



European Green Capital Award 2025

Brescia application Indicator 3

3. Biodiversity, Green Areas & Sustainable Land Use

3.A Present Situation

Please complete the following tables:

Table 1: Benchmarking Data – Land use within the city

* For EGL applicants the following applies: when the applicant cannot provide certain benchmark data, a brief description of the current situation regarding land use within the city.

Land Use Data (in % of total surface area)	Inner City ¹	Overall City ¹	Unit	Year of Data
Public Green Area	26.1	24.0	%	2018
Private Green Area	8.9	5.4		
(Urban) Agricultural Land	23.5	48.9		
Water	1.7	0.8		
Other	39.8	20.9		
Total	100%	100%		
Urban tree canopy cover (% of total surface area)	17	20		
Population Data	Inner City ¹	Overall City ¹	Unit	Year of Data
Population density in built-up areas (city area minus green and blue)	52	33	Inhabitants/ha	2018
Percentage of people living within 300 m of green urban areas of >5,000 m ²	100	71	%	2018

Table 2: Benchmarking Data – Nature and Biodiversity

* For EGL applicants the following applies: when the applicant cannot provide certain benchmark data, a brief description of the current situation regarding nature and biodiversity.

Indicator	Number	Total Area (ha)
Number and total area of Natura 2000 sites within the city limits	0	0
Number and total area of designated sites of national biodiversity importance within the city (habitat/species management areas)	0	0
Number and total area of designated sites of local (city) biodiversity importance within the city (habitat/species management areas)	2	3'500

This section is aimed at providing information on the current importance of green areas and biodiversity in your city. Please provide the following:

1. A brief explanation of the data in the above tables.
2. One or more maps with the following information:
 - a. protected areas, sites, habitats, ecosystems or biotopes.
 - b. land use, showing the municipality boundaries delineating the overall city area and the inner-

¹ Please refer to Guidance Note on how to delineate 'Inner City' and 'Overall City'.

city area.

- c. green and blue (water) areas in the city, and their connectivity and coherence.
3. The species and habitat monitoring programmes your city has in place.
4. Your city's approach to involving and engaging residents, visitors, business and institutions in planning and action for nature.

(max. 1000 words and five graphics, images or tables)

Brescia is strategically located in the north eastern side of the region Lombardy stretching from the pre-alps to the Po' Valley plain. It features mountainous landscapes in the north, highly urbanized areas in the middle, and rural areas in the south. The mountains are marked by a wide forest covering the north and south slopes, which is more extensive than in the second half of the past century. Grasslands are present in the more accessible sub-plain areas and on the slopes closer to population centres. Within the Overall City boundaries, the green areas have an extension of about 145 km² and include both wooded areas and urban green areas. Corresponding to the city, the hill system features in the north eastern part by Mount Maddalena (874 m) while in the north western part by the Campiani Hills. The urbanisation has 6.4 km² of green areas (3.8 km² of parks and gardens) and 120'000 trees along roads and in parks. Each inhabitant has an average of 32 m² of urban green space (national average value 31.1 m²). In the Overall City territory, 32.5 km² of private green areas are added to the public green space, 8 km² of which is in the Inner city. The main water network is defined by the Mella River, which runs through the territory from north to south, while the secondary water network has several streams and canals. The territory of Brescia presents several quarry lakes, recently regenerated. The Overall City is characterized by lowland rural areas (295 km²): here the residential fabric is partly interconnected with industrial and commercial production areas. On the other hand, in the Inner City, the urban fabric is prevalent and is closely interconnected with the manufacturing fabric, despite significant patches of agricultural land use to the south. (21.3 km²) (Figure 1).

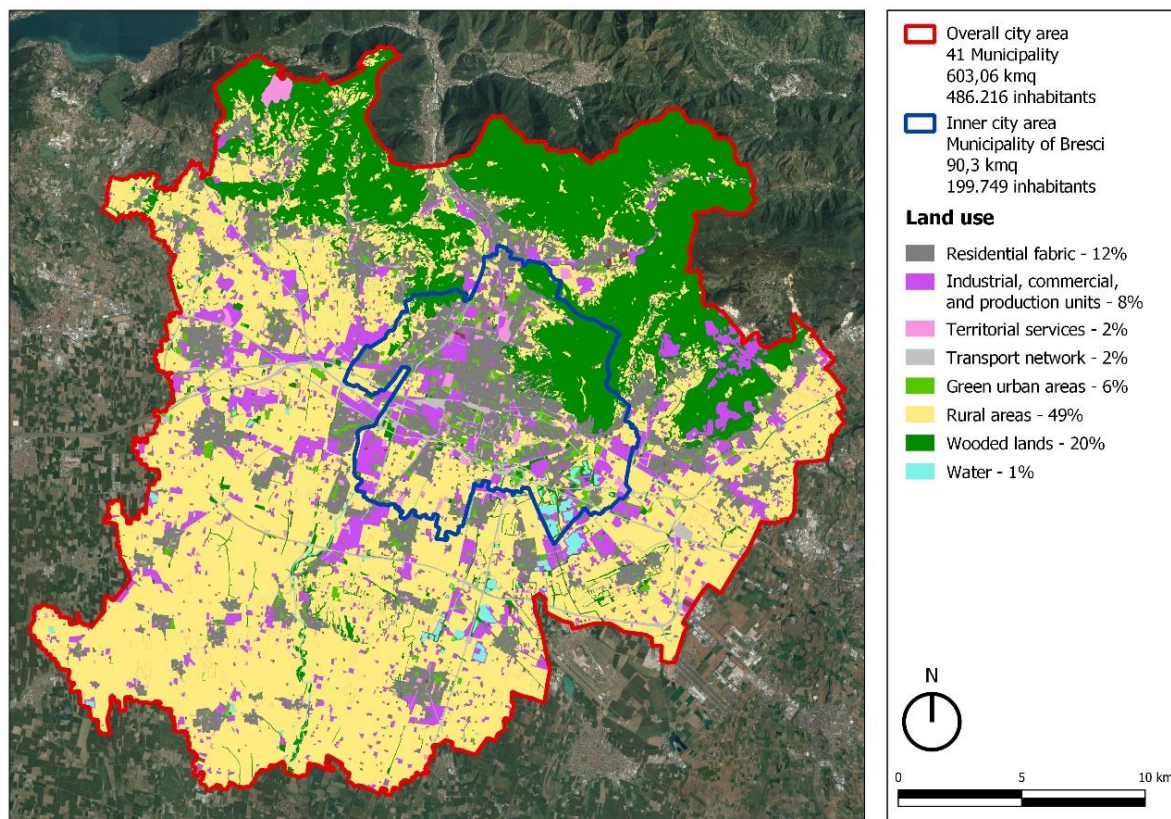


Figure 1: Land use map

The goals of conserving, safeguarding and enhancing the natural environment set out in the Strategic Urban Plan (SUP) [1], allow the Hills Local Park of Supra-municipal Interest (LPSI) (which includes the municipalities of Brescia, Bovezzo, Cellatica, Collebeato, Rezzato, Rodengo Saiano) extension up to the Mella river greenway (2016), for a total of 25.45 km² of protected areas. Another important operation was the establishment in 2018 of the Buffalora and San Polo Quarries LPSI: a 9.60 km² area in the

south eastern portion of the city, aimed at restoring naturalness in areas subject to sand and gravel mining. Accessibility to urban green areas is provided by an extensive cycle paths network (230 km) and public transport planned to connect major urban nodes with the green areas themselves. In particular, the cycle network provides routes distinct from the main traffic arteries, connects open spaces through greenways, and penetrates urban areas to ensure user accessibility (Figure 2).

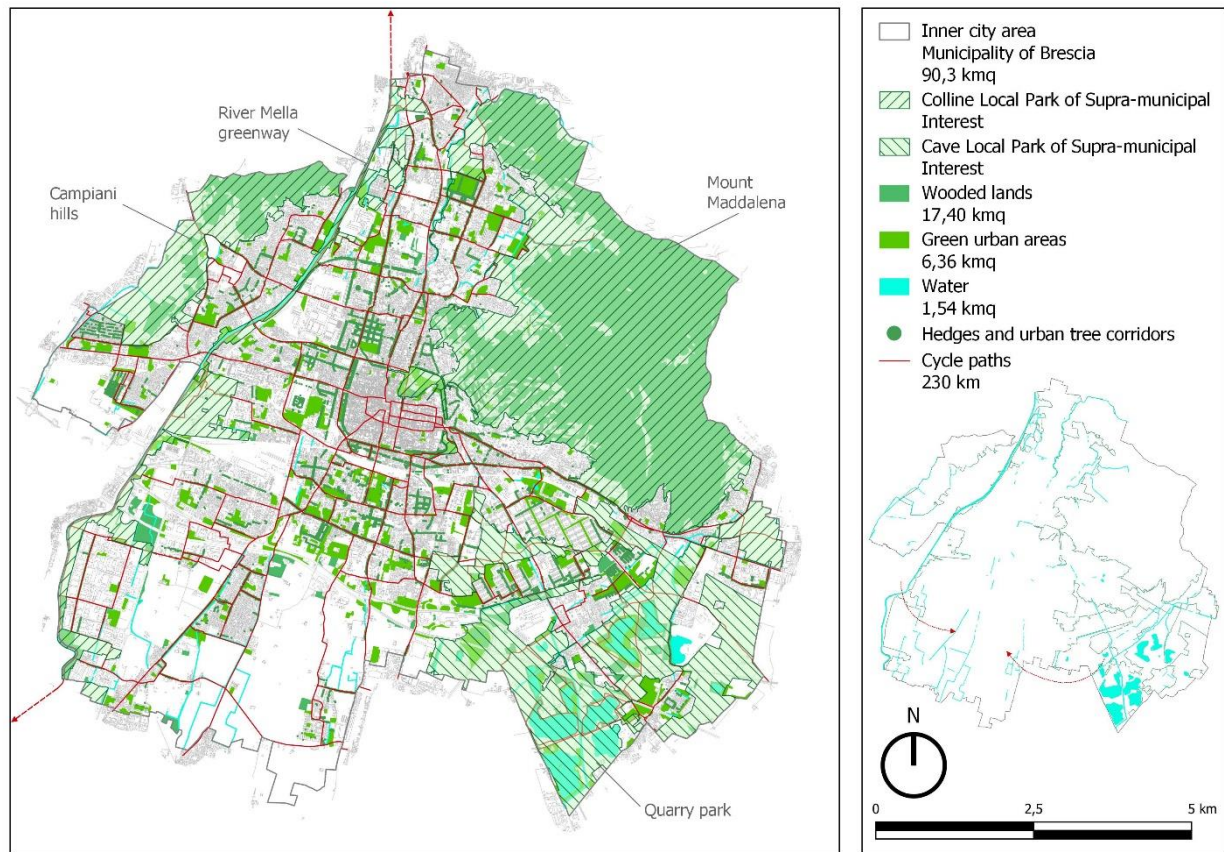


Figure 2: Connectivity between green and blue areas

In this biogeographical context, there are more than 70 km² of protected areas and 60 km² of Biodiversity Priority Areas (BPAs). In addition to the Hills and Quarries LPSI, the Overall City contains the Monte Netto Regional Agricultural Park (14.71 km²), the Collina Di Castenedolo Agricultural Park (5.68 km²), and part of the following BPAs: Cariadeghe Upland (5.40 km²), Mella River and Sant'Anna Hill (11.35 km²), Eastern Sebino Hills (3.30 km²), Central Fountain Belt (36.42 km²).

There are no Natura 2000 sites, but adjacent to the Overall city boundary there are two Special Areas for Conservation (SAC): The Natural Reserve "Torbiere del Sebino" (IT2070020) and "Cariadeghe Upland" (IT2070018). They are connected to the protected areas system through the supra-municipal ecological network, where several habitats are present [2] (Figure 3).

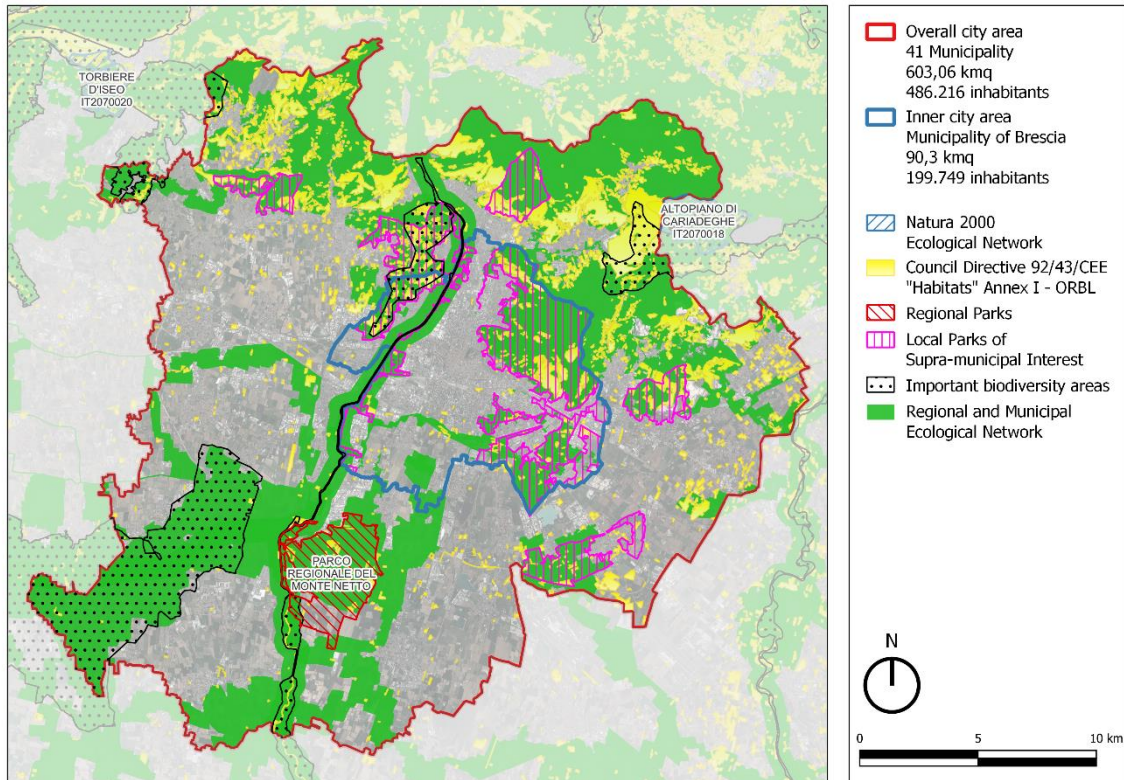


Figure 3: Protected areas and habitats map

According to the EU Council Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora [2] and an agreement signed with the Regional Observatory of Biodiversity [3], the municipality of Brescia ensures the monitoring of habitats. The Natural Sciences Museum (NSM), in collaboration with the University of Brescia, provides mapping and monitoring of habitats and species in the protected areas and surrounding Brescia Hills Park where, for example, the most important *Himantoglossum adriaticum* [2] species of Alpine Lombardy are found (Carobbio Valley, Inner City). The distribution of alien species [4] is also monitored in order to define containment or eradication protocols. Within Ducos Park in Brescia, annual monitoring and control of the Exotic Marsh Tortoise (*Trachemys scripta*) population is carried out. This urban park is the first permanent regional collection centre implemented in 2021 [5].

The main planning and implementation tool of the city of Brescia is the Climate Transition Strategy (CTS) [6] approved in 2021, which has among its objectives the protection and enhancement of natural capital. The CTS provides adaptation and mitigation actions, and involvement of citizens and stakeholders in order to fight climate change. The main actions are the de-sealing of impermeable surfaces, urban and peri-urban reforestation, the creation of green roofs and the promotion of several actions to disseminate the sustainability culture. Awareness activities include the protection of ecosystems, ecosystem services and biodiversity management, with the aim of encouraging private actors to adopt nature-based solutions in a current climate crisis scenario. Education activities on nature and sustainability are promoted by the *Un Filo Naturale* project (in which the STC is included) and carried out by the partners AmbienteParco, Euro-Mediterranean Centre on Climate Change, NSM and Hills Park. These offer activities and workshops for schools and lessons open to the public on the topic of climate transition.

To involve stakeholders, Brescia has created an online platform where all the actions regarding the involvement and dissemination of nature, biodiversity, climate change and CTS converge [7].

The municipality also promotes many citizen science actions such as biodiversity monitoring using CSMON-LIFE [8], an international online platform that encourages science among citizens. Furthermore, the NSM involves the city's nature associations in the study of semi-natural areas around the city for the establishment of new Natura 2000 sites (e.g., Val Carobbio, which shows a richness of species and habitats).

3.B Past Performance

The aim of this section is to make clear how the situation described in the previous section has been achieved. Where available, quantitative information and data should be provided for the previous ten years in order to show recent trends. Please provide information on:

1. Trends on/changes in:
 - a. The area protected for nature and biodiversity
 - b. Presence of habitat and species
 - c. The total green area within the city limits.
2. Map(s) of the location of brownfield sites (derelict zones) that have been regenerated in the past 10 years.
3. Actions and measures taken by the city authorities in the last 10 years that significantly affected the trends and changes mentioned under points 1 and 2.

(max. 600 words and five graphics, images or tables)

Already within the 2002 SUP [9] the trend is to maintain, extend and integrate urban green areas and safeguard parks, enriching their biodiversity. In addition to these spaces, there is a compensation filter around the major traffic roads to mitigate polluting gas emissions and noise.

The most important objective is the conservation of the existing green space, followed by its enhancement and improvement. The first action was realised with the establishment of the Hills LPSI. Since 2012, the SUP [10] has been the planning tool for the city's territory and includes the connection system of green areas of the Municipal Ecological Network, which incorporates the indications of the provincial and regional ecological network. The plan aims to restore environmental and landscape resources to their original conditions. Over the years, the Municipality of Brescia has promoted the establishment of new protected areas by submitting proposals for the creation of new parks and the extension of existing ones. Important is the recognition of the Hills LPSI in 2002, its expansion to the neighbouring Municipality of Collebeato (2015) and along the primary ecological corridor of the Mella River and the Caionvico district area (2016), and the establishment of Quarries LPSI (2018). In 2022, the neighbouring municipality of Castenedolo also established the Collina Di Castenedolo Agricultural Park [11]. Since 2015, the areas have increased by approximately 17% compared to the initial ones (Figures 4, 5). Each protected area is endowed with a three-year public works program [12] in which actions for the conservation and recovery of habitats and the containment and eradication of invasive exotic species are planned.

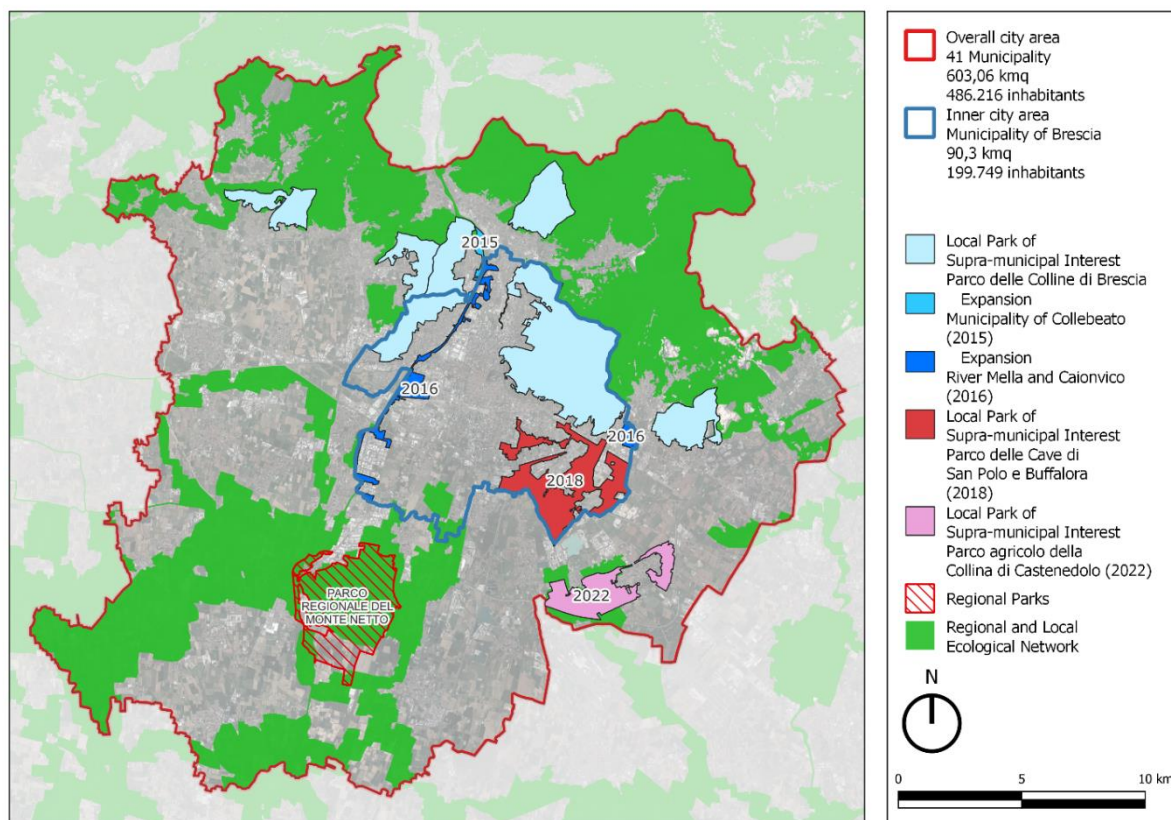


Figure 4: New protected areas established since 2015

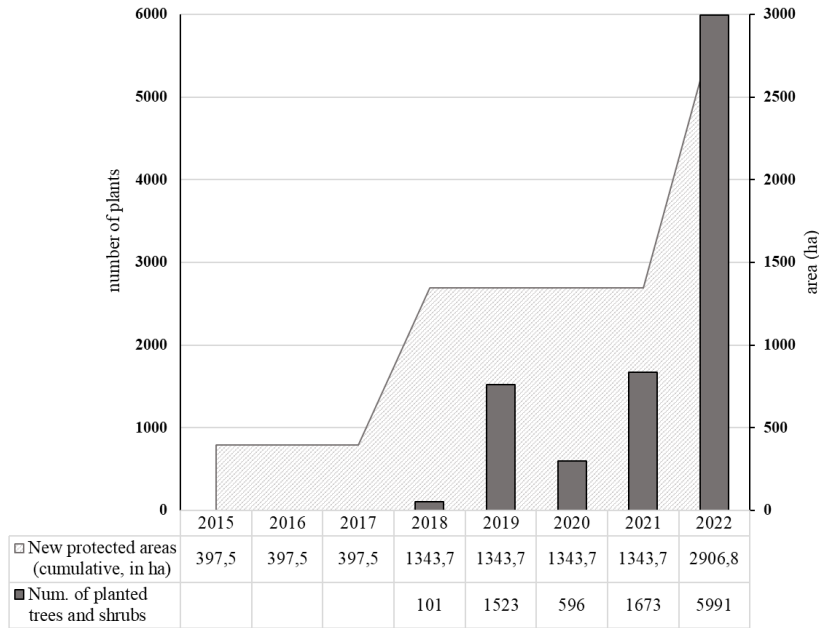


Figure 5: New protected areas and tree planting since 2015

Also, the municipality of Brescia has deepened its knowledge of its territory's natural capital status. Based on the habitat distribution model of the Lombardy Region there are 13 habitats [2] in the Overall City, of which the priority ones are 6210 (arid grasslands) and 91HO (Pannonian woodlands).

In the Inner City there are 8 habitats, whose conservation status is “unfavourable” [13, 14]. Also, a similar situation is highlighted for the flora species [15]. Among birds 3 species are “Endangered”, 5 are “Vulnerable” and 5 are “Near threatened”. Some species are even spreading inside the overall city and 2 of them (*Ixobrychus minutus* and *Plegadis falcinellus*) have been recorded for the first time in the last ten years. Furthermore, a population of the near-threatened dragonfly *Oxygastra curtisii* was recently found in the Quarries LPSI (Table 1).

Type	EU directive	Overall City (excluding Inner City)	Inner City
HABITAT (3150; 3260; 3270; 6170; 6210(*); 6510; 8120; 8210; 8310; 91H0*; 91K0; 91LO)	(I) 92/43/ECC	12	8
FLORA (<i>Himantoglossum adriaticum</i> ; <i>Gladiolus palustris</i> ; <i>Primula glaberrima</i>)	(II/IV) 92/43/ECC	3	1
VERTEBRATE FAUNA (<i>Rana dalmatina</i> ; <i>Hyla arborea</i> ; <i>Triturus carnifex</i> ; <i>Podarcis muralis</i> ; <i>Hierophis viridiflavus</i> ; <i>Coronella austriaca</i> ; <i>Zamenis longissimus</i> ; <i>Natrix tessellata</i> ; <i>Rhinolophus ferrumequinum</i>)	(II) 92/43/ECC	3	8
INVERTEBRATE FAUNA (<i>Leucorrhinia pectoralis</i> ; <i>Ophiogomphus cecilia</i> ; <i>Oxygastra curtisii</i>)	(II) 92/43/ECC	0	3
AVIFAUNA (<i>Alcedo atthis</i> ; <i>Ardea alba</i> ; <i>Ardea purpurea</i> ; <i>Ardeola ralloides</i> ; <i>Aythya nyroca</i> ; <i>Botaurus stellaris</i> ; <i>Bubo bubo</i> ; <i>Calandrella brachydactyla</i> ; <i>Caprimulgus europaeus</i> ; <i>Ciconia ciconia</i> ; <i>Circaetus gallicus</i> ; <i>Circus aeruginosus</i> ; <i>Circus cyaneus</i> ; <i>Circus pygargus</i> ; <i>Egretta garzetta</i> ; <i>Falco columbarius</i> ; <i>Falco peregrinus</i> ; <i>Falco tinnunculus</i> ; <i>Grus grus</i> ; <i>Hieraaetus pennatus</i> ; <i>Ixobrychus minutus</i> ; <i>Lanius collurio</i> ; <i>Luscinia svecica</i> ; <i>Milvus migrans</i> ; <i>Nycticorax nycticorax</i> ; <i>Pernis apivorus</i> ; <i>Phalacrocorax pygmeus</i> ; <i>Plegadis falcinellus</i> ; <i>Sterna hirundo</i>)	(I) 79/49/ECC	29	24

Table 1: Habitats, flora and fauna present in the territory

Beginning in the 1970s, the dismissal of large industrial areas freed up spaces that allowed the city to expand without consuming the land. If the 2002 SUP [9] proposed preserving, adapting and transforming the built environment, even the 2012 SUP [10], limits land consumption for new settlement uses. The aim is to complete buildings, generating continuity with the urban landscape, including public green spaces design. With the 'Norma projects' [9], the city proposes and binds a precise intervention design for large strategic areas of urban transformation, imposing the theme of reuse of the built heritage (Figure 6).

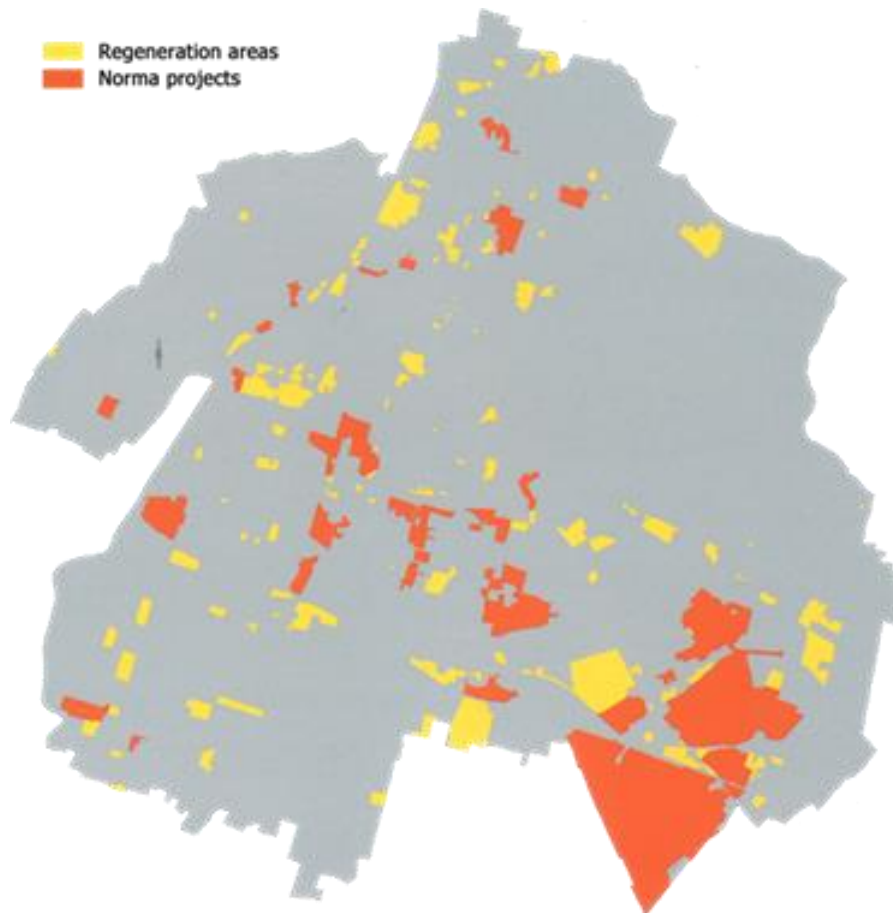


Figure 6: Regeneration areas and Norma projects

The last decade has seen a considerable decrease in brownfields, from an area of 3.5 km² to the current 1.4 km². In particular, outside the main historical core, regenerated and to-be-regenerated areas are considerable portions of land used as industrial areas, military facilities and farmsteads. Therefore, these are important regeneration operations that aim to reconstitute the territory and establish new functions (Figure 7).

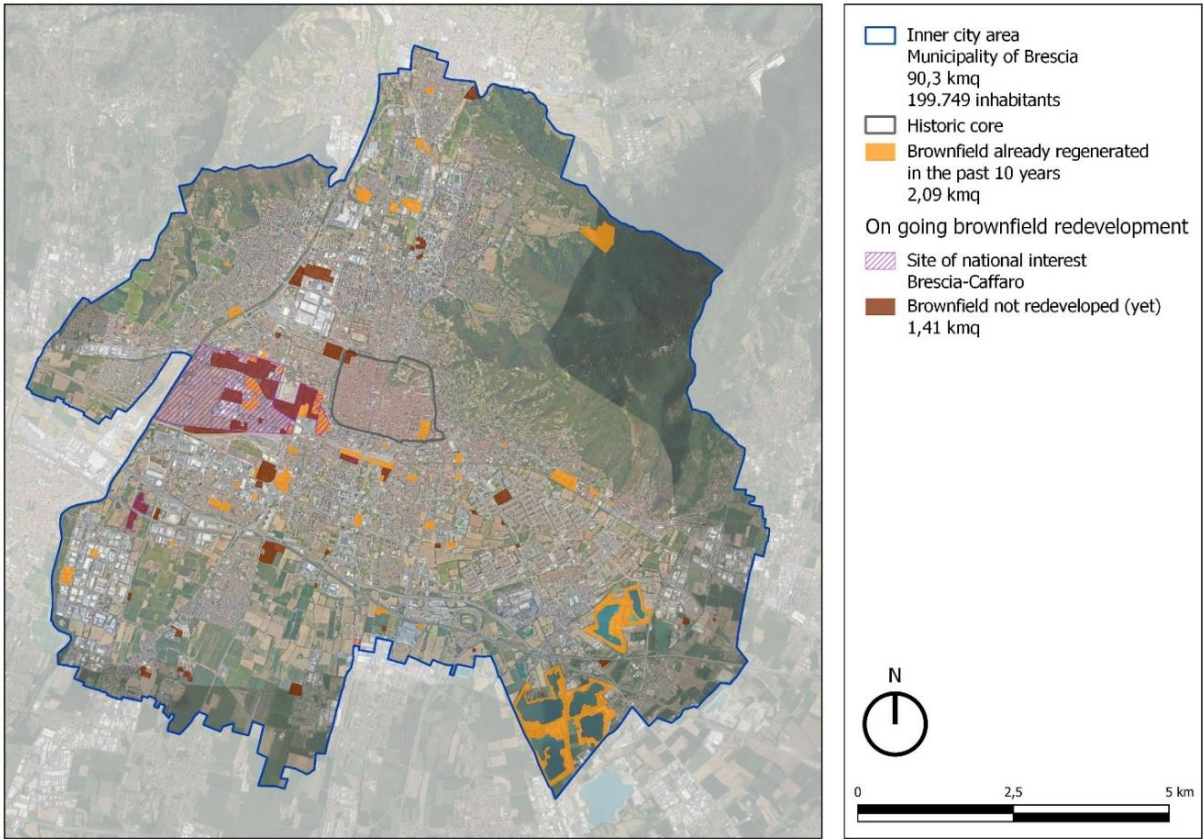


Figure 7: Location of brownfield sites

3.C Future Plans

Please provide the following information:

1. The medium term (2030) and long term (2050) objectives for:
 - a. nature and biodiversity, including the contribution to the EU goal to plant 3 billion additional trees.
 - b. establishment and management (maintenance) of green urban areas (publicly and privately owned), including the goal to reduce net land take (EU Soil Strategy)
 - c. the rehabilitation of brown field sites (derelict and/or contaminated land)
2. The planned measures to achieve the ambitions described under 1. Please also indicate if your city has developed an Urban Greening Plan as per guidance available at European level². In addition, please indicate which innovations your city is planning to use.
3. How the ambitions and measures described under 1 and 2 are supported by:
 - a. strategic and policy commitments
 - b. budget and resource allocations
 - c. plans for monitoring of impacts
 - d. participatory approaches
4. Current or outstanding ongoing environmental legal proceedings, including infringements regarding the EU Birds and Habitat Directive. If there are, please indicate how and when you are planning to comply.

(max. 600 words and five graphics, images or tables)

² https://environment.ec.europa.eu/topics/urban-environment/urban-greening-platform_en

In the SUP new variant, adopted in January 2023 [16], the administration intends to continue what is defined by the previous plans. The SUP provides incentives for the redevelopment and regeneration of the existing urban fabric, through actions aimed to defend, strengthen and enhance the unbuilt area. These objectives can be achieved through the reduction of free-soil consumption, and the valorisation of the environmental connections system to preserve the continuity of the ecological corridors. As a matter of fact, the LPSI surface was increased all over the years and a further extension of the Hills LPSI to the southern agricultural areas is planned [16] [17] (Figure 8, 9) to preserve and enhance the green border creation. This will favour the creation of new ecological corridors.

Brescia Local Parks of Supra-municipal Interest

■ LPSI 2002 ■ LPSI 2016 ■ LPSI 2022

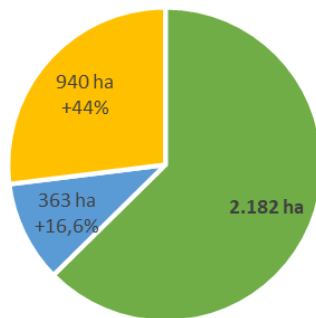


Figure 8: Local Parks of Supra-municipal Interest (LPSI) extension

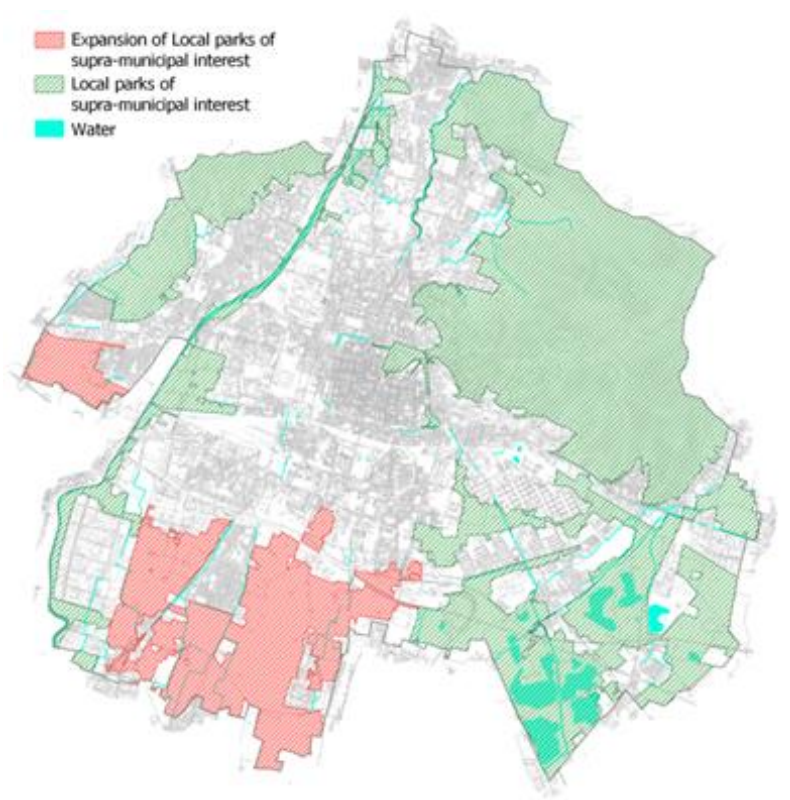


Figure 9: Local parks of supra-municipal interest's extension map

To improve biodiversity in the medium term, the administration will continue to promote territorial studies and monitoring activities already underway. In particular, the purpose of these activities is to:

- i. identify areas of particular naturalistic importance;
- ii. set up new Natura 2000 network sites (e.g. Val Carobbio);
- iii. assess the conservation status of habitats and species to plan conservation interventions, especially for priority habitats (6210, 91H0).

Between 2023 and 2024 urban and peri-urban forests (0.35 km², 52'000 new trees/shrubs) will be created, to facilitate the spread of wild pollinators. Furthermore, the administration is developing a feasibility plan for the establishment of a conservation area that will involve more than 20 municipalities (Figure 10).

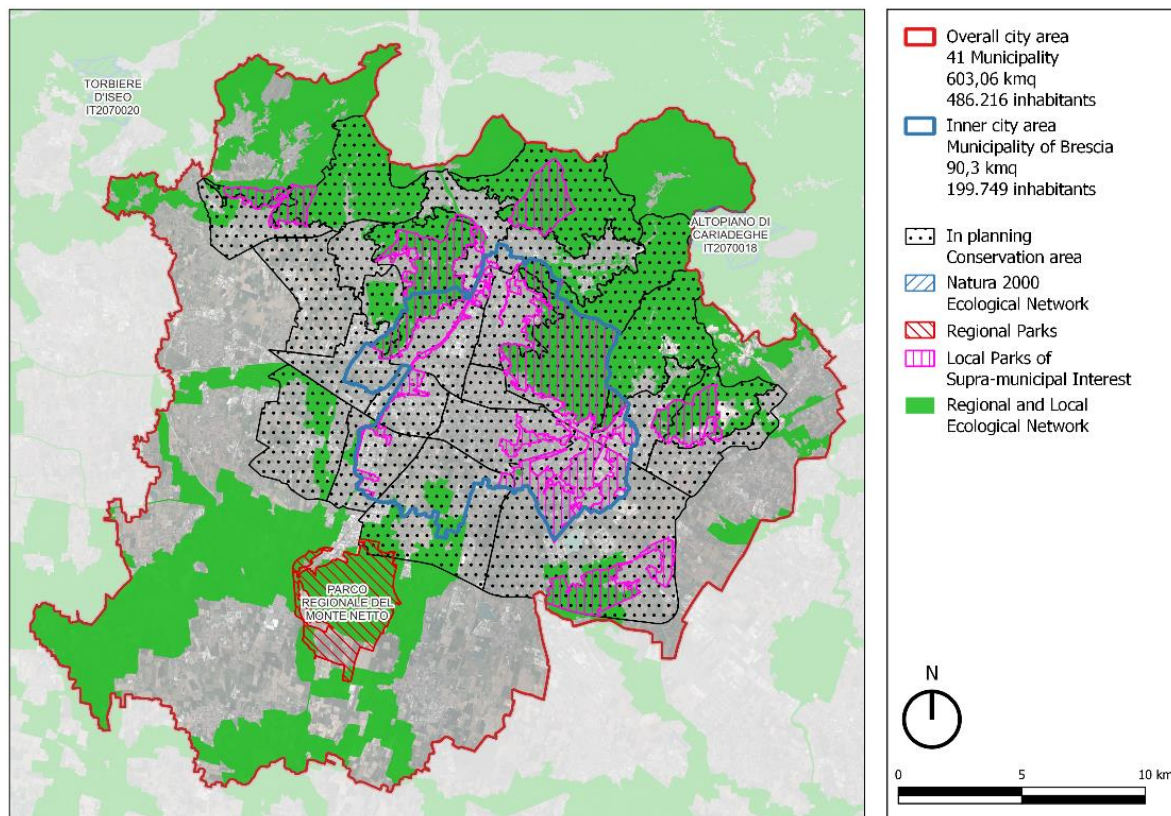


Figure 10: Future parks and protected areas

In the coming years, a new model of sustainable forest management will be defined involving public and private properties with a shared form of governance in which Hills Park will be the catalyst, providing the technical and economic support for the start-up of management.

At the local scale, some pilot projects have recently been activated: in urban green areas mowing of flowerbeds has been reduced to allow the spontaneous flora reproductive cycle and to facilitate the spread of wild pollinators and small fauna. These flowerbeds are monitored by the city's naturalistic associations with the aim of assessing the effects on biodiversity.

For contaminated areas, reclamation actions are envisaged based on experimental studies to evaluate:

- the phytoremediation capacity of the soils by spontaneous and cultivated biodiversity [18];
- the effects of agricultural practices to evaluate the effects on spontaneous flora, phytocontainment and bioremediation [19].

The last SUP variant [16] provides the strengthening of territorial ecosystem services, the adoption of nature-based solutions in urban planning-building practice, the activation of consolidated fabric regeneration interventions, and the recovery of brownfields. Article 31 of the New Building Regulations (June 2022) [20] establishes the minimum requirements to be followed for interventions on existing and/or newly built buildings, with regard to environmental sustainability.

Furthermore, the medium-long-term plan for Public Green areas and Biodiversity of the city, financed by the Ministry of Ecological Transition (€ 99'820'00), is being defined. In line with the National Urban Green Strategy and the PNRR, the plan aims to improve the well-being of citizens, through the ecosystem functions of adaptation, and mitigation that urban green and plant biodiversity can provide.

To reduce greenhouse gas emissions, the STC foresees short-term pilot actions (by 2024) and longer-term strategic actions. The adaptation and mitigation actions (like the containment of temperatures and surface water run-off) aim to improve the livability of urban areas. Thanks to the co-financing of the Cariplo Foundation and the Lombardy Region for the "Un Filo Naturale" project, the resources available up to 2024 for the pilot actions amount to € 6'112'000 divided as in Table 2. Moreover, the budget and resource allocations for adaptation actions are shown in Table 3.

Financiers	Budget (€)
Cariplo foundation	1'850'000
Lombardy region	1'400'000
Municipality of Brescia and other partnership members	2'862'000

Table 2: Funding for the Un Filo Naturale project

Adaptation Actions	Extention (m ²)	Budget (€)
De-sealing	1'700	1'980'000
Green roofs	1'100	475'000
Associated forest management based on a new governance model	-	238'000
Containment of the risk of pollution and environmental improvement of polluted agricultural areas	-	65'000
Forestry and creation of new habitats	130'000	500'000
Enhancement of green areas and creation of an urban orchard	-	300'000
Mitigation works for infrastructural axes.	200'000	3'800'000
Pilot interventions to reduce the risk of flooding canals	20'000	30'000

Table 3: Budget for adaptation actions

3.D References

List supporting documentation, adding links where possible. Further detail may be requested during the pre-selection phase. Documentation should not be forwarded at this stage.

(max. 400 words)

- [1] Municipality of Brescia (2016). General Report PGT 2016
https://www.comune.brescia.it/servizi/urbanistica/PGT/Documents/PGT%202016/DC_DOCUMENTAZIONE%20COMUNE/V-DG00%20Relazione%20Generale.pdf
- [2] DH 92/43 CEE
- [3] n. 484, 11/16/ 2022
- [4] EU 1143/2014
- [5] Life IP GESTIRE 2020, Action A7
- [6] Municipality of Brescia (2021). Climate Transition Strategies (STC)
https://www.comune.brescia.it/servizi/urbancenter/unfilonaturale/Documents/210720_UC_AT_188-RELAZIONE_STC_BS_rev2.pdf
- [7] Climate Transition Strategy (CTS) website
<https://www.unfilonaturale.it/>
- [8] Biodiversity of Brescia (GERT)
<http://www.csmon-life.eu/pagina/campagne/43>
- [9] Municipality of Brescia (2002). General Report PRG 2002
- [10] Municipality of Brescia (2012). General Report PGT 2012
https://www.comune.brescia.it/servizi/urbanistica/PGT/Documents/PGT%2012_Relazione%20Generale/RG00.pdf
- [11] DPP Brescia no. 76/2022
- [12] Municipality of Brescia. Three-year public works program.
<https://www.comune.brescia.it/trasparenza/operepubbliche/Pagine/Opere-pubbliche.aspx>
- [13] ERCOLE S., ANGELINI P., CARNEVALI L., CASELLA L., GIACANELLI V., GRIGNETTI A., LA MESA G., NARDELLI R., SERRA L., STOCH F., TUNESI L., GENOVESI P. (ed.), 2021. *Rapporti Direttive Natura (2013-2018). Sintesi dello stato di conservazione delle specie e degli habitat di interesse comunitario e delle azioni di contrasto alle specie esotiche di rilevanza unionale in Italia*. ISPRA, Serie Rapporti 349/2021.
<https://www.isprambiente.gov.it/it/pubblicazioni/rapporti/rapporti-direttive-natura-2013-2018>
- [14] JANSSEN, J. A. M., et al. European red list of habitats. Luxembourg: Publications Office of the European Union, 2016
https://ec.europa.eu/environment/nature/knowledge/redlist_en.htm
- [15] Annex II/IV 92/43/CEE
- [16] Municipality of Brescia (2022). Preliminary SEA Report IV Variant PGT.
https://www.comune.brescia.it/servizi/urbanistica/PGT/Documents/QUARTA%20VARIANTE_2022/Allegato%20n_1_quadro%20conoscitivo.pdf

[17] Municipality of Brescia (2018). General Report PLIS.
https://www.comune.brescia.it/servizi/urbanistica/PGT/Documents/PGT%202016/DC_DOCUMENTAZIONE%20COMUNE/Relazione%20proposta%20Plis%20Cave%20Brescia.pdf#search=PLIS%20CAVE

[18] Terzaghi, Elisa, et al. "Rhizoremediation of weathered PCBs in a heavily contaminated agricultural soil: results of a biostimulation trial in semi field conditions." *Science of the total environment* 686 (2019): 484-496

[19] DALLE FRATTE M, MONTAGNOLI A, ANELLI S, ARMIRAGLIO S, BEATRICE P, CERIANI A, LIPRERI E, MIALI A, NASTASIO P AND CERABOLINI BEL, 2022. Mulching in lowland hay meadows drives an adaptive convergence of above- and below-ground traits reducing plasticity and improving biomass: A possible tool for enhancing phytoremediation. *Front. Plant Sci.* 13:1062911. doi: 10.3389/fpls.2022.1062911
<https://www.frontiersin.org/articles/10.3389/fpls.2022.1062911/full>

[20] Municipality of Brescia (2022). Building regulations
<https://www.comune.brescia.it/servizi/casa/SUE/Documents/Regolamento%20edilizio.pdf>

Word Count Check

Please complete the below word count check.

Section	Number of words in graphics/images/tables	Number of words in body of text	Total number of words in graphics/ images/ tables and body of text	Max. words
3A	0	974	974	1000
3B	0	559	559	600
3C	0	594	594	600