FEDRIGONI

FEDRIGONI GROUP BIODIVERSITY IMPACT ASSESSMENT

PROXIMITY ANALYSIS

Wesley Snell, Maria Lizcano

ETIFOR valuing nature

Padova University Spin-off

Università degli Studi di Padova

INDEX

GUIDANCE TO THE DOCUMENT

The organization of the report is as follows:

1. BACKGROUND AND CONTEXT

The report begins by establishing the context for the analysis, including a brief overview of recent trends in biodiversity loss, land-use change, and proximate effects of human activity on local diversity. It also summarizes the main indicators and methods used in this report.

2. SUMMARY OF RESULTS

A summary table including the main results of multiple biodiversity indicators for each Fedrigoni site.

3. OVERVIEW OF FEDRIGONI SITES AND PROTECTED AREAS

Brief description of each Fedrigoni manufacturing site, their distribution across Italy, and information related to protected areas and Other Effective Area-based Conservation Measures (OECM) as defined by the IUCN and CBD.

4. PROXIMITY ANALYSIS

This section provides information about each site's nearest important biodiversity area and the nearest-neighbour mapping methodology used to identify them.

5. OVERLAP ANALYSIS

The overlap analysis provides information about all the protected areas or OECM that may be affected by Fedrigoni's manufacturing sites and the mapping methodology used to identify them.

6. HABITAT QUALITY INDEX

The Habitat Quality analysis provides information about the extent of suitable habitats across the landscape surrounding the Fedrigoni sites and their relative state of degradation. It includes a summary of the inVEST modelling software and variables used to identify them.

7. ANNEXES

Detailed maps and tables that clarify the data presented in sections 1 – 7, including Annex A: Protected Areas and OECM, Annex B: Overlap analysis for each Fedrigoni site, Annex C: Land-use/Land-cover and roads within a relevant buffer zone surrounding each site, and Annex D: Habitat quality indices

The information provided in this report was produced to guide Fedrigoni's decision-making in biodiversity-related projects and identify priority areas for intervention. However, this is a diagnostic – not a prescriptive – report, meant only to identify the areas where Fedrigoni sites may exert proximate effects on local biodiversity.

BACKGROUND AND CONTEXT

Biodiversity underpins many of the ecosystem services that support human well-being, including medicine, food, healthy soil, and clean water. Widespread, rapid, accelerating, and synchronized losses in biodiversity necessitate a coordinated response (Ceballos et al., 2015; Hallmann et al., 2017; Steffen et al., 2018; Watson et al., 2019) (Ceballos et al., 2015; Hallmann et al., 2017; Steffen et al., 2018; Watson et al., 2019). Many agree that we are entering Earth's sixth mass extinction event – the extinction rate for vertebrate species is conservatively estimated between 100 to 1000x the background extinction rate (Ceballos et al., 2015). If we accept vertebrates as a proxy for the overall biodiversity of a system, recent trends suggest that the extinction rate is accelerating: At least 543 vertebrates went extinct during the 20th century and given the rate of land conversion and population extirpations, the same number of vertebrate species is projected to go extinct by 2040 (Ceballos et al. 2020). However, the extinction rate does not capture the severity of population losses even among species of "least concern" – in a recent study by Gerardo Ceballos and his colleagues, 32% of 27,600 vertebrates sampled have decreased in population size since 1900, and of the 177 mammals for whom they had detailed data, all have lost at least 30% of their geographic range and over 40% have experienced >80% range shrinkage and severe population decline (Ceballos et al. 2017). This indicates that beyond the accelerated extinction rate, the planet is experiencing massive population collapse and extirpations.

Entomologists have noticed a similar trend in the Insecta class: since the mid-20th century, total insect abundance has declined globally by between 1 – 2.5%/yr, with a loss of between 25-40% total insect abundance and proportionate rise in threatened species in the last 30 years (Sanchez-Bayo & Wyckhyus 2019; van Klink et al. 2020). Another study conducted in Germany demonstrates that these losses are not spread equally, with >75% reduction in flying insect biomass over 27 years in protected areas (Hallman et al. 2017). These extinctions can instigate cascading extinction chains and compromise critical ecosystem functions such as nutrient cycling, population regulation, carbon storage and sequestration, or even stream morphology (Rippler et al. 2014; Ceballos et al. 2020).

Land-use change – including agricultural expansion and intensification, urbanization, mining, cattle-grazing, and other forms of natural resource exploitation – is the most important driver of recent massive losses in biodiversity (Ceballos et al., 2015; Hallmann et al., 2017; Klink et al., 2020; McKinney, 2005; Sánchez-Bayo & Wyckhuys, 2019; Watson et al., 2019). A global assessment by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) reports that approximately 75% of the earth's land surface and 66% of its ocean area have been significantly altered by humans (IPBES 2019). Drivers of biodiversity loss differ in magnitude and distribution across different countries, but overall the IPBES report suggests that the primary pressure on terrestrial species is land use change – especially agricultural conversion and intensification – while direct exploitation of organisms through overfishing has had the biggest impact on marine ecosystems (IPBES 2019).

Human infrastructure also exerts proximal effects on nearby ecosystems that extend beyond the bounds of the construction area. This includes air, light, and noise pollution, toxic waste discharge, habitat fragmentation, and other pressures that are exerted at the landscape level within and between a matrix of land-cover and land-use types; in other words, land-cover types interact with each other and influence biodiversity between patches (Benítez-López et al., 2010; Brockerhoff et al., 2017; Girardello et al., 2019; Torres et al., 2016a; Watson et al., 2019). For example, a review by (Pfeifer et al., 2017) found that forest edges affected the abundance of 85% of observed species, with specialist species populations inhabiting forest cores requiring at least 200-400 meters of

forest buffer to remain stable. Declines in mean species abundance (MSA) for mammals have been observed up to 17 kilometres from human infrastructure and roads, with the most severe impacts within 5 kilometres (Benítez-López et al., 2010). Figure 1 illustrates the relationship between MSA for birds and mammals and distance to infrastructure based on a review of more than 150 reports (Torres et al., 2016b).

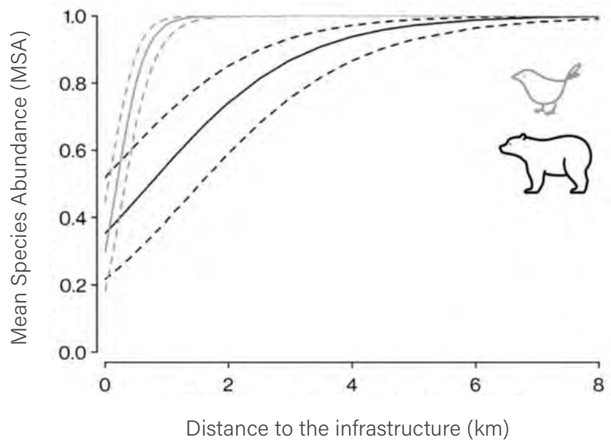


Figure 1. Relationship between MSA of birds and mammals and distance to infrastructure. Solid lines show the MSA curve for mammals while grey lines show the MSA curve for birds, with dashed lines representing the 95% confidence interval for each (Torres et al., 2016 adapted from Benitez-Lopez 2010)

The data included in this report is meant to guide decision-making for mitigating proximate impacts and highlighting priority areas for intervention. Given the complexity, uncertainty, and lack of standardized methodologies for quantifying proximate effects on biodiversity, we measured three indicators based on best practices and scientific literature. First, we applied a 20 km radius buffer zone from the centre of each Fedrigoni manufacturing site – this represents the most conservative estimate of the extent of proximal effects on large mammals by the manufacturing sites. All protected areas and other areas designated as significant for biodiversity within or nearby the buffer zone were mapped, and an overlay analysis showed the percentage area overlap and total protected area within the proximate zone. Finally, a habitat quality index was constructed based on land-use classes and distance-decay functions to map available habitat and its relative state of degradation within the buffer. In essence, this report includes the nearest protected area or area of biodiversity importance to each manufacturing site, the total protected area in which the manufacturing infrastructure might exert an influence on biodiversity, and the relative habitat quality within the proximate-effect zone for each site which indicates how Fedrigoni sites are embedded within a broader land-use matrix.

SUMMARY OF RESULTS

Type of Analysis	Variables	Value						
Site Description	**Name**	**Arco**	**Cordenons**	**Fabriano**	**Pioraco**	**Scurelle**	**Varone**	**Verona**
	Site Type	Manufacturing	Manufacturing	Manufacturing	Manufacturing	Manufacturing	Manufacturing	Manufacturing
	Main products	Paper; Self-adhesives	Paper; Self-adhesives	Paper; Self-adhesives	Paper; Self-adhesives	Paper; Self-adhesives	Paper; Self-adhesives	Paper; Self-adhesives
	Size (ha)	12,41	6,20	8,93	3,18	0,55	4,65	5,84
Nearest PA/ OECM*	Nearest PA or OECM to Manufacturing Site	Biotopo Monte Brione	Risorgive del Vinchiaruzzo	Faggeto di San Silvestro	Valle Scurosa, Piano di Montelago e Gola di Pioraco	Val Campelle	Crinale Pichea - Rochetta	Fiume Adige tra Verona est e Badia Polesine
Overlap	Number of PA or OECM within Relevant Buffer Zone	55	12	33	31	47	59	13
	Area of PA or OECM within Relevant Buffer Zone (ha)	30.829	14.580	54.060	40.343	69.996	39.701	4.452
Relative Habitat Quality	Mean Habitat Quality Index (HQI)	0,85	0,29	0,86	0,88	0,95	0,85	0,33
	StdDev HQI	0,19	0,26	0,21	0,21	0,12	0,19	0,27
	Min HQI	0,12	0,05	0,11	0,11	0,11	0,12	0,05
	Max HQI	1	0,99	1	1	1	1	0,96

**PA = Protected Area and OECM = Other Effective Area-based Conservation Measure*

FEDRIGONI MANUFACTURING SITES

The Fedrigoni Group includes seven manufacturing plants distributed across the country in the regions of Trentino-Alto Adige, Friuli-Venezia Giulia, Veneto, and Marche. The manufacturing plants Arco, Varone, and Scurelle are located in the region of Trentino-Alto Adige. The manufacturing plant Verona in the Veneto region, Cordenons in Friuli-Venezia Giulia and Pioraco and Fabriano in the region of Marche, east Italy.

Figure 2. Fedrigoni manufacturing plants across Italy

Name	Latitude	Longitude	Area (ha)
Arco	45,9007684	10,8777866	12,41
Cordenons	45,9676435	12,7135008	6,20
Fabriano	43,1804347	13,0016477	8,93
Pioraco	46,0673126	11,5011685	3,18
Scurelle	45,9097770	10,8384983	0,55
Varone	45,4224260	10,9859906	4,65
Verona	43,3263662	12,8937544	5,84

Table 1. Summary of the Fedrigoni's manufacturing sites with coordinates and surface area

Figure 3. Arco manufacturing plant

The Arco manufacturing plant is located in the industrial area called "Zai-Linfano" in the Alto Garda area at Via Linfano, 16 in the city of Arco, Trento, Trentino-Alto Adige. It has a surface of 12,4 hectares corresponding to facilities and adjacent green areas. The plant is situated in the orographic right of the Sarca river by the Sarca plain.

The plant was established in 1962/63. Until 1993 it produced exclusively uncoated paper and backing for self-adhesive labels. Following a financial and technological investment, the plant specialised in producing coated paper for graphic purposes.

ARCO

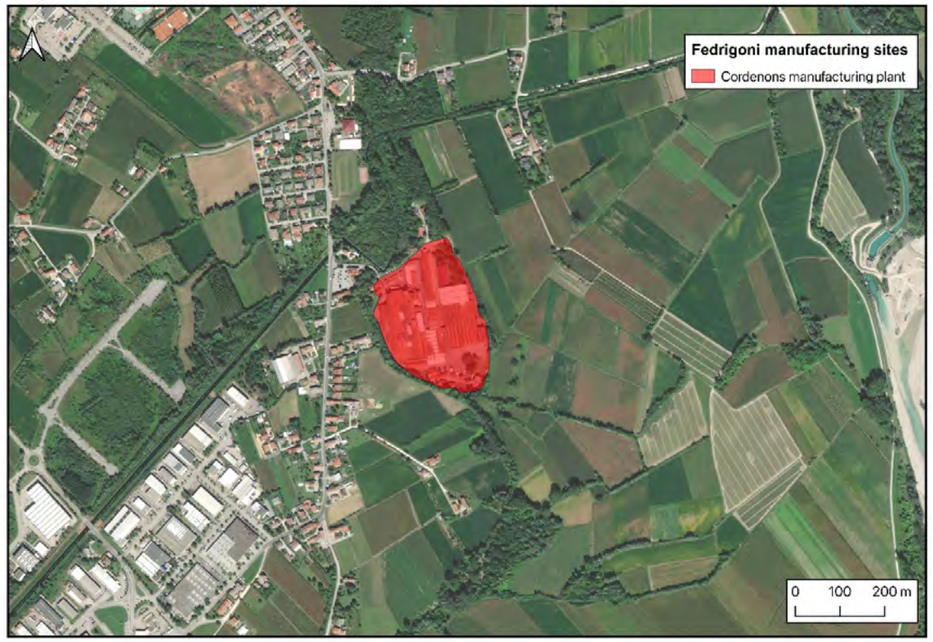


Figure 4. Cordenons manufacturing plant

The Cordenons plant is located south of the hamlet 'Pasch' in the municipality of Cordenons and 200 m north-east of the hamlet 'Gardonio delle Acque'. It is located directly south of Lake Venzon, in a bend of the Viazol canal, in the province of Pordenone, Friuli-Giulia Venezia. The plant has a surface of 6,20 hectares corresponding to facilities and adjacent green areas.

The first historical records of the paper mill date back to 1630, when it belonged to the Conti Avanzo di Cordenons. Since 1984, the Cordenons paper mill has been completely renovated, focusing on producing high-quality special papers. In July 2018, the Cordenons Group became part of the Fedrigoni Spa Group. Since then, the production of this plant has consisted of high-quality unique papers for writing, printing, filtration, impregnation, coated, and embossed papers.

CORDENONS

Figure 5 Fabriano manufacturing plant

The Fabriano plant is located in Ponte del Gualdo, better known as Vetralla di Fabriano, in Viale XIII Luglio n. 91 / A (ex SS76), in the industrial area south of the city of Fabriano.

The site consists of five separate buildings used for different purposes. The central building concentrates the production activity. One of the facilities houses the cotton warehouse. Adjacent to this facility is the "vats" department manufacturing handmade paper. The last building is used as a shelter for the electricity distribution cabin and warehouse. Beyond the stream, it is the thermoelectric plant (C.T.E.). Adjacent to the C.T.E., the industrial wastewater purification plant is located, while incoming water filtration one is located on the other side of Viale XIII Luglio.

In 1974, the second part of building no. 1 was constructed on two floors. Since 2002, Cartiere Miliani Fabriano has been part of the Fedrigoni Group of Verona. Towards the end of 2004, the new thermoelectric energy co-generation plant started operating and consisted of two turbo gas and a recovery boiler with a post-burner. In 2007 the battery of sand filters and the new biological wastewater purification part were installed.

The Fabriano plant mainly produces xerographic and offset printing paper, fine drawing and printing papers, and watermarked and marked papers. It is the only plant in the world where papers are still produced today with the three paper production processes: hand-made paper, machine-made paper in the round, and flat-table papers.

FABRIANO

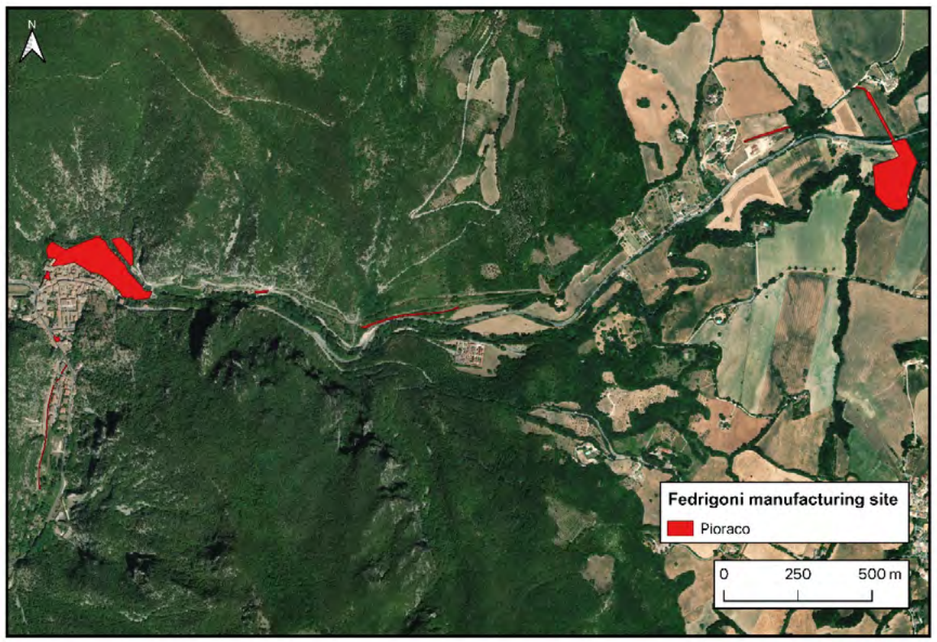


Figure 6 Pioraco manufacturing plant

Since 2002, Cartiere Miliani Fabriano has been part of the Fedrigoni Group of Verona. The Pioraco manufacturing plant is located west of Pioraco, in Macerata, Marche. It has a surface of 3,18 hectares corresponding to the papermill, warehouses, power plant and water purifier. This plant also has inlet water treatment plants, loading tanks, a hydropower plant, turbines, pipelines, and intake sources. The site, which develops along the valley carved by the Potenza River, does not border other industrial realities.

The position characterised by an accentuated slope between the entrance of the plant and the city has resulted in development on various levels (n ° 7), which are identified in the plan according to their altitude. The site consists of four facilities: Building no. 1, which houses the production and set-up, is located on the left bank of the Potenza River and is spread over four levels (-20m; -23m; -27.60m and -32m); Building no. 2 is spread over three levels (0m; -5.40m; -14.7m), positioned on the same bank upstream from the central body, and is used as a warehouse for raw materials and additives. Building no. 3 is located on the hydrographic right of the watercourse and houses the thermal power plant (CTE). The effluent purification plant is located near the CTE. Building no. 4 at zero altitude near the border with the city housed a line for cardboard production; however, it is no longer in production since about 1960.

The Pioraco plant mainly produces paper for offset printing, watermarked, lined, marked, and paper for drawing and writing. The plant is equipped with a series of proprietary hydroelectric plants that allow the manufacturing processes to have a large part of its energy produced from renewable sources.

PIORACO

Figure 7. Scurelle manufacturing plant

The Scurelle plant is located in the urban Borgo Valsugana area as part of the province of Trento, Trentino-Alto Adige. It has a surface of 0,55 hectares corresponding to facilities and adjacent green areas. The settlement is positioned, proceeding along with provincial road no. 41 in the west part area of Scurelle and in the south area of the basin created by the urban areas of Castellare and Palua.

The paper mill was founded in 1715 and belonged to diverse Venetian families. Since 1984, the Cordenons paper mill has been completely renovated, focusing on the production of high-quality special papers for writing and printing. In July 2018, the Cordenons Group became part of the Fedrigoni Spa Group.

SCURELLE

Figure 8. Varone manufacturing plant

The Varone manufacturing plant is located in Riva del Garda upstream from the town of Varone, in the province of Trentino, Trentino-Alto Adige. It has a surface of 4,65 hectares corresponding to facilities and adjacent green areas.

The production plant occupies an area where paper production activity was carried out since the 19th century. After the construction of the Fedrigoni S.p.A. plant, the town of Varone, in its urban expansion, has completely incorporated the industrial site of the paper mill.

The production of the Varone plant of Fedrigoni S.p.A. includes special natural printing papers, colored and white, for publishing and fine paper converting, with about 1,500 different items for series, type, color and finish.

VARONE

Figure 9. Verona manufacturing site

The Verona manufacturing plant is located in the urban area of the city of Verona, Veneto. It has a surface of 5,84 hectares corresponding to facilities and adjacent green areas. The western and southern sides of the plant are adjacent to residential houses and a major traffic road into the city. Beyond this road, there is a large area occupied by the Verona railway yard.

The Verona plant mainly produces high-quality writing and printing paper, watermarked, laid, embossed, high gloss, pearlescent coated papers, and label papers. The main specialisation of the plant is on white papers, which account for the most significant quantity, though coloured papers are also produced.

PROTECTED AREAS AND OTHER EFFECTIVE AREA-BASED CONSERVATION MEASURE (OECM)

Italy currently designates nearly 4.000 Protected Areas (PA) and Other Effective Area-based Conservation Measure (OECM) areas as defined by the International Union for Conservation of Nature (IUCN) and the Convention on Biological Diversity (CBD). The CBD defines OECM in the Aichi Biodiversity Targets as:

"A geographically defined area other than a Protected Area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the in-situ conservation of biodiversity, with associated ecosystem functions and services and, where applicable, cultural, spiritual, socio-economic, and other locally relevant values." (CBD, 2018)

A protected area is, according to the IUCN:

"A protected area is a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values." (Dudley & Stolton, 2008)

PA and OECM locations and dimensions are derived from the World Database on Protected Areas (WDPA), published jointly by the United Nations Environment Program (UNEP) and the IUCN (UNEP-WCMC 2019). The data source is updated monthly and provides key information about areas significant for biodiversity, including size, year of establishment, management authority, and protected designation. Each area is also classified according to directive or regulation of the designation, e.g., Habitats Directive, Birds Directive, Ramsar sites, World Heritage Sites, etc., designation type, IUCN category (Ia. Strict Nature Reserve, Ib. Wilderness Area, II. National Park, III. Natural Monument IV. Habitat/ Species Management V. Protected Landscape/ Seascape, VI. Managed Resource Protected Area), governance type, among many others. The WDPA is the most comprehensive and up-to-date global database on terrestrial and marine areas significant for biodiversity.

PROXIMITY ANALYSIS

The proximity analysis identifies the nearest biodiversity important area to each site. For this analysis, Fedrigoni sites and the PA and OECM were mapped and their proximity quantified using the nearest neighbour tool in the QGIS software. This tool calculates the closest point to the Fedrigoni sites based on the spatially-explicit nearest neighbour relationship.

Each Fedrigoni manufacturing sites is located within 5 kilometres from an area important for biodiversity. Table 2 summarises the closest protected area or OECM to each manufacturing site, the designation of the area, the type, and the distance in meters. More detailed information for each site can be found in Annex A.

Name	Closest protected area or OECM	Designation	Designation type	Distance in m
Arco	Biotopo Monte Brione	Other Protected Natural Regional Areas	National	30,5
Cordenons	Risorgive del Vinchiaruzzo	Special Areas of Conservation (Habitats Directive)	Regional	152,3
Fabriano	Faggeto di San Silvestro	Special Areas of Conservation (Habitats Directive)	Regional	75,1
Pioraco	Valle Scurosa, Piano di Montelago e Gola di Pioraco	Special Protection Area (Birds Directive)	Regional	0,0
Scurelle	Val Campelle	Special Areas of Conservation (Habitats Directive)	Regional	362,2
Varone	Crinale Pichea - Rocchetta	Special Protection Area (Birds Directive)	Regional	290,0
Verona	Fiume Adige tra Verona Est e Badia Polesine	Special Areas of Conservation (Habitats Directive)	Regional	205,1

Table 2. Summary of the closest protected area or OECM to each manufacturing site with its designation, designation type, IUCN category and distance in meters

OVERLAP ANALYSIS

In order to understand how the number and extent of protected or OECM areas that may be affected by Fedrigoni operations, 20km-radius buffer was applied following the most conservative estimates on the proximate impacts infrastructure may exert on biodiversity (Benítez-López et al., 2010; Torres et al., 2016a, See Figure 1). The overlay analysis was conducted using QGIS software to spatially analyse the distribution of the important biodiversity areas and the Fedrigoni manufacturing sites. An example of how the overlap analysis was developed can be observed in figure 10. The specific results for each manufacturing site can be found in annexes A and B.

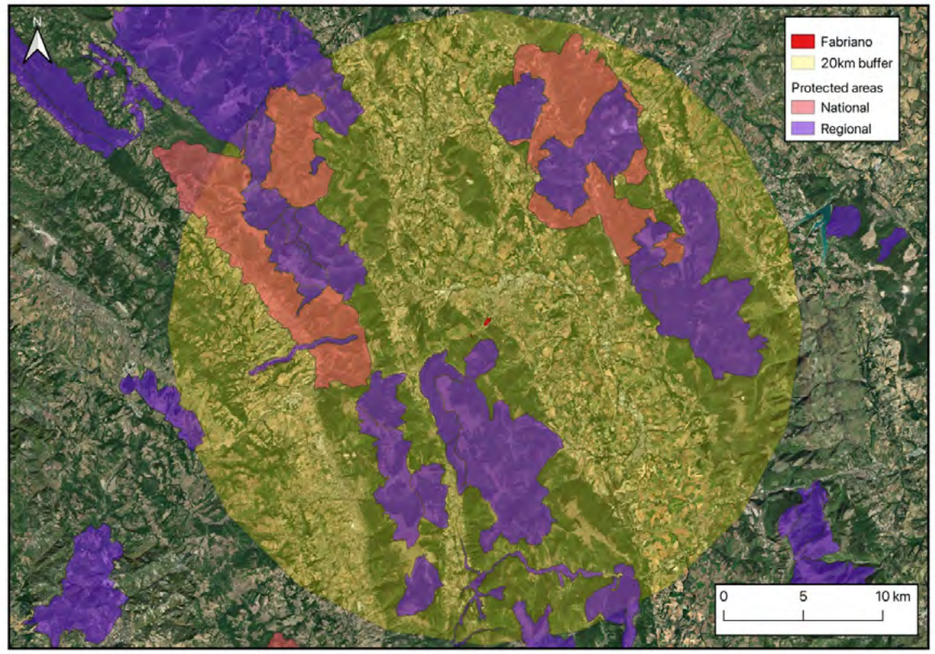


Figure 10. Overlap analysis performed for Fabriano manufacturing site.

ARCO

According to the overlap analysis results, important biodiversity areas intersecting with Arco's manufacturing plant are 55 areas within a 20 km radius (refer to figure 1 Annex A and B). In conformity with the analysis, two of the protected areas overlapping are under IUCN category *Ia. Strict Natural protected areas. Fifteen are under IV. Habitat or Species Management* and thirty-eight are under any reported IUCN category. Forty-two out of 55 of these areas are 100% in the 20km buffer of the manufacturing site.

CORDENONS

According to the overlap analysis results, important biodiversity areas intersecting with the manufacturing plant Cordenons are 12 areas within a 20 km radius (refer to figure 2 Annex A and B). From the analysis, none of the areas are under an IUCN category. However, 8 out of 12 areas are designated under the Habitats Directive and the remaining four under the Birds Directive. All the areas are regional designated areas. Six out of 12 of these areas are 100% in the 20km buffer of the manufacturing site.

FABRIANO

According to the overlap analysis results, important biodiversity areas intersecting with the manufacturing plant Fabriano are 33 areas within a 20 km radius (refer to figure 3 Annex A and B). From the analysis, two of the protected areas overlapping are under the IUCN category, one of them, one under the *IV. Habitat/ Species Management* and the other under *V. Protected Landscape/Seascape*. The remaining ones are not reported under any IUCN category. Two areas are designated on a national scale and 31 on a regional scale. Twenty-five out of 33 of these areas are 100% in the 20km buffer of the manufacturing site.

PIORACO

According to the overlap analysis results, important biodiversity areas intersecting with the manufacturing plant Pioraco are 31 areas within a 20 km radius (refer to figure 4 Annex A and B). From the analysis, 20 areas are designated under the Habitats Directive, seven under the Birds Directive, two under Regional or Provincial Nature Parks, one under Ramsar Site, Wetland of International Importance and one under National Park. The two Regional or Provincial Parks are under the IUCN category *IV. Habitat/ Species Management* and the National Park under *II. National Park* category. Eighteen out of 31 of these areas are 100% in the 20km buffer of the manufacturing site.

SCURELLE

According to the overlap analysis results, important biodiversity areas intersecting with the manufacturing plant Scurelle are 47 areas within a 20 km radius (refer to figure 5 Annex A and B). From the analysis, 33 areas are designated under Special Areas of Conservation of the Habitats Directive, eight under Other Protected Natural Regional Areas, and 6 under Special Protection Area of the Birds Directive. From the total of areas, 8 of them are under the IUCN category: *IV. Habitat/ Species Management* and belong to National scale designation. Thirty-five out of 47 of these areas are 100% in the 20km buffer of the manufacturing site.

VARONE

According to the overlap analysis results, important biodiversity areas intersecting with the manufacturing plant Varone are 59 areas within a 20 km radius (refer to figure 6 Annex A and B). From the analysis, 34 regions are under Special Areas of Conservation of the Habitats Directive, 12 are Other Protected Natural Regional Areas, 8 are Special Protection Areas of the Birds Directive), 4 are Regional/ Provincial Nature Reserves and 1 Regional/ Provincial Nature Park. Regarding IUCN categories, fifteen of them are classified as *IV. Habitat/ Species Management* and two as *Ia. Strict Nature Reserve*. Thirty-eight out of 59 of these areas are 100% in the 20km buffer of the manufacturing site.

VERONA

According to the overlap analysis results, important biodiversity areas intersecting with Verona's manufacturing plant are 13 areas within a 20 km radius (refer to figure 7 Annex A and B). From the analysis, nine areas are categorised as Special Areas of Conservation of the Habitats Directive, and the other 4 are Special Protection Areas of the Birds Directive. None of the areas is reported under an IUCN category. Seven out of these areas are 100% in the 20km buffer of the manufacturing site.

SUMMARY

All the production sites are located within 20 km to areas important for biodiversity. Arco and Varone are the manufacturing sites with the highest number of areas in the 20km established buffer. However, the area overlapping these protected areas is rather small in comparison with other manufacturing sites like Scurelle or Fabriano, which overlap with a lower number of protected areas but with a higher surface area. The site with the least concern in terms of overlapping is Verona, mainly due to its location within an urban matrix. See Annex B for a detailed description of the overlap analysis for each Fedrigoni site. These results allow prioritising the areas with a higher impact over regions with high biodiversity value.

Site	Number of areas overlapping	Area overlapping with PA and OECM (in ha)
Arco	55	30.829
Cordenons	12	14.580
Fabriano	33	54.061
Pioraco	31	40.343
Scurelle	47	69.996
Varone	59	39.702
Verona	13	4.453

Table 3. Summary table of the overlap analysis for each site

HABITAT QUALITY INDEX

Habitat quality plays an essential role in the abundance and distribution of species, dispersal mechanisms, resource allocation, and population dynamics. (Ah-King, 2019; Mortelliti et al., 2010). In this report, habitat quality indices are derived using Habitat Quality models within the inVEST software. InVEST (Integrated Valuation of Ecosystem Services and Trade-offs), published by the Natural Capital Project, is a suite of free and open-source software comprised of models compiled by experts from multiple disciplines to map the value, quantity, and flow of ecosystem services and compare the effects of multiple land management scenarios. The Habitat Quality model uses relative habitat quality as a proxy for biodiversity by illustrating the extent and degradation of multiple habitat types in a landscape. Habitat is defined by the model as "the resources and conditions present in an area that produce occupancy – including survival and reproduction – by a given organism" (Hall et al., 1997). Habitat quality indicates the capacity of an ecosystem to provide the necessary conditions to support a given population.

The model included in this analysis runs on several inputs:

CURRENT LAND COVER

Raster dataset of current land-use and land cover (LULC). Land-use and Land-cover (LULC) values were derived from Sentinel-2 satellite imagery cleaned and corrected by Malinowski et al 2020 at 10 m2 resolution. (Malinowski et al., 2020)

THREATS TABLE

This includes the type of threat, the maximum distance to which they affect biodiversity, and how these effects decay over distance from the threat (linear or exponential). Included LULC threats were infrastructure, roads, and agriculture. Threat magnitude, maximum distance, and distance-decay functions were defined following reference studies suggesting the sensitivity of biodiversity to certain types of land use and land cover (Benítez-López et al., 2010; Forman & Alexander, 1998; Francisco Sanchez-Bayo, 2011; Freemark & Boutin, 1995; Torres et al., 2016a).

SENSITIVITY TABLE

The relative sensitivity of each habitat type to identified threats, ranging from 0 (not sensitive) to 1 (highly sensitive).

The inVEST model normalizes habitat quality in an index with values bounded between 0 and 1, where low values indicate highly disturbed and poorly functioning ecosystems and high values refer to relatively intact ecosystems with structures, processes, and functions within a range of historic variability. A detailed description of the inVEST Habitat Quality model can be found at https://naturalcapitalproject.stanford.edu/software/invest-models/habitat-quality.

Figures 11 – 14 illustrate LULC and Habitat Quality Index (HQI) scores for Scurelle and Cordenons, respectively. HQI values of 0 indicate areas not suitable for habitat and were filtered from the analysis. High-resolution LULC maps for each manufacturing site can be found in Annex C and HQI maps for all sites can be found in Annex D of this report.

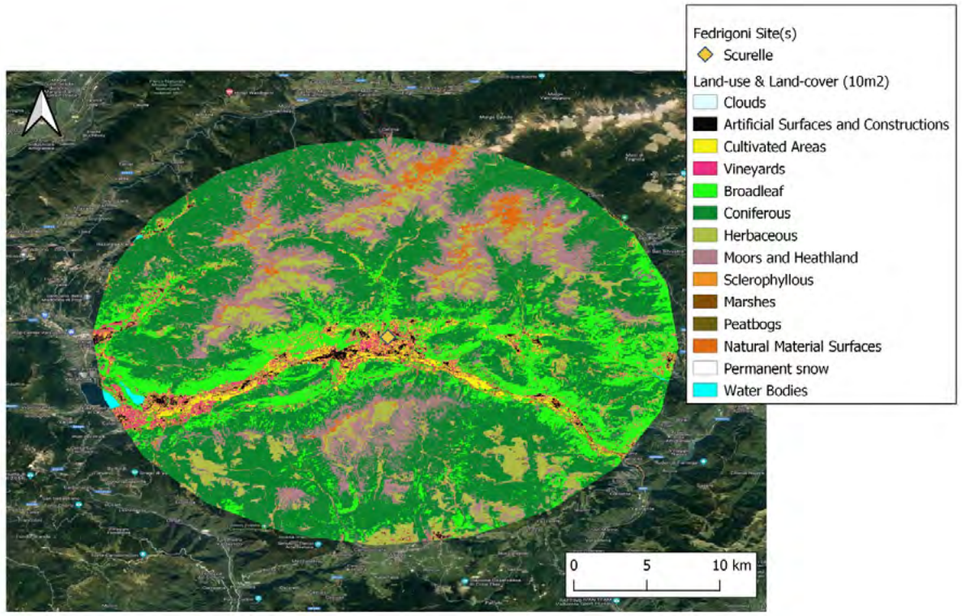


Figure 11. Scurelle site LULC

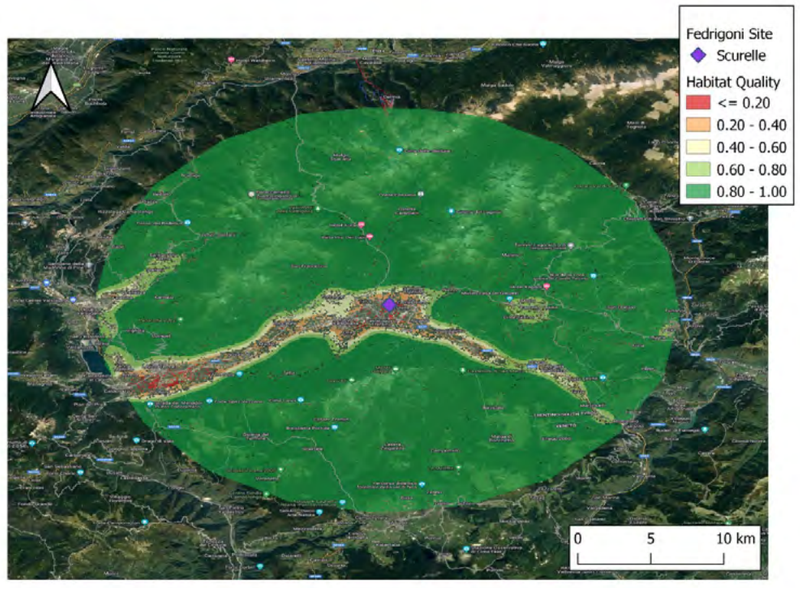


Figure 12. Scurelle area Habitat Quality Index

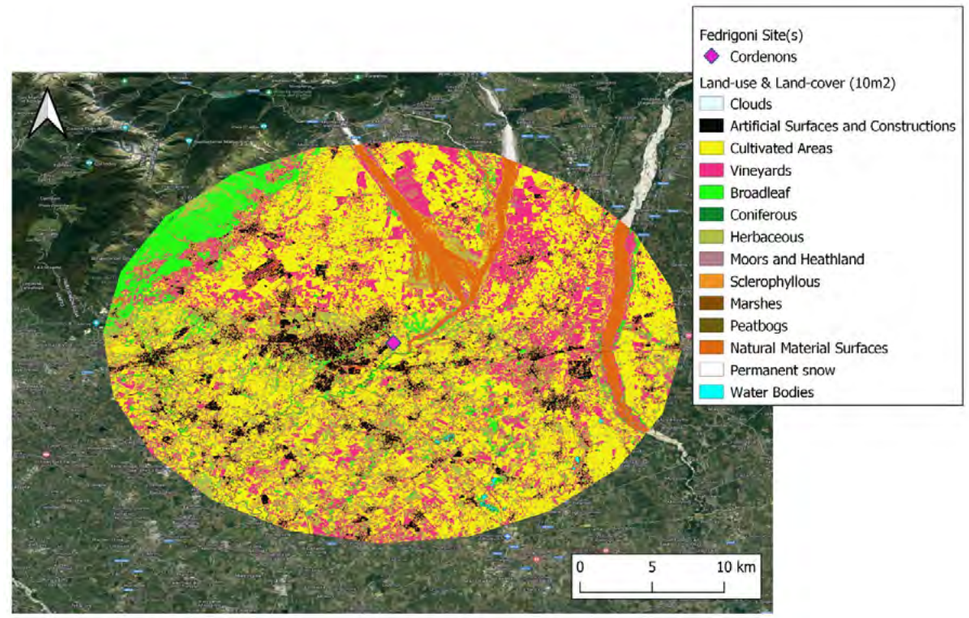


Figure 13. Cordenons area LULC

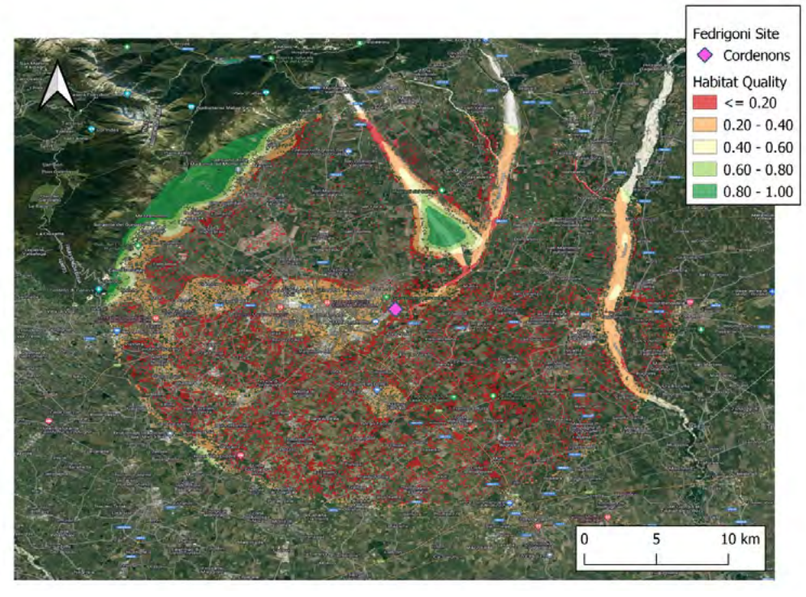
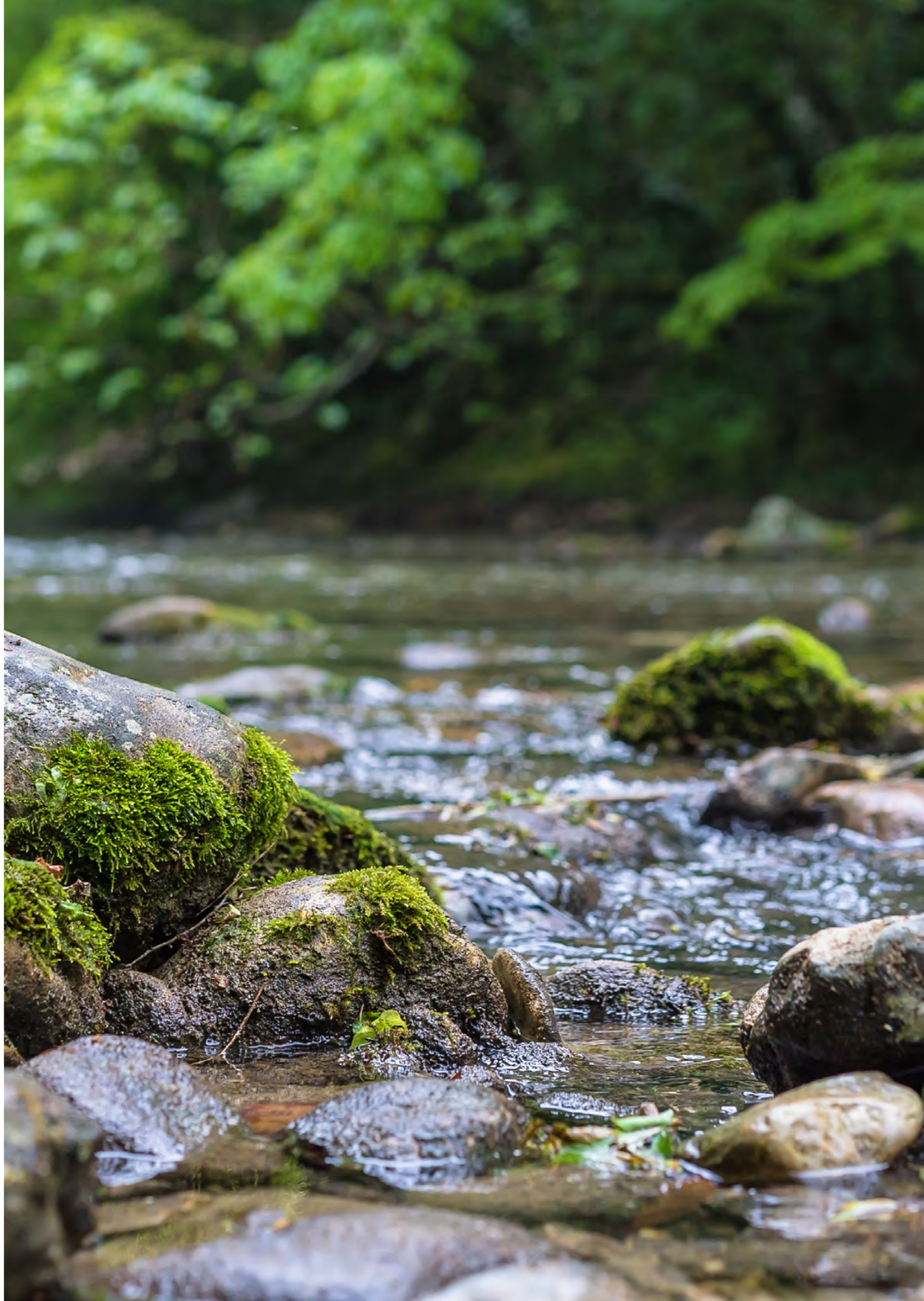


Figure 14. Cordenons area Habitat Quality Index

The values are presented in a discrete scale where, 1 indicates high habitat suitability and 0 non-suitable habitat. The transparent areas mean there is no habitat due to urbanization, roads, or agriculture.

Site	Mean Habitat Quality Index (HQI)	StdDev	Min HQI	Max HQI
Arco	0,85	0,19	0,12	1
Cordenons	0,29	0,26	0,05	0,99
Fabriano	0,86	0,21	0,11	1
Pioraco	0,88	0,21	0,11	1
Scurelle	0,95	0,12	0,11	1
Varone	0,85	0,19	0,12	1
Verona	0,33	0,27	0,05	0,96

Table 4. Summary table of the Habitat Quality Index (HQI), containing the mean, standard deviation, minimum and maximum value



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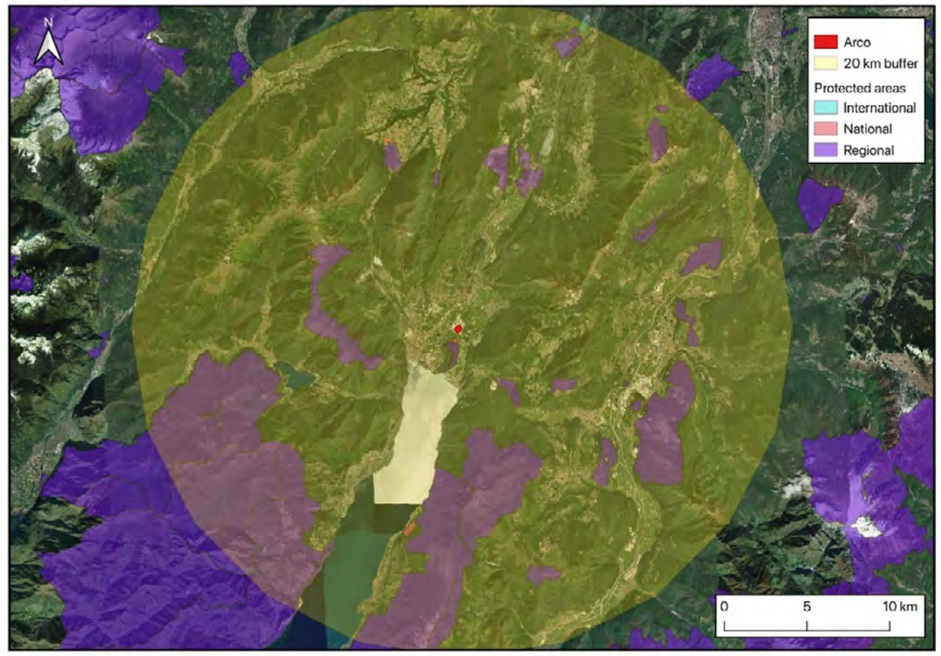
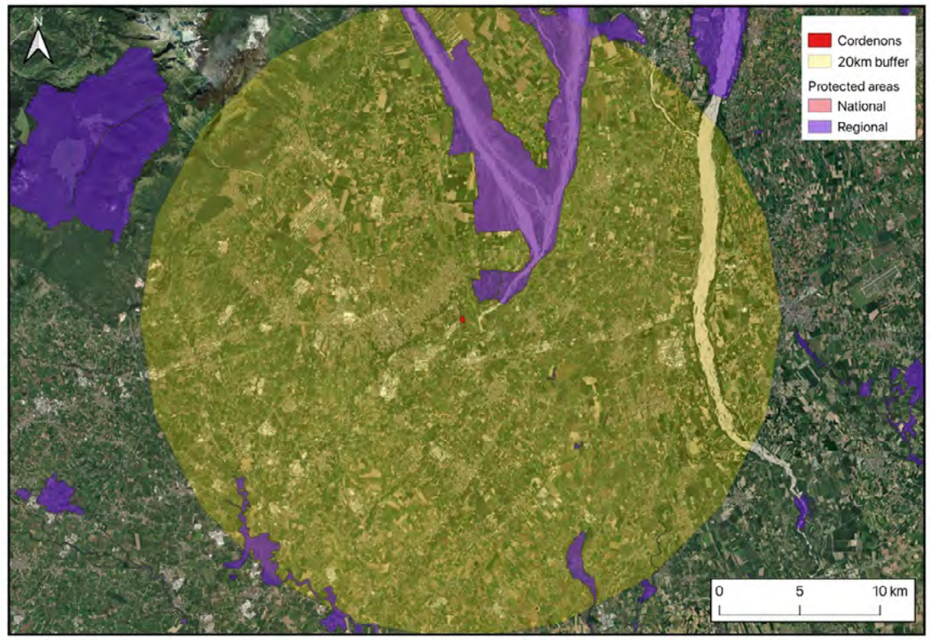
ANNEX A: PROTECTED AREAS AND OECM

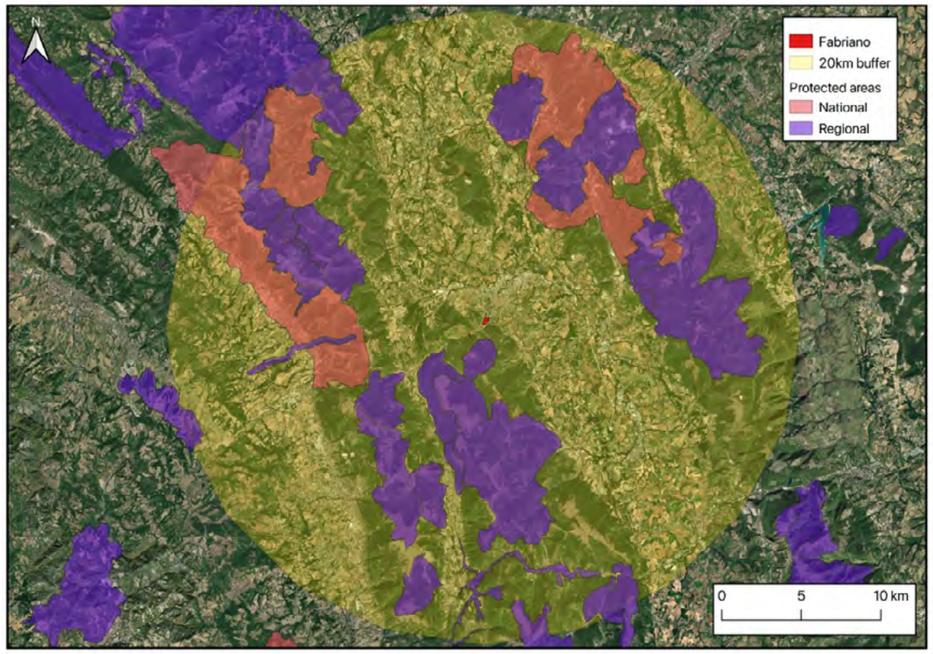
Protected areas overlapping Arco site within a 20km buffer.



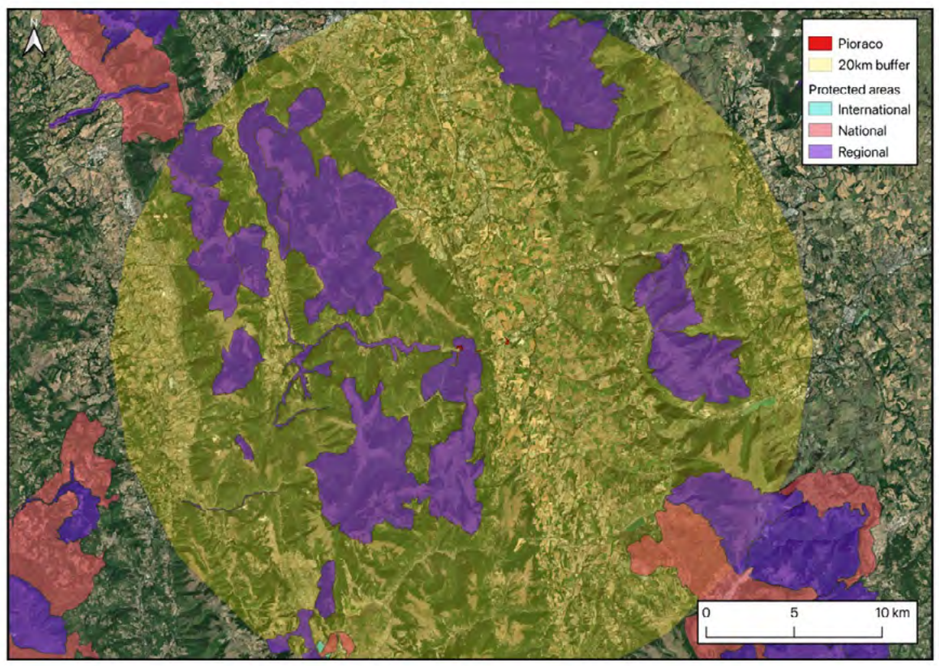
Protected areas overlapping Cordenons site within a 20km buffer.



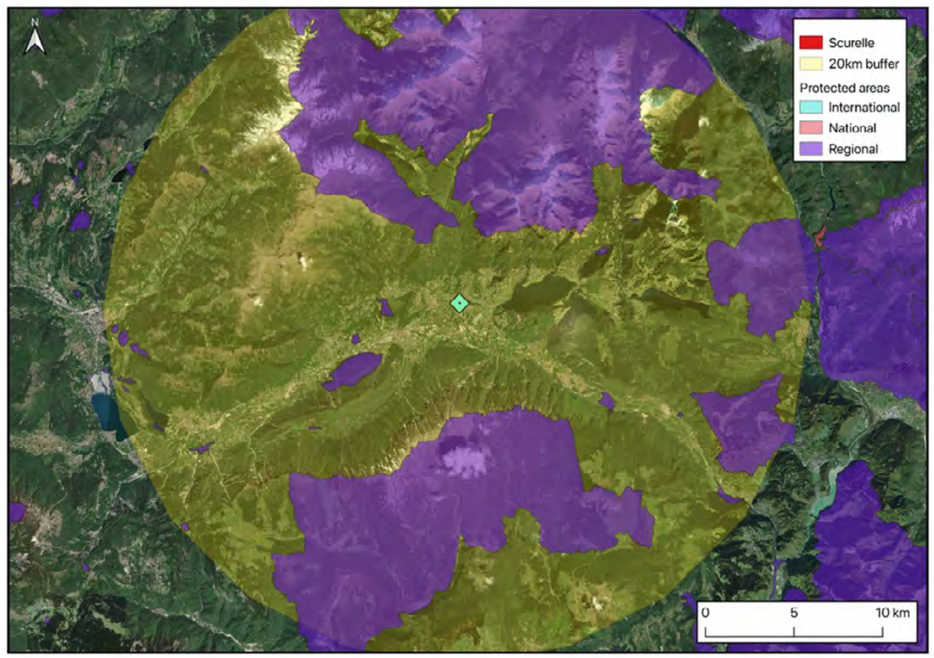
Protected areas overlapping Fabriano site within a 20km buffer.



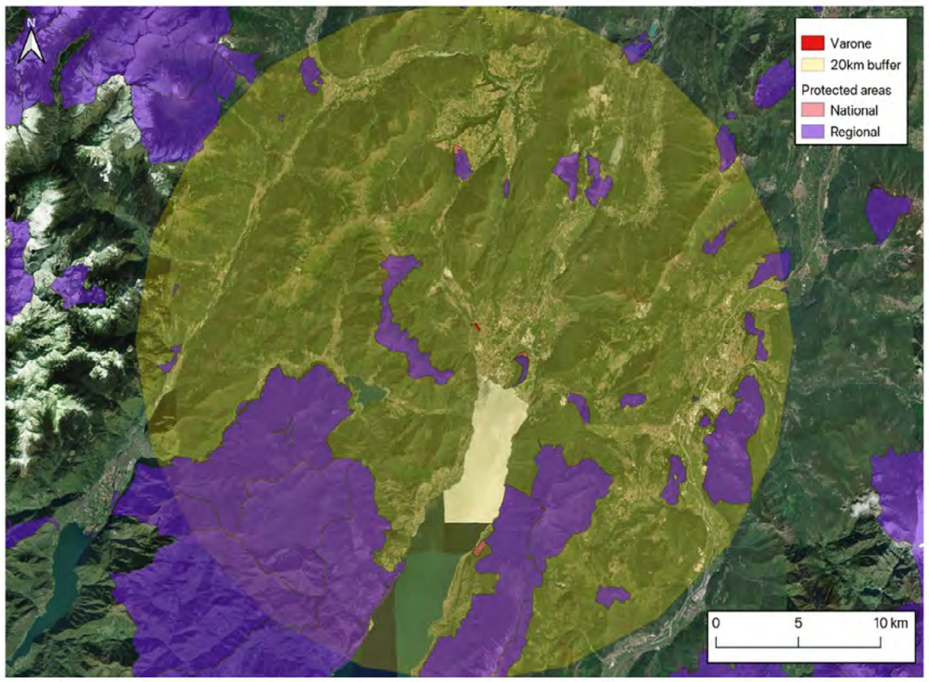
Protected areas overlapping Pioraco site within a 20km buffer.



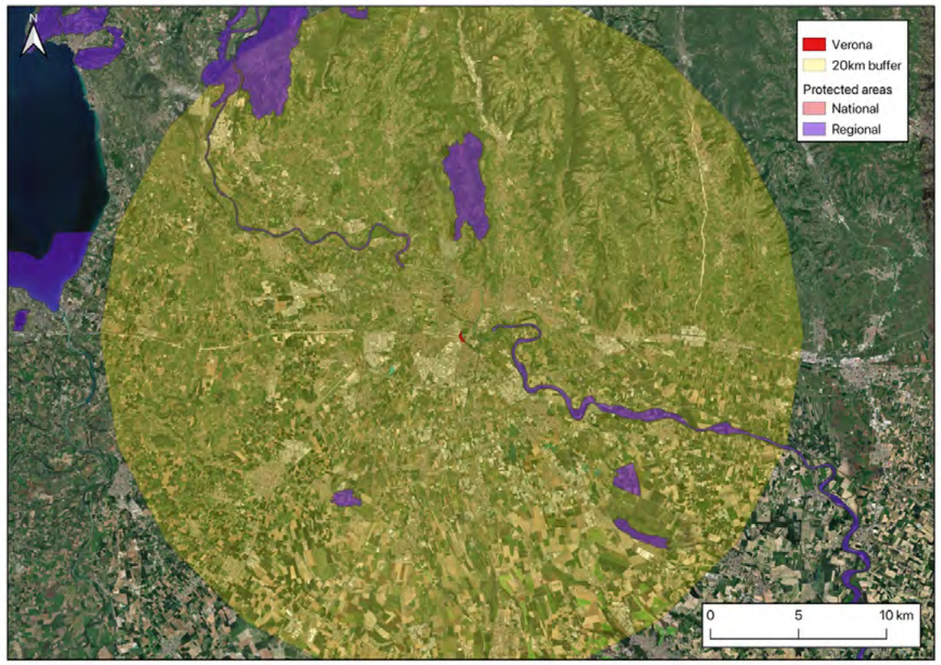
Protected areas overlapping Scurelle site within a 20km buffer.



Protected areas overlapping Varone site within a 20km buffer.



Protected areas overlapping Verona site within a 20km buffer.



ANNEX B: OVERLAP ANALYSIS

Protected areas overlapping the Arco manufacturing site within a 20km radius.

The table includes information about the name of the protected area, the designation, designation type, IUCN category (if reported), the year of establishment of the protected area and the percentage overlapping within the 20km radius.

Name of the protected area	Designation	Designation type	IUCN category	Year established	% overlap
Bus del Diaol	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Biotopo Taio	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1989	100%
Taio di Nomi	Special Protection Area (Birds Directive)	Regional	Not Reported	2000	100%
Taio di Nomi	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Biotopo Di Interesse Provinciale Adige	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	2003	100%
Biotopo Lago D'Ampola	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1990	100%
Biotopo Di Interesse Provinciale Torbiera Delle Viote	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	2003	100%
Lago d'Ampola	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Torbiera delle Viote	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Biotopo Lomasona	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1987	100%
Torbiera Lomasona	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%

Name of the protected area	Designation	Designation type	IUCN category	Year established	% overlap
Biotopo Lavini Di Marco	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1992	100%
Laghetti di Marco	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Bocca di Caset	Special Protection Area (Birds Directive)	Regional	Not Reported	1998	100%
Bocca di Caset	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Monte Brione	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Riserva Naturale Valle Di Bondo	Regional/Provincial Nature Reserve	National	IV. Habitat/ Species Management	1985	100%
Biotopo Monte Brione	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1992	100%
Biotopo Prà Dell' Albi - Cei	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1992	100%
Manzano	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Biotopo Lago Di Loppio	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1987	100%
Lago di Loppio	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Pra dall'Albi - Cei	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Biotopo Lago Di Toblino	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1992	100%
Fiave'	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Monte Ghello	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Biotopo Fiavè	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1988	100%
Lago di Toblino	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%

Name of the protected area	Designation	Designation type	IUCN category	Year established	% overlap
Bocca D'ardole - Corno della Paura	Special Protection Area (Birds Directive)	Regional	Not Reported	1998	100%
Bocca D'ardole - Corno della Paura	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Riserva Naturale Integrale Delle Tre Cime Di Monte Bondone	Regional/Provincial Nature Reserve	National	IV. Habitat/ Species Management	1968	100%
Tre Cime Monte Bondone	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Riserva Naturale Integrale Gardesana Orientale	Regional/Provincial Nature Reserve	National	Ia. Strict Nature Reserve	1971	100%
Talpina - Brentonico	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Marocche di Dro	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Monte Brento	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Biotopo Marocche Di Dro	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1989	100%
Servis	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Crinale Pichea - Rocchetta	Special Protection Area (Birds Directive)	Regional	Not Reported	1998	100%
Crinale Pichea - Rocchetta	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Monte Zugna	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Monte Baldo di Brentonico	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Monte Baldo - Cima Valdritta	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	85,2%

Name of the protected area	Designation	Designation type	IUCN category	Year established	% overlap
Corno della Marogna	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	81,0%
Adige	Special Protection Area (Birds Directive)	Regional	Not Reported	2006	70,7%
Adige	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	70,7%
Riserva Naturale Integrale Lastoni Selva Pezzi	Regional/Provincial Nature Reserve	National	Ia. Strict Nature Reserve	1971	69,7%
Monti Tremalzo e Tombea	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	64,5%
Monte Baldo Ovest	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	50,6%
Monte Baldo Ovest	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2018	50,6%
Monte Cas - Cima di Corlor	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	45,2%
Alto Garda Bresciano	Special Protection Area (Birds Directive)	Regional	Not Reported	2004	26,2%
Parco Naturale Dell'Alto Garda Bresciano	Regional/Provincial Nature Park	National	IV. Habitat/ Species Management	2003	25,4%
Tione - Villa Rendena	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	6,7%
Burrone di Ravina	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	4,6%

Protected areas overlapping the Cordenons manufacturing site within a 20km radius.

The table includes information about the name of the protected area, the designation, designation type, IUCN category (if reported), the year of establishment of the protected area and the percentage overlapping within the 20km radius.

Name of the protected area	Designation	Designation type	IUCN category	Year established	% overlap
Magredi del Cellina	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2013	100%
Bosco Zacchi	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	100%
Risorgive del Vinchiaruzzo	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2013	100%
Bosco Marzinis	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2013	100%
Bosco Torrate	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2013	100%
Bosco Zacchi	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2018	100%
Magredi di Pordenone	Special Protection Area (Birds Directive)	Regional	Not Reported	2007	79%
Ambiti Fluviali del Reghena e del Lemene - Cave di Cinto Caomaggiore	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	67%
Ambito Fluviale del Livenza	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	59%
Fiumi Reghena e Lemene - Canale Taglio e rogge limitrofe - Cave di Cinto Caomaggiore	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2018	50%
Ambito fluviale del Livenza e corso inferiore del Monticano	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2018	32%
Magredi di Tauriano	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2013	7%

Protected areas overlapping the Fabriano manufacturing site within a 20km radius.

The table includes information about the name of the protected area, the designation, designation type, IUCN category (if reported), the year of establishment of the protected area and the percentage overlapping within the 20km radius

Name of the protected area	Designation	Designation type	IUCN category	Year established	% overlap
Parco Naturale Regionale Della Gola Della Rossa E Di Frasassi	Regional/Provincial Nature Park	National	IV. Habitat/ Species Management	1997	100%
Monte lo Spicchio - Monte Columeo - Valle di S, Pietro	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Gola di Frasassi	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Gola della Rossa	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Monte Nero e Serra Santa	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Fosso della Vallaccia - Monte Pormaiore	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Le Gorghe	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Torrente Vetorno	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Monte Cucco (sommità)	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Valle delle Prigioni (Monte Cucco)	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Valle del Rio Freddo (Monte Cucco)	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Monti Maggio - Nero (sommità)	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Monte Puro - Rogedano - Valleremita	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Monte Maggio - Valle dell'Abbadia	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Monte Giuoco del Pallone - Monte Cafaggio	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Monte S, Vicino	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Poggio Pantano (Scheggia)	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Valle Scappuccia	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Faggeto di San Silvestro	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Valle Vite - Valle dell'Acquarella	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Monte Giuoco del Pallone	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	100%
Monte San Vicino e Monte Canfaito	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	100%
Gola della Rossa e di Frasassi	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	100%
Monte Cucco e Monte Columeo	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	100%
Valle Scappuccia	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	100%
Gola del Corno di Catria	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	98%
Piana di Pioraco	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	98%
Parco Del Monte Cucco	Regional/Provincial Nature Park	National	V. Protected Landscape/ Seascape	1995	90%
Gola di Pioraco	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	86%
Boschi del Bacino di Gubbio	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	25%
Valle Scurosa, Piano di Montelago e Gola di Pioraco	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	18%
Monte Catria, Monte Acuto e Monte della Strega	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	14%
Monte Catria, Monte Acuto	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	7%

Protected areas overlapping the Pioraco manufacturing site within a 20km radius.

The table includes information about the name of the protected area, the designation, designation type, IUCN category (if reported), the year of establishment of the protected area and the percentage overlapping within the 20km radius

Name of the protected area	Designation	Designation type	IUCN category	Year established	% overlap
Fiume Topino (Bagnara - Nocera Umbra)	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Monte Nero e Serra Santa	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Fosso della Vallaccia - Monte Pormaiore	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Monti Maggio - Nero (sommità)	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Col Falcone (Colfiorito)	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Monte Puro - Rogedano - Valleremita	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Monte Giuoco del Pallone - Monte Cafaggio	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Monte Alago (Nocera Umbra)	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Piani di Montelago	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Faggeto di San Silvestro	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Gola di Sant'Eustachio, Monte d'Aria e Monte Letegge	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	100%
Monte Giuoco del Pallone	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	100%
Monte Pennino - Scurosa	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Valle Scurosa, Piano di Montelago e Gola di Pioraco	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	100%
Monte Letegge - Monte d'Aria	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Piana di Pioraco	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Gola di S, Eustachio	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Gola di Pioraco	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Monte Maggio - Valle dell'Abbadia	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	97%
Monte S, Vicino	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	96%
Piani di Annifo - Arvello	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	82%
Palude di Colfiorito	Ramsar Site, Wetland of International Importance	International	Not Reported	1976	75%
Parco Del Colfiorito	Regional/Provincial Nature Park	National	IV. Habitat/ Species Management	1995	72%
Monte San Vicino e Monte Canfaito	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	72%
Valle Vite - Valle dell'Acquarella	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	59%
Palude di Colfiorito	Special Protection Area (Birds Directive)	Regional	Not Reported	1988	40%
Palude di Colfiorito	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	40%
Dalla Gola del Fiastrone al Monte Vettore	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	6%
Valnerina, Montagna di Torricchio, Monte Fema e Monte Cavallo	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	6%
Parco Nazionale Dei Monti Sibillini	National Park	National	II. National Park	1988	4%
Parco Naturale Regionale Della Gola Della Rossa E Di Frasassi	Regional/Provincial Nature Park	National	IV. Habitat/ Species Management	1997	4%

Protected areas overlapping the Scurelle manufacturing site within a 20km radius.

The table includes information about the name of the protected area, the designation, designation type, IUCN category (if reported), the year of establishment of the protected area and the percentage overlapping within the 20km radius.

Name of the protected area	Designation	Designation type	IUCN category	Year established	% overlap
Biotopo Fontanazzo	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1994	100%
Biotopo Di Interesse Provinciale Pizè	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	2003	100%
Biotopo Inghiaie	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1992	100%
Biotopo Di Interesse Provinciale I Mughi	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	2003	100%
Biotopo Palude Di Roncegno	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1992	100%
Biotopo Masi Carretta	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1989	100%
Biotopo Canneto Di Levico	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1988	100%
Biotopo Sorgente Resenzuola	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1994	100%
Albere' di Tenna	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Palu' di Monte Rovere	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Monte Calvo	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Palude di Roncegno	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Lago delle Buse	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
I Mughi	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Masi Carretta	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Sorgente Resenzuola	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Inghiaie	Special Protection Area (Birds Directive)	Regional	Not Reported	2006	100%
Canneto di Levico	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Fontanazzo	Special Protection Area (Birds Directive)	Regional	Not Reported	2006	100%
Redebus	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Pize'	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Il Laghetto	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Passo del Broccon	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Torcegno	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Grotta del Calgeron	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Il Colo	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Grotta di Ernesto	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Assizzi - Vignola	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Zaccon	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Grotta della Bigonda	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Grotta di Costalta	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Grotta Uvada	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%

Name of the protected area	Designation	Designation type	IUCN category	Year established	% overlap
Val Campelle	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Inghiaie	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Fontanazzo	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Altopiano dei Sette Comuni	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	97%
Altopiano dei Sette Comuni	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2018	97%
Cima Campo - Monte Celado	Special Protection Area (Birds Directive)	Regional	Not Reported	2008	97%
Cima Campo - Monte Celado	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2018	97%
Valli del Cismon - Vanoi: Monte Coppolo	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	91%
Valli del Cismon - Vanoi: Monte Coppolo	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2018	91%
Valle del Vanoi	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	84%
Val Cadino	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	77%
Catena di Lagorai	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	66%
Lagorai	Special Protection Area (Birds Directive)	Regional	Not Reported	2007	52%
Zona Umida Valfloriana	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	34%
Fiume Brenta dal confine trentino a Cismon del Grappa	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2018	3%

SCURELLE

Protected areas overlapping the Varone manufacturing site within a 20km radius.

The table includes information about the name of the protected area, the designation, designation type, IUCN category (if reported), the year of establishment of the protected area and the percentage overlapping within the 20km radius

Name of the protected area	Designation	Designation type	IUCN category	Year established	% overlap
Biotopo Fiavè	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1988	100%
Biotopo Lavini Di Marco	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1992	100%
Riserva Naturale Integrale Gardesana Orientale	Regional/Provincial Nature Reserve	National	Ia. Strict Nature Reserve	1971	100%
Biotopo Monte Brione	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1992	100%
Biotopo Palù Di Boniprati	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1994	100%
Biotopo Lago D'Ampola	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1990	100%
Biotopo Lago Di Loppio	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1987	100%
Biotopo Lomasona	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1987	100%
Riserva Naturale Valle Di Bondo	Regional/Provincial Nature Reserve	National	IV. Habitat/ Species Management	1985	100%
Biotopo Marocche Di Dro	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1989	100%
Biotopo Prà Dell' Albi - Cei	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1992	100%
Biotopo Di Interesse Provinciale Adige	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	2003	100%
Corno della Marogna	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	100%
Palu' di Boniprati	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Torbiera Lomasona	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%

VARONE

Name of the protected area	Designation	Designation type	IUCN category	Year established	% overlap
Marocche di Dro	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Fiave'	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Lago d'Ampola	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Lago di Loppio	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Laghetti di Marco	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Pra dall'Albi - Cei	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Monte Brione	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Bocca D'ardole - Corno della Paura	Special Protection Area (Birds Directive)	Regional	Not Reported	1998	100%
Crinale Pichea - Rocchetta	Special Protection Area (Birds Directive)	Regional	Not Reported	1998	100%
Bocca di Caset	Special Protection Area (Birds Directive)	Regional	Not Reported	1998	100%
Condino	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Monte Brento	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Manzano	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Le Sole	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Bus del Diaol	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Monte Ghello	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Tione - Villa Rendena	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%

Name of the protected area	Designation	Designation type	IUCN category	Year established	% overlap
Talpina - Brentonico	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Monte Baldo di Brentonico	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Bocca D'ardole - Corno della Paura	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Crinale Pichea - Rocchetta	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Bocca di Caset	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Monte Zugna	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	100%
Biotopo Taio	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1989	89%
Monti Tremalzo e Tombea	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	87%
Monte Baldo - Cima Valdritta	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	86%
Monte Cas - Cima di Corlor	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	81%
Riserva Naturale Integrale Delle Tre Cime Di Monte Bondone	Regional/Provincial Nature Reserve	National	IV. Habitat/ Species Management	1968	80%
Riserva Naturale Integrale Lastoni Selva Pezzi	Regional/Provincial Nature Reserve	National	Ia. Strict Nature Reserve	1971	78%
Tre Cime Monte Bondone	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	78%
Servis	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	75%
Taio di Nomi	Special Protection Area (Birds Directive)	Regional	Not Reported	2000	75%
Taio di Nomi	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	75%

Name of the protected area	Designation	Designation type	IUCN category	Year established	% overlap
Adige	Special Protection Area (Birds Directive)	Regional	Not Reported	2006	71%
Adige	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	71%
Monte Baldo Ovest	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	55%
Monte Baldo Ovest	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2018	55%
Parco Naturale Dell'Alto Garda Bresciano	Regional/Provincial Nature Park	National	IV. Habitat/ Species Management	2003	53%
Alpe di Storo e Bondone	Special Protection Area (Birds Directive)	Regional	Not Reported	1998	49%
Alpe di Storo e Bondone	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	49%
Alto Garda Bresciano	Special Protection Area (Birds Directive)	Regional	Not Reported	2004	40%
Biotopo Lago Di Toblino	Other Protected Natural Regional Areas	National	IV. Habitat/ Species Management	1992	36%
Lago di Toblino	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2014	33%
Valvestino	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2016	25%

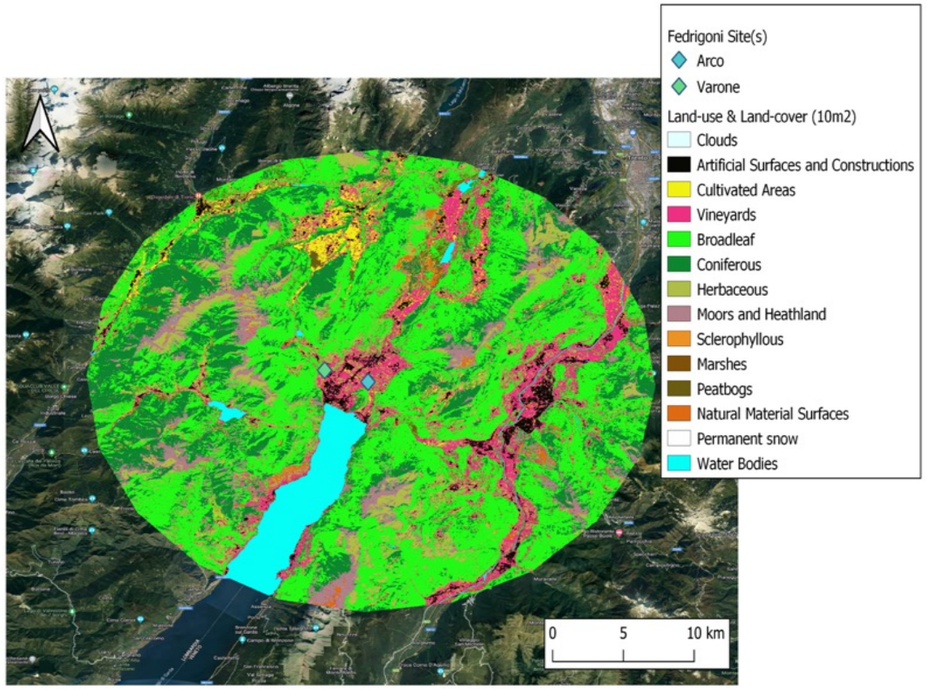
Protected areas overlapping the Verona manufacturing site within a 20km radius.

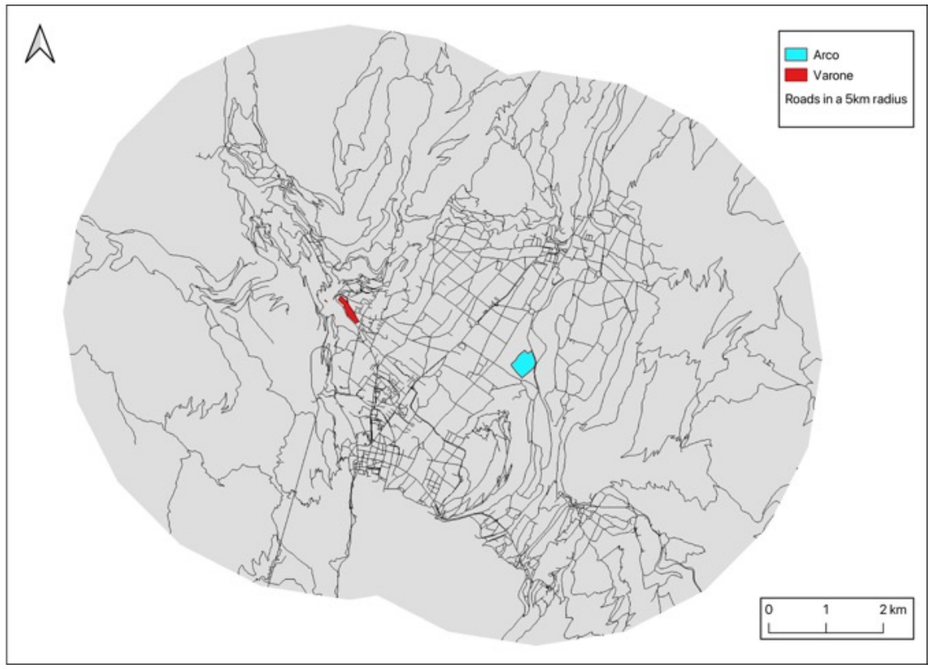
The table includes information about the name of the protected area, the designation, designation type, IUCN category (if reported), the year of establishment of the protected area and the percentage overlapping within the 20km radius

Name of the protected area	Designation	Designation type	IUCN category	Year established	% overlap
Fontanili di Povegliano	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	100%
Palude del Feniletto - Sguazzo del Vallese	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	100%
Val Galina e Progno Borago	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2018	100%
Sguazzo di Rivalunga	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	100%
Fontanili di Povegliano	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2018	100%
Palude del Feniletto - Sguazzo del Vallese	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2018	100%
Sguazzo di Rivalunga	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2018	100%
Monte Pastello	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2018	65%
Fiume Adige tra Belluno Veronese e Verona Ovest	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2018	49%
Monti Lessini: Cascate di Molina	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2018	44%
Fiume Adige tra Verona Est e Badia Polesine	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2018	33%
Monte Baldo Est	Special Protection Area (Birds Directive)	Regional	Not Reported	2003	6%
Monte Baldo Est	Special Areas of Conservation (Habitats Directive)	Regional	Not Reported	2018	6%

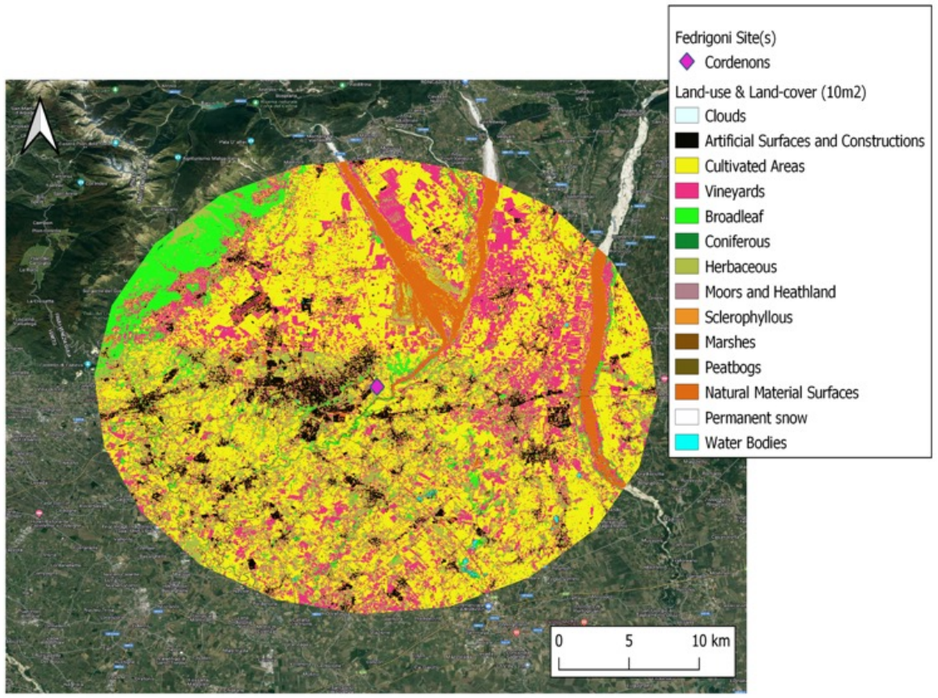
ANNEX C: LAND-USE/LAND-COVER & ROADS

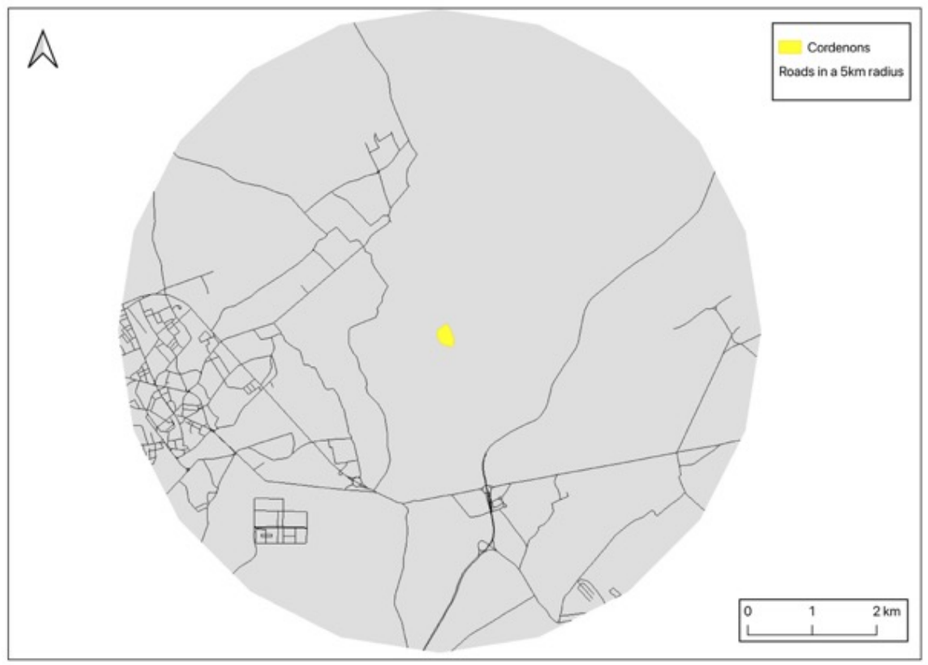
Arco and Varone land use, land cover and roads proximity.



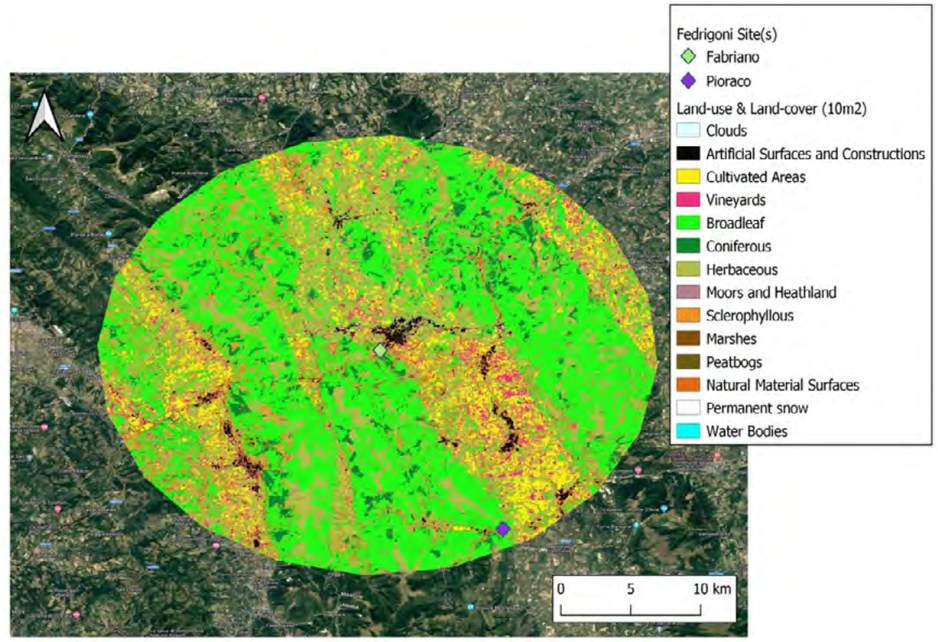


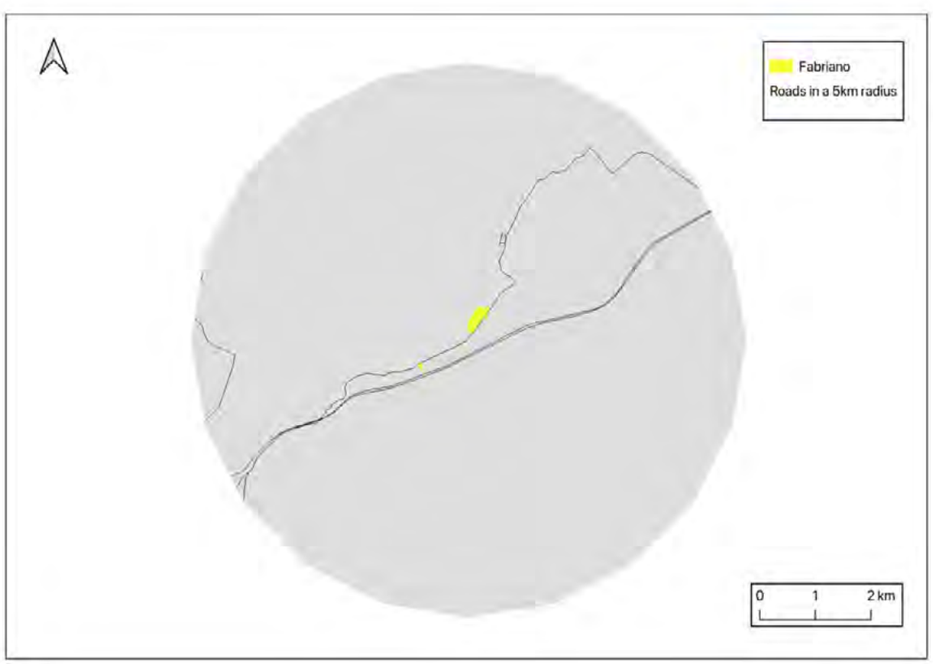
Cordenons land use, land cover and roads proximity.



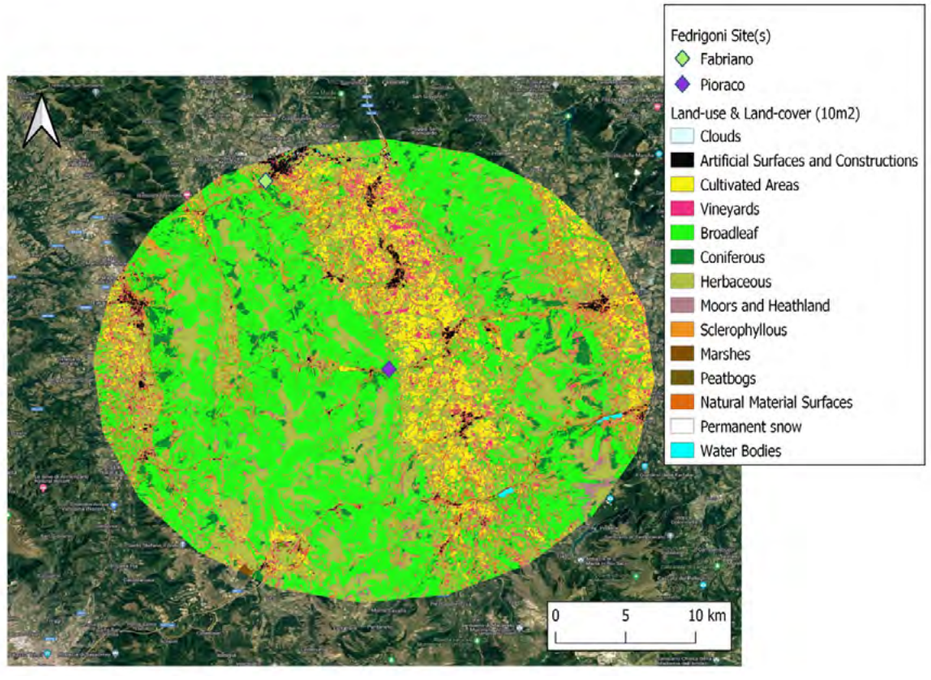


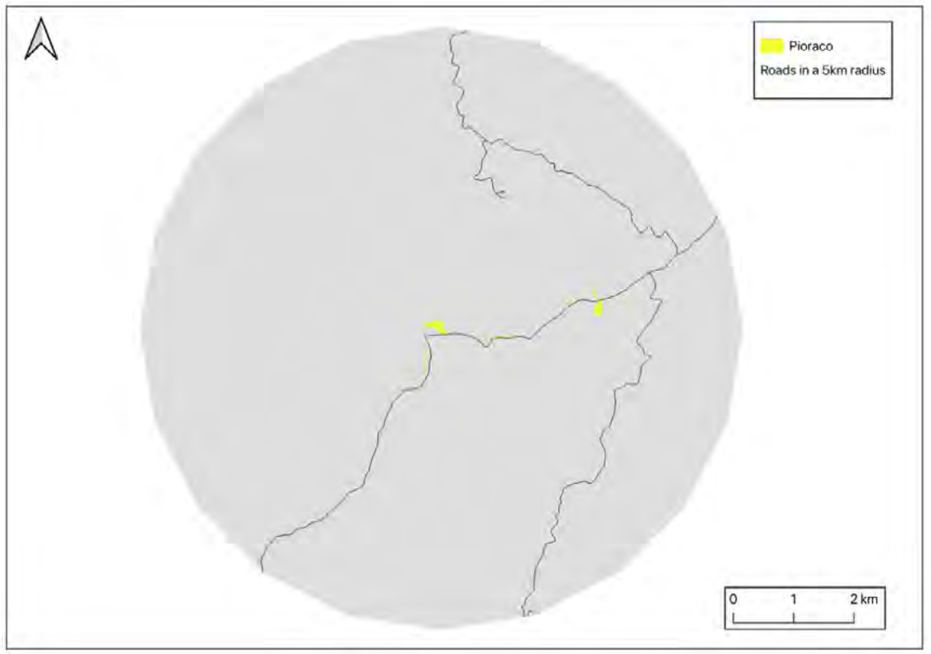
Fabriano land use, land cover and roads proximity.



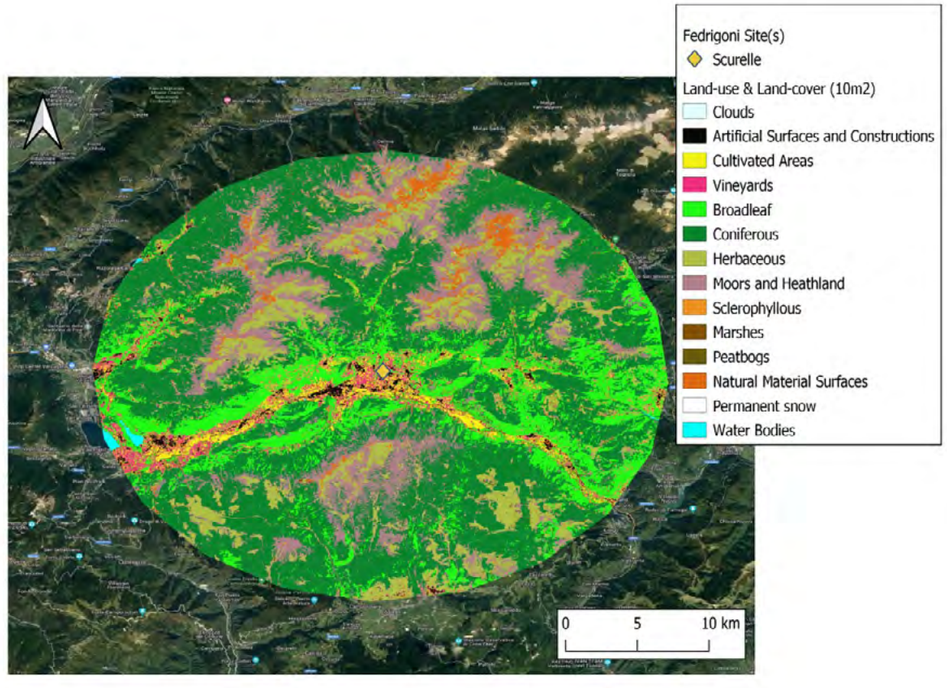


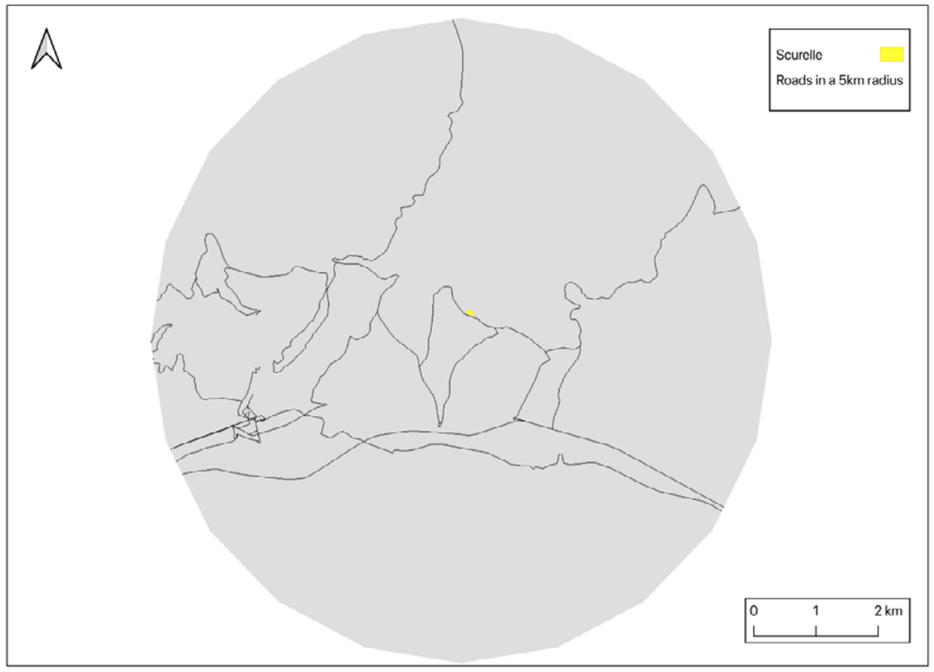
Pioraco land use, land cover and roads proximity.



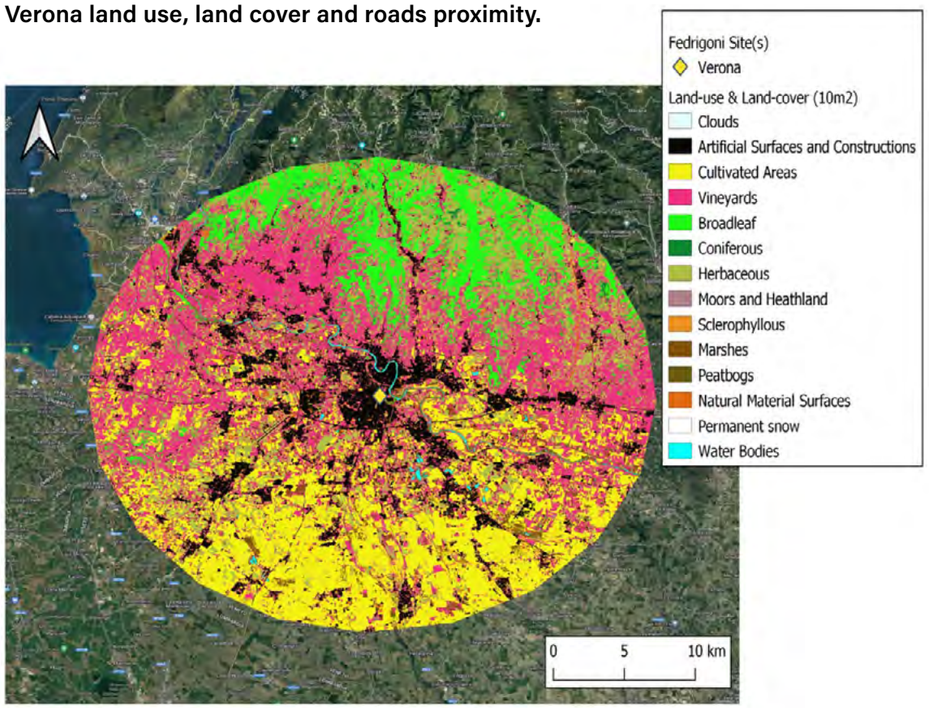


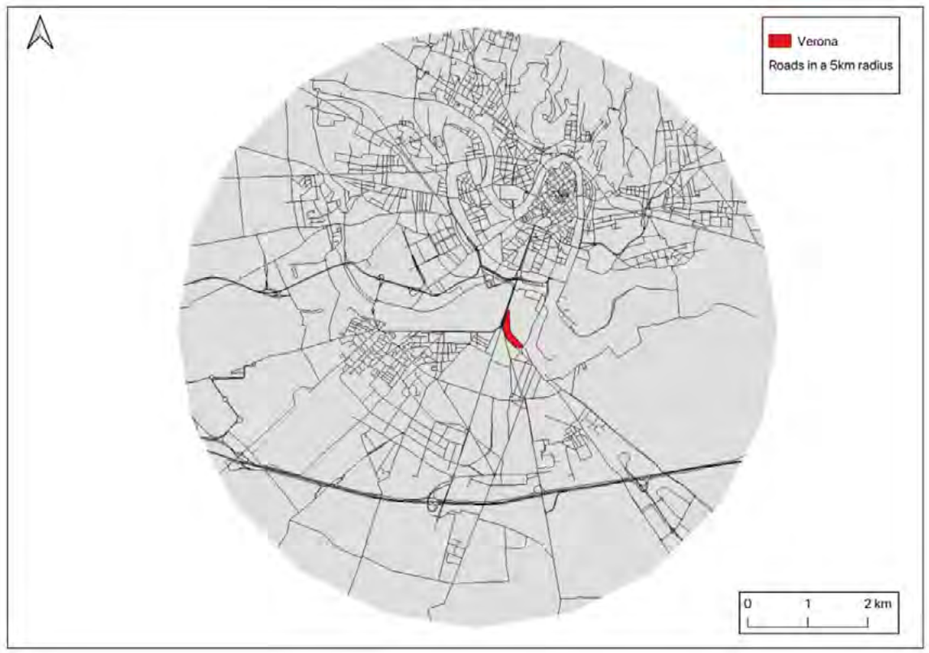
Scurelle land use, land cover and roads proximity.



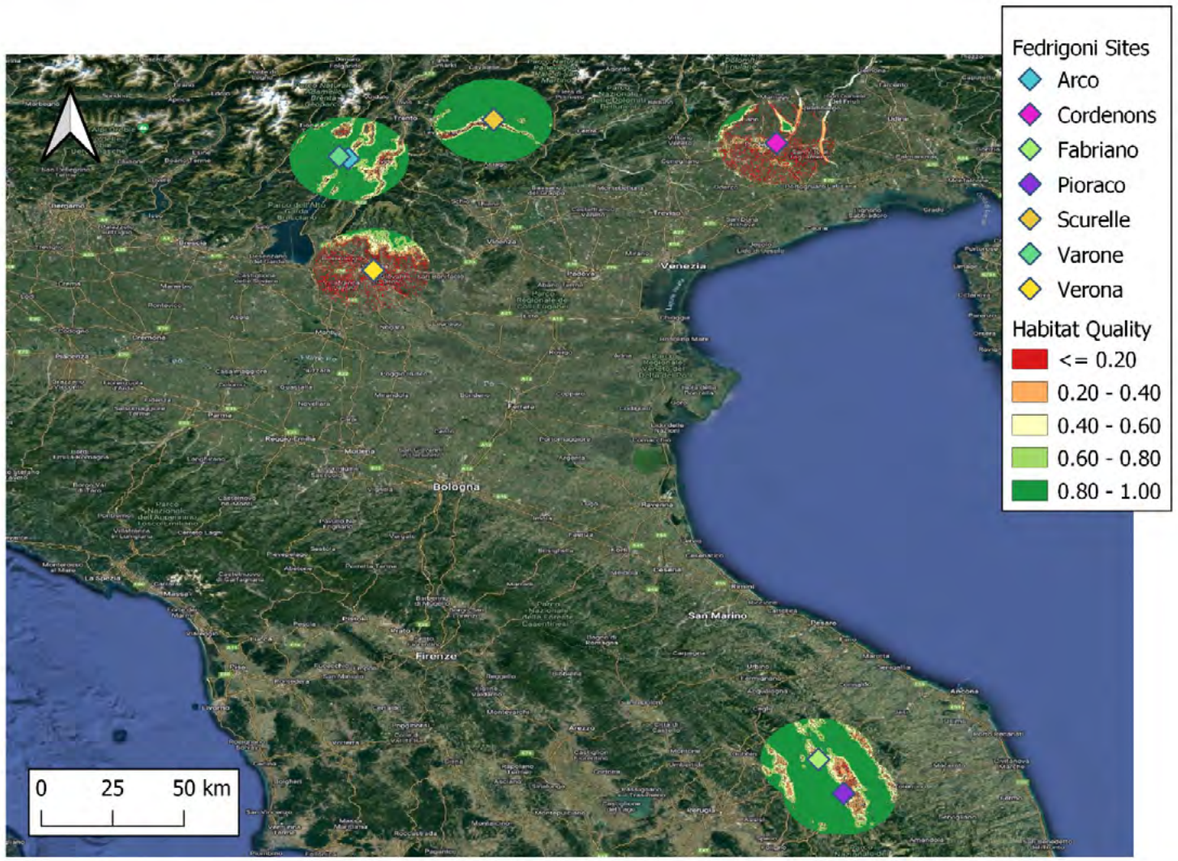


Verona land use, land cover and roads proximity.



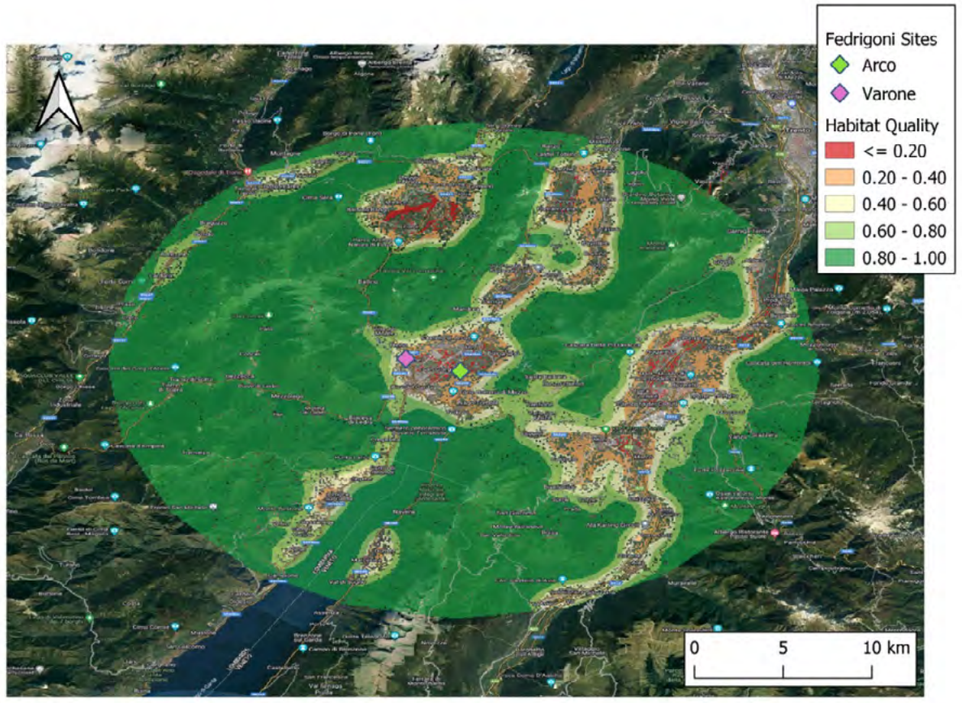


ANNEX D: HABITAT QUALITY

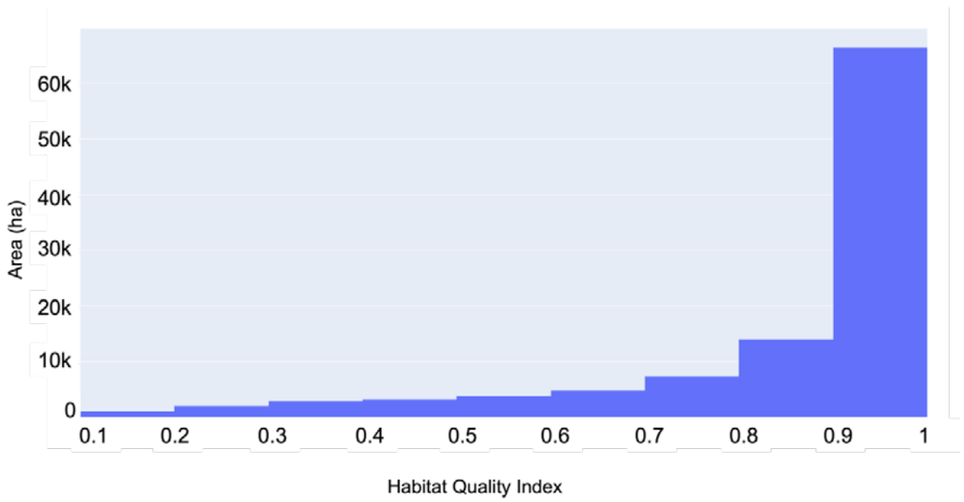


Arco and Varone habitat quality index

The values are presented in a discrete scale where 1 indicates high habitat suitability and 0 non-suitable habitats. The transparent areas mean no habitat due to urbanisation, roads, or agriculture.

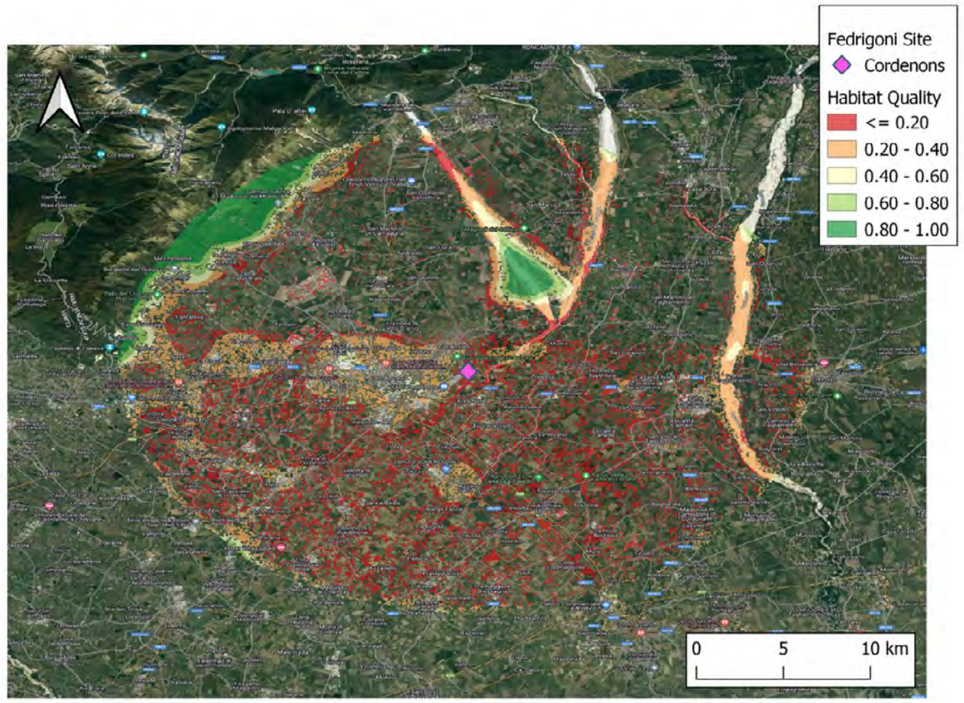


1b. Arco and Varone histograms show the distribution of the habitat suitability for each site according to the model of the Habitat Quality Index. The histogram shows the number of hectares for each degradation value. The Y-axis is the number of hectares. The X-axis is the Habitat Quality Index (0-1).

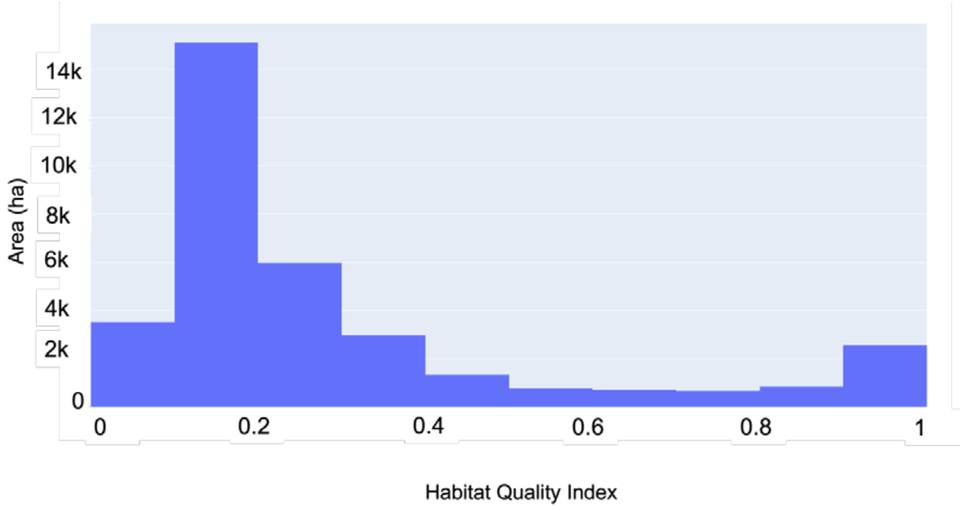


Cordenons habitat quality index

The values are presented in a discrete scale where 1 indicates high habitat suitability and 0 non-suitable habitats. The transparent areas mean no habitat due to urbanisation, roads, or agriculture.

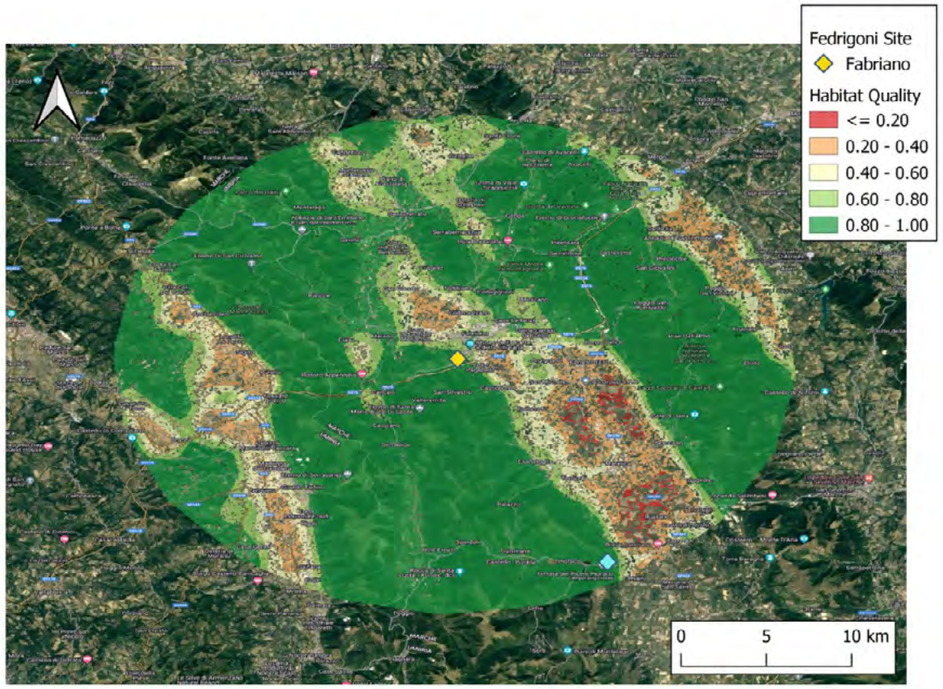


2b. Cordenons histogram shows the distribution of the habitat suitability according to the model of Habitat Quality Index. The histogram shows the number of hectares for each degradation value. The Y-axis is the number of hectares. The X-axis is the Habitat Quality Index (0-1).

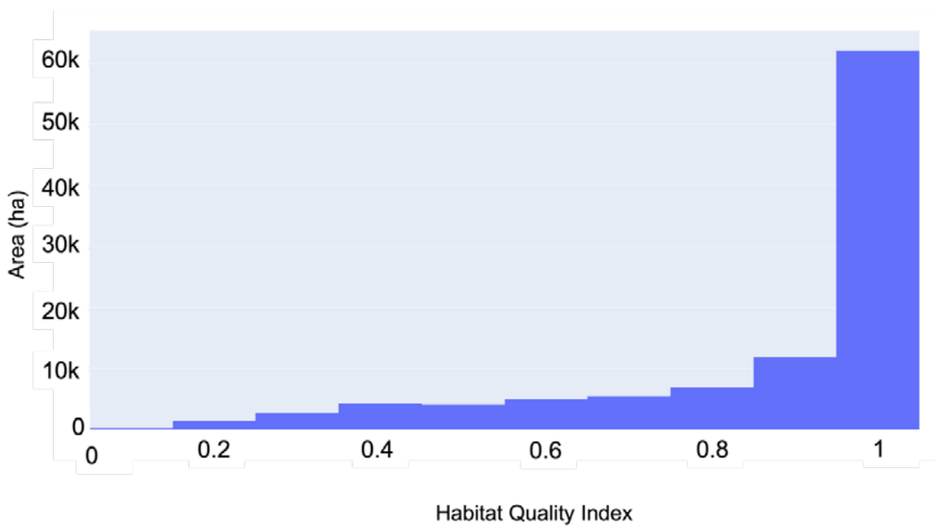


Fabriano habitat quality index

The values are presented in a discrete scale where 1 indicates high habitat suitability and 0 non-suitable habitats. The transparent areas mean no habitat due to urbanisation, roads, or agriculture.

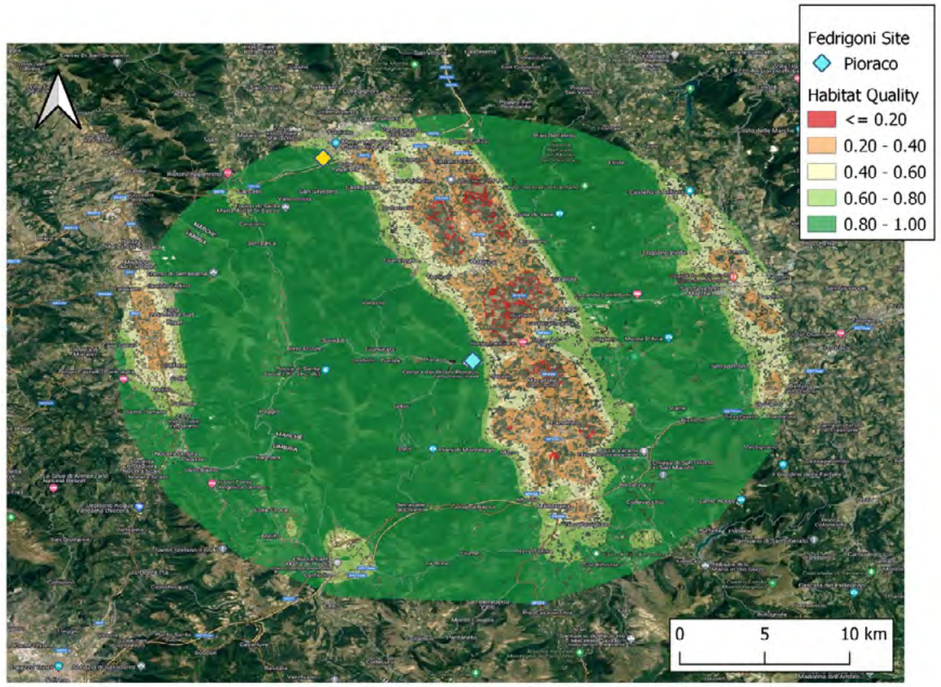


3a. Fabriano histogram shows the distribution of the habitat suitability according to the model of Habitat Quality Index. The histogram shows the number of hectares for each degradation value. The Y-axis is the number of hectares. The X-axis is the Habitat Quality Index (0-1).

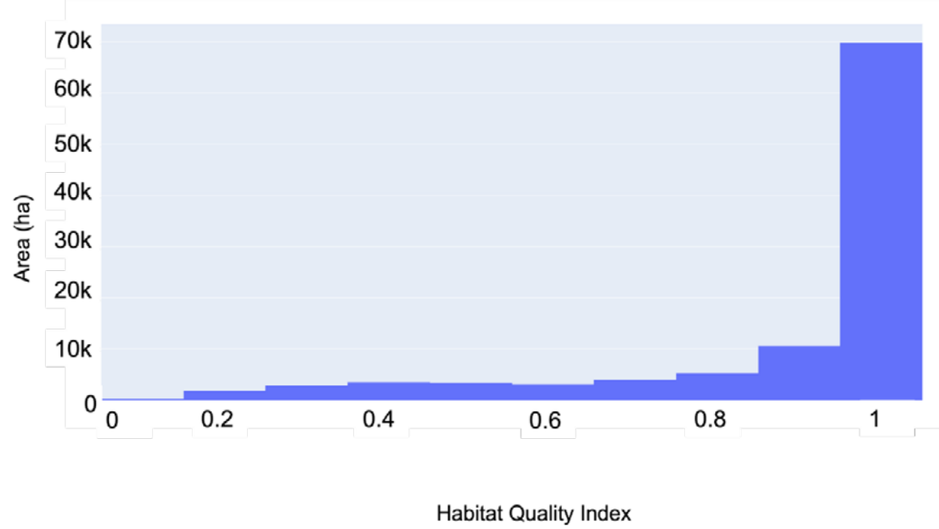


Pioraco habitat quality index

The values are presented in a discrete scale where 1 indicates high habitat suitability and 0 non-suitable habitats. The transparent areas mean no habitat due to urbanisation, roads, or agriculture.

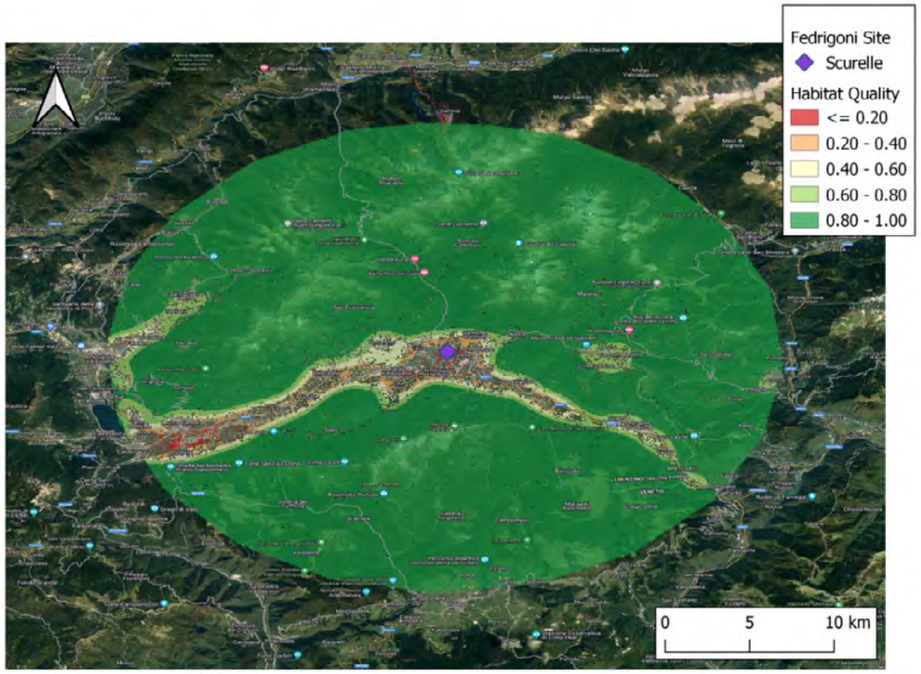


4b. Pioraco histogram shows the distribution of the habitat suitability according to the model of Habitat Quality Index. The histogram shows the number of hectares for each degradation value. The Y-axis is the number of hectares. The X-axis is the Habitat Quality Index (0-1).

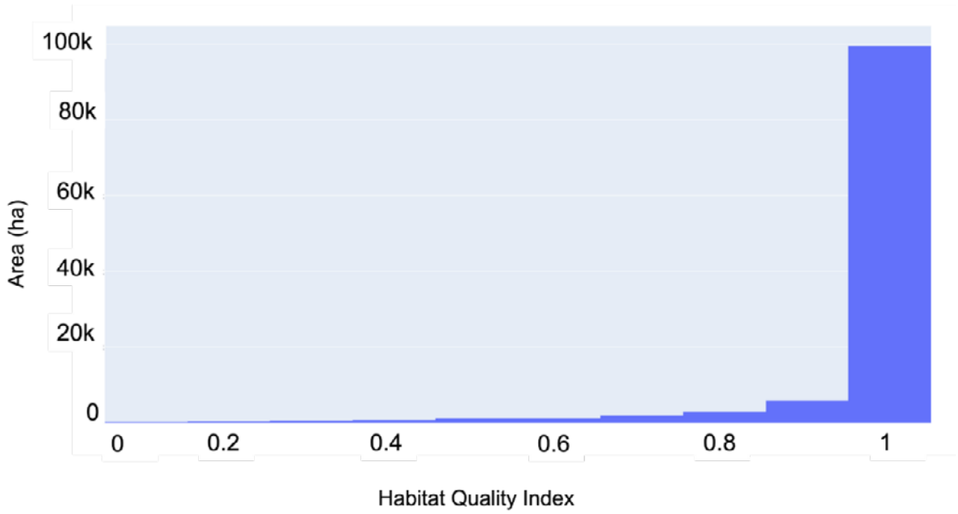


Scurelle habitat quality index

The values are presented in a discrete scale where 1 indicates high habitat suitability and 0 non-suitable habitats. The transparent areas mean no habitat due to urbanisation, roads, or agriculture.

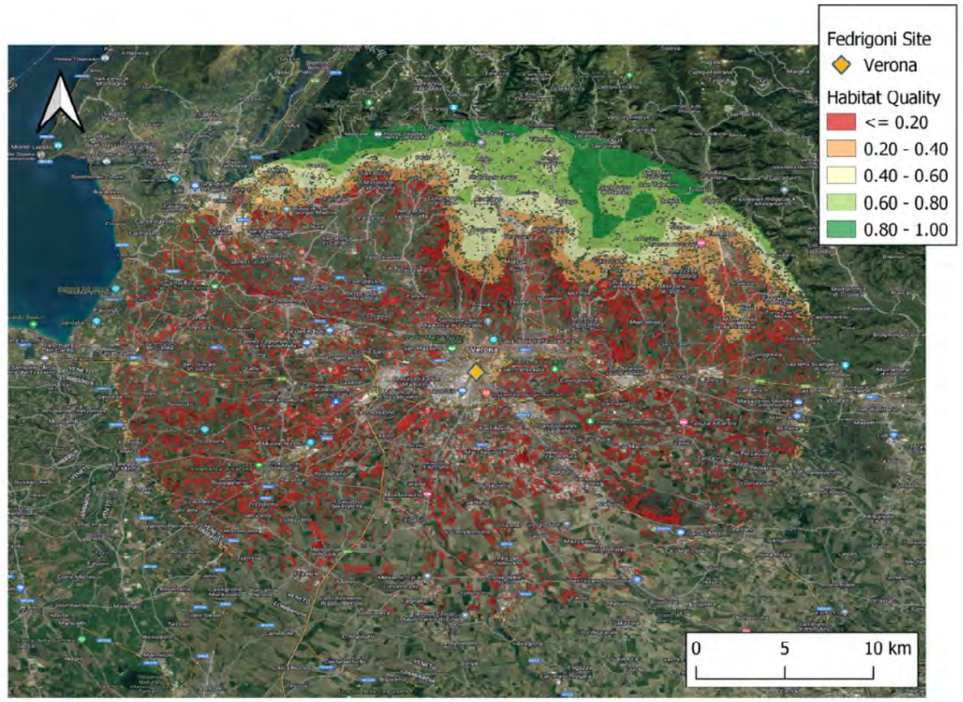


5b. Scurelle histogram shows the distribution of the habitat suitability according to the model of Habitat Quality Index. The histogram shows the number of hectares for each degradation value. The Y-axis is the number of hectares. The X-axis is the Habitat Quality Index (0-1).

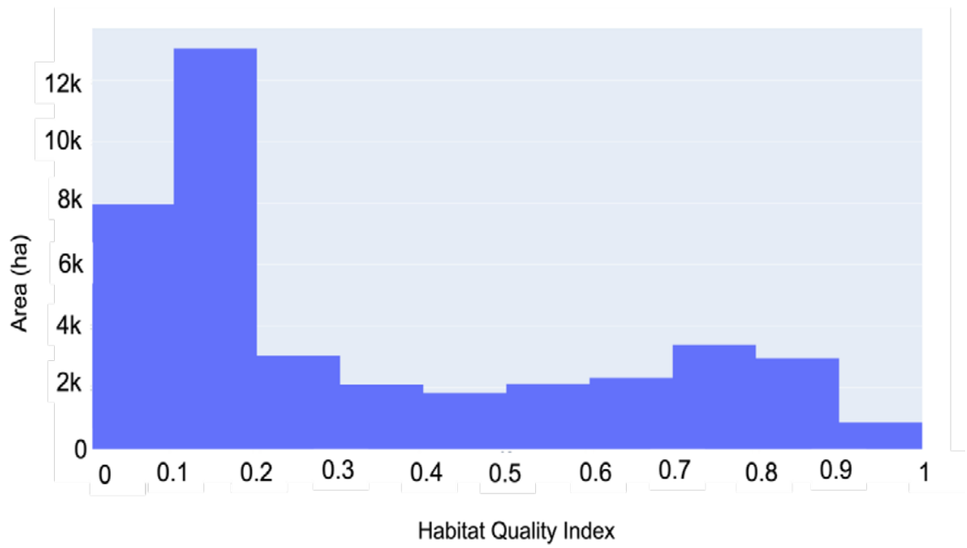


Verona habitat quality index

The values are presented in a discrete scale where 1 indicates high habitat suitability and 0 non-suitable habitats. The transparent areas mean no habitat due to urbanisation, roads, or agriculture.



6b. Verona histogram shows the distribution of the habitat suitability according to the model of Habitat Quality Index. The histogram shows the number of hectares for each degradation value. The Y-axis is the number of hectares. The X-axis is the Habitat Quality Index (0-1).



E T I F O R

valuing nature

Etifor s.r.l.
Piazza A. De Gasperi, 41
35131 Padova, Italy

etifor@etifor.com

etifor.com