban area saw the emergence of a series of **concepts that have led to a new approach to urban nature**, an approach that has involved and brought together a wide range of municipal experts from diverse disciplines. The main disciplines are green infrastructure (GI), naturalisation, nature-based solutions (NBS), socio-environmental or ecosystem services and biophilia.

A lot of progress has been made since 2013. The tools that are being used in the public administration, both political and technical, bear testimony to the fact that urban nature has become part of the municipal political agenda:

Political declarations and pledges, creation of a structure in the municipal organisation and allocation of resources

Establishment of benchmark technical criteria and manuals (good practices, ISO-EMAS environmental quality systems, protocols)

Incorporation of biodiversity-conservation criteria in work projects, planning and the mandatory terms and conditions in technical specifications.

Presence in byelaws.

Financial incentives and subsidies.

Information and awareness-raising actions and participation.

Agreements and collaboration with civil society and other public authorities.

An assessment of the work carried out so far is presented below, under the framework of the Green Infrastructure and Biodiversity Plan 2013-2020 and based on the roll-out of its 10 strategic lines.

2.1. Planning, designing and creating new green spaces (Lines 2, 3 and 4)

HIGHLIGHTED INITIATIVE: COMMITMENT TO INCREASE GREENERY PER RESIDENT BY 2030

Barcelona committed itself to increasing greenery by 1 m² per resident by 2030, at the Paris Climate Change Conference (COP21) in December 2015. A climate-change adaptation measure that would be equivalent to **160 new hectares of greenery**. This target was promoted by the Barcelona Climate Commitment 2015, the government measure “Urban Green Infrastructure Promotion Programme 2017-2030” and subsequently with the Climate Plan 2018-2030 (now the Climate Emergency Action Plan 2030).

The average growth rate of greenery in the city for meeting the commitment would have to be 10.67 hectares every year, which would be the equivalent to an average of 40 hectares per political term of office. **Achieving the goal will be increasingly difficult owing to the lack of space, although for all the density and consolidation of the city’s urban fabric,** there are options for increasing green spaces, which are not just concentrated in the areas provided for under the plan such as urban parks. Contributions from city residents are very important in this process. Every action enabling more vegetation to be established in the city is considered an increase in greenery, given that **more vegetation will help to mitigate the heat island effect, make us more resilient to heat waves and promote better thermal regulation, as well as a greater carbon sequestration.**

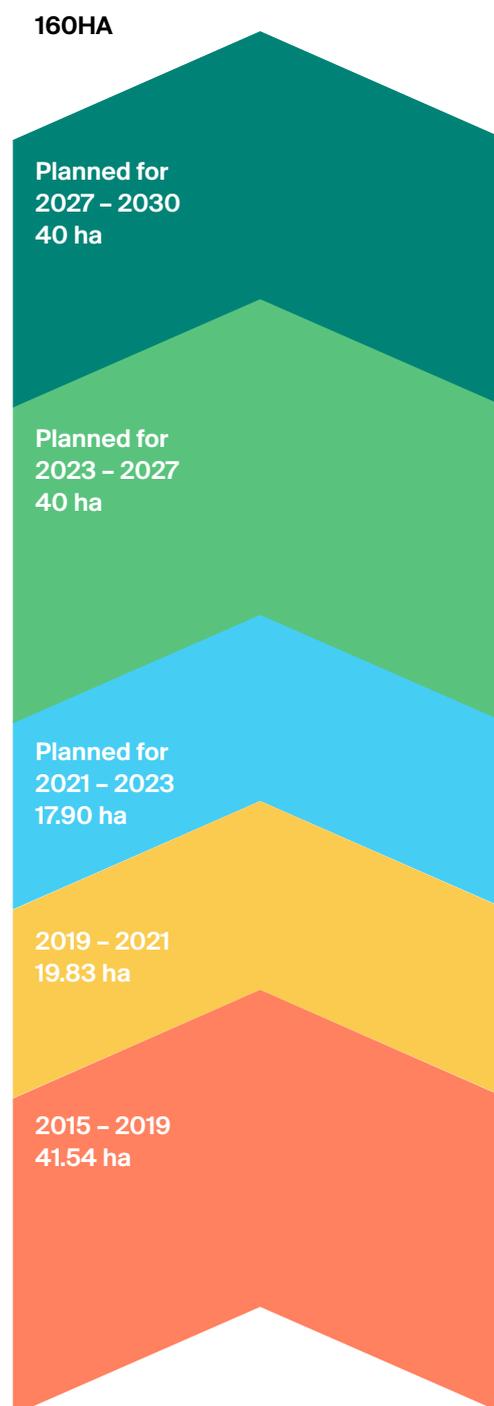


Figure 5. Increase in greenery 2015-2030.

Source: Parks and Gardens, Municipal Institute.

Increase in greenery 2015-2020

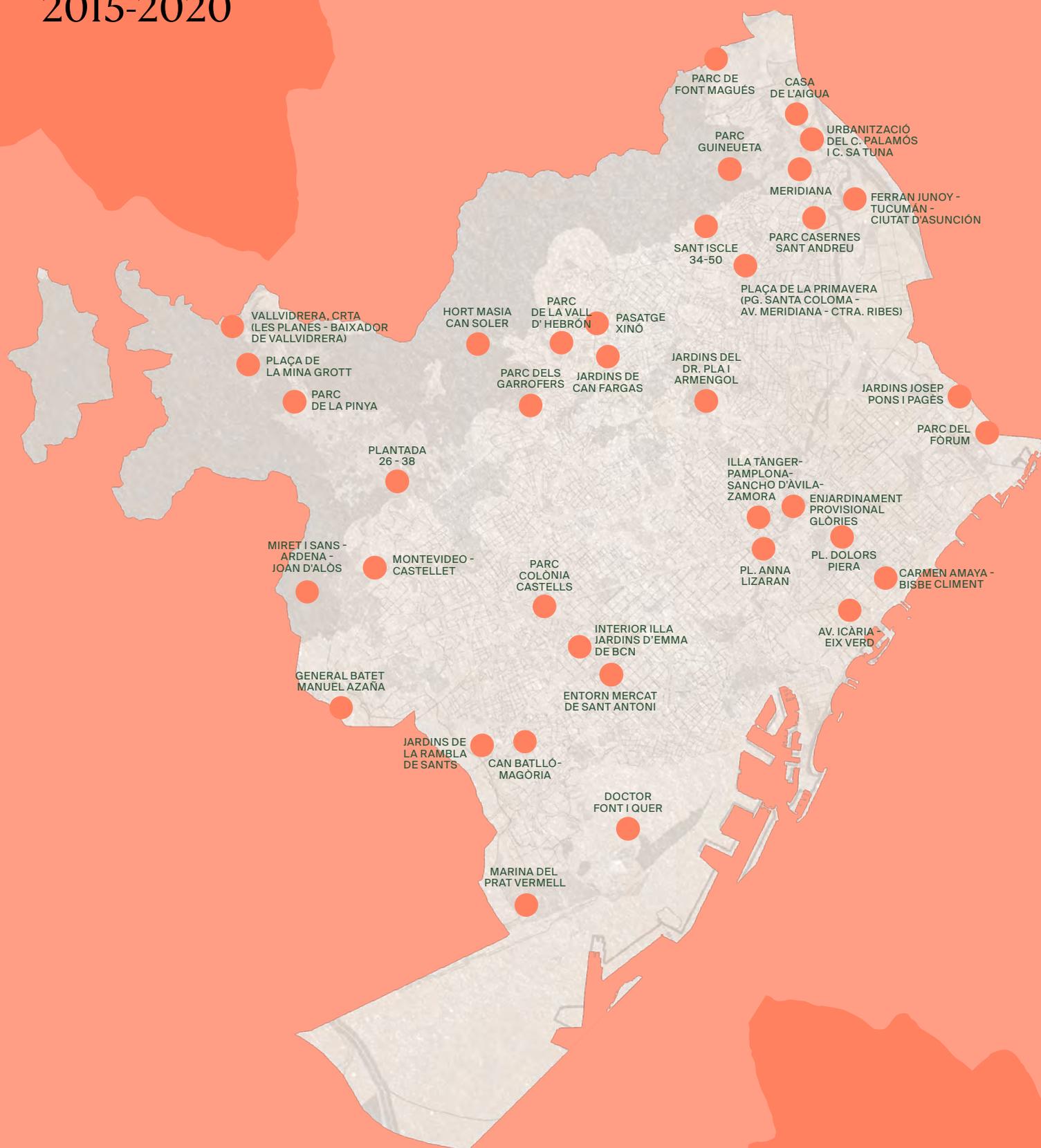


Figure 6. Actions for increasing and improving greenery in the city 2015-2020.

Source: Parks and Gardens, Municipal Institute.

Barcelona City Council has launched the following projects for the purposes of planning, designing and increasing the city's green infrastructure:



Drawn up by Barcelona Regional: Identification the city's green infrastructure (NDVI), Greenery Model (see following page), Contributions to green infrastructure by Barcelona City Council in the Advance of the Urban Development Master Plan (PDU), development of socio-environmental service studies on urban green spaces and drafting of the Greenery and Biodiversity Charter: Guide to Design Criteria for Green Spaces.



Drafting of the "Landscape studies" on Clota, Vallcarca, Farró, Font d'en Fargues, Can Peguera, Font de la Guatlla, Guinardó, Congrés, Sagrera, Trinitat Vella, Vallbona, Montbau, Nova Esquerra de l'Eixample and 22@.



Approval and roll-out of the government measure "Barcelona Green Urban Infrastructure Promotion Programme 2017-2037".



The project entitled "Healthy Besòs. A joint vision of interventions for renaturalisation and sustainable mobility in spaces of opportunity on the banks of the River Besòs" is being implemented.



Approval of the updated Technical Instructions for Application Environmental Criteria to Public Works, which incorporate biodiversity protection.



Comprehensive Management Plan for Parc Fluvial del Besòs and the project "Experience the River Besòs. Plan for conserving and restoring ecosystems and biodiversity and for preserving the coastal space and water resources".



Incorporation of greenery and biodiversity values in urban transformation projects.



Approval of the Special Plan for Protecting the Environment and Landscape of Parc Natural de la Serra de Collserola (PEPNat) and amending the Collserola General Metropolitan Plan (MPGMCo).



Approval of the Protocol for Installing Green Roofs on Municipal Buildings.



Description of the natural values of Morrot del Migdia (Montjuïc) and Tres Turons.



Advances in the Party Wall Plan.

Barcelona Greenery Model

The Greenery Model studies the possibilities of increasing greenery in Barcelona, prioritises actions and proposes the tools for making them possible.

This greenery is planned and understood as a system from the ecological and functional points of view and from the provision of socio-environmental services for the population. Planning is carried out where it can contribute to social cohesion, where it can regulate the temperature of the urban fabric more, where it can contribute from a biodiversity perspective and where there is little access to local nature.

There are areas where greenery has to be a priority in any actions for rethinking the city to make it more resilient and enable it to tackle the challenges of climate change better, while improving the health of city residents and creating more socially equitable spaces. Such greenery needs to be found not only in parks, gardens and streets but also in squares and block interiors as well as private spaces such as roof terraces, courtyards, party walls, balconies and marginal places such as land sites, interstitial road and railway spaces.

The Greenery Model studies greenery from several perspectives and offers a series of proposals for re-greening the city, not to mention its relationship with the rest of the metropolis. It therefore proposes the following goals:

A fair greenery.

We need to have our own quality green spaces accessible to all city residents, so their environmental services can be enjoyed to the full.

A connected greenery.

We need a system that establishes a network, a true green infrastructure that is complex and connected, designed by reconnecting the city's various green spaces.

A greenery reinforced in biodiversity nodes.

We need to preserve and improve the spaces that contribute greater diversity and complexity to the urban green infrastructure to enrich the entire system.

A metropolitan greenery.

We need to interconnect the green infrastructure from within the city with metropolitan-scale structural elements.

To detect where greenery is needed and therefore where there should be a structuring element, a map has been created that covers all the above-mentioned aspects on both city and metropolitan scales.

To achieve a fair greenery

Flaws have been detected in accessibility to the socio-environmental services of the urban green spaces (see the study in Chapter 3.2) and priority-action areas have been detected through a combination of green cover and green area per resident (based on the NDVI which determines the vitality and density of vegetation through satellite images or flights with multi-spectral sensors, so that it is also valid for monitoring their state in time).

To connect greenery

Breaks or discontinuities have been detected both in green connectivity on foot (difficulty for walking between two green spaces taking account of various factors such as plants, type of cover, anthropic factors, etc.) and in green connectivity by flight (difficulty for birds to fly between two green spaces taking account of the density of the vegetation, built-up areas and similarity of the ground cover). Breaks in structuring green corridors have also been detected (combination of connectivity on foot and by flight by a section-to-section analysis of six variables: density, volume and discontinuity of the greenery, the IMD, ecological intricacy and connectivity).

To strengthen biodiversity nodes

Local urban nature reserves have been detected (spaces with natural or semi-natural origins found in the city with important plant, fauna and physical geography values, which are managed by attending to these values and their potential for conserving their natural heritage) as well as high-performance parks as regards the functioning of their ecosystem (spaces that offer better performing ecological services, whether as habitats or connectors, which are the ones with the most potential for becoming green infrastructure nodes, such as the Tres Turons and Ciutadella) and the green spaces of the surroundings (to be able to strengthen the nodes by expanding them and thereby enable greater biodiversity).

To integrate greenery on a metropolitan level

Areas critical for inter-connectivity have been detected (areas where there is strong pressure on the connectivity between the nearest natural spaces such as Collserola with the Marina range or the Ordal mountains, which include fauna paths poorly adapted for each fauna group and the connecting river corridors of interest).

Greenery Model

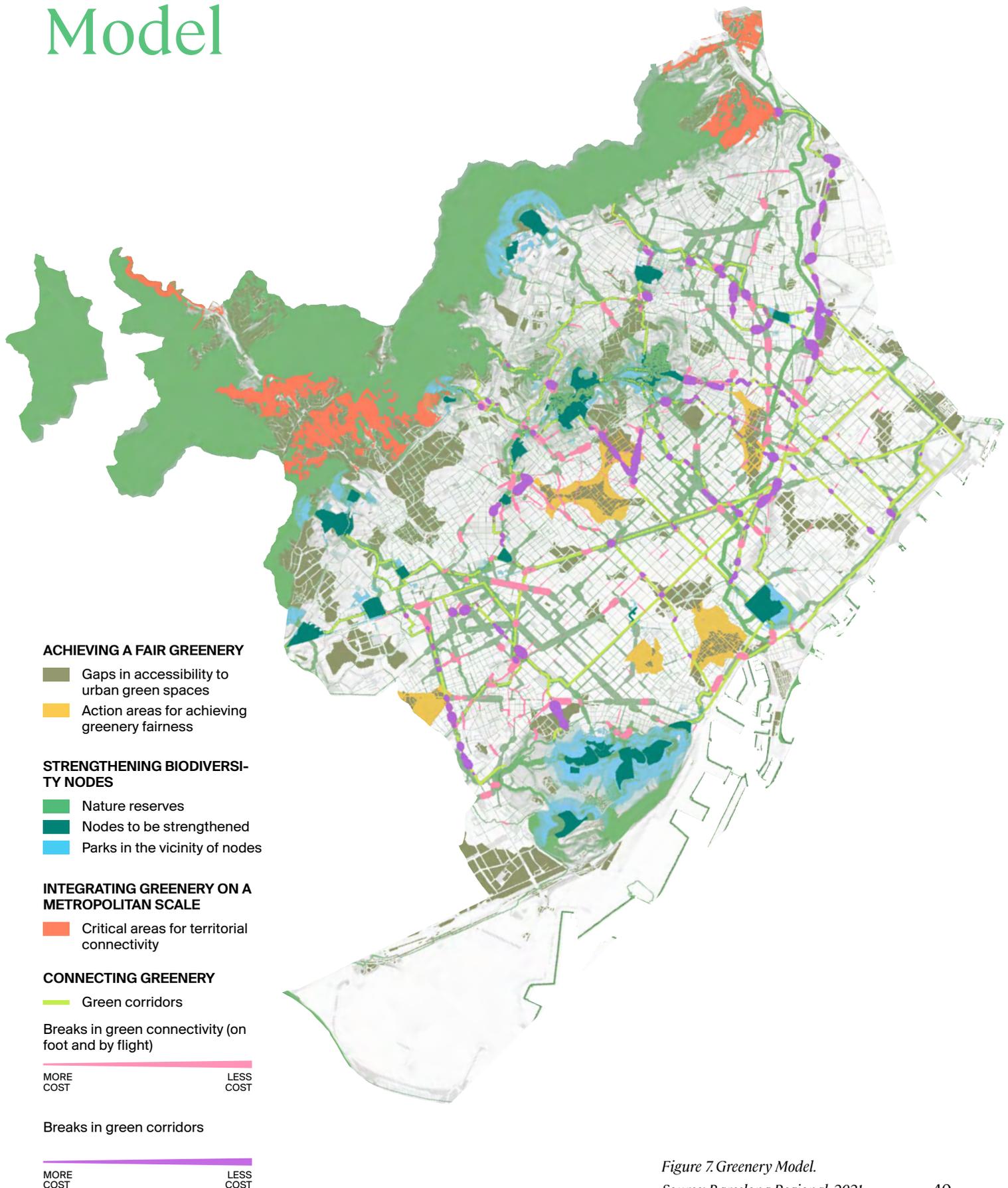


Figure 7. Greenery Model.
Source: Barcelona Regional, 2021.

2.2. Conserving and managing the city's natural heritage (Lines 1, 5 and 6)

HIGHLIGHTED INITIATIVE: ECOLOGICAL MANAGEMENT AND NATURALISATION

In the last few years Barcelona City Council opted for ecological management and naturalisation of green spaces, with the aim of helping to conserve and increase nature in the city and bring about better health and quality of life.

As conceived for Barcelona, **the goal of ecological management is sustainable use of resources, protection of the natural heritage and environment and, therefore, health, and it applies to all the city's greenery. Naturalising urban green spaces means transforming them by managing more in favour of ecological processes and the spontaneous entry of flora and fauna, without losing aesthetic quality and by gearing them towards social and health benefits and the conservation of biodiversity.** It is a matter of transforming naturalised spaces into habitats for flora and fauna. **Naturalisation is being applied in several parts of the city.** We are thereby achieving more and better green spaces that help to compensate the needs of the urban ecosystem and, therefore, the well-being of those who live there.

A few examples of ecological management are offered below:

- applying environmental criteria to purchasing;
- eliminating the purchase of invasive plants;
- greening the vehicle fleet and machinery;
- optimising irrigation water, or
- reducing plant waste.

Examples of flagship naturalisation projects include:

- creating habitats for flora and fauna (land, fresh water, coastal and so on);
- defining low-maintenance areas of natural interest for conserving and improving biodiversity (Collserola, Montjuïc and Tres Turons);
- landscaping that imitates nature;
- managing ponds so aquatic fauna can live in them; evolution of lawns into meadows or grasslands;
- growth of wild plants;
- planting friendly or beneficial flora that encourages useful fauna (mainly in tree pits and allotments), or installing nesting boxes and other structures for fauna.

•



Among the biodiversity conservation and management projects, the following stand out:



“Fauna in buildings” project that has included the creation of a website and a publication, and more than 349 interventions in buildings for bird conservation and 963 addresses of registered buildings with nests present.



Greenery-protection protocol (PIJBIM) has incorporated criteria for protecting fauna.



Measures for conserving and improving fauna populations: land and marine vertebrates and invertebrates, in greenery and buildings. Note the installation of structures for fauna:

- in 2017, 19 nesting towers for bats, with 40% occupation;
- in 2019, 15 nesting boxes for insectivore birds in allotments in the municipal network, 40 insect hotels, 145 nesting boxes (tits, Eurasian scops owl, little owl, house sparrow), 34 nesting towers/boxes for bats, 21 bio-trunks, 16 fauna ramps, 9 rocky sites, 5 herb spirals, 4 wood pyramids and 2 swallow bogs; and
- in 2020, 24 bird kitchens and 8 nesting boxes for hedgehogs.



Drafting and implementing management protocols:

- Revision of the “Quality-control protocol for green-area maintenance”, from the “Specifications for maintaining green spaces”, and from the “Work methodologies for Parks and Gardens” to include naturalisation criteria.
- Drafting of management criteria for biota, ponds and ornamental fountains.
- Creation of a Protocol for pruning street-lining trees - management of budgerigar nests taking care of animal well-being.
- Environment instructions for pruning street-lining trees respecting the fauna’s calendar.
- Protocol for collecting swarms in public streets and squares.
- Protocol for relocating cat colonies located in spaces of interest for biodiversity.



Wild-boar programme for reducing incidents in the city.



Naturalisation of ponds. Promoting actions for conserving amphibians and biota in general, in ponds in public and private green spaces. The project being carried out in the Jardins de Mossèn Cinto Verdaguer has enabled the Iberian waterfrog population to recover, having achieved a stability, and maximum load capacity of the space. There were 390 Iberian waterfrogs in the garden in 2007 while the population in 2019 came to a thousand. The frogs have already begun to move to other green spaces on Montjuïc, achieving a natural colonisation.



Ethical urban pigeon control project using nicarbazin.



Publication of “Good gardening practices: conserving and improving biodiversity” for the city’s gardening corps and online: 26 biodiversity improvement actions and 58 biodiversity conservation actions.



Hedgehog conservation actions.



Protection of the artificial island of the Bogatell breakwater to conserve the Common shag.



Change in management of Zin-Zina (Catalan initials for areas of natural interest and altered areas of natural interest).



Management of invasive plant species.



Implementation of the Tree Master Plan 2017-2037.



Conservation of orchids.



Drafting and implementation of the Strategic Framework for Historical Gardens (MEJH).



Reduction of seasonal flower groups and increase in perennial plants.



Barcelona Technical Plan for harnessing alternative water resources (PLARHAB 2020).



Biological pest control.



Coastal Plan. Strategic Plan for the City's Coastal Spaces, 2028.



Reduction of user impact in Collserola and on Montjuïc.



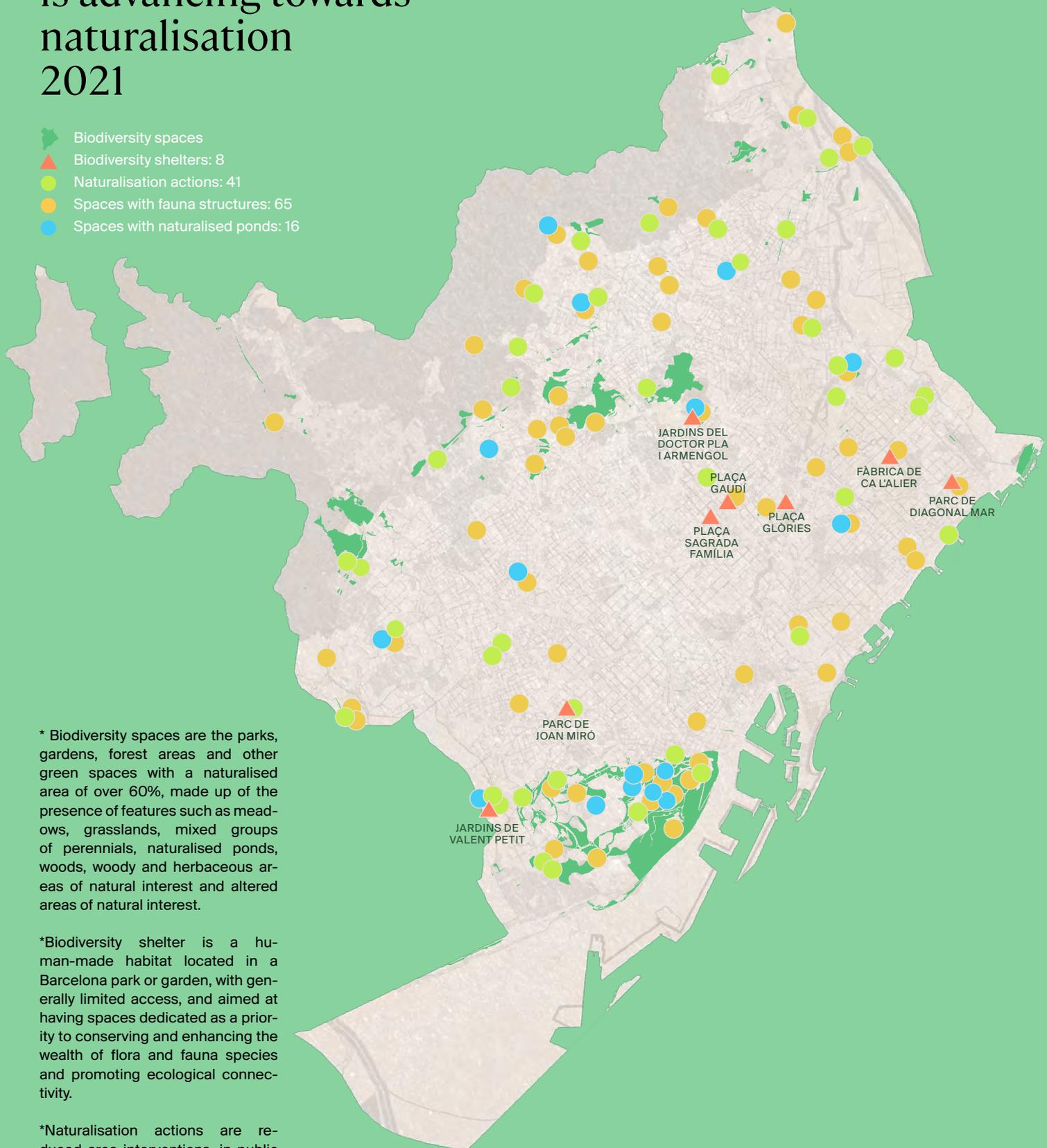
Beach action programme.



Approval and roll-out of the government measure on eradicating glyphosate.

Barcelona is advancing towards naturalisation 2021

-  Biodiversity spaces
-  Biodiversity shelters: 8
-  Naturalisation actions: 41
-  Spaces with fauna structures: 65
-  Spaces with naturalised ponds: 16



* Biodiversity spaces are the parks, gardens, forest areas and other green spaces with a naturalised area of over 60%, made up of the presence of features such as meadows, grasslands, mixed groups of perennials, naturalised ponds, woods, woody and herbaceous areas of natural interest and altered areas of natural interest.

*Biodiversity shelter is a human-made habitat located in a Barcelona park or garden, with generally limited access, and aimed at having spaces dedicated as a priority to conserving and enhancing the wealth of flora and fauna species and promoting ecological connectivity.

*Naturalisation actions are reduced-area interventions, in public greenery, for changing plants and support fauna, with the aim of conserving and improving the wealth of flora and fauna species and of encouraging ecological connectivity.

Figure 8. Barcelona is advancing towards naturalisation 2021.

Source: Barcelona Parks and Gardens, Municipal Institute.

2.3. Disseminating and promoting the value of greenery and biodiversity, and strengthening municipal leadership (Lines 8, 9 and 10)

HIGHLIGHTED INITIATIVE: THE BARCELONA URBAN AGRICULTURE STRATEGY AND “ALL HANDS TO GREENERY” PROGRAMME

The Barcelona Urban Agriculture Strategy was launched in 2019 with the mission of extending agricultural culture to the city by bringing city residents over to urban allotments and supporting citizen urban-agriculture initiatives. The strategy plans the actions needed for ensuring the improvement and enhancement of agricultural areas in the city, under an agro-ecological model, working in four areas (territorial; agro-ecological model; social and community; and governance and coordination) and deploying the relevant actions in each area.

Work was carried out in 2020 for drafting the “All hands to greenery” programme, which came about from the aim to become a framework programme that covered all the initiatives (including, the Urban Agricultural Strategy) for involving city Barcelona’s residents and economic and social players in looking after the city’s greenery and biodiversity.

The aim under this programme is, on the one hand, to encourage city residents to take the initiative by cultivating public or private spaces and empowering themselves there and, on the other hand, to make more green spaces available to contribute to the good health and well-being of people and diversity, under a collaborative management model for public spaces.

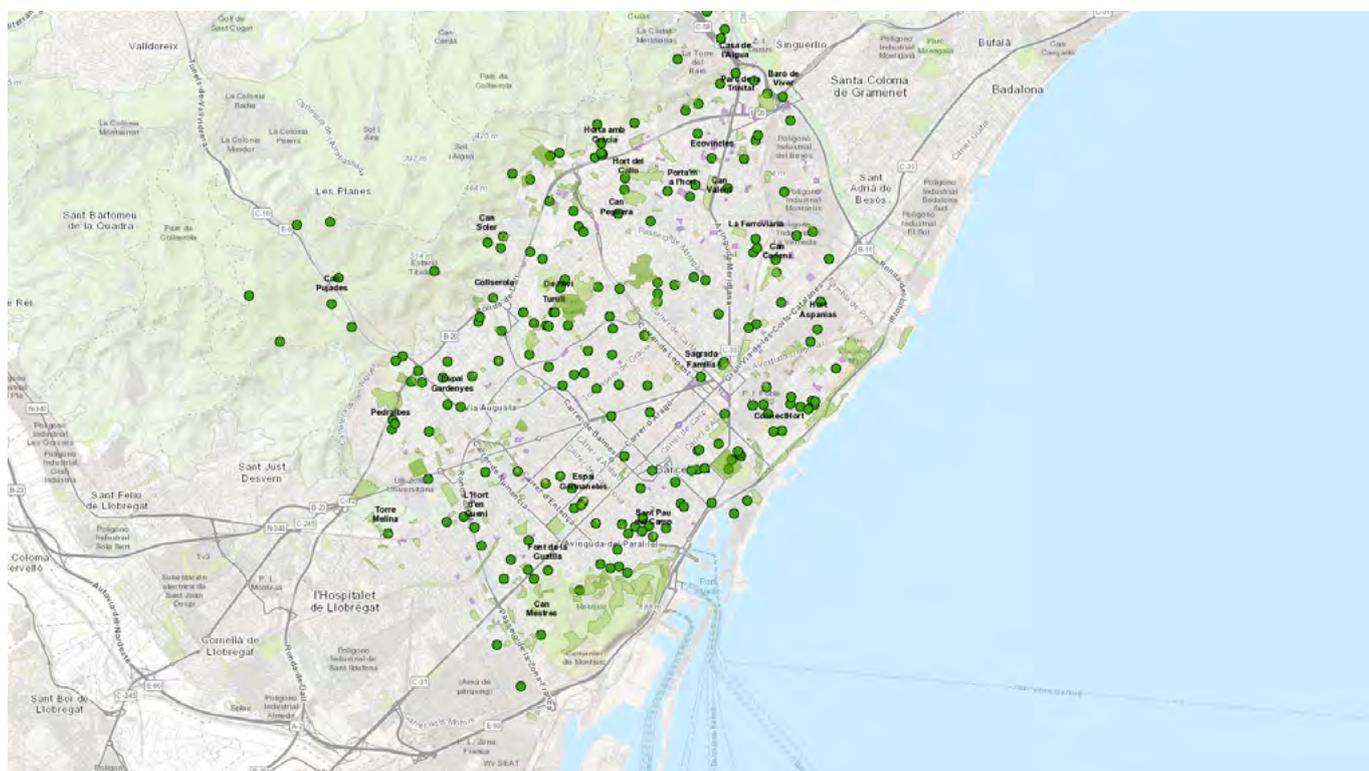


Figure 9. Map of Barcelona's urban allotments.

Source: Barcelona Regional (2020).

The projects relating to city residents and their link to greenery and biodiversity in the city, stand out for the following results:

 <p>The drafting of the Strategic Plan of the El Laberint Training Centre.</p>	 <p>62 state schools taking part in the “Open playgrounds” project.</p>
 <p>The drafting of the Manifesto in defence of Barcelona’s greenery and biodiversity, by the Greenery and Biodiversity Work Group (in the framework of the initiatives linked to the More Sustainable Barcelona Commitment Network. This manifesto was signed by 179 organisations and 287 individuals.</p>	 <p>Debate with city residents on the greenery renovation and increase projects. The main projects include the following: the Sants roof, the Barça Space, La Sagrera, Tres Turons, Doctor Pla i Armengol, Pi i Margall, Feixes Trinitat Vella, the renovation of La Meridiana, the definition of La Model, Canòpia, Superblock, Can Soler, PEPNat Collserola, Clota, Marina del Prat Vermell and Font de la Guatlla.</p>
 <p>The holding of eleven editions of Bioblitz, with results published in the Global Biodiversity Information Facility (GBIF).</p>	 <p>The compilation of the Atlas of Barcelona’s Nesting Birds with over 300 volunteers taking part.</p>
 <p>Co-management for tree-pit planting with 5 associations and 100 tree-pit units planted.</p>	 <p>The annual visit of between 12,000 and 15,000 people to the Rose Garden in May during days of the <i>Barcelona New roses competition</i>.</p>
 <p>Some twenty new private green roofs, winners of the “<i>Whoever has a roof, has a treasure</i>” competition.</p>	 <p>Hundreds of activities relating to greenery and biodiversity promoted by municipal environmental facilities.</p>
 <p>Over 60,000 people having taken part (2019) in some urban-nature activity or event.</p>	

As projects relating to the strengthening of the municipal leadership in greenery and biodiversity in the city, the following stand out:



The Enfortim project, a reflection carried out by the Parks and Gardens organisation to assess and strengthen its capacity for taking on the change that the new city model entails, the new way of making public space and the new management of greenery.



First and second prize received by Barcelona for its "Management criteria for biota, ponds and ornamental fountains" and the "Barcelona Green Infrastructure and Biodiversity Plan 2013-2020" projects, awarded by the "Red Española de Biodiversidad (FEMP)".



Transformation of the greenery transformation model, which has incorporated biodiversity.



Relations established with more than 25 institutions and more than 15 associations, working in greenery and biodiversity.



Promotion of the challenges of the plan and exchange and innovation beyond Barcelona City Council with city residents.



Winner of the Prize for "Atles de la biodiversitat" [Atlas of Barcelona's Nesting Birds] and the prize for "Promotion of local biodiversity in municipal spaces and buildings", awarded by More Sustainable City Council.



Implementing the Green Infrastructure and Biodiversity Plan with the entire organisation. The plan's challenges were present in the technical and legal documents and in the urban-planning transformation of the projects.



Participation in city networks: Red Española de Biodiversidad (FEMP); the ICLEI Cities With Nature programme, the "Action for Biodiversity" (LAB) local programme from the ICLEI "Local Governments for Sustainability" cities network; "MediverCities" (improving protection and management of biodiversity in the Mediterranean basin); "Earth Observation in Support of the City Biodiversity Index" (EO4CBI) international project; C40; "URBES – Urban Biodiversity and Ecosystem Services" international research project; Blue Health; "World Federation of Roses Societies".



Presentation of the Barcelona Green Infrastructure and Biodiversity Plan 2013-2020 in both national and international day events, conference, forums, technical tours, courses and talks.



Winner, in 2020, of the first prize for good citizen-awareness practice for "Atles dels ocells nidificants de Barcelona" [Atlas of Barcelona's Nesting Birds] and "Atles de la biodiversitat" [Atlas of biodiversity] and runner-up prize for the Project for bird conservation in buildings and urban structures, in the framework of the "Premio a las Buenas Prácticas Locales por la Biodiversidad" awarded by the "Red Española de Biodiversidad (FEMP)".



Partners: CREAF, ICTA-UAB, ICLEI, UB, ICO, IEC, CONAMA, CREAL, Advisory Committee of Subnational Governments to the UN Convention on Biological Diversity; UICN – Office for the European Union and "The Nature of Cities"; collaboration in drafting the NTJ Normes Tecnològiques de Jardineria [Technological Rules of Gardening], published by the La Jardineria i el Paisatge Foundation; UPC-Arquitectura; Prat Airport; other local councils, Signatories to the Commitment working in Greenery and Biodiversity; Greenery and Biodiversity Work Group; More Sustainable Schools; private initiatives: Urbaser, AGBAR, Sagrada Família, Barça, vertical school allotments sponsored by "la Caixa", Pastoret, etc.

2.4. Knowledge (Line 7)

HIGHLIGHTED INITIATIVE: ATLES DE LA BIODIVERSITAT [ATLAS OF BIODIVERSITY]

The **Atles de la Biodiversitat de Barcelona** is an online tool that shows the most important data of the city's species of flora and fauna. This is an educational project for both the educational community and city residents, open and downloadable, whose aim is to share knowledge and provide new apps.

It currently identifies the various species of plants, plant communities, birds and other vertebrates, butterflies and naturalised ponds with the flora and fauna that live in them, found in every neighbourhood or specific address. It also includes public green spaces.

The species are documented on the basis of inventories made with several sources:

- Citizen science projects
- ICO (Catalan Ornithological Institute)
- Galanthus
- Oxygastra
- uBMS (Urban Butterfly Monitor Scheme)
- CBMS (Catalan Butterfly Monitoring Scheme)
- UB (University of Barcelona)
- UAB (Universitat Autònoma de Barcelona) – CREAM (Centre of Ecological Research and Forest Applications) and other institutions
- BR (Barcelona Regional)
- BCASA (Barcelona Cicle de l'Aigua, SA)
- PIJBIM (Municipal Institute of Parks and Gardens)

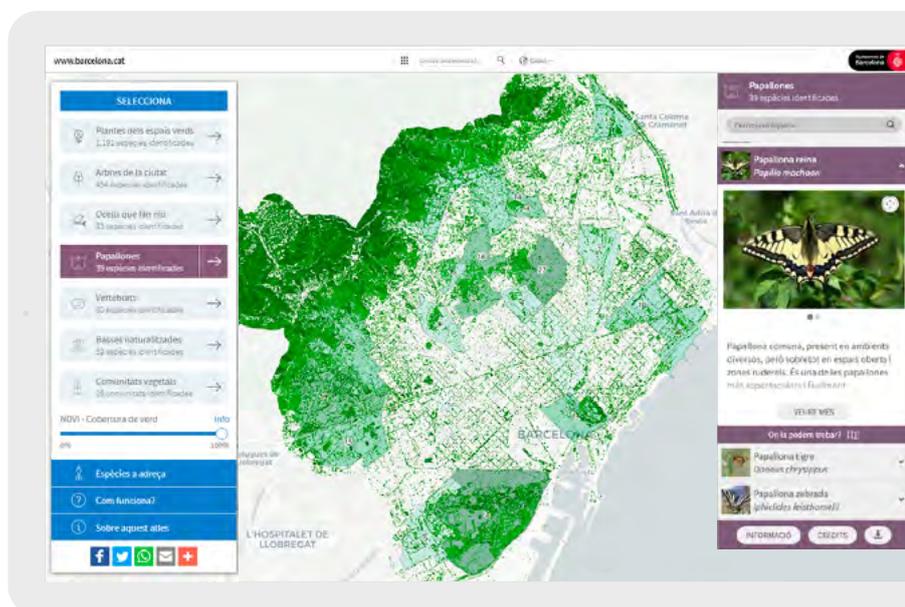
The Atles de biodiversitat offers the scientific and common names of each species, a small description and, in some cases, a photograph or illustration of it. The app also shows the extent of the city's plant cover through a normalised difference vegetation index (NDVI).



Figure 10. Picture of *Atles de biodiversitat* [Atlas of Biodiversity].

Source: Urban Ecology website.
Barcelona City Council.

Pollinator in Lotus corniculatus.





Notable studies, monitoring and publications of the development of the city's flora, fauna and green spaces:

CREAF

Analysis of the invasive capacity of the environment of most planted alien plants in Barcelona's public green spaces, 2014.

Analysis of the invasive capacity of the environment for alien plants in Barcelona's public green spaces, 2017.

Potential contribution of the current and potential network of gardens in improving butterfly populations in Barcelona, 2017.

Analysis of the role of urban land plots in improving the connectivity of Barcelona's butterfly populations, 2018.

Analysis of methodologies and first field tests for biological control of the pine processionary moth in Barcelona's urban area, 2019.

uBMS - Urban Butterfly Monitoring Scheme - Citizen Observatory of Diurnal Butterflies, from 2018 to 2020.

Citizen science for studying plant-insect interactions in Barcelona, 2020.

ICO-UB-Zoo

Atles dels ocells nidificants de Barcelona [Atlas of Barcelona's Nesting Birds]. Publication 2017.

ICO

Causes de la davallada d'ocells salvatges a Barcelona, 2020/21 [Causes for the drop in wild bird numbers in Barcelona, 2020/21].

Control biològic de la processonària del pi: caixes niu per a ocells insectívors i ratpenats, 2020 [Biological control of the pine processionary moth: nesting boxes for insectivore birds and bats, 2020].

UB-ICO

Seguiment d'ocells comuns de Catalunya (SOCC). De 2005 a 2020. [Monitoring Catalonia's common birds (SOCC). From 2005 to 2020].

UB

La gavina corsa a la ciutat de Barcelona, 2013. [Audouin's gull in Barcelona, 2013].

Seguiment de la Foixarda. Ocells, papallones i libèl·lules, 2013. [Monitoring in La Foixarda. Birds, butterflies and dragonflies, 2013].

Estudi de les espècies de quiròpters presents a la Foixarda, 2014. [Study of the Chiroptera species found in La Foixarda, 2014].

Seguiment d'ocells del Sot del Migdia, 2015. [Monitoring the birds of Sot del Migdia, 2015].

Els ocells del Sot del Migdia i camí del Mar, 2016. [The birds of Sot del Migdia and El camí del Mar, 2016].

Bioseguiment amb líquens epífits per a l'avaluació de la qualitat de l'aire, a la ciutat de Barcelona, 2019. [Bio-monitoring with epiphytic lichens for assessing air quality in Barcelona, 2019].

MCNB. Jardí Botànic

Inventari de les herbes urbanes comunes a Barcelona, 2018. [Inventory of common urban herbs in Barcelona, 2018].

Seguiment d'hotels d'abelles. De 2018a 2020. [Monitoring Catalonia's common birds (SOCC).From 2005 to 2020].

CTFC. Technological Forest Centre of Catalonia

Seguiment biològic de la naturalització d'espais verds urbans de Barcelona, 2018. [Biological monitoring of the naturalisation of Barcelona's urban green spaces, 2018].

UV. University of Vic

Anàlisi de la vegetació i la fauna de la ciutat de Barcelona. 2018.

Parc de Collserola

Afluència, freqüentació i caracterització dels usuaris del Parc Natural de la Serra de Collserola (terme municipal de Barcelona), 2017. [Influx, frequenting and characterisation of Parc Natural de la Serra de Collserola's users (municipal boundaries of Barcelona), 2017].

Anàlisi i valoració de l'estat dels corriols del municipi de Barcelona dins el Parc Natural de la Serra de Collserola, 2017. [Analysis and assessment of the state of plovers within the Barcelona municipality in Parc Natural de la Serra de Collserola, 2017].

ASPB [Barcelona Public Health Agency]

Urban Pest Monitoring and Control Service: Study on monk parakeets in Barcelona. Effectiveness of nest management, 2017.

Galanthus

Annual reports on naturalised-pond management. Supporting urban biodiversity (Birds in buildings, hedgehogs and amphibians). 2008-2020 period.

Inspection of bat nest boxes in Barcelona's allotments, 2017.

Urban Architecture and Fauna. Architectural solutions in renovations and new work for integrating nesting and shelter spaces. Publication 2019.

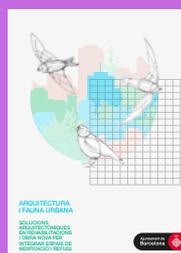
BCN-Parks and Gardens-AMB-Jardí Botànic –Zoo-UB

Bioblitz from 2010 to 2020.

Oxygastra

Report on Odonata found in the city's ponds, 2018.

Notable publications



Barcelona Regional

Construcció de l'Observatori de l'Agricultura de Barcelona, 2019 [Construction of the Barcelona Agriculture Observatory, 2019] and those mentioned in page 31.

SEFAs–UAB

El porc senglar a la ciutat de Barcelona. 2014.

ICTA–ISGLOBAL

Supporting greenery and biodiversity studies on climate change and health, and on greenery and health. Collaboration in the "Assessing the distributional environmental justice implications of street tree benefits in Barcelona" project prepared by the ICTA-UAB.

Barcelona's Parks and Gardens. MI

Studies for the implementation of the strategic framework of historical gardens: Determining historical stages and criteria for assessing Barcelona's historical gardens, Study on the artistic styles of Barcelona's historical gardens and Historical studies on the gardens of Mossèn Costa i Llobera, Can Sentmenat, Plaça de Francesc Macià, Jardins Muñoz Ramonet, Parc del Laberint d'Horta.

Selection, description and assessment of new plant species for gardening with the potential for adaptation to climate disturbances.

Publication of greenery and biodiversity data in Open Data and BcnRoc.

Completion of the inventory of municipal public trees and green spaces for NEV (Green Spaces Nature app) management.

Seguiment de les orquídes dels espais verds. De 2003 a 2020. [Monitoring orchids in green spaces. From 2003 to 2020].

Itineraris de papallones de Montjuïc. De 2015 a 2020 [Montjuïc's butterfly itineraries] (Data in Catalan Butterfly Monitoring Scheme - Museu de Ciències de Granollers).

Sample of new perennial, shrubby and arboreal plant species in green spaces and monitoring of the city's spontaneous flora in collaboration with the Barcelona Botanical Institute.

BLOCK 2

From the Green Infrastructure and Biodiversity Plan



2020 to the Barcelona Nature Plan 2030

Barcelona is strengthening its commitment to nature and the people.

3.



Why
a new Plan?

3.1. Because the challenges for the future are more and more important

Both the work of the United Nations (UN) and the EU Biodiversity Strategy for 2030 highlight the loss of biodiversity on a global scale. Meanwhile, the problem resulting from climate change has become an emergency. We now find ourselves in an ecological crisis that is affecting the entire world and looking after nature has become paramount. The EU strategy concludes that nature is important both for our physical and mental well-being and for our society's capacity to take on global change, health threats and disasters. Hence the pressing need to act. **We need the ecosystems on planet Earth to be resilient and to continue contributing basic services for life, such as regulation and supply, and nature to be present in our lives.**



3. WHY A NEW PLAN?

Cities have to play an active and committed role regarding the conservation of the Earth's biodiversity. The assessment prepared by the IPBES considered the need for building sustainable cities that attend to the most pressing needs not to mention nature conservation, biological-diversity restoration and maintenance and strengthening of the ecosystems' services. **One of the most important goals considered for cities is reducing their environmental impact on the Earth.**

That is why **one of the main measures of Barcelona's Climate Emergency Declaration presented on 15 January 2020 focuses on conservation and increasing urban green infrastructures.**

We are exploiting nature faster than it can replenish itself.



In 2019, the UN conducted and approved the fullest assessment ever carried out, with 130 experts from around the world, through its Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). It concluded that the loss of biodiversity was as catastrophic as climate change and that they are two inter-related problems, as the contributions of nature to human life are being compromised. According to Robert Watson, the Chair of the IPBES and the former Chair of the Intergovernmental Panel on Climate Change (UN IPCC), "a million species are currently threatened with extinction and we are weakening the entire natural infrastructure that our world depends on. We are exploiting nature faster than it can replenish itself".

Health in cities and health on the planet are connected.



The global ecological crisis over loss of biodiversity and climate change is highly complex and is worsening with the addition of problems such as changes in land use; hence the talk of global change. Added this was the declaration of the Covid-19 pandemic in 2020, putting the focus on the importance of nature in cities for human life, and making it clear that all the Earth's ecosystems made up a highly inter-related web of life throughout the planet. What goes on in China goes on over here. **It is clear that loss of biodiversity, global change and pandemics are inter-related problems and that health in cities and the planet's health are connected.**

Climate change and loss of biodiversity create risks regarding future pandemics.



In response to a report compiled by IPBES experts, Peter Daszak, the Chair of EcoHealth Alliance and the chair of the panel convened by the IPBES that drafted it, declared that "there is no great mystery about the cause of the Covid-19 pandemic". "The same human activities that drive climate change and biodiversity loss also drive pandemic risk through their impacts on our environment". He pointed out too that "changes in the way we use land; the expansion and intensification of agriculture; and unsustainable trade, production and consumption disrupt nature and increase contact between wildlife, livestock, pathogens and people. This is the path to pandemics".

3.2. To go a step further for citizen health



The situation caused by the Covid-19 pandemic in 2020 put the focus on the **importance of nature in cities, as a support for the physical and emotional health** of people, and as a contribution to biodiversity on Earth. The value of free and clean air, silence and plants has been experienced. City residents have discovered the city has an extremely rich range of flora and fauna it can enjoy. This has been accompanied by a raised awareness of the **need for preserving nature**, as there is no doubt that its alteration is harming humanity.

This importance of nature and, above all, of urban nature for city residents is hardly a new discovery. Research has been piecing together scientific evidence of this reality for years. According to the Executive Secretary of the **Convention on Biological Diversity**: “Healthy biodiversity is the essential

infrastructure that supports all life on Earth, including human life”.

The study of nature’s contribution to the well-being of individuals working with the concept of ecosystem services, which are the benefits that humans obtain from ecosystems. There are numerous benefits and even more in urban environments, given that city residents are subject to big environmental pressures that affect their health (atmospheric pollution, heat associated with the increase of climate change temperatures and the heat island effect, noise, urban congestion and so on).

10 benefits to having nature in cities

ICLEI. Cities with Nature Network.
(To mark Biodiversity Day, 22 May 2020).



Nature provides us with essential ecosystem services, such as clean water and air, making life possible.



Many people in cities depend on nature and its benefits for their subsistence.



Being in nature and having it close keeps us physically healthy, as nature encourages people to do exercise and spend their lives outdoors.



By protecting nature on a local level, urban nature contributes to the national and international goals of biodiversity conservation.



Spending time in nature improves our mental health, even reducing depression and anxiety.



Urban agriculture contributes to food safety and is playing an important and increasing role in global food safety.



Nature spaces in cities are of an immense cultural and spiritual value, connecting communities and creating a sense of belonging to the place.



Solutions based on nature help with adaptations to climate change and its impact for creating more resilient cities.



Nature provides citizens with social benefits, creating safer environments where crime is reduced.



Nature helps to mitigate climate change, providing cities with an efficient and low-cost option for action.

3. WHY A NEW PLAN?

Urban green spaces contribute ecosystem services (also known as socio-environmental services in Barcelona) in a very direct way, as there is a large amount of population in the vicinity. Barcelona has a study at its disposal, conducted *ad hoc*, on the socio-environmental services of its green spaces (Socio-environmental services of Barcelona's green spaces, Barcelona Regional, 2018). The aim was to assess the benefits that green spaces generate and find out their potential for various socio-environmental services: ecological, regulatory, psychological and spiritual, leisure, social and relational, sports, urban byelaw, health tourism and economy). The results enable identification of the areas with the most accessibility and with the largest deficit of services; they are shown on a map that justifies the need for increasing their presence, improving their state and disseminating their importance proactively, invariably through participatory processes and ongoing generation of knowledge.

Number of services provided

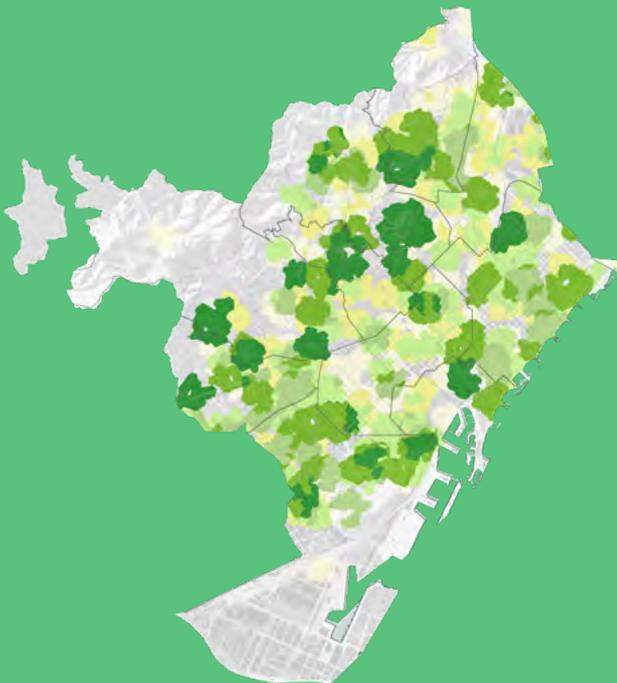


Figure 11. Number of services provided per green space.

Source: Barcelona Regional, 2018.

Number of deficient services

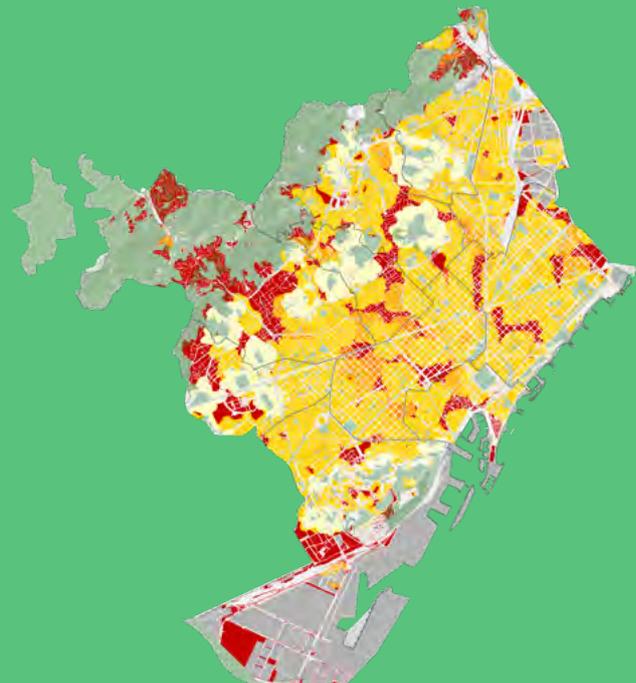


Figure 12. Number of deficient services per green space.

Source: Barcelona Regional, 2018.

3. WHY A NEW PLAN?

According to the Health and Environment Observatory (2020), a DKV initiative carried out in collaboration with IS-Global (Barcelona Institute of Global Health), **nature has to be something that city residents are prescribed, along with increased exposure to nature.** Among the conclusions drawn from this Observatory on how urban nature positively affects the health of city residents, the following are noteworthy, under the framework of this Nature Plan:

Health depends on lifestyle, the environment and the socio-economic context.

Human health is not just determined by health care or genetic factors, but also by lifestyle, environment and socio-economic context, among other things.

The state of the environment affects our health.

The World Health Organisation (WHO) estimates that environmental risk factors are responsible for 24% the world's disease burden and for 23% of all deaths globally. More specifically, they represent 1.4 million deaths a year in Europe.

A healthier city presents less mortality from natural causes.

20% of deaths by natural causes could be prevented every year if the world's cities (where 70% of the population will be concentrated by 2050) met the international recommendations on physical activity, exposure to atmospheric pollution, noise and heat and access to green spaces.

More and more countries are becoming actively involved in research.

On the international scene, more and more countries are becoming actively involved in research and development of projects linking nature to health, as a preventive or complementary health-assistance resource.

This is not about conserving, but about increasing the benefits of greenery on health.

Increasing greenery and biodiversity in cities and improving and conserving their state should not be solely aimed at preventing harm to natural systems and therefore our own health but also, above all, at considering how we can multiply the benefits that green spaces bring people, improve their well-being and prevent certain illnesses.

Incorporating natural spaces as assets for health.

A social prescription based on nature is a tool for enriching the health-protection recipes given out by health professionals.

There is clear scientific evidence on the positive effects to being in touch with nature.

All these benefits come from the promotion of physical activity, prevention of obesity and diabetes, reduction of stress, cognitive and inter-active improvements and social cohesion. In addition, it has also been asserted that contact with nature is beneficial to the immune system and metabolism, among other things. Mitigating exposure to atmospheric pollution, reducing levels of noise pollution, increasing biodiversity and regulating temperature (minimising heat island effects) also have direct positive effects on health.

Green infrastructures as a health resource.

The steady urbanisation of the population is leading to less and less contact with green spaces. That is why there are more and more cities that are integrating a new green infrastructure in their urban fabric as a means of support for illness “treatment” or prevention .

Trees offer big advantages in the city.

The presence of trees on streets improves air quality (in capturing carbon), reduces surface runoff, saves energy, has a clear aesthetic value, even generates commercial attractiveness and offers shade during periods of very hot weather.

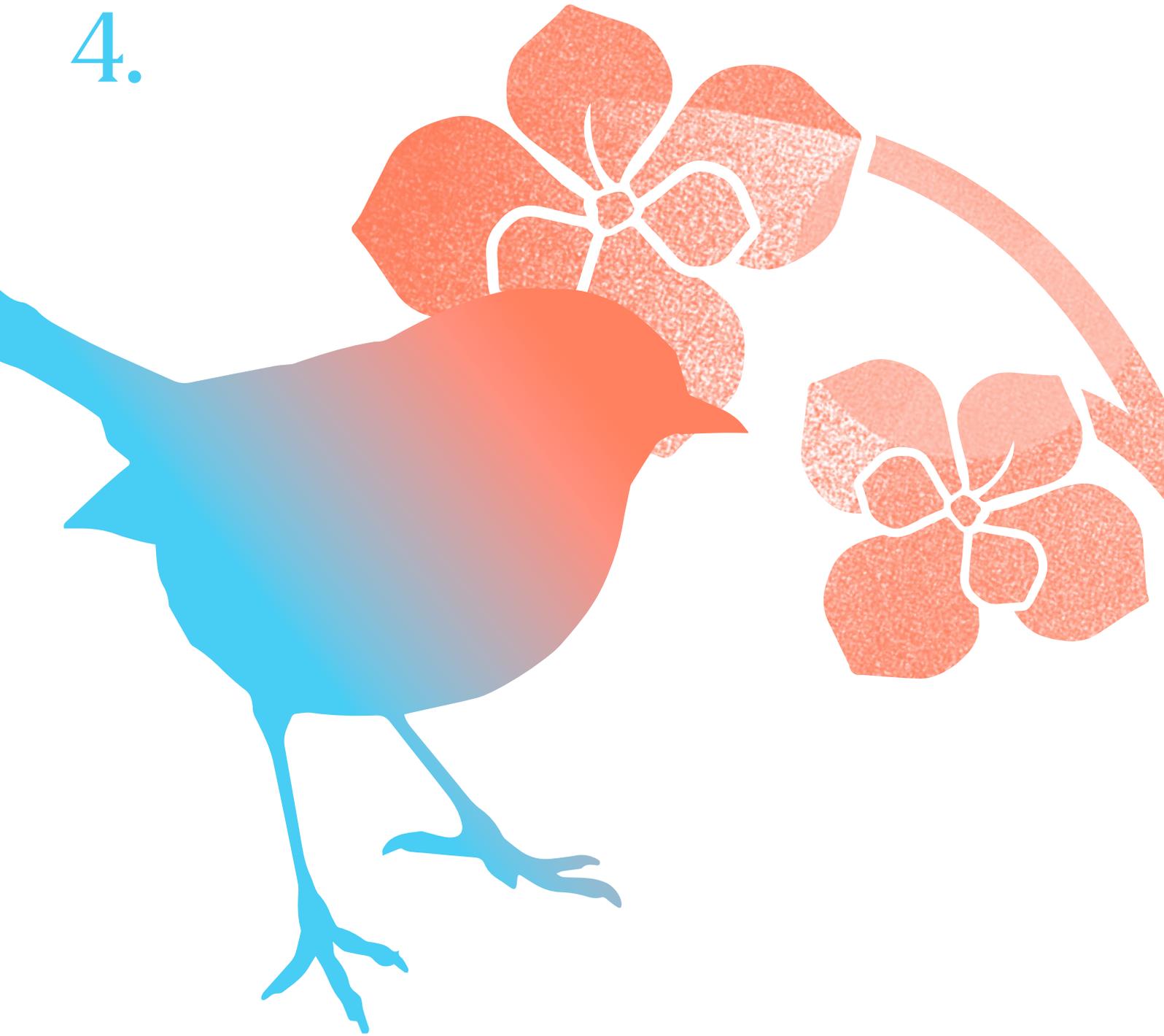
Investing in nature means investing in health and therefore reducing associated costs.

Allocating some of the municipal budget to conserving, improving and enhancing urban green spaces reduces health costs. **It is estimated that lack of physical exercise, exposure to air pollution, sound and health and little access to green spaces led to a surplus cost for Barcelona (in 2017) of over 20 million euros.** Or, 2,350 million euros a year could be saved in health costs were every citizen in England, for example, to have access to green spaces, above all, because of the increased physical activity they would bring about.

Given the current situation, there is more need than ever for drafting a new plan that sets out the lines of action for urban nature in Barcelona during the coming years. We are talking about the Nature Plan for 2021-2030, a 10-year strategy seen with a short-term action programme under which a series of priority or lead projects will be carried out. This plan is meant to act as an influential contribution to the Climate Emergency Action Plan and to the problems of the Earth expressed as a global change and a healthy urban life.

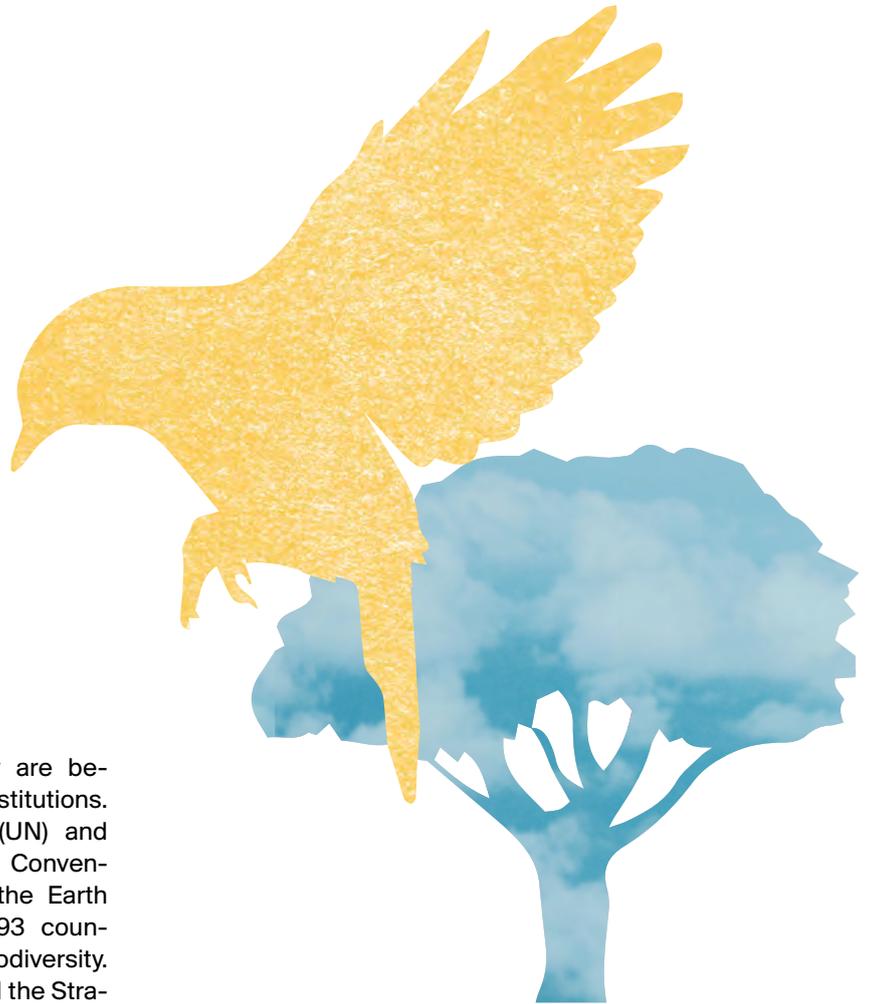


4.



Biodiversity strategies

4.1. From the world to Barcelona



Challenges relating to the Earth's biodiversity are being launched from several international institutions. The main ones include the United Nations (UN) and the European Union. The UN adopted the Convention on Biological Diversity (CBD) in 1992 at the Earth Summit held in Rio, which was ratified by 193 countries and established the current plans on biodiversity. In 2010, the signatory parties to the CBD adopted the Strategic Plan for Biodiversity 2011-2020 in Aichi (Japan); a 10-year action plan for all the countries and interested parties to protect biodiversity and the benefits that it provides people with. Twenty very ambitious but realistic goals were adopted under this plan, known as the Aichi Targets.

To guide the actions throughout the world, the Secretary of the CDB published the first draft of a new world framework for biodiversity in 2021, with targets for 2030 for preserving and protecting nature and its essential services to people, and with a 2050 vision of harmonious coexistence with nature. This framework will be presented at the 15th Conference of the Parties (COP-15), planned in Kunming, China.

As for the EU, its continuation of the previous Strategic Plan for 2020 is the "EU Biodiversity Strategy 2030: Bringing nature back into our lives" as a comprehensive, ambitious and long-term plan for protecting nature and reversing the degradation of ecosystems. The strategy is aimed at putting European biodiversity on the path to recovery by 2030 and includes specific actions and commitments.

4. BIODIVERSITY STRATEGIES

On 20 May 2020, at the height of the Covid-19 pandemic, Brussels presented a communication from the European Commission to the European Parliament, Council, Economic and Social Committee and the Committee of the Regions calling on all cities of at least 20,000 inhabitants to design an “Urban greening plan” by the end of 2021 with measures for achieving the following targets by 2030:



To increase biodiversity.



To eliminate the use of pesticides.



To promote access to and the creation of urban forests, parks, gardens, green roof terraces, vertical gardens, urban meadows and shrubby areas.



To limit excessive pruning and mowing and other practices that may be negative for biodiversity.



To improve connectivity between green spaces (green corridors).



To strengthen regulations and initiatives on the use of fertilisers, ecological agriculture and local produce, pollinators and invasive species.

4. BIODIVERSITY STRATEGIES

Besides these key strategies, the **UN 2030 Agenda for Sustainable Development includes seventeen global goals** (the SDGs), two of which, numbers 14 and 15, directly refer to biodiversity conservation:

SDG 14: Life below water.

To conserve and make sustainable of use the oceans, seas and marine resources for sustainable development.

SDG 15: Life on land.

To protect, restore and promote the sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

Other SDGs refer indirectly to loss of biodiversity through their call for climate action (13), responsible consumption and production (12) and sustainable cities and communities (11).

As regards the Spanish State, 2011 saw the approval of the **Strategic Plan for Natural Heritage and Biodiversity 2011-2017**. This is a fundamental tool for the conservation and sustainable use of biological diversity and represents the application of the CBD Strategic Plan in the Spanish State. This State-level strategic plan is becoming more ambitious than the Spanish Strategy for the conservation and sustainable use of biological diversity approved in 1998. On the other hand, **Act 42/2007, on Natural Heritage and Biodiversity**, features the rules and recommendations that international environmental bodies and systems, such as the CBD, have been establishing, in addition to transposing EU regulations.



4. BIODIVERSITY STRATEGIES

The strategy in Catalonia is enshrined in three main reference documents:

Catalan Strategy for Adaptation to Climate Change (ESCACC) 2013-2020.

The strategic goal is for Catalonia to become a region that is less vulnerable to the impact of climate change; to that end we shall have to generate and transfer all the necessary knowledge on this phenomenon and increase the adaptive capacity of sectors and systems.

Strategy for Natural Heritage and Biodiversity in Catalonia for 2018-2030.

The Catalan government approved this text as a strategic planning document setting out the roadmap of nature-conservation policies in Catalonia up to 2030.

Sustainable Development Strategy for Catalonia (EDSCAT). 2026.

This strategy consists of 7 cornerstones, developed along 15 strategic lines based on 101 goals. It will guide the development of Catalonia towards more social, economic and environmental sustainability by 2026.

Barcelona is setting itself big present and future environmental challenges within this global framework; challenges that have become all the more clear with the Covid-19 pandemic. Cities need to respond with healthier urbanisation, generating environments with better air quality and more accessible, more sustainable, safer and fairer mobility. The role of greenery and biodiversity is becoming increasingly key in all these aspects, hence the talk of green infrastructure. This is about planning the big urban challenges more comprehensively, giving a key role to nature when thinking up and planning cities, in every area: housing, mobility, open spaces, leisure, education, consumption and so on.

This is where the Barcelona Nature Plan for 2030, a development of the Greenery and Biodiversity Plan for 2013-2020, is situated.

4. BIODIVERSITY STRATEGIES

<p>Barcelona</p> 	<p>Greenery and Biodiversity Plan 2013-2020.</p>	<p>Barcelona Nature Plan for 2030.</p>
<p>Barcelona Metropolitan Area and Barcelona Area</p> 	<p>Plan for the Improvement of Biodiversity in the Barcelona Metropolitan Area's Network of Parks and Beaches (2018).</p> <p>Declaration from the Network of Cities and Towns towards Sustainability for a green and socially fair recovery (September 2020).</p>	<p>Metropolitan Urban Development Master Plan, in preparation (PDU). It sets out 10 goals, which will guide the PDU's regulatory decisions. Five of these 10 goals include greenery and biodiversity directly or indirectly.</p>
<p>Catalonia</p> 	<p>Catalan Strategy for Adaptation to Climate Change (ESCACC) 2013-2020.</p>	<p>Strategic Plan for Natural Heritage and Biodiversity in Catalonia 2018-2030.</p> <p>Sustainable Development Strategy for Catalonia (EDSCAT) (by 2026).</p>
<p>Spain</p> 	<p>Act 42/2007 on Natural Heritage and Biodiversity.</p> <p>Strategic Plan for Natural Heritage and Biodiversity 2011-2017.</p> <p>Spanish Strategy for the Conservation and Strategic Use of Biological Diversity (2018).</p>	<p>National Strategy for Greenery Infrastructure and Ecological Connectivity and Restoration for 2020-2050.</p>
<p>Europe</p> 	<p>The European Biodiversity Strategy for 2020.</p>	<p>EU Biodiversity Strategy for 2030.</p>
<p>World</p> 	<p>Assessment of the meeting of the targets set by the UN in Aichi under the Convention on Biological Diversity for the 2011-2020 period.</p> <p>In 2015, publication of the sustainable development goals (SDGs), launched by the United Nations.</p>	<p>15th UN Biodiversity Conference (COP-15), Kunming, China. A New Global Framework for Managing Nature through 2030 and Vision for 2050.</p> <p>Application of the SDGs by 2030.</p>

Table 4. Development of the main targets on biodiversity in the local and international context.

Source: Original.

4.2. Comparison with the world's other greenery and biodiversity plans



Cities in Europe and around the world have been working on urban green infrastructures for years, with a strategic city vision as to their nature. The Nature Plan was conceived through consultations of other plans considered more innovative or better adapted to Barcelona's case. We are talking about a total of 10. Some of these cities have specific greenery and biodiversity plans while others, in contrast, incorporate other, more general strategies which also include other environmental vectors (including greenery and biodiversity).

4. OTHER BIODIVERSITY PLANS

The specific plans notably include the following:

Plan Biodiversité de Paris
2018-2024

Washington Biodiversity Conservation Strategy
2017-2030

Plan de Développement des Espaces Naturels Lyonnais (PDEN)
2013-2016

Actions en faveur de la biodiversité sur le territoire de la métropole de Lyon
2016

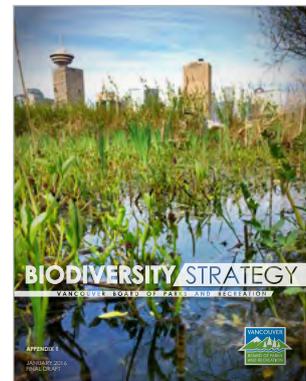
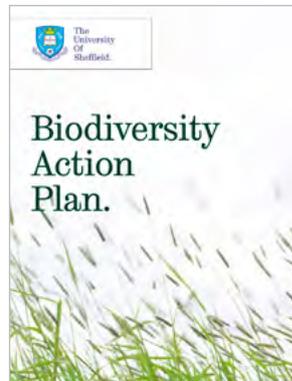
Biodiversity Strategy Vancouver
2020

Sheffield Biodiversity Action Plan
2012

Biodiversity Action Plan London
2016-2020

Strategie Stadtlandschaft Berlin
2012-2050

Lisbon Biodiversity Strategy
2020

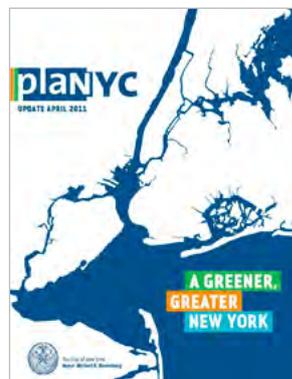


The more cross-cutting plans featuring greenery and biodiversity notably include the following:

The London Plan
2021

Montréal durable
2016-2020

PlaNYC
2011-2030



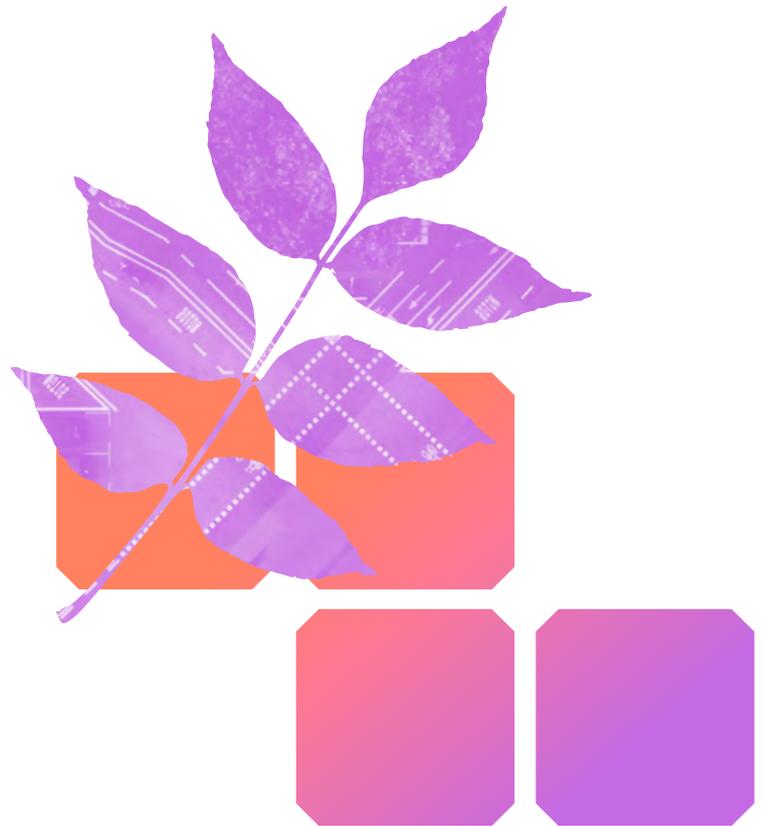


5.



The city's commitments

The current situation for biodiversity is more serious and better acknowledged. Barcelona's response is its commitment to the Nature Plan.



The worldwide situation and social development regarding it have brought about advances in the city. One advance is the process carried out by Barcelona through its launch of the Greenery and Biodiversity Plan, and with a whole series of strategies dealing wholly or partly with the plan's goals. The current situation for biodiversity is more serious and better acknowledged. Barcelona's response is its commitment to the nature Plan; the new designation opts this concept, as it is communicative, comprehensive and connects us to the world, a world with a global ecological crisis.

Barcelona has launched a series of policies such as plans, government measures and other initiatives which, taken as a whole, confirm the consistency of municipal policies intended to increase, improve and conserve greenery and biodiversity at the service of city residents. Especially important here is the government measure known as the Green Urban Infrastructure Promotion Programme for 2017-2030. This is a programme for increasing and improving greenery, with citizen co-responsibility in its management. It includes targets (160 new hectares of greenery, in other words, an extra 1 m² per resident for the year 2030) and specific commitments to carrying out the city's transformation projects. The Greenery and Biodiversity Plan for 2013-2020, then, has had this tool for its implementation since 2017.

5. THE CITY'S COMMITMENTS

Barcelona's commitment to changing and transforming the city's urban greenery has also been promoted through several strategic tools:

Measure for eradicating glyphosate for 2016-2020.

It is the municipal strategy whose purpose is to eliminate the use of glyphosate and other similarly toxic pesticides from green spaces and municipal public streets and squares, to reduce the risks and effects that arise from their use, above all in the area of human health and the environment. The measure deploys 15 actions which, apart from eliminating glyphosate, opt for biological pest control and changes in greenery management as well as projects for naturalising spaces.

Tree Master Plan for 2017-2037.

It is the municipal strategic document which sets out the vision, goals, strategic lines and actions relating to the planning, management and conservation of the tree heritage, public and private alike, within Barcelona's municipal boundaries. It deploys 50 actions through 10 lines, to achieve iconic and sustainable trees that are healthy, biodiverse, abundant, mature and safe, with more native species in parks and gardens, which need to have the best conditions available for their development, adapted to the urban ecosystem and connected to the city's green infrastructure.

Urban Agricultural strategy for 2019-2030.

It is a tool for planning the actions needed to improve and increase agricultural land areas in the city under an agro-ecological model. The allotments are intended to maximise environmental and social services, and increase the presence of nature in the city for the benefit of the people and biodiversity conservation. The vision for 10 years from now is one of an eco-friendly, healthy, resilient city, whose citizens are involved in the management of its allotments and promoting agro-ecology and food sovereignty.

"All hands to greenery" programme for 2020-2023.

It is a programme that contains every initiative for involving Barcelona's residents and economic and social players in looking after the city's green spaces. Its aim, on the one hand, is to encourage city residents to take the initiative by cultivating public or private spaces and empowering themselves there and, on the other, to have more green spaces available to contribute to the good health and well-being of people and diversity, under a collaborative management model for public spaces.

**Government measure
“Towards a policy of play in
public spaces”
(2018-2030).**

The Plan for Play in Public Spaces is the result of the “Barcelona plays things right” government measure approved in February 2018. This sets out the challenges when promoting play in public spaces and in daily life, identifying the actions planned for 2018 and 2019, and 2020-2030. The Plan for Play aims to move the city on from a city with play areas to a playable city and sets out 63 actions.

**Strategic framework for
Barcelona’s historical
gardens.**

The MEJHB proposes the establishment of a management plan that ensures its short-, medium- and long-term survival and maintenance, with the architectural, sculptural, civil-work and plant features that make them up. It also provides for citizen communication and dissemination.

**Enfortim Project,
for Parks and Gardens
(2022).**

The Enfortim project represents a reflection of the organisation of the Municipal Institute of Parks and Gardens, to turn the Institute into a unified, strong and relational organisation prepared to meet the new challenges presented by global and technological change. This reflection was made through participation and collaboration, and every worker was able to contribute their own vision, proposals and suggestions to it. Enfortim sets out 65 tangible projects making up the Action Plan that will be implemented up to the end of 2022.

**Municipal Institute of Parks and
Gardens’ Internal Equality Plan for
2019-2022.**

The Equality Plan in progress consists of a series of measures to be applied to selection processes, international communication, occupational risk prevention etc. Also being implemented is the new Protocol for the Prevention of, Detection of, Action against and Resolution of Situations of Sexual Harassment and Harassment on the Grounds of Sex, Sexual Orientation, Gender Identity and Gender Expression.

Nevertheless, **other cross-cutting municipal plans and programmes have been drafted with greenery policies and which therefore include actions found in the Green Infrastructure and Biodiversity Plan.** Some examples include:

Climate Emergency Declaration.

Barcelona declared a climate emergency on 15 January 2020 and is speeding up a series of changes involving all the city's players. Irrefutable scientific evidence and the effects of the global climate crisis that we have already been seeing are compelling us to take urgent and forceful action. **The city aims to be carbon neutral by 2050 and to reduce greenhouse gas emissions (GHG) by 50% by 2030, compared to the 1992 values. This means reducing around 1,950,000 tonnes of GHG.**

Some of the many measures dealing with nature are as follows:

- To increase the urban greenery and ensure it is distributed in a balanced way throughout the territory.
- To transform public space to improve its environmental and health conditions, reclaiming space allocated to private vehicles for social use and increased urban greenery and fostering sustainable and collective means of mobility.
- To provide urban-planning tools with climate features: urban - planning regulations, indicators, speed and funding mechanisms.
- To protect against biodiversity loss in the current context of global change.

The Declaration is notable for its provision for the "city's naturalisation", by developing 10 green roofs and façades on municipal buildings to set an example, to create 10 biodiversity shelters, develop the programmes required for protecting the species of flora and fauna most vulnerable to climate change, promote urban green corridors, with special attention to the Ciutadella-Collserola corridor with the intervention in Carrer de Pi i Margall and depave (make permeable) 3 ha, reclaiming its organic soil.

Superblocks Programme.

Thanks to implementation of the Superblock programme, Barcelona City Council is moving towards a healthier, more sustainable public-space model designed for the people. A model that encourages social relations, fosters local trade and puts the needs of the city's children and senior citizens at the centre. The Superblock programme prioritises street-calming, giving more weight to pedestrians and sustainable mobility, increases greenery and promotes citizen interaction. The programme implements a network of green axes and new squares that safely linking up facilities and green spaces for people, reduce local traffic and put pedestrians and clean air at the centre.

Amendment to the General Metropolitan Plan in the area of the Parc Natural de la Serra de Collserola (MPGMCo).

It was drafted and processed up to its provisional approval by the AMB, on 30 April 2019, under a framework of governance and very broad consensus. The MPGMCo, which aims to ensure maximum protection and conservation of a nature space of great importance, adapts the urban-development plan to the current regulatory framework. The Territorial Commission of Catalonia gave its final approval of the MPGMCo on 12 December 2020.

Special Protection Plan for the natural environment and landscape of Parc Natural de la Serra de Collserola (PEPNat).

It was drafted and processed up to its provisional approval by the AMB, on 30 April 2019, under a framework of governance and very broad consensus. The plan, which aims to ensure maximum protection and conservation of a nature space of great importance, has an ecological strategy as its supporting and cross-cutting cornerstone which is based on improving biodiversity and boosting the potential of ecosystem services.

The Catalan government gave its final approval to the Special Protection Plan for the natural environment and landscape of Parc Natural de la Serra de Collserola (PEPNat) on 6 April 2021, on the motion of the Catalan Ministry of Territory and Sustainability.

Viu el Besòs [Experience the River Besòs] project. “Plan for conserving, restoring ecosystems, biodiversity and preservation of the coastal space and water resources”.

Drafted by the El Besòs consortium and the El Besòs Tordera Consortium, with the backing of other authorities, including the AMB, Barcelona Provincial Council and the Catalan Water Agency, as well as consortium local authorities. It proposes a comprehensive improvement of the El Besòs basin. It is a plan with actions aimed at reducing pollution, increasing biodiversity, reclaiming river spaces – diversifying habitats, creating health spaces for the population – facilitating sustainable mobility, adapting the basin to the challenges brought about by the climate emergency, making citizens and other authorities co-responsible and providing tools for environmental education.

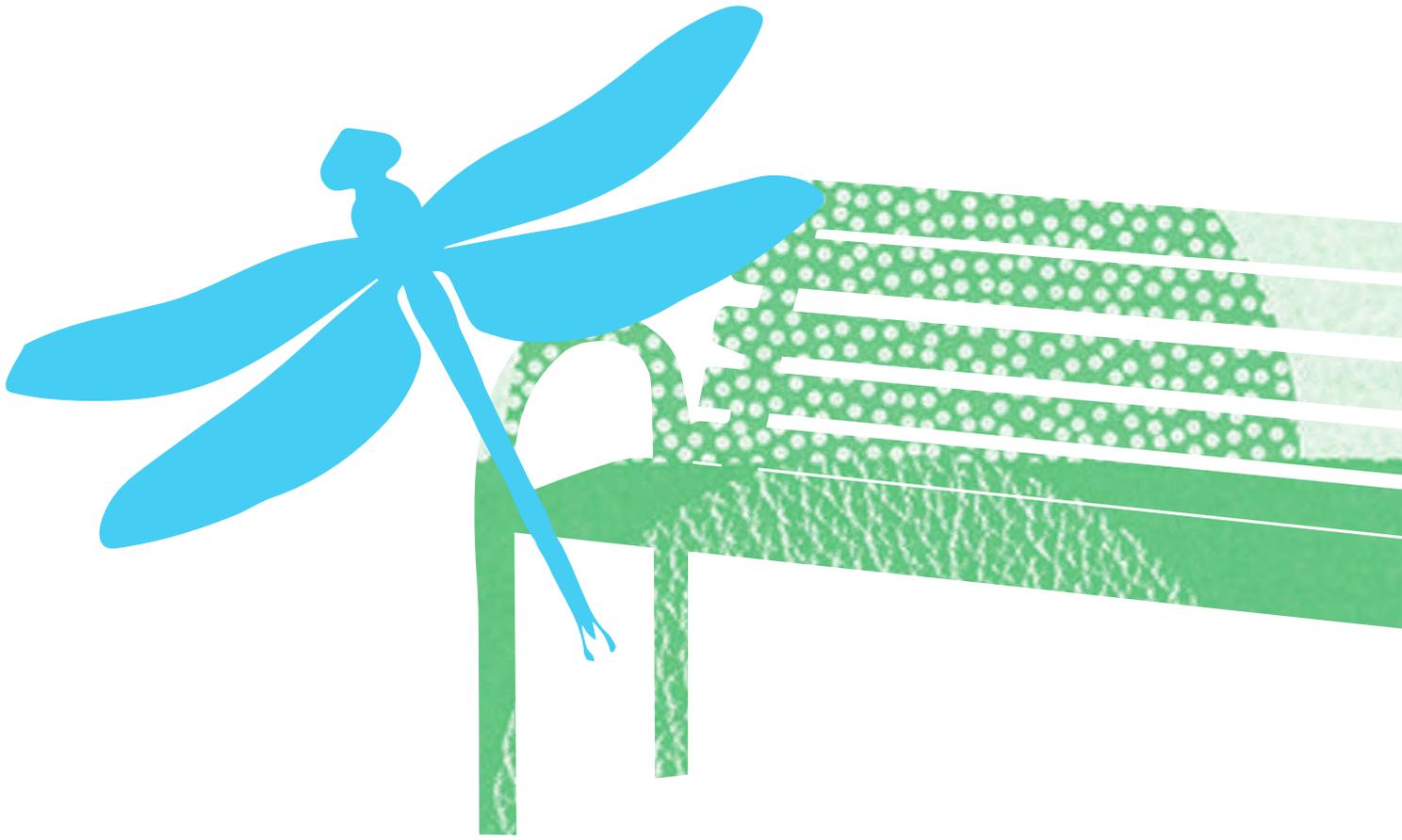
“Besòs saludable” [Health Besòs] project.

This is a joint vision of interventions for renaturalisation and sustainable mobility in spaces of opportunity along the banks of the River Besòs.

The new policies have strengthened the participatory processes and citizen co-responsibility, changes that are also reflected in other strategic documents such as the Air Quality Plan, the Neighbourhood Health Plan and the Citizen Commitment to Sustainability for 2012-2022.



6.



Plan's co-design and participation process

6. PLAN'S CO-DESIGN AND PARTICIPATION PROCESS

An essential part in the drafting of the Nature Plan for 2030 was the participatory process carried out in several sessions and which was used for sharing the diagnosis, agreeing to long-term challenges and goals and gathering proposals on biodiversity and greenery to prepare an action plan.

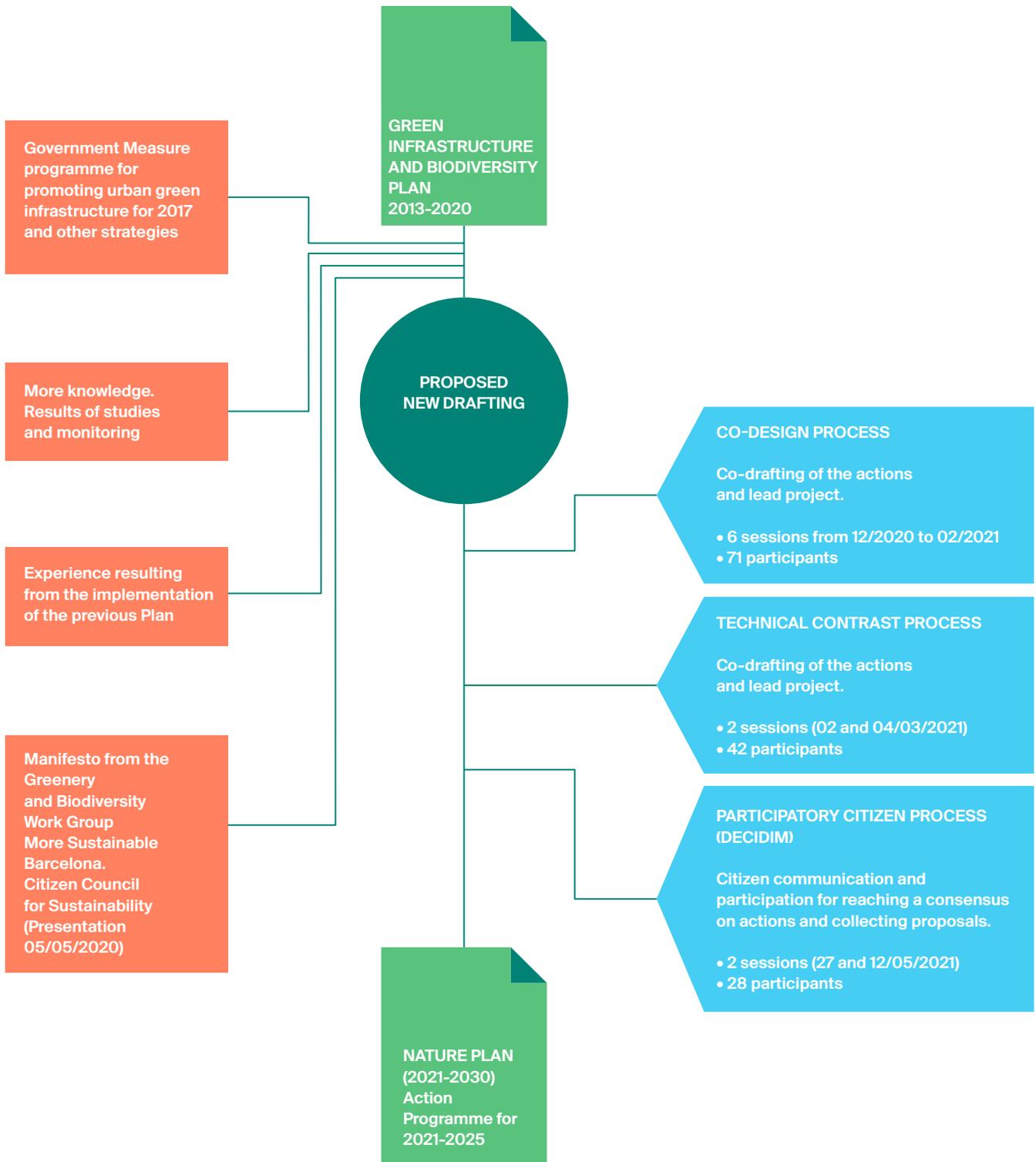


Figure 13. Drafting, co-designing, technical contrast and citizen-participation process of the Nature Plan.

Source: Original.

The Nature Plan was drafted in several stages involving participation from players from both within and without the City Council:

1

The first stage before this participatory process involved **internal work** that included the experience acquired by the Greenery and Diversity Team during the drafting and implementation of the previous plan, as well as benchmarking on other cities. Work was also carried out with the More Sustainable Barcelona Greenery and Biodiversity Work Group (linked to the Citizen Sustainability Council) which drafted a manifesto in June 2020 which was considered for the preparation of the current plan.

2

The second stage involved **co-design work with several of the City Council's services**, in six sessions, to be precise. Those day events of discussion and pooling brought in a total of 71 participants who were informed of the plan's new structure and contributed proposals for specific projects to be implemented by 2030.

3

During the third stage, once several actions had been defined with a few specific projects for carrying them out, two **technical contrast** sessions were thought up and streamlined, not just from the City Council but also from other authorities and organisations relating to greenery and biodiversity in Barcelona. Internal technical meetings were likewise held. A total of 42 people were involved.

4

The fourth stage involved the creation of a discussion and debate space on the plan in the **Decidim** platform and two information and discussion sessions with **citizens in general**.

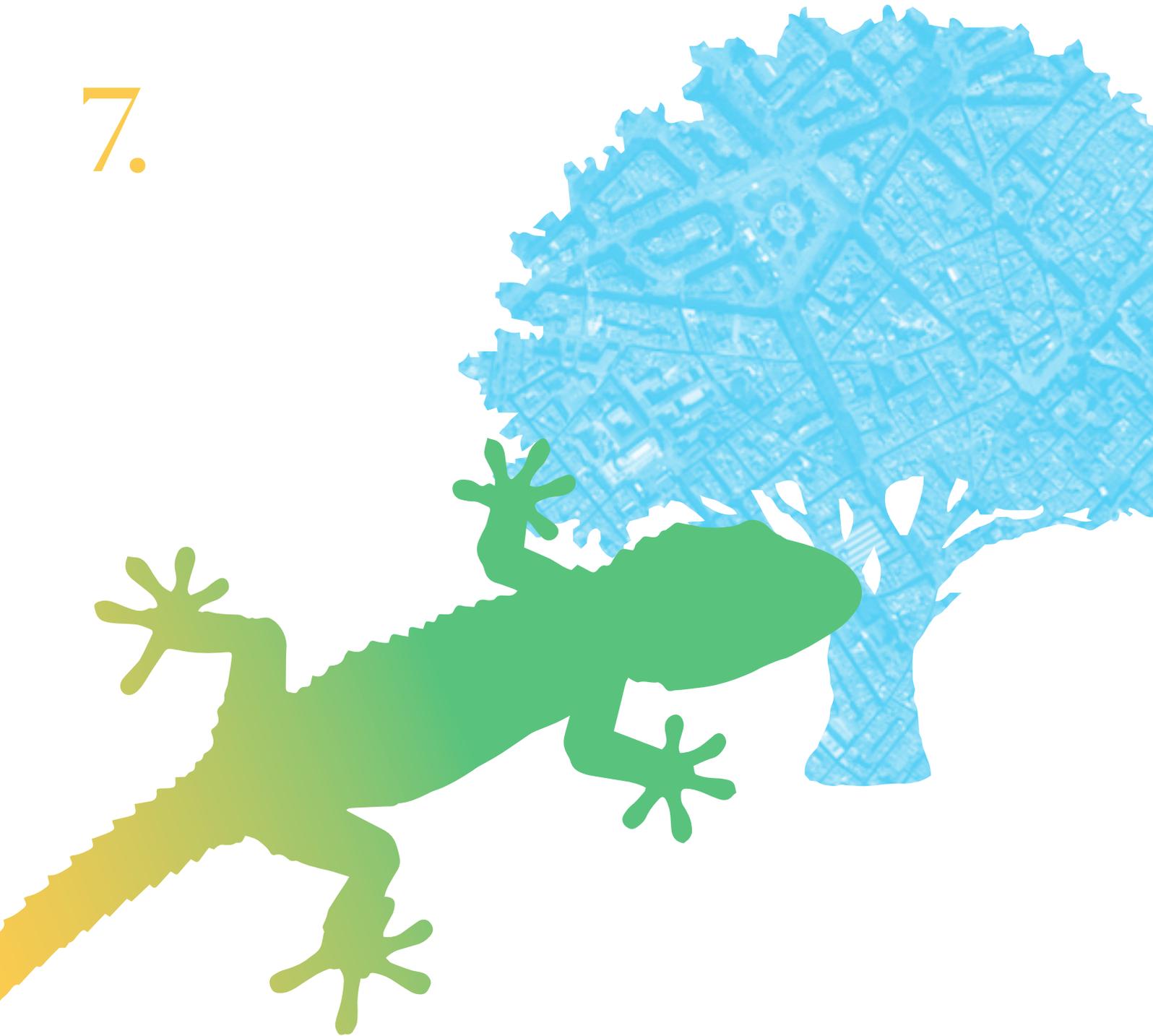
BLOCK 3

The Nature Plan Barcelona is op- ting for a partici- patory



city plan, with
lead actions
and projects.

7.



Vision, goals and structure

7.1. General goals and structure of the plan

The **Barcelona Nature Plan for 2030** is a **strategic and participatory tool** that defines and sets out the goals and commitments of the municipal government to increasing the city's green infrastructure, to conserving biodiversity and to how city residents can find out about, enjoy and improve urban nature and take care of it.

The Barcelona Nature Plan for 2030 offers a **vision** of a city from the year 2050 with a **functional and ecological green infrastructure, with a fair, accessible greenery that is connected in the urban fabric and with a green metropolitan network**, for maximising **social and environmental services**, above all those of **health and adaptation to climate change**. This urban nature network is appreciated and conserved as a natural heritage of the Earth and as a benefit for people, present and future generations, who can enjoy the **connection with nature and are involved in the creation of green spaces and in the conservation and improvement of biodiversity**.

The Nature Plan's general goals are as follows:

To increase the city's green infrastructure and thereby maximise its services, above all those of adapting to climate change, and improve the access of all citizens to urban nature..

To conserve and promote biodiversity, protecting species and improving habitats and their connectivity.

To deploy and consolidate ecological management and naturalisation in nature management, at the service of citizen health and the conservation of biodiversity on the Earth.

To develop knowledge, enjoyment and care of urban nature and to facilitate and promote citizen involvement in its conservation and improvement.

The **Barcelona Nature Plan 2021-2030** is divided into three lines and two cross-cutting areas that are backed up with the following key ideas:

Line 1: More greenery and biodiversity.	Area 1: Knowledge.	Area 2: Governance.
Line 2: Conserving and improving greenery and biodiversity.		
Line 3: With and for city residents.		

7.2. List of quantitative goals

The Barcelona Nature Plan establishes quantitative goals for the year 2030 that are set out as follows:

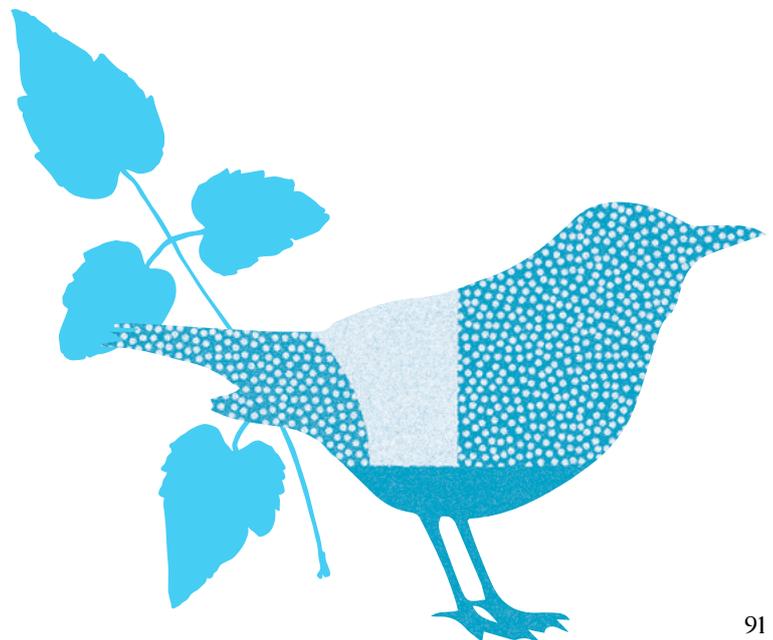
To increase the area by 160 hectares from 2015 and honour the 2015 Climate Commitment: 1 m² more greenery per resident (equivalent to 40 new hectares during this term of office).

To add an extra 100 hectares to the naturalised area.

To create 10 biodiversity shelters.

To double the number of participants in nature activities.

40 new projects under the programme “All hands to greenery”.



8.



Implementa- tion: 20 actions and 100 projects



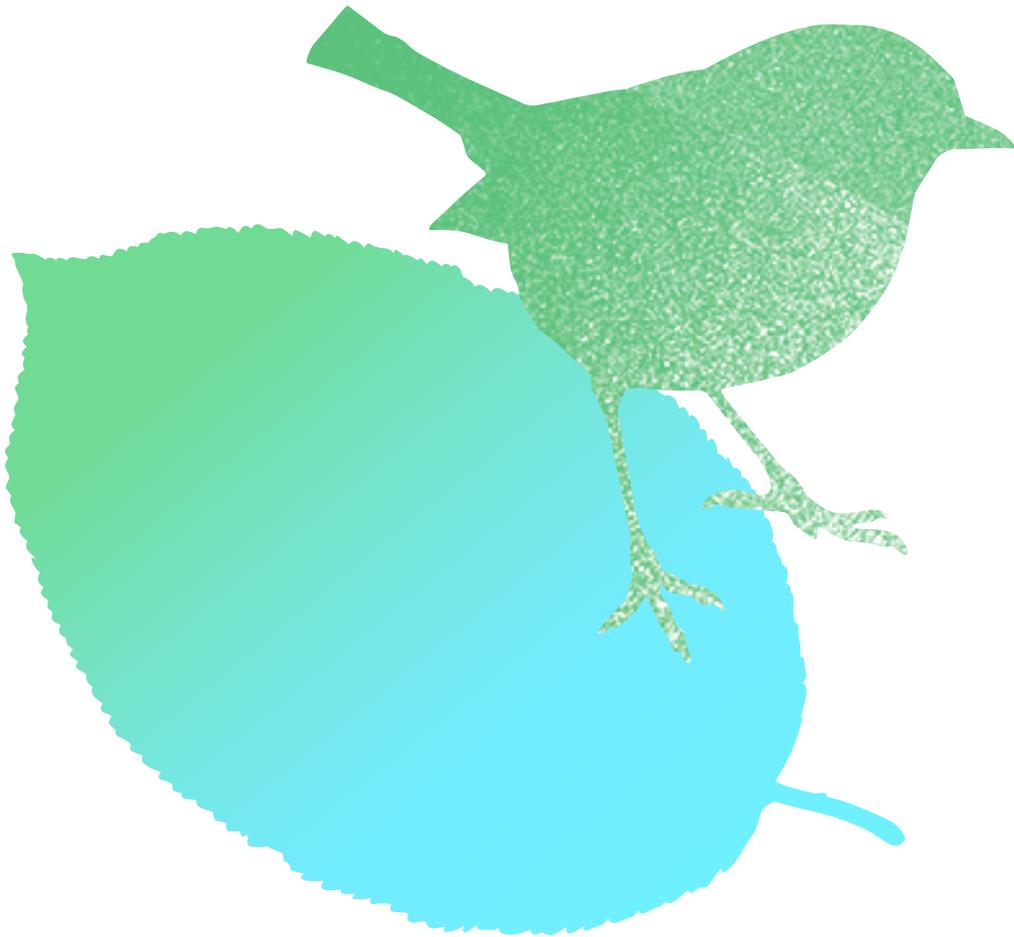
The plan consists of 20 actions which consider the context and the big concepts and strategies for acting under and which are deployed through projects. A total of 100 projects are planned for 2021-2030, of which 10 are lead projects, and they will be carried out between 2021 and 2025.





LINE 1

More greenery and biodiversity



Barcelona is working on a model for planning the increase in greenery and ensuring a fair distribution of all the services and benefits that greenery and biodiversity bring. This “Greenery Model” provides for the strengthening of the green infrastructure bearing in mind the scale of the green spaces and seeking their connectivity with one another and with the metropolitan environment’s nature spaces: Collserola, the spaces of the River Llobregat and the River Besòs and the sea. In sum, a greenery model based on fairness, size, connectivity and metropolitan connection.

Besides quantity, the quality of this green space is very important. The “Greenery and Biodiversity Charter” is a

tool that shows how to design cities and green spaces while taking account of socio-environmental services and incorporating pro-biodiversity and pro-sustainability criteria. Green spaces improve air quality, regulate temperatures, reduce noise, regulate water flows, improve biodiversity, enhance the urban landscape and promote a more pleasant version that is closer to nature and are therefore key to health and well-being. For all the above, their conception and design need to be at the service of these benefits in order to strengthen them.

Action 1. To deploy the Greenery Model to increase and connect the urban green infrastructure



Street-lining trees.

1. To plan the city's green infrastructure, based on the diagnosis of priority areas of action under the Greenery Model and by prioritising fairness, the gender perspective, accessibility, size and quantity as well as city and metropolitan connections. To establish the model integrating green corridors, the Superblocks Programme, the PDU's corridors, and to give special attention to the most deficient areas and to social-justice challenges.
2. To include the planning of the city's green infrastructure in the PDU and develop it in other planning tools.
3. To incorporate green roofs in big renovation projects and new public works ensuring compatibility with other environmental uses.

Action 2. To implement the Greenery and Biodiversity Charter



Greenery and Biodiversity Plan.

4. To apply the Greenery and Biodiversity Charter to projects for urbanising, building and improving public spaces, as a tool for designing with regard to land, water and plants, attending to the diversity of the city's environments (coastal, forest, urban centre etc.). To define the mechanisms for establishing a monitoring of the application of the Greenery Charter's criteria in the greenery projects carried out and to gather the lessons learnt to systematise the experience attained.
5. To apply the Greenery Charter's criteria to the Passeig Marítim de Sant Martí master project, as a pilot test of naturalisation in a coastal environment.
6. To include the design guidelines of the various planning tools and to evaluate the possibility of including them in mandatory regulations.
7. To carry out work sessions and other initiatives, to disseminate the Greenery Charter's criteria among professionals.
8. To include the supply of alternative water resources in the new green spaces, wherever possible (for example, use of ground water, collection of rain water).
9. To implement soil-permeabilisation projects in public spaces (parks and gardens, roads surfaces and pavements) by replacing pavings with plants. To establish structural soils that produce a large useful volume of plants and to implement SUDS projects.

Action 3. To promote the creation of new green spaces and the renovation of existing ones, in line with the criteria of the Greenery Model and the Greenery Charter



Parc de les Glòries.

10. To implement the projects planned under the Greenery Model to continue with the target of achieving 160 new hectares by 2030 (increasing the greenery by 1 m² per resident), in accordance with the Greenery Charter's criteria.
11. To prioritise increasing greenery in the more deficient neighbourhoods located in districts such as Ciutat Vella and Eixample, bearing in mind the various types of spaces such as interior-block gardening and roof and wall greening.
12. To implement projects for connecting greenery projects inside the city and with the metropolitan green infrastructure, at the service of city residents.
13. To promote urban green corridors, paying special attention to the Ciutatella-Collserola corridor with the intervention on Carrer de Pi i Margall.
14. To implement initiatives such as fauna paths, butterfly gardens, tree plantations etc., to boost the ecological connectivity of fauna and the general functioning of the ecosystem.
15. To renovate parks and gardens attending to intervention priorities.
16. To landscape municipal facilities, such as schools, community centres, sports centres, senior citizens' centres, neighbourhood centres, libraries, museums and so on and to green roofs there applying the protocol for greening roofs in municipal buildings.
17. To create spaces for greenery and biodiversity in temporarily vacant green land plots and to establish the criteria for ensuring the conservation of their nature and greening to the full.

Increase in greenery 2021-2023

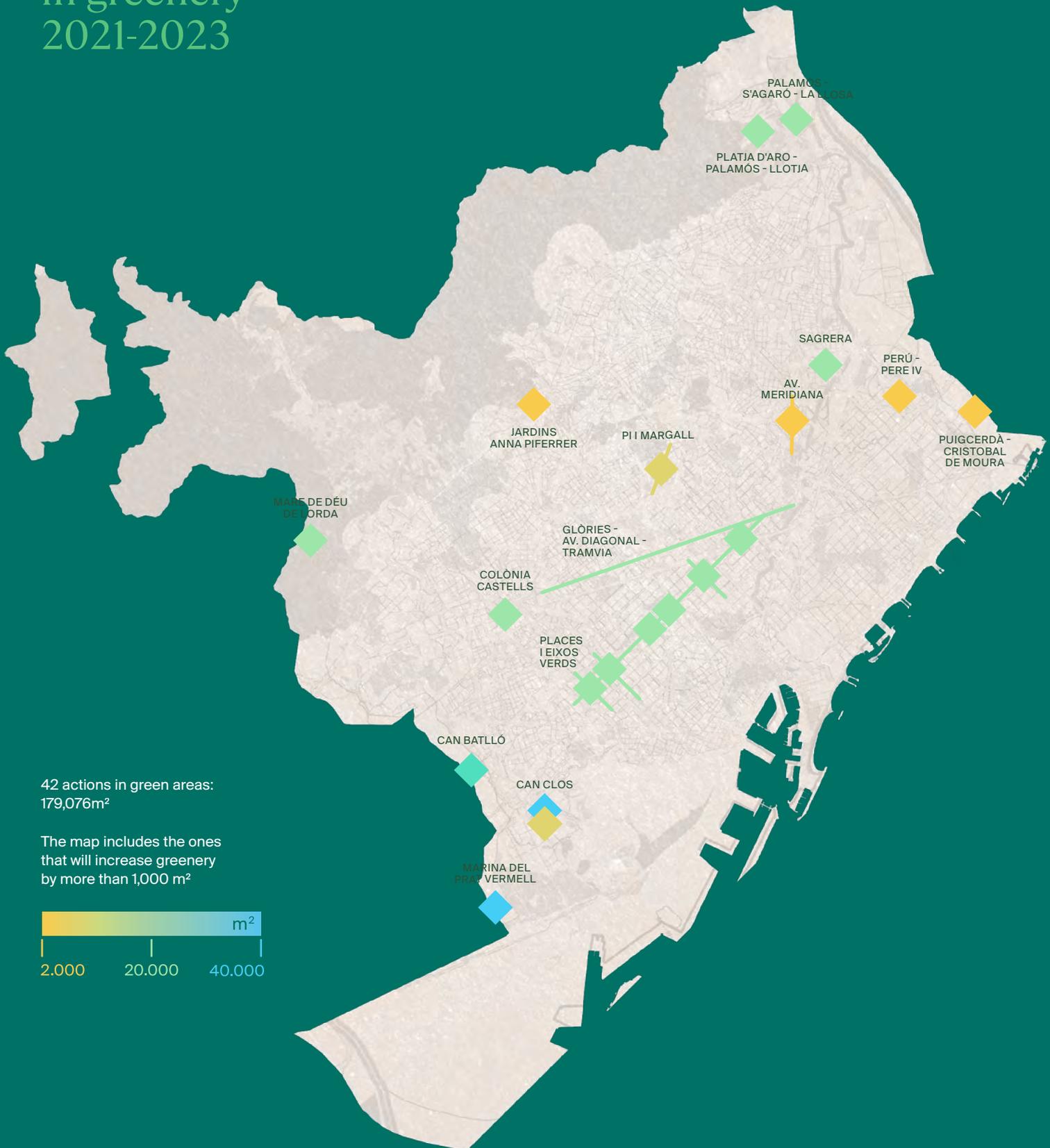


Figure 14. Increase in greenery 2021-2023.
Source: Barcelona City Council, 2021.

Planned renovation projects for 2021-2023

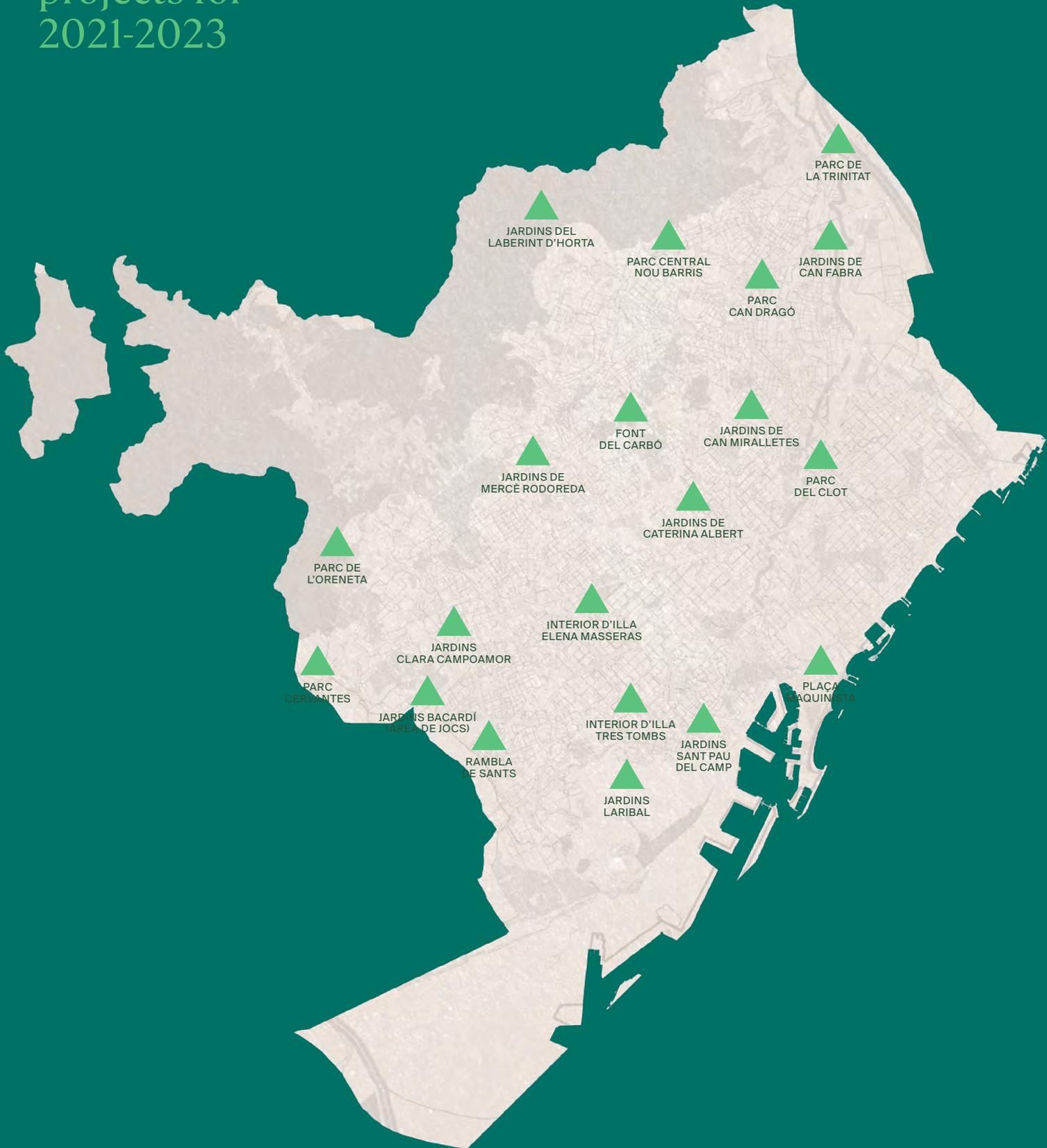


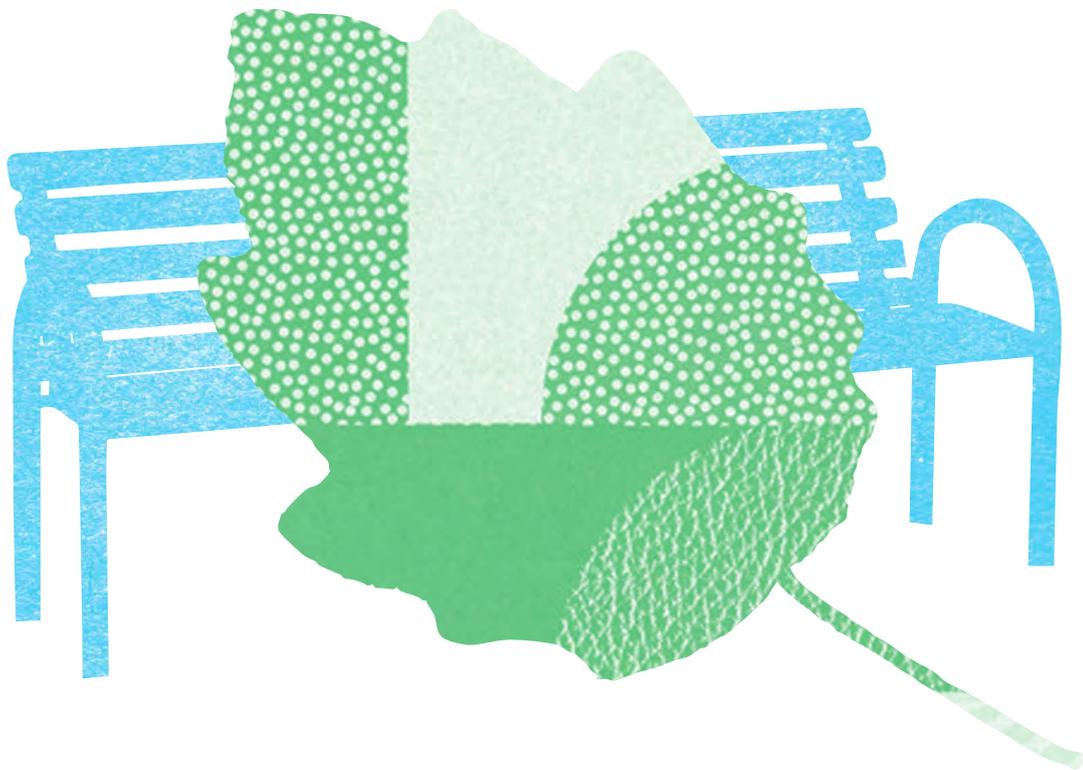
Figure 15. Planned renovation projects for 2021-2023.

Source: Barcelona Parks and Gardens, Municipal Institute, 2021.



LINE 2

To conserve and improve greenery and biodiversity



Conservation of the natural heritage of the Earth is one of the main challenges of sustainability. This challenge in the city is specifically to conserve and improve nature and to prevent the loss of species and habitats.

As for the management of green spaces, the city is applying ecological management and promoting naturalisation. **The aim of ecological management is sustainable use of resources, protection of the natural heritage and en-**

vironment and, therefore, health, and applies to greenery throughout the city, attending to the special features of every park and garden, including biodiversity and heritage parks and gardens. Naturalising urban green spaces means transforming them by managing more in favour of ecological processes and spontaneous entry of flora and fauna, without losing aesthetic quality and by gearing them towards a social and health benefit and the conservation of biodiversity, and is applied in several green spaces.

Action 4. To conserve and improve terrestrial habitats and species



Two-tailed pasha (Charaxes jasio).

18. To formalise the protection of the Tres Turons as a local nature reserve; to establish and apply a conservation protocol.
19. To formalise the protection of the nature value spaces of Montjuïc (cliffs and Foixarda) as a local nature reserve; to establish and apply a conservation protocol.
20. To formalise the protection of the Rec Comtal as a local nature reserve; to establish and apply a conservation protocol.
21. To take part actively from Barcelona in implementing the “Healthy Besòs. A joint vision of interventions for renaturalisation and sustainable mobility in spaces of opportunity along the banks of the River Besòs” and “Experience the River Besòs. Plan for conserving and restoring ecosystems and biodiversity and for preserving the coastal space and water resources” projects.
22. To devise action plans for species and groups to protect in particular fauna such as: squirrels, hedgehogs, house sparrows, peregrine falcons, birds of prey, birds living in buildings, birds that have an impact on build-ings, insectivore birds, reptiles, amphibians, invertebrates (butterflies and others); and to apply those plans.
23. To increase the abundance of protected and functional fauna species.
24. To devise and apply systems for controlling excessive numbers of animal species: cat, budgerigar, pigeon, Asian wasp etc., colonies.
25. To carry out actions to prevent the impact of the city's lighting and noise on urban fauna.
26. To create a network of hives for honey bees.
27. To plant trees and shrubs in parks and gardens to enrich the woody stratum, replace losses and improve biodiversity.
28. To cultivate coastal plants in backshore spaces, creating solutions for sheltering from increased temperatures and sunlight.

Action 5. To conserve and improve aquatic habitats and species: fresh water and seawater

29. To devise action plans for protecting species and groups of great interest found in the coastal and marine environment, such as the plover and the European shag.
30. To increase the number of naturalised ponds and to make new naturalised head ponds in Collserola's torrents.



Cormorant (Phalacrocorax penicillatus).

Action 6. To implement the ecological-management and naturalisation project



Insect hotel.

31. To increase the city's total number of naturalised green areas.
32. To create biodiversity shelters in green spaces and to draft and apply conservation protocols for existing ones.
33. To apply the forest-management system defined for ZIN-ZINA management (areas of natural interest and altered areas of natural interest).
34. To reduce and monitor tree and shrub pruning.
35. To diversify shrub species, balancing the abundance among the various species and increasing native species.
36. To establish meadows and grasslands for more ecological management and to encourage fauna such as pollinators.
37. To sow flower meadows attending especially to native flora.
38. To minimise the planting of seasonal flowers, increasing the number of deciduous flowering-plant groups.
39. To consolidate the spontaneous flora project in tree pits and expand the friendly flora project by attending to the diversity of types in the city and the various areas (urban, coastal, forest etc.).
40. To implement actions for conserving flora of special nature interest (for example, orchids, aquatic flora, Montjuïc flora, rupicolous flora) and to highlight the city's spontaneous herbaceous flora.
41. To define the most problematic invasive plant species, prioritise the zones and area to act on and define the methodology for acting with and applying.
42. To install and conserve fauna structures in favourable environments.
43. To devise and apply good practices for managing and preventing the impact of wild boars on the city's greenery.
44. To apply alternative methods for plant pest and weed control, likewise establishing minimal chemical treatments, to advance towards the "Zero pesticide" goal.
45. To promote the Tres Pins Plant Nursery as a research and experimentation space for improving the soil, plants and fauna, at the service of the city.
46. To green the fleet of vehicles and machinery at Parks and Gardens.
47. To recycle pruning waste for gardening and other projects: cushioning, compost, fauna structures. etc.
48. To make a purchasing policy sensitive to sustainability and biodiversity values.
49. To continue advancing in the sustainable management of water irrigation, with special attention to promoting the use of alternative water resources.

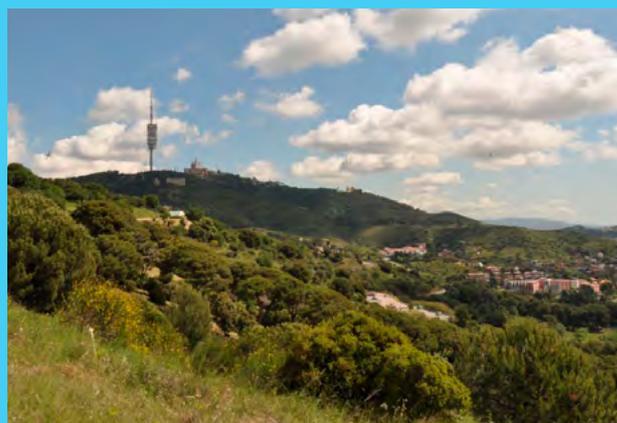
Action 7. To conserve and improving greenery and biodiversity in heritage green spaces

- 50. To establish criteria for conserving biodiversity in the implementation of the Strategic Framework of Historical Gardens and to apply them.
- 51. To specify and implement naturalisation actions in heritage gardens.
- 52. To look after the natural heritage in cemeteries establishing criteria for conserving biodiversity.



Jardí de la finca de Muñoz Ramonet.

Action 8. To take part actively from Barcelona in deploying the Collserola PEPNat, to strengthen its values as a protected nature space and to nourish Barcelona as a city of nature.



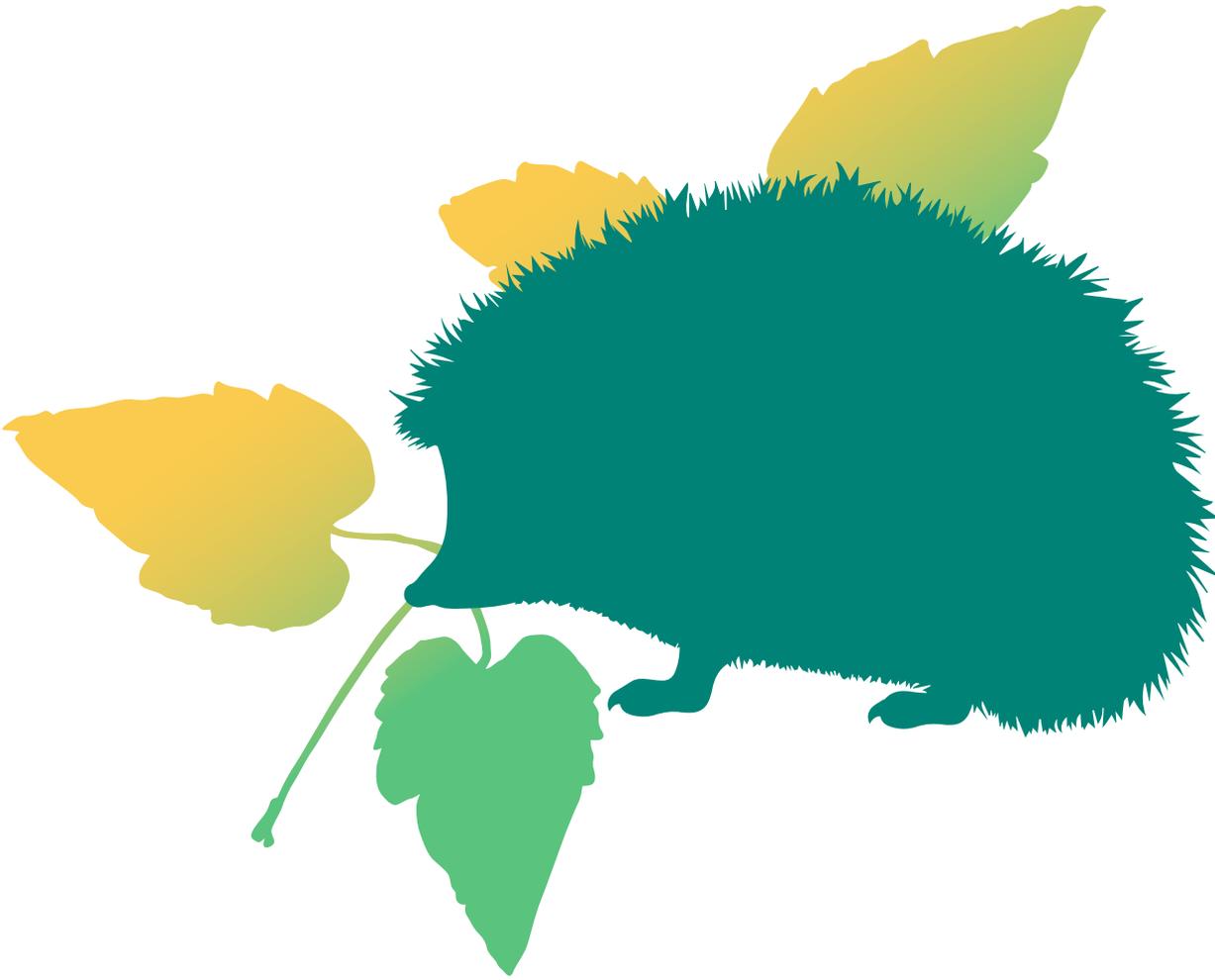
View of Parc Natural de Collserola.

- 53. To take part actively from Barcelona in deploying the Special Protection Plan for the natural environment and landscape of Parc Natural de la Serra de Collserola (PEPNat), likewise taking the defined functional space into consideration.
- 54. To implement naturalisation projects in the area of contact between Barcelona's urban fabric and Parc de Collserola, both inside the area of the Park and in the functional space.
- 55. To implement projects for conserving the Vallvidrera river and marsh, attending to its naturalisation, flora and fauna values and regulation of uses.
- 56. To promote and apply conservation measures to the open landscape of dry meadows on the Barcelona slope.





LINE 3 With and for city residents



Parks, urban gardens and beaches are the only possibility available to many people for enjoying nature. **Green spaces contribute to the interaction between people and to positive community life and are the ideal framework for activities that strengthen the recreational and social values of urban nature and promote knowledge of biodiversity.** We need to include and facilitate citizen initiatives and also offer specific proposals for communication, training, education and involvement so that city residents, organisations and all the other players can have an active role in promoting and conserving urban biodiversity, working actively to protect and therefore improve diversity in both public and private areas.

Day event with volunteers collecting oranges.

Action 9. To foster an active role for citizens in promoting and conserving urban nature in public areas



Plants in a tree pit cultivated by the Eskocells organisation.

57. To carry out citizen-involvement projects for nature actions in the city and to encourage more voluntary workers. For example: “All hands to greenery” project, urban agricultural strategy and awareness-raising and co-responsibility-encouraging activities on beaches.
58. To attend to the new needs of parks such as interaction with nature in children’s playing, adapting parks as climate shelters, regulating uses for pandemics, gender perspective and social justice.
59. To make and implement plans with specific uses for nature and/or historical places that are frequently visited or especially sensitive to the effects of over-use by people or dogs.
60. To regulate uses and activities in the coastal environment, to protect biodiversity and ensure the functionality of coastal ecosystems.
61. To establish shared diagnoses with districts and citizens of the uses and socio-environmental services of the green spaces and beaches.
62. To create park councils among the Authorities and city residents, for better management of parks and gardens.

Action 10. To activate citizen involvement in conserving, protecting and improving greenery and biodiversity in private areas



Balcony with flowers.

63. To carry out initiatives on private greenery by promoting allotments and the greening of balconies, terraces, roof terraces, roofs, walls and gardened courtyards as well as ecological management.
64. To open private green spaces for public use.
65. To develop a training, advice, subsidy and resource-supplying services to attend to the needs of the various organisation (associations, hospitals, shops, hotels, enterprises, industries etc.,) to expand nature in its spaces in the framework of the More Sustainable Barcelona Network.
66. To approve a tool that enables the effective protection of private greenery, attending especially to the gardens along the Collserola strip, for their ecological connection function, and playgrounds in neighbourhoods with deficient greenery.
67. To maintain, expand and create subsidies and financial competitions that promote nature in the city.

Action 11. To disseminate knowledge on urban nature and the value of its conservation



Environmental education day with students and gardeners.

- 68. To carry out nature environmental-education projects, attending to the wealth and diversity of its habitats.
- 69. To carry out education projects for co-existence between animals and city residents.
- 70. To create a networking system for bringing nature to city residents in neighbourhoods through both existing and new facilities.
- 71. To create and provide an interpretation centre with greenery and biodiversity in Barcelona.
- 72. To hold nature festivals for city residents in green spaces.
- 73. To create open days in private gardens and extend their benefits to local residents.

Action 12. To communicate to city residents the value of urban nature



Signposting in Turó Park.

- 74. To create a website on greenery and biodiversity in Barcelona.
- 75. To issue technical-type and outreach publications and videos on nature issues (for example, good gardening practices for shops, associations and organisations).
- 76. To carry out communication actions for advancing towards a positive citizen perception of nature, using communication media, digital media, street performances etc.
- 77. To publish an annual assessment of the advances of the plan and the state of biodiversity in Barcelona.

Action 13. To promote the incorporate of biodiversity values among professionals



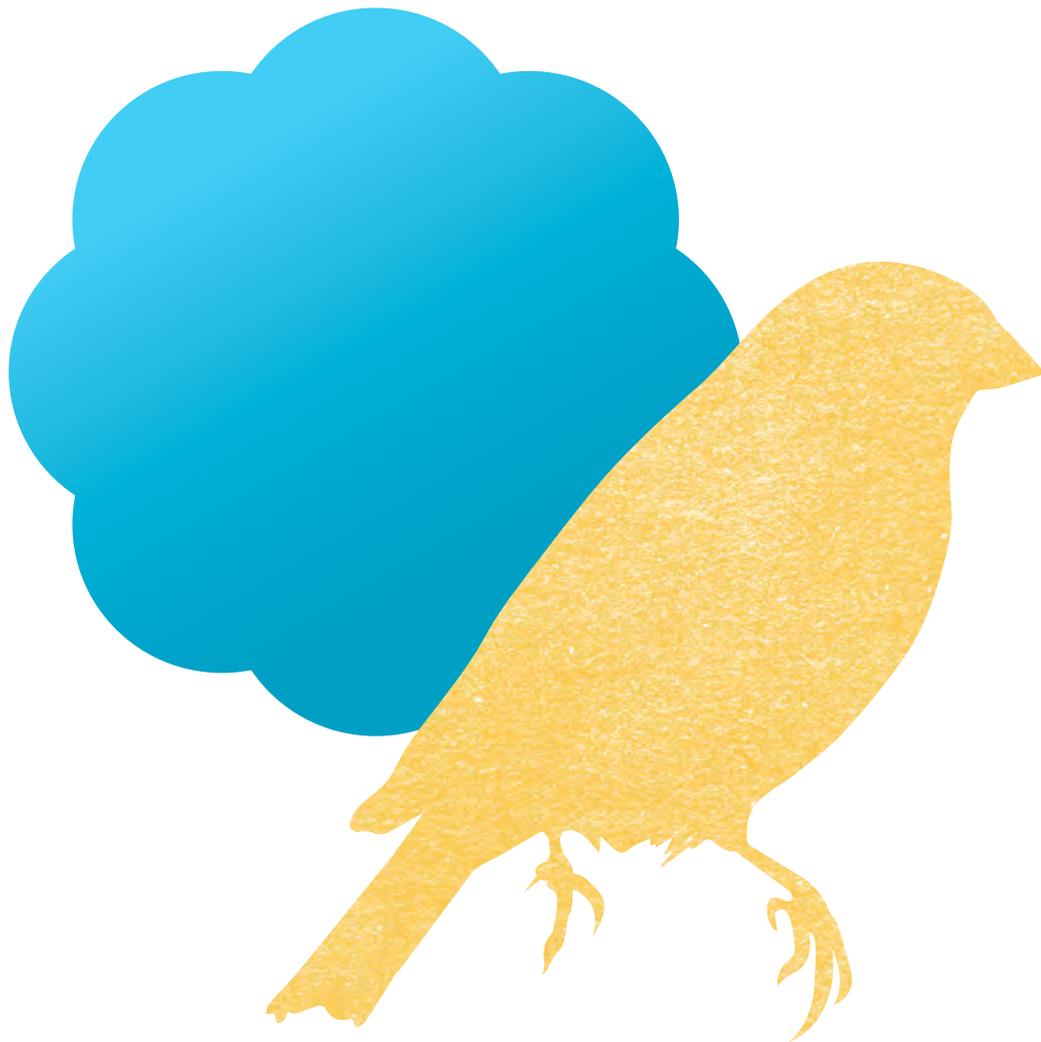
Outreach session in Parc del Laberint d'Horta.

- 78. To promote the incorporate of biodiversity among professionals, by planning and applying training actions.



CROSS-CUTTING AREA

1 Knowledge



Conservation of biodiversity in the urban environment and the relationship between nature and health are two aspects that are being considered by local governments around the world and regarding which we need to make progress in both theory and applied knowledge. Planning, managing and maintaining the natural heritage on a rigorous scientific and technical basis **requires deep knowledge of greenery and biodiversity, studies into the behaviour and needs of species in urban environments and the environmental and social benefits that they generate. Meanwhile, we will**

need to be diligent and follow the transformation process that climate change is bringing about in the natural environment both on land and in the sea.

Likewise, **the relationship between urban nature and health is a central issue where we need to delve deeply if we are to apply the conclusions at the service of a healthy life to cities which promote greenery accessibility and fairness.**

Action 14. To create the Barcelona Biodiversity Observatory using on knowledge from citizen science



Citizen Science Day (Bioblitz).

79. In the framework of the Biodiversity Observatory, to devise studies for monitoring the state and development of the natural heritage with a data bank. For example, monitoring the development of the plant cover, a comprehensive inventory of the urban flora and monitoring of the terrestrial fauna and marine biodiversity.
80. To maintain and expand the Atles de biodiversitat de Barcelona, with information on not just terrestrial but also coastal and marine communities.
81. To elaborate and publish an assessment of the overall impact of nature on the health of city residents which considers services such as mental health and well-being, air quality, noise reduction and heat reduction etc., and disservices such as allergies and the emission of volatile organic compounds (VOCs).
82. To study the plant species adapted to each type of greenery, above all to green walls and roofs.
83. To study the plant species most adapted to shading and the areas that need especially thermoregulatory plants and admit xerophile plants.
84. To calculate the impact of maintaining green spaces with regard to the various environmental aspects.
85. To assess the benefits of greenery in each of the city's transformation projects.
86. To assess the impact of dogs and cats on the city's greenery and biodiversity.
87. To study the impact on ornithofauna from bird collisions with glass.
88. To deepen our knowledge of the impact of cities on the Earth's overall biodiversity.
89. To promote research into the effects of climate change on natural heritage.

Action 15. To establish synergies with research centres for transferring knowledge

90. To strengthen and expand collaboration with research institutions and centres to facilitate decision-taking based on knowledge.



View of the old Jewish Cemetery, on Montjuïc.





CROSS-CUTTING AREA 2

Governance



The plan needs to work in a shared and cross-cutting way with the municipal authority itself and with city residents. The Nature Plan's challenges must be promoted and work on exchange and innovation beyond the municipal arena. **A network needs to be created and institutional relations bolstered with the organisations involved in the conservation of biodiversity and greenery and the natural heritage in general.** Working in the city with these challenges means working for the natural heritage of humanity as a whole and for a full life for city residents, because the city's footprint is having an impact on nature well beyond the municipal boundaries.

Action 16. To incorporate the challenges of biodiversity into municipal regulations and technical documents



Peregrine falcon (*Falco peregrinus*).

91. To revise and update current legislation to resolve legal pitfalls regarding citizen action in urban greenery, legalisation of beekeeping, marketing of farming products, etc.

Action 17. To take a deep look at complementary funding systems such as green taxation and sponsorship and to apply them



Mercat de Sant Antoni Superblock.

92. To analyse the cost of maintaining existing and planned greenery and biodiversity, with regard to human, financial and material resources. To include the new associated infrastructures such as SUDS, structural soils, green roofs.
93. To study the possibilities of green taxation and alternative management and funding channels for creating and maintaining green spaces, such as private sponsorship, stewardship actions, temporary assignments of use, permits, discounts etc.

Action 18. To carry out cross-cutting work throughout the municipal and metropolitan area



Day event cleaning the ponds in the Jardí de Mossèn Cinto i Verdaguer.

94. To set up a Parks and Gardens organisation suitable for the new ecological and naturalisation management of greenery and biodiversity, taking into consideration the resources, need for new professional profiles and the promotion of the eco-gardening profession.
95. To approve and implement the municipal instructions for conserving and promoting urban biodiversity in every work, maintenance, activity and practice that may have an impact on biodiversity.
96. To bolster training on greenery and biodiversity for the entire municipal workforce, under the “More Sustainable City Council” programme.
97. To establish three cross-cutting work boards: Greenery and Health; Biodiversity Conservation and City Greenery Model.

Action 19. To strengthen the city’s leadership in biodiversity and take part in international initiatives



View of Barcelona from Parc Natural de Collserola.

98. To take part actively in international initiatives and with the most important bodies committed to dealing with biodiversity problems.
99. To study the application of nature rights in the city Barcelona.

Action 20. To network with associations and organisations for biodiversity

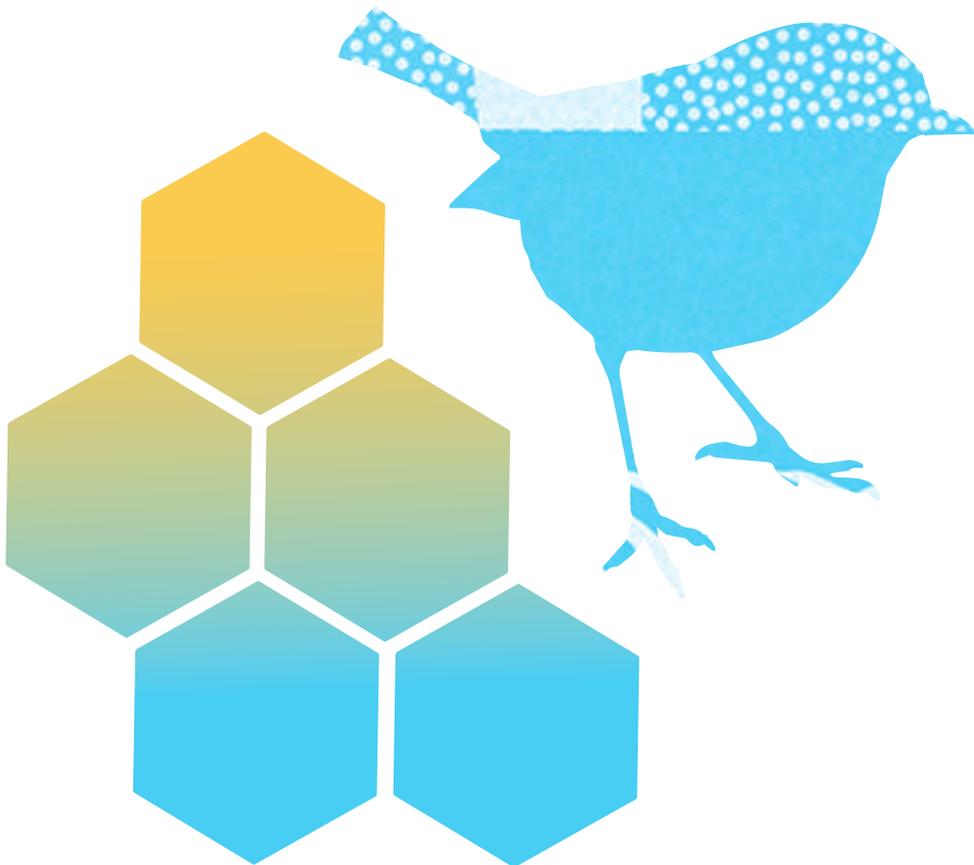
100. To monitor the Nature Plan periodically through the Citizen Council for Sustainability.

9.



Action Programme. The lead projects for 2021-2025

Of the hundred projects planned under the framework of the Barcelona Nature Plan for 2030, 10 are considered priority and intended to be implemented during the 2021-2025 period. These are what are known as **lead projects** which shape the action programme of the Nature Plan.



Lead projects LINE 1 2021-2025

To plan the city's green infrastructure, based on the diagnosis of priority areas of action under the Greenery Model and by prioritising fairness, the gender perspective, accessibility, size and quantity as well as city and metropolitan connections. To establish the model integrating green corridors, the Superblocks Programme, the PDU's corridors, and to give special attention to the most deficient areas and to social-justice challenges.

To apply the Greenery and Biodiversity Charter to projects for urbanising, building and improving public spaces, as a tool for designing with regard to land, water and plants, attending to the diversity of the city's environments (coastal, forest, urban centre etc.). To define the mechanisms for establishing a monitoring of the application of the Greenery Charter's criteria in the greenery projects carried out and to gather the lessons learnt to systematise the experience attained.

To implement the projects planned under the Greenery Model to continue with the target of achieving 160 new hectares by 2030 (increasing the greenery by 1 m² per resident), in accordance with the Greenery Charter's criteria.

Lead projects LINE 2 2021-2025

To take part actively from Barcelona in deploying the Special Protection Plan for the natural environment and landscape of Parc Natural de la Serra de Collserola (PEPNat), likewise taking the defined functional space into consideration.

To increase the city's total number of naturalised green areas.

Lead projects LINE 3 2021-2025

To carry out citizen-involvement projects for nature actions in the city and to encourage more voluntary workers. For example: "All hands to greenery" project, urban agricultural strategy and awareness-raising and co-responsibility-encouraging activities on beaches.

To develop a training, advice, subsidy and resource-supplying services to attend to the needs of the various organisation (associations, hospitals, shops, hotels, enterprises, industries etc.) to expand nature in its spaces in the framework of the More Sustainable Barcelona Network.

Lead projects AREA 1 2021-2025

In the framework of the Biodiversity Observatory, to devise studies for monitoring the state and development of the natural heritage with a data bank and indicator and bio-indicator greenery and biodiversity systems. For example, monitoring the development of the plant cover, a inventory of the urban flora and monitoring of the terrestrial fauna and marine biodiversity.

To elaborate and publish an assessment of the overall impact of nature on the health of city residents which considers services such as mental health and well-being, air quality, noise reduction and heat reduction etc., and disservices such as allergies and the emission of volatile organic compounds (VOCs).

Lead projects AREA 2 2021-2025

To set up a Parks and Gardens organisation suitable for the new ecological and naturalisation management of greenery and biodiversity, taking into consideration the resources, need for new professional profiles and the promotion of the eco-gardening profession.





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