



Regione Emilia-Romagna



MINISTERO DELLA
TRANSIZIONE ECOLOGICA

PROPOSAL OF THE

EVAPORITIC KARST AND CAVES OF NORTHERN APENNINES

FOR INSCRIPTION ON
THE UNESCO NATURAL
WORLD HERITAGE LIST

EXECUTIVE
SUMMARY

- (cover)
*Stream bend in the
resurgence of Rio
Basino cave. Vena del
Gesso Romagnola ©
2008 Piero Lucci*
- (inside)
*Dissolution features
in the gypsum rock.
Vei stream, Trias, Alta
Valle del Secchia ©
1988 Stefano Sturloni*

EKCNA



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STATE PARTY

Italy

STATE, PROVINCE OR REGION

Emilia Romagna Region, Province of Reggio Emilia, Bologna, Rimini and Ravenna.

NAME OF PROPERTY

Evaporitic Karst and Caves of Northern Apennines.

GEOGRAPHICAL COORDINATES TO THE NEAREST SECOND

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

The entire nominated serial property	Latitude	Longitude
centroid	44° 13' 59" N	11° 27' 38" E
north-west vertex	44° 36' 09" N	10° 18' 53" E
south-eastern vertex	43° 51' 48" N	12° 36' 23" E

The areas and the coordinates of the centroid of each component site are as follows:

ID	Name of the component part	Latitude of the central point	Longitude of the central point	Area of nominated component part (ha)	Area of the Buffer Zone (ha)
c.s.1	Alta Valle Secchia	44° 21' 41" N	10° 23' 10" E	1596 ha	1294 ha
c.s.2	Bassa Collina Reggiana	44° 35' 06" N	10° 35' 56" E	274 ha	1385 ha
c.s.3	Gessi di Zola Predosa	44° 27' 40" N	11° 13' 13" E	57 ha	128 ha
c.s.4	Gessi Bolognesi	44° 26' 15" N	11° 24' 00" E	237 ha	325 ha
c.s.5	Vena del Gesso Romagnola	44° 15' 07" N	11° 38' 38" E	1313 ha	4775 ha
c.s.6	Evaporiti di San Leo	43° 55' 05" N	12° 20' 45" E	119 ha	165 ha
c.s.7	Gessi di Onferno	43° 52' 30" N	12° 32' 51" E	84 ha	276 ha
				3 680 ha	8 348 ha

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

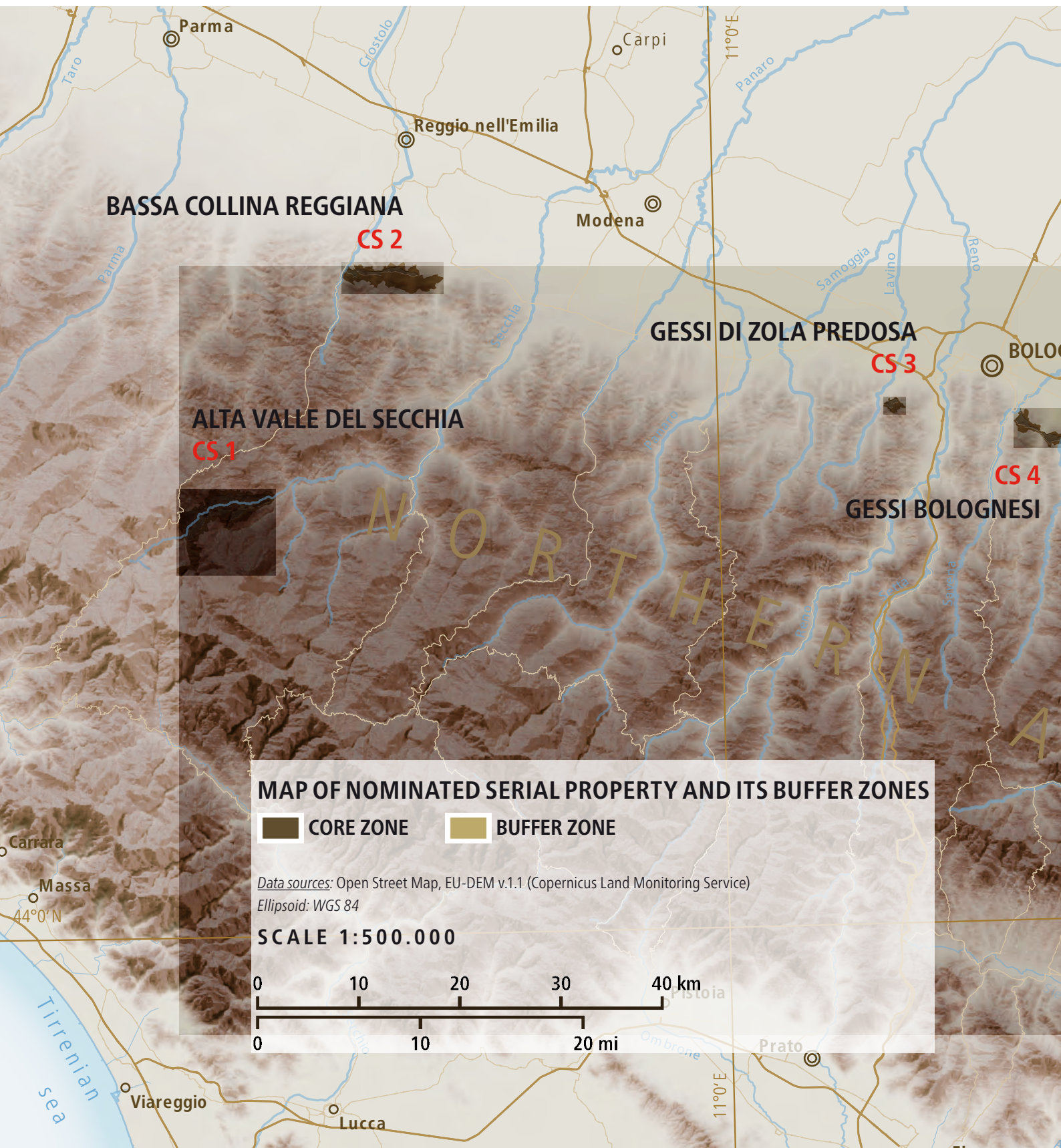
TEXTUAL DESCRIPTION OF THE BOUNDARY(IES) OF THE NOMINATED PROPERTY

The nominated property extends over a territory consisting of 7 component sites. It surrounds the entire straight ridge of evaporite outcrops that emerges on the northern slopes of the Apennines, from the "Vena del Gesso Romagnola" to the Secchia River Valley, which exposes, by erosion, some older evaporite deposits. The boundaries of the nominated property extend also underground, to include the cavities produced by karst phenomena.

- (facing page)
Dissolution
pendants in the
selenite rock
of the Tanaccia
cave, Vena del
Gesso Romagnola
© P. Lucci

MAP OF THE NOMINATED PROPERTY SHOWING THE BOUNDARIES AND BUFFER ZONE

The candidate area extends over a territory consisting of 7 component sites. It surrounds the entire straight ridge of evaporite outcrops that emerges on the northern slopes of the Apennines, from the "Vena del Gesso Romagnola" to the Secchia River Valley, which exposes, by erosion, some older evaporite deposits. The boundaries of the candidate property extend also underground, to include the cavities produced by karst phenomena. All the major known caves in evaporites are included in the nominated property and



A 3D rendering of a globe showing the continents of Europe and Africa. The landmasses are colored in a light olive green, while the oceans are light blue. A grid of latitude and longitude lines is visible. A red location pin with a white dot is placed in Central Europe, specifically over Germany. The globe is tilted, showing the Arctic region at the top.



CRITERIA UNDER WHICH PROPERTY IS NOMINATED

The **Evaporitic Karst and Caves of the Northern Apennines** represent a natural system of a unique record of evaporitic karst phenomena. The proposal for inscription is under **criterion (viii)** :

"be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features."

The nominated property hosts a density of superficial karst forms, caves, saline springs, minerals, speleothems, and palaeontological contents that has no equal in the world, thanks to its peculiar geological and climatic context. For this reason, the phenomena have been studied here since 16th century and this has been the place where many of modern scientific theories about evaporitic karst are born.

CULTURAL LANDSCAPE

The property is nominated as a cultural landscape : NO.

DRAFT STATEMENT OF OUTSTANDING UNIVERSAL VALUE

A. BRIEF SYNTHESIS

The **Evaporite Karst and Caves of Northern Apennines** serial property constitute the most complete, outstanding and accessible examples of the karst phenomena in gypsum and anhydrite at sub-tropical wet climate conditions. Located in northern Italy, this serial site unites together the most internationally studied areas with regard to hydrogeology, mineralogy and speleology in evaporitic karstic systems since 16th century: the explorations and discoveries that took place in this area are considered as milestones in the development of the respective disciplines. As highlighted by the comparative analysis, many speleothems and minerals are unique to this area, due to a complex relationship between rocks, geological evolution and climate. The serial property includes all the deposits that host different type of mineralogical evolution of gypsum, including its transformation in anhydrite and alabaster as well as all the historical study areas described in the pioneer speleological publications.

In fact, despite evaporite karst is generally considered unspectacular, in this area it constitutes a prominent feature of the landscape and crystals over one meter in height can be observed in some localities. In a very narrow belt made of vertical cliffs emerging from the surrounding clays it is possible to study the evolution of Mesozoic and Cenozoic evaporitic deposits, with the same easiness of access that led to their exploration since the pre-scientific era. Actually, caves have been explored since prehistorical times, and they became one of the first excavation areas of lapis specularis, the stunning transparent crystals, which could replace glass during Roman times. Excavation in the nominated area is strictly regulated in order to preserve the caves and the landscape. The standards of protection, management (including specific hypogean protection measures) and monitoring ensure that the Evaporite Karst and Caves of Northern Apennines phenomena and the ecosystems that are linked to them will be preserved and continue to evolve naturally.

For these reasons this area can be considered an unicum on the entire planet, that collects, protects, documents and makes available to scientists from all over the world the set of karst forms and phenomena that develop in evaporites in subtropical-humid climates.

B. JUSTIFICATION FOR CRITERIA

Criterion (viii): The nominated serial property comprises one of the most complete evaporitic karst systems in the world. By an exceptional combination of humid sub-tropical climatic conditions and a peculiar geological setting, the candidate area is a one of his kind in the world. It constitutes one of the best places where karst in gypsum and anhydrite deposits can be observed and studied. In a relatively small area over 900 caves (amongst the largest, deepest and most complex of this



type in the world) allow an easy access to most of the phenomena observable in evaporitic karst, a geological setting not yet represented in the World Heritage List.

An uncommon richness of rare speleothems and minerals, sometimes unique to these caves, have attracted naturalists and scientists since the 16th century. In these places the discipline of speleology in evaporites was born, and tens of phenomena have been described here for the first time.

Nowadays the rocks and caves of the Northern Apennines represent the best scientifically documented sulfate-halite karst in the world from the geological, speleological and hydrological points of view. These features can be easily accessed and explored, making this area a leading evaporitic karst research location.

- *The Secchia river flowing through the Triassic gypsum outcrops, Alta Valle Secchia (view from Mt. Duro)*
© S. Sturloni

C. STATEMENT OF INTEGRITY

The seven component sites of the nominated serial property involve approximately 90% of the entire evaporitic rocks of the northern Apennine ridge. They represent the whole karst phenomena in gypsum and anhydrite, including all the outcropping and underground karst areas, all the main karst aquifers, and all their recharge areas. They also include a complete collection of epigeal and hypogean karst morphologies from the dissolution surfaces in vertically exposed gypsum cliffs to the speleothems in the abysses of the caves.

From the environmental integrity point of view, the quality of the karst systems is excellent. The continuity of the karst hydrological system, above and below ground, is well preserved in all the component sites. The fruition of the few caves open to the public takes place with speleological modalities, without alterations of the natural cavities and their habitats.

From the development pressures point of view, settlement pressures are absent, although some component sites fall within the range of influence of intensely settled areas, agriculture – if present - is very limited and extensive, and the management of the existing woods is conservative, aimed

- (cover)
Stream bend in
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Rio Basino cave.
Vena del Gesso
Romagnola ©
2008 Piero Lucci
- (inside)
Dissolution
features in the
gypsum rock.
Vei stream, Trias,
Alta Valle del
Secchia © 1988
Stefano Sturloni

at increasing their wilderness. The mining exploitation of gypsum for local use, which has affected these areas since Roman times, is now prohibited in the nominated property. As a whole, the natural property is essentially perceived also as a site of scientific and cultural interest and therefore the human use and intervention are very limited.

D. STATEMENT OF AUTHENTICITY FOR PROPERTIES NOMINATED UNDER CRITERIA (i) TO (vi)

Not relevant as this nomination is submitted under criterion (viii).

E. REQUIREMENTS FOR PROTECTION AND MANAGEMENT

All evaporitic karst areas of the nominated property are specifically identified and strictly protected by a specific geological and speleological heritage protection act, in accordance with European, national and regional regulations.

The great majority (96%) of the nominated property is protected by European Community directives and is part of the Natura 2000 network. Most of the nominated property (71%) is protected by a national park and by two regional parks. The remaining areas are nature reserves and protected landscapes, preserved by law. The land adjacent to the nominated property is subject to the territorial and landscape planning of the Emilia-Romagna Region that establishes the rules for the management of the territory and is one of the most effective tools to implement the protection measures.

The management system consists of two management bodies. The component site 1 is managed by the Appennino Tosco-Emiliano National Park. The component sites from 2 to 7 are under the control of the the Emilia-Romagna Region which directly supervise the management bodies of the regional protected areas. These management body have a management plan, a specific budget and a dedicated staff (technical and administrative) to manage and control the respective areas.

Key management issues include the protection of the attributes and values of the geological heritage, conservation measures for habitats and species of Community interest, knowledge and communication of the natural environments. The karst hydrological system is also a very relevant management topic in these highly dynamic environments. Other management themes include education, enhancement, the quality of visitor experience, and finally the environmental restoration and conversion of abandoned and disused quarries for educational purposes.

A long-term monitoring system has been set up, using ground- and underground-based observations, for improved evaluation of the chemical and ecological state of karst aquifers, seismo-tectonic movements, and climate cave conditions. Key aspects of the nominated property's flora and fauna are also monitored

NAME AND CONTACT INFORMATION OF OFFICIAL LOCAL INSTITUTION/AGENCY

RER	Emilia-Romagna Region
name 1	Barbara Lori <i>Councillor for mountains, internal areas, spatial planning, equal opportunities</i>
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name 2	General Directorate for Territorial and Environmental Protection <i>Secretariat of nomination process</i>
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