



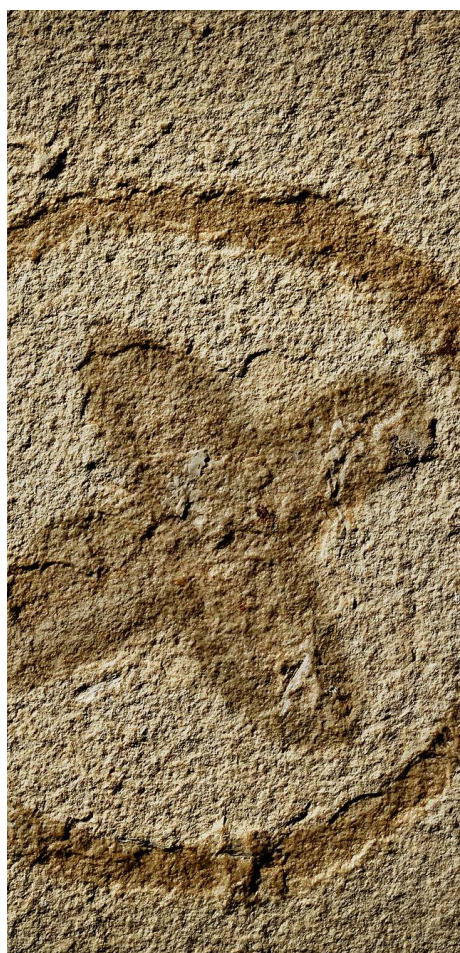
MINISTERO DELL'AMBIENTE
E DELLA SICUREZZA ENERGETICA



PROPOSAL FOR THE INSCRIPTION ON
THE UNESCO NATURAL WORLD HERITAGE LIST

EXECUTIVE SUMMARY

THE EOCENE MARINE ECOSYSTEM
IN THE VAL D'ALPONE - BOLCA,
SAN GIOVANNI ILARIONE, RONCÀ





Executive Summary

State Party

Italy

State, Province or Region

Veneto Region, Province of Verona and Vicenza

Name of nominated property

The proposed name is *The Eocene Marine Ecosystem in the Val d'Alpone - Bolca, San Giovanni Ilarione, Roncà*

Geographical coordinates to the nearest second

The geographical coordinates of the centre of the nominated property, considered as a whole, are the following:

Latitude: 45° 31' 10" N

Longitude: 11° 15' 42" E

The geographic coordinates for each of the components of the nominated property are as follows:

ID	Name of the nominated	coordinates of the central point		UTM coordinates (EPSG:32632 - WGS 84 / UTM zone 32N)		SURFACES	
		Latitude	Longitude	X	Y	area of nominated component part	area of buffer zone
01	Bolca	45°36'06" N	11°13'20"E	673316,692	5052191,785	21.00 ha	52.50 ha
02	San Giovanni Ilarione	45°31'09"N	11°15'43"E	676675,274	5043133,193	2.30 ha	21.60 ha
03	Roncà	45°29'35"N	11°17'26"E	678965,166	5040311,233	65.00 ha	142.00 ha
	EME-VdA nominated serial property	45°31'10"N	11°15'42"E	677370,515	5043489,414	88.30 ha	216.10 ha
						TOTAL AREA (in ha)	

Coordinate reference system: International ellipsoid - World Geodetic System 1984 (WGS84, also called EPSG: 4326). Values are expressed in sexagesimal degrees (degrees, minutes, seconds) rounded to the nearest second.

Textual description of the boundary(ies) of the nominated property

The nominated property is located in the North-East of Italy in the Veneto Region. Located in the Val d'Alpone and in the upper Chiampo Valley in its northernmost areas, the property is composed of three components parts: Bolca, San Giovanni Ilarione and Roncà.

The Bolca component part is located partly in the Municipality of Altissimo in the Province of Vicenza and partly in the Municipality of Vestenanova in the Province of Verona.

The San Giovanni Ilarione component part is located in the Municipality of San Giovanni Ilarione in the Province of Verona.

The Roncà component part is located in the Municipality of Roncà in the Province of Verona. 60% of the nominated property (core zone) and 70% of buffer zone are within the boundaries of the Lessinia Regional Natural Park.

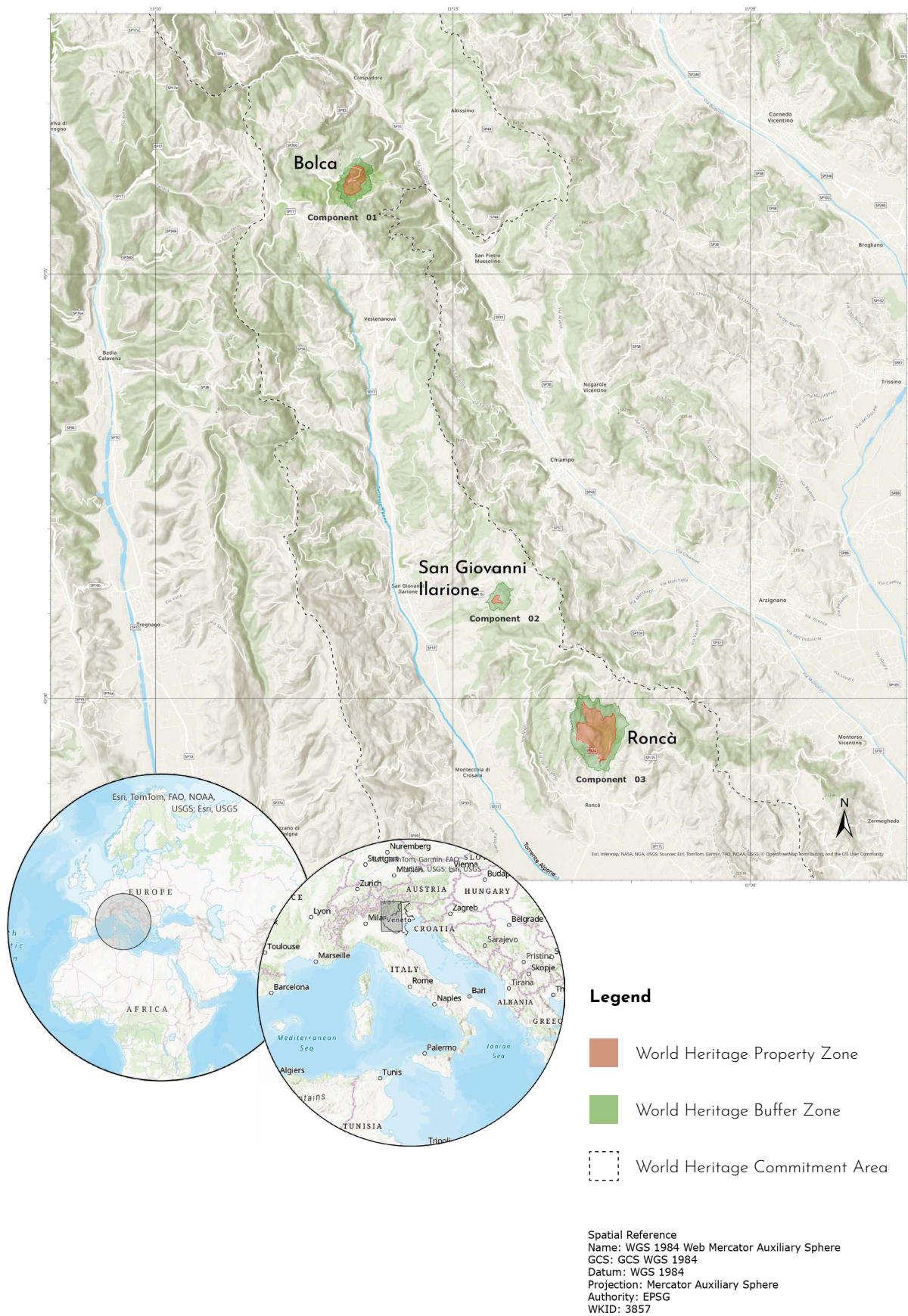
The shape and dimensions of the *buffer zone* are defined in order to protect the deposits and outcrops identified over time. There is a distance of about 13 kilometers between the Bolca component part and the Roncà component part with the San Giovanni Ilarione component part in between.

Next page: Regional setting of the named property.

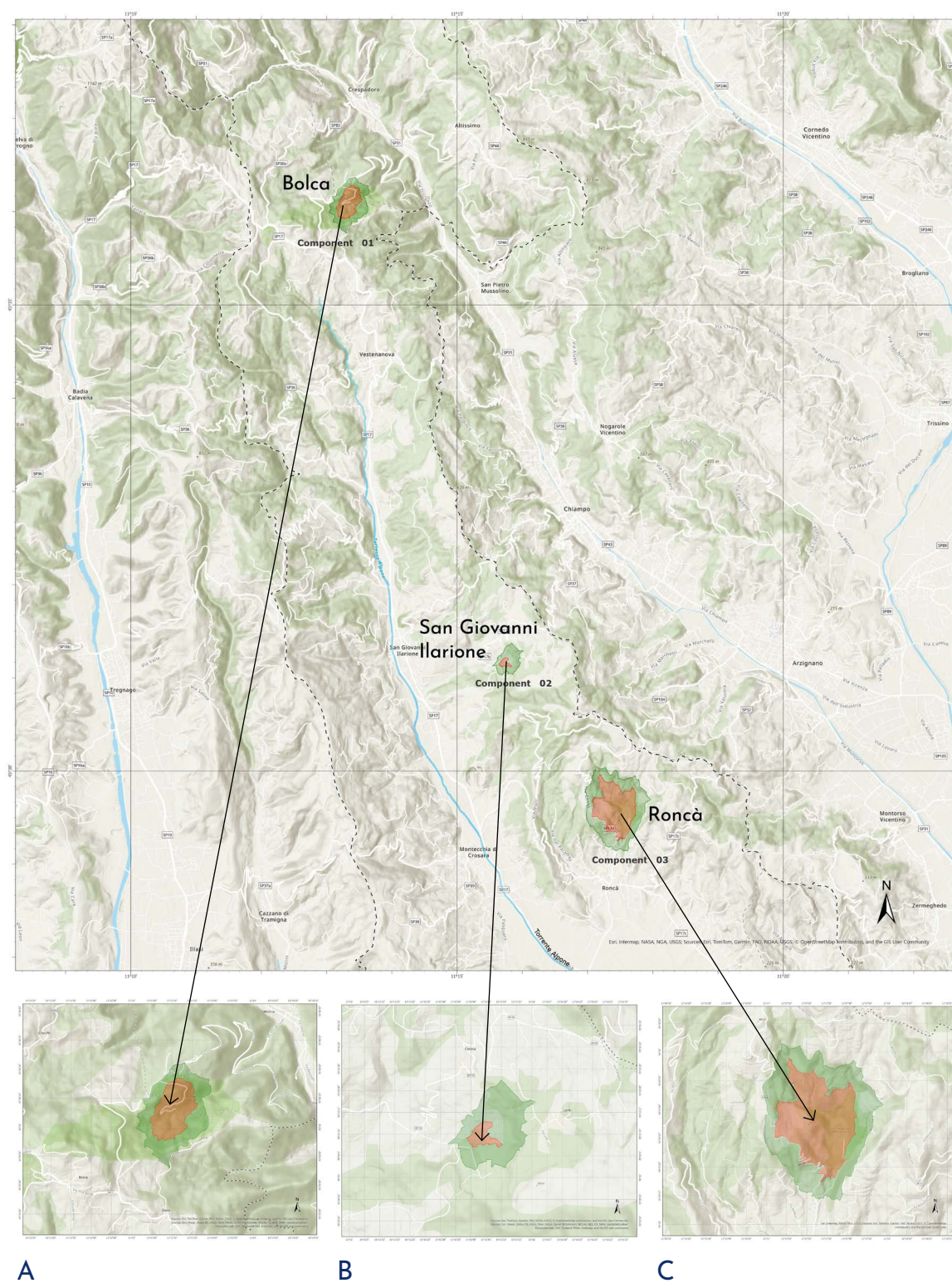
Below: Some specimens of *Dilatilabrum* found in the Roncà area



A4 or A3 size map(s) of the nominated property, showing boundaries and buffer zone (if present)
(Annex 1 Cartography, map 1.4)



Physical cartography of the serial nominated property “The Eocene Marine Ecosystem in the Val d’Alpone - Bolca, San Giovanni Ilarione, Roncà” and its component parts



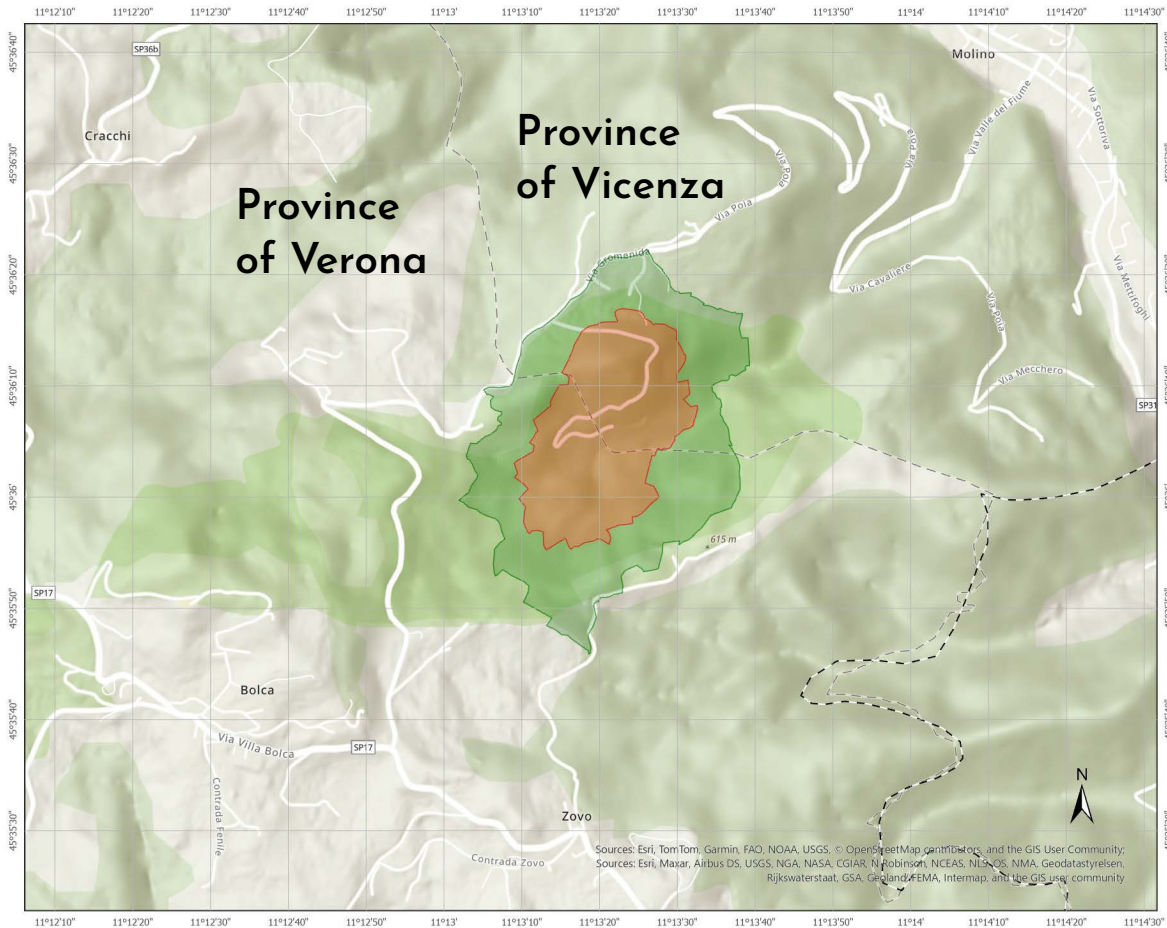
A. Bolca component part

B. San Giovanni Ilarione component part

C. Roncà component part

Physical maps of the three component parts of the nominated property and its buffer zone

Bolca component (01)



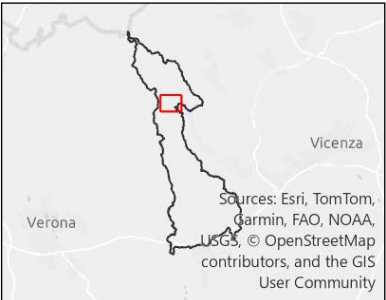
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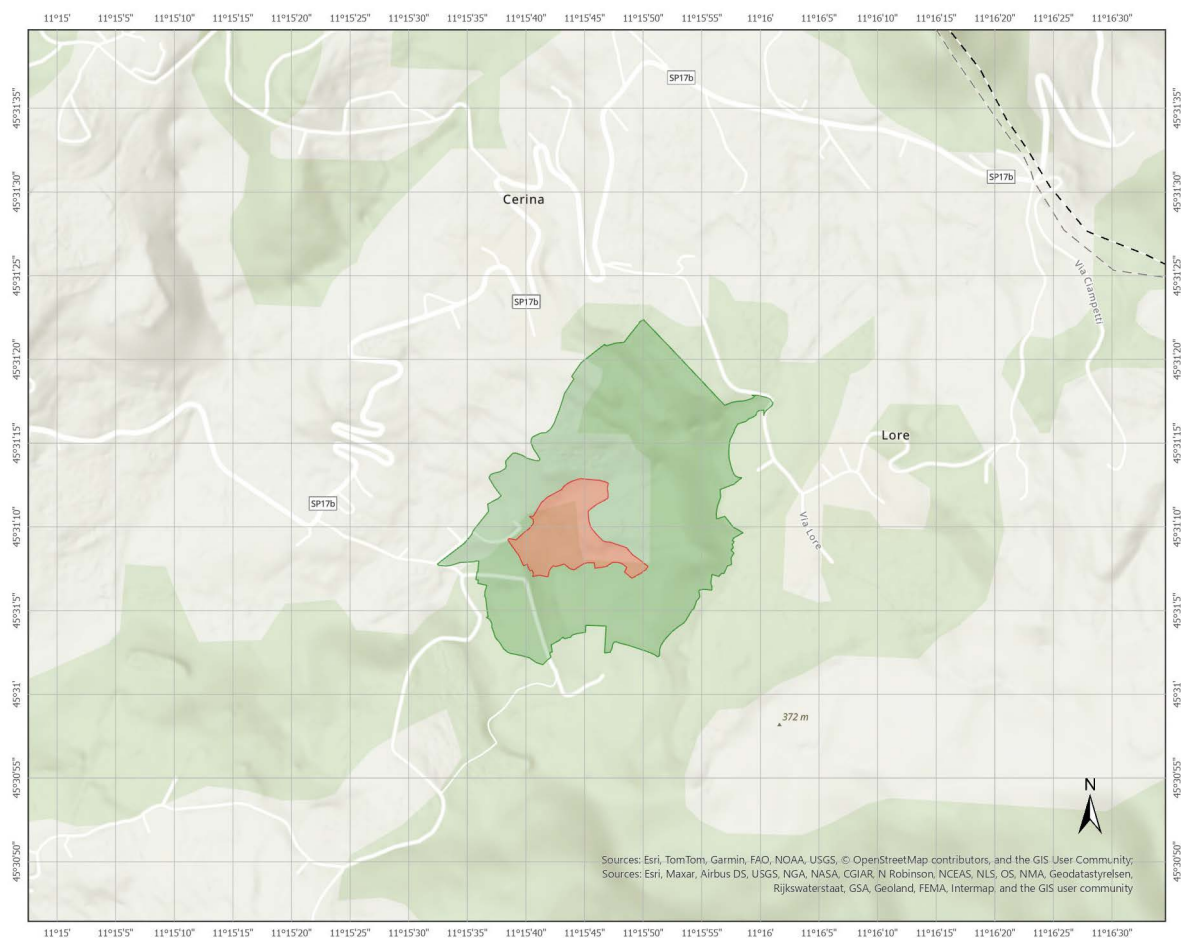
Legend

- World Heritage Property Zone
- World Heritage Buffer Zone

Spatial Reference
 Name: WGS 1984 Web Mercator Auxiliary Sphere
 GCS: GCS WGS 1984
 Datum: WGS 1984
 Projection: Mercator Auxiliary Sphere
 Authority: EPSG
 WKID: 3857



San Giovanni Ilarione component (02)



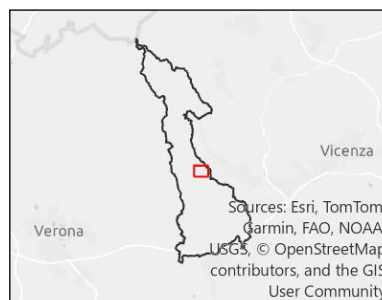
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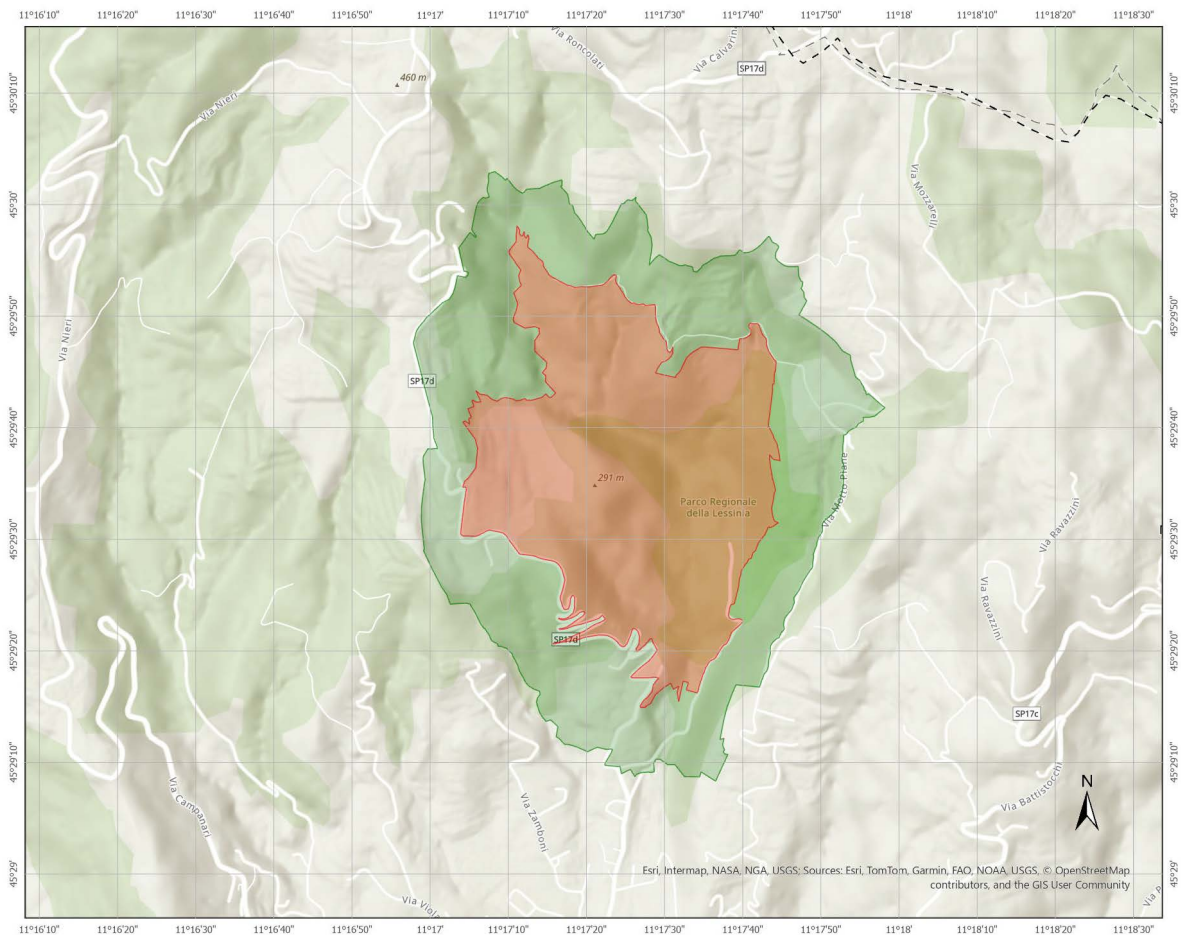
Legend

- World Heritage Property Zone
- World Heritage Buffer Zone

Spatial Reference
Name: WGS 1984 Web Mercator Auxiliary Sphere
GCS: GCS WGS 1984
Datum: WGS 1984
Projection: Mercator Auxiliary Sphere
Authority: EPSG
WKID: 3857



Roncà component (03)



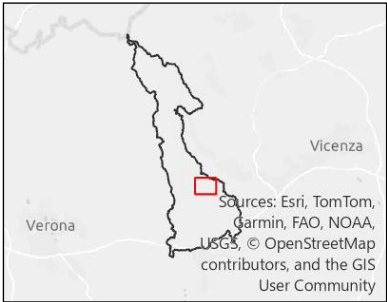
Scale 1:15.000



Legend

- World Heritage Property Zone
- World Heritage Buffer Zone

Spatial Reference
Name: WGS 1984 Web Mercator Auxiliary Sphere
GCS: GCS WGS 1984
Datum: WGS 1984
Projection: Mercator Auxiliary Sphere
Authority: EPSG
WKID: 3857



To support the nomination process a Temporary Association of Purpose "Val d'Alpone - fauna, flore e rocce del Cenozoico" was established to represent the territory of the Alpone Valley; its members include territorial, cultural and scientific representatives, economic entities and some cultural associations.

This Association has involved, in addition to the Superintendence of Archaeology, Fine Arts and Landscape for the provinces of Verona, Rovigo and Vicenza, also the Veneto Region, as well as the Lessinia Regional Natural Park Authority.

Criteria under which property is nominated (itemize criteria)

The fossil evidence from the deposits of the components of Bolca, San Giovanni Ilarione and Roncà, located in the Val d'Alpone, are unique, irreproducible and irreplaceable natural documents describing of the Eocene marine ecosystem.

The inscription of the site **"The marine ecosystem of the Eocene in the Val d'Alpone - Bolca, San Giovanni Ilarione, Roncà"** is proposed in accordance with criterion (VIII):

"Constitute an extraordinary testimony of the main periods of the evolution of the Earth, including evidence of life, of geological processes in progress in the development of the physical characteristics of the Earth's surface or of significant geomorphic or physiographic characteristics"

The nominated property possesses in the three deposits a unique marine Eocene paleontological heritage and as a whole provides a broad ecological image of the bathymetric gradient in a period in which the Earth experienced very high temperatures, marine biodiversity reached its climax and relatives of the organisms that dominate modern seas established themselves.

The remarkable number of fossils present and their exceptional biodiversity, the extraordinary state of conservation of marine and terrestrial vertebrates and invertebrates, are documented by over five centuries of research and studies.

Cultural Landscape

The property is NOT nominated as a cultural landscape

Draft Statement of Outstanding Universal Value

a) Brief synthesis

The nominated property is located in the North-East of Italy, in the Veneto Region and in the Val d'Alpone area. The serial property is composed of the components of Bolca, San Giovanni Ilarione and Roncà which contain

3 distinct deposits with 14 outcrops whose paleontological content allows us to describe the evolution of marine life on Earth during the Eocene, thanks also to one of the most consistent and complete fossil records in the world.

The Val d'Alpone is crossed by the stream carrying the same name and extends over an area of approximately 16,700 hectares, at altitudes between 30 and 925 m s.l.m. above sea level and is part of the plateau of the eastern Lessini Mountains. This territory is characterized by extensive outcrops of volcanic rocks with gentle and wavy morphologies from which conical shapes and remains of ancient volcanic "buildings" emerge. Marine sedimentary rocks are interspersed with the volcanic rocks. The volcanic rocks, locally fossiliferous, also contain olistoliths of various sizes of carbonate rocks with a rich paleontological content attributable to the Eocene (between 56 and 34 million years ago), an era characterized by important biological, climatic, environmental and geodynamic changes. In the Val d'Alpone, over 40 Eocene fossiliferous outcrops have been recorded, indicating a very high paleontological density for such a small territory, with peculiar characteristics in which marine and terrestrial vertebrates, marine invertebrates and both marine and terrestrial plants can be recognized. The 3 deposits have a stratigraphic continuity between the lower Eocene (Monte Postale/ Pesciara, about 49 Ma = megaannum, i.e. million years ago) and the middle Eocene (San Giovanni Ilarione and Roncà, about 40 Ma), highlighting a variety of depositional

environments that include intertidal environments (Roncà), shallow subtidal (Monte Postale, environment associated with the "Pesciara di Bolca" deposit) and subtidal with a depth between a few meters and 20-30 meters (San Giovanni Ilarione). Taken together, the three components constitute a "serial property" that provides a complete ecological scenario of the bathymetric gradient in a time interval in which the Earth experienced exceptionally high temperatures and marine biodiversity reached its climax after a long period of recovery after the mass extinction and the groups of organisms that still dominate marine habitats today have established themselves.

The characteristic elements of the three components of the nominated property are described in the following sections.

The Bolca component, with the 8 outcrops of Pesciara and Monte Postale, is one of the most famous locations in the world for ichthyofauna. Past and current excavations have also allowed the recovery of remains of reptiles, birds and a rich association of invertebrates represented by insects, arachnids, jellyfish, crustaceans, bivalves, gastropods, cephalopods, corals, brachiopods, annelids, macroforaminifera, ostracods and bryozoans. Terrestrial plants are also frequent, the latter very often accompanied by flowers and fruits.

Pesciara and Monte Postale are the most famous and important *Fossil-Lagerstätten* in Italy and undoubtedly among those of greatest importance for the entire Cenozoic at a global level. Many of the Bolca fossil fish have "relatives" still living.

Due to the great variety of fish found in the five fossil levels, Pesciara can be considered one of the richest deposits in the world. In fact, during each excavation new finds for science are brought to light. The reconstruction of the ancient living environment of the Bolca fish is rather complex as suggested by the great variety and shapes of the fish.

Some are similar to those that currently live in coral reef environments, others are characteristic of shallow sandy seabeds with meadows of marine plants and algae.

The sedimentation environment of Monte

Postale must have been close to the coast, characterized by coral bioconstructions and "mangroves", while recent studies reconfirm the more "traditional" model for Pesciara, with the sedimentation of calcareous muds inside an intra-platform basin, where the existence of anoxic conditions on the seabed and the development of microbial biofilm on the cadavers have allowed the perfect preservation in the fossil state of the rich and varied fauna.

The San Giovanni Ilarione component, with the Ciupio deposit, documents the high diversity of molluscs, but also of crustaceans.

The fossils are mainly represented by gastropods and bivalves, are found in a relatively small area and are mostly representative of the depositional environment of the open sea.

The shell remains found in San Giovanni Ilarione, particularly important and abundant at various levels of the stratigraphic succession, have been studied for two centuries as a tool for stratigraphic correlation and unique evidence of the maximum values of biodiversity reached on a global scale after the mass extinction at the end of the Cretaceous. San Giovanni Ilarione can also be considered a classic locality for the knowledge of fossil crustaceans from the Middle Eocene of the Veneto Region. Many specimens, almost all found in the Ciupio tuffs, were the subject of important studies in the 19th century by Bittner and at the beginning of the 20th century by Fabiani. It is a fauna of brachyurans of a marine environment with a good degree of differentiation.

The Roncà component, with its 5 outcrops, is particularly rich in marine gastropods and bivalves representative of intertidal environments. From these contexts, unique information has been obtained and continues to be obtained, thanks to the excavations still in progress, regarding the conspicuous faunal biodiversity.

Each deposit, to a different but complementary extent, continues to contribute to implementing the rich fossil heritage which is collected, restored, studied and exhibited in local national and international museums: the Bolca Fossil

Museum, the Roncà Paleontological Museum, the Civic Museum of Natural History of Verona, the Museum of Nature and Man of the University of Padua and the paleontological collections of many small and large museums around the world.

The richness and uniqueness of the nominated property are highlighted by the interest that these components have aroused over the centuries in philosophers of science and naturalists starting from the eighteenth century, contributing extensively to the debate on the origin and evolution of Earth and on the nature of fossils.

b) Justification for Criteria

Criterion (viii)

The paleontological documentation of the nominated property is central to describing the history of marine geology and evolutionary biology of the Eocene. These are fossil testimonies that identify an ecological scenario of the entire bathymetric gradient, in a period in which Earth experienced exceptionally high temperatures, marine biodiversity reached its climax after a long period of post-mass extinction recovery and the groups of organisms that today populate our seas established themselves.

The extraordinary state of conservation of the fossils (vertebrates, invertebrates and plant remains), the richness of species and forms represented by the high taxonomic diversity, the uniqueness of the fish with anatomical structures and pigmentations that rarely fossilize, constitute the most complete traces of a broad and detailed picture of marine life of the Eocene.

Furthermore, five centuries of history and over a thousand publications document the exceptional value of the Eocene fossils of the Alpone Valley, the result of a unique combination of taphonomy, stratigraphic and paleogeographic characteristics.

c) Statement of Integrity

The nominated property, consisting of the

components of Bolca, San Giovanni Ilarione and Roncà, contains 14 outcrops that are subject to protection for their content of paleontological and natural values.

These components are home to those fossils that in five hundred years have contributed to explaining the evolution of Eocene marine life on Earth. The fossils collected are protected and preserved in local museums and around the world. The integrity of the deposits and their outcrops is not only linked to the conservation and protection reserved for them but also to the factors that contribute to their development. For this reason, the proposed boundaries of the core zones areas that contain the outcrops have been defined taking into account the geopaleontology of the places and, to ensure better conservation in the future, three *buffer zones* were created to protect the site.

The delimitation of the latter was also carried out considering the physiographic and cultural limits. Overall, the area of the designated property is 88.3 ha (*core zone*) protected by an external area adjacent to the property boundaries of 216.1 ha (*buffer zone*). Most of this territory is cultivated with coppice and meadows. The deposits and outcrops have only been partially excavated and explored based on ministerial concessions.

The extension of the deposits, the powerful stone and detrital deposits that cover them and the modest excavation volumes prevent the depletion of the fossil horizons and constitute elements in favor of the conservation and protection of the nominated property. In fact, the integrity of the property, with its values and attributes, is guaranteed by the application of cutting-edge excavation and research methods that produce a significant increase in scientific knowledge while guaranteeing a careful and balanced conservation of the heritage. The correct extraction technique and the extraordinary state of conservation of the recovered fossils allow a broad and complete reconstruction of the biotic, climatic and environmental variations and allow us to understand the phylogenetic and paleoecological significance of these fossils. The abundance of fossil remains extracted in the past and their richness has not

impoverished the deposits, allowing us to continue research with new and modern excavation campaigns, in agreement with the Ministry of Culture - Superintendence of Archaeology, Fine Arts and Landscape for the provinces of Verona, Rovigo and Vicenza. A part of the invaluable paleontological heritage collected in the past has played a fundamental role in the history of science. Currently, this heritage is preserved in the museum of the Val d'Alpone and in the collections of museums all over the world. About 60% of the *nominated property* and 70% of the *buffer zone* falls within the area of the Lessinia Regional Natural Park. All the outcrops have been catalogued by the "Val d'Alpone - fauna, flore e rocce del Cenozoico". On these outcrops, the Superintendence of Archaeology, Fine Arts and Landscape for the provinces of Verona, Rovigo and Vicenza has recognized a preventive protection, in 2020 and in 2023.

d) Requirements for protection and management

All the outcrops of the components of the nominated property have a strong legal protection framework. It consists of a coherent system of measures that link different levels of legislation (European, national, regional and local) and protects the paleontological values and attributes of the property and its natural habitats. The 3 components are subject to the following levels of legislative protection:

- The entire extension of the present and future fossil deposits and outcrops are subject to the Cultural Heritage and Landscape Code (Legislative Decree no. 42/2004), according to which the fossils found on Italian territory are property of the State and the trade of fossils is prohibited. Paleontological excavations can be carried out but must have preventive permission (by the Ministry of Culture - General Directorate of Archaeology, Fine Arts and Landscape). With the purpose to protect the paleontological and fossil finds contained, the Ministry of Culture had protected by Ministerial Decree some areas: the Pesciara

deposit in 1963 (Ministry of Public Education Ministerial Decree 20.08.1963) and in 1992 (Ministry of Cultural and Environmental Heritage Decree of 22.09.1992) and an outcrop of Monte Postale in 1992 (Ministry of Cultural and Environmental Heritage Decree of 22.09.1992).

- The Superintendence of Archaeology, Fine Arts and Landscape for the provinces of Verona, Rovigo and Vicenza, responsible for the control, monitoring and supervision of paleontological deposits/outcrops, in 2020 and 2023 has given a positive approval and formal support to this nomination.
- Approximately 60% of the *core zone* and 70% of the *buffer zone* fall within the area of the Lessinia Regional Natural Park. Among the objectives, in addition to the protection of soil, flora, fauna and water, there is also the protection of specific paleontological, geomorphological, anthropological, archaeological, vegetational and faunal peculiarities. The park's environmental plan took into account the objectives and purposes of the European Parliament and of the Council on the conservation of wild birds and on the conservation of natural and semi-natural habitats and of wild flora and fauna.
- The local Municipalities engaged into the nomination process (Altissimo, Vestenanova, San Giovanni Ilarione and Roncà) which have administrative and regulatory competence for urban planning are among the promoters of the nomination and participate in the protection, conservation, enhancement and management of the nominated property.

The deposits of the nominated property are, for the most part, in privately owned areas, but according to the Italian Legislation, fossils finds are owned by the State and the trade is prohibited.

The owners were involved in the nomination process and understand and share its outstanding values; today they carry out a first level of protection, in particular that of custodians of the paleontological outcrops present on their properties.

Furthermore, direct contacts were maintained with public administrators and with the heads of socio-economic and cultural associations in the Val d'Alpone area, with the land owners, with representatives of professional categories, schools and citizens.

The proposed management framework for the nominated property has a governance system aimed to the protection and conservation of paleontological heritage through 4 main points:

- preventive protection action based on national legislation headed by the Superintendence of Archaeology, Fine Arts and Landscape for the provinces of Verona, Rovigo and Vicenza;
- constant monitoring of the territory of the serial site by local administrations and the Lessinia Regional Natural Park Authority;
- surveillance of the outcrops carried out

involving landowners;

- periodic checks carried out by expert personnel of the Technical Scientific Committee belonging to the A.T.S. "Val d'Alpone - fauna, flore e rocce del Cenozoico". and composed of researchers, scholars and university professors expert in Paleontology.

Tourists and enthusiasts can visit the outcrops independently or accompanied by guides the paleontological and fossil finds are visible in the Bolca Fossil Museum and in the Paleontological Museum of Roncà.

The monitoring system, as laid down in the Management Plan, provides for the verification of a series of key factors which provides a complete overview on the state of conservation and integrity of both the paleontological values and of the surrounding natural environment.



NAME AND CONTACT INFORMATION OF OFFICIAL LOCAL INSTITUTION/AGENCY/ORGANIZATION

The President of the Temporary Association of Purpose - "Val d'Alpone - faune, flore e rocce del Cenozoico"

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