



epigrafe

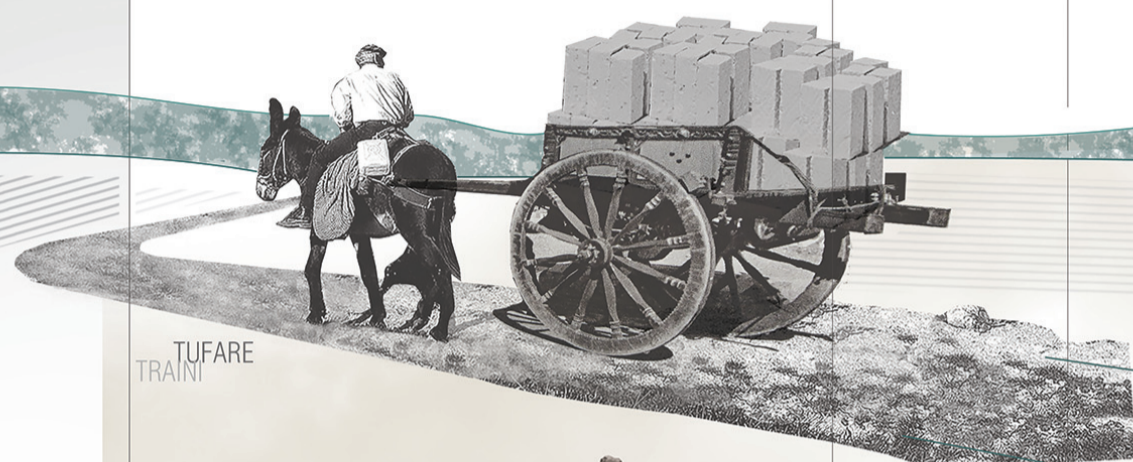


DIMORA-RIFUGIO

transumanza

MORRE

jazzi



TUFARE TRAINI

TRATTURI CAZZATURE

ZOCCATORI CAVAMONTI



TUFI



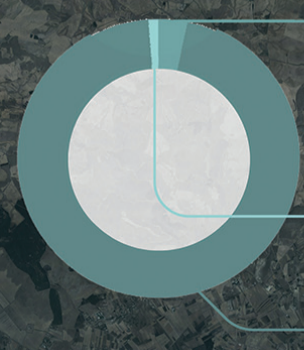
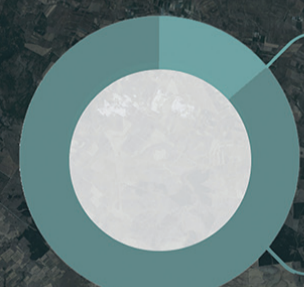
DUE PALMI ZOCCO



TAJATE



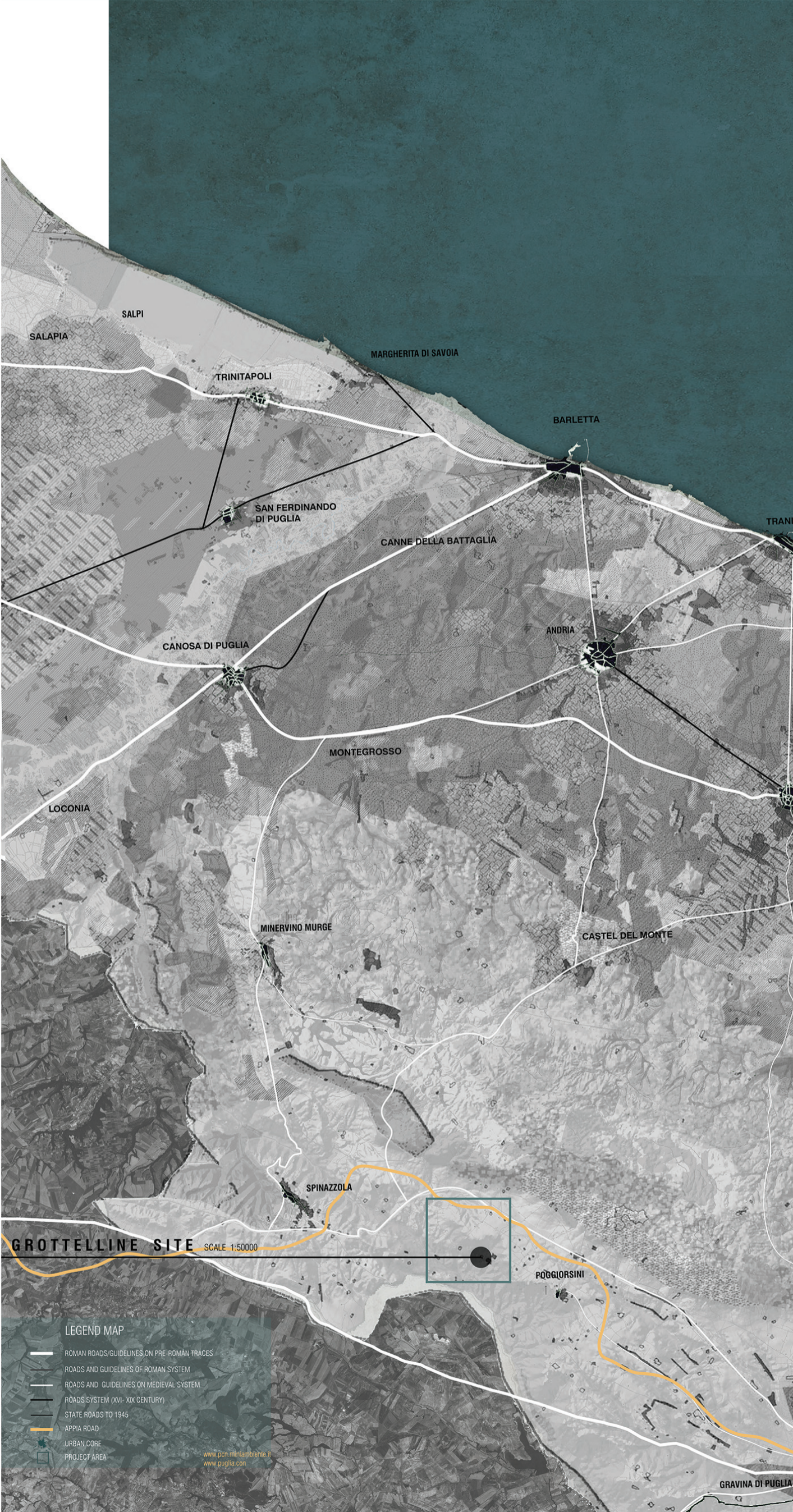
QUARRIES SITUATION



SOURCES:
 www.paesaggiopuglia.it
 PPTIR Regione Puglia
 www.Puglia.com.it
 Regione Puglia - Ufficio Attività Estrattive
 Regione Puglia - Sezione ciclo dei rifiuti e bonifiche

Regione Puglia - Rapporto sullo stato delle attività estrattive CTR Regione Puglia
 "L'attività estrattiva in Puglia" di Prof. F. Micheletti
 ISTAT - Le attività estrattive da cave a maneggio dal 2015
 LEGAMBIENTE - Rapporto Cave 2017

TERRITORIAL CONTEXT HISTORICAL SYNTHESIS OF THE SETTLEMENT AND CULTURAL PERMANENCE



LEGEND MAP

- ROMAN ROADS/GUIDELINES ON PRE-ROMAN TRACES
- ROADS AND GUIDELINES OF ROMAN SYSTEM
- ROADS AND GUIDELINES ON MEDIEVAL SYSTEM
- ROADS SYSTEM (XVI - XIX CENTURY)
- STATE ROADS TO 1945
- APPIA ROAD
- URBAN CORE
- PROJECT AREA

www.pcn.milanoambiente.it
www.puglia.com

TERRITORIAL CONTEXT

SPINAZZOLA-POGGIORSINI (BAT)
PUGLIA, ITALY

SCALE 1: 25000



MAP LEGEND

ANTHROPIC FIELD

- WOODED AREA
- AGRICULTURAL LANDSCAPE
- APPIA ROUTE
- RAILWAYS
- MAIN ROUTES
- SECONDARY ROUTES
- TRATTURI ROUTES
- BUILDINGS
- MASSERIE
- JAZZI

MORPHOLOGICAL FIELD

- HEIGHTS
- RIVER
- WATER CANALS
- CLAY (PLEISTOCENE)
- SANDS AND CONGLOMERATES
- DETRITIC CALVES AND ORGANOGENIC BENCH TYPE
- PROJECT AREA

www.pcn.minambiente.it
www.puglia.com

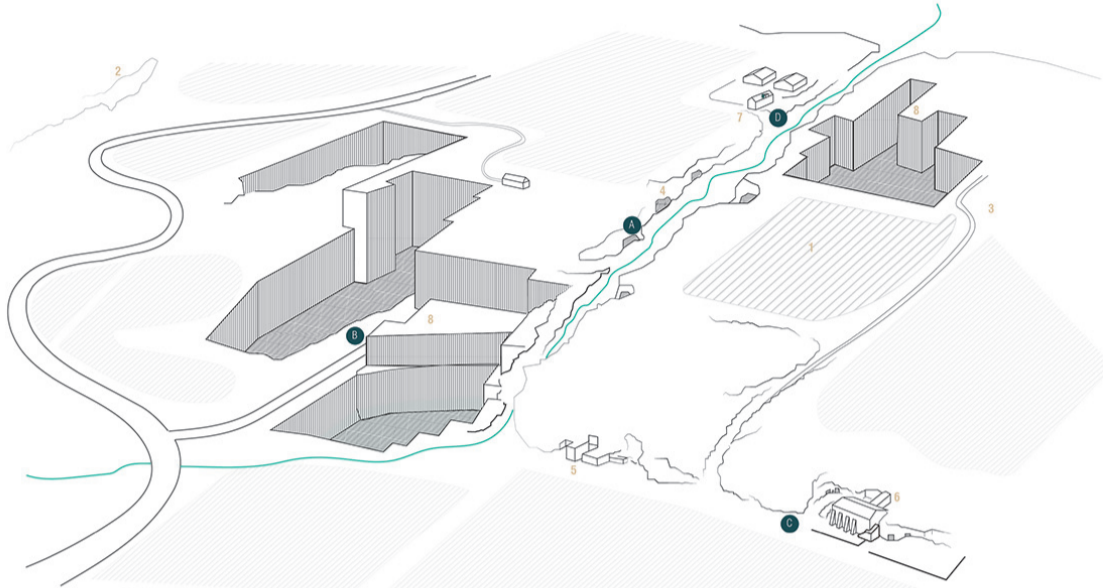




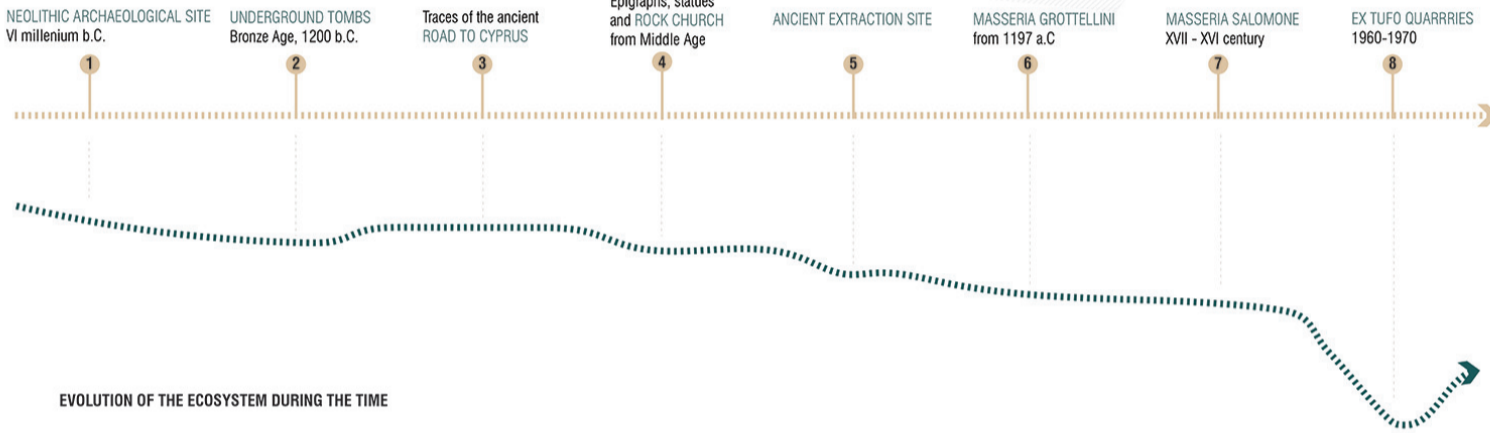
GROTTELLINE SITE

SPINAZZOLA, POGGIORSINI(BAT)
PUGLIA, ITALY

PRESENCE OF HUMANS

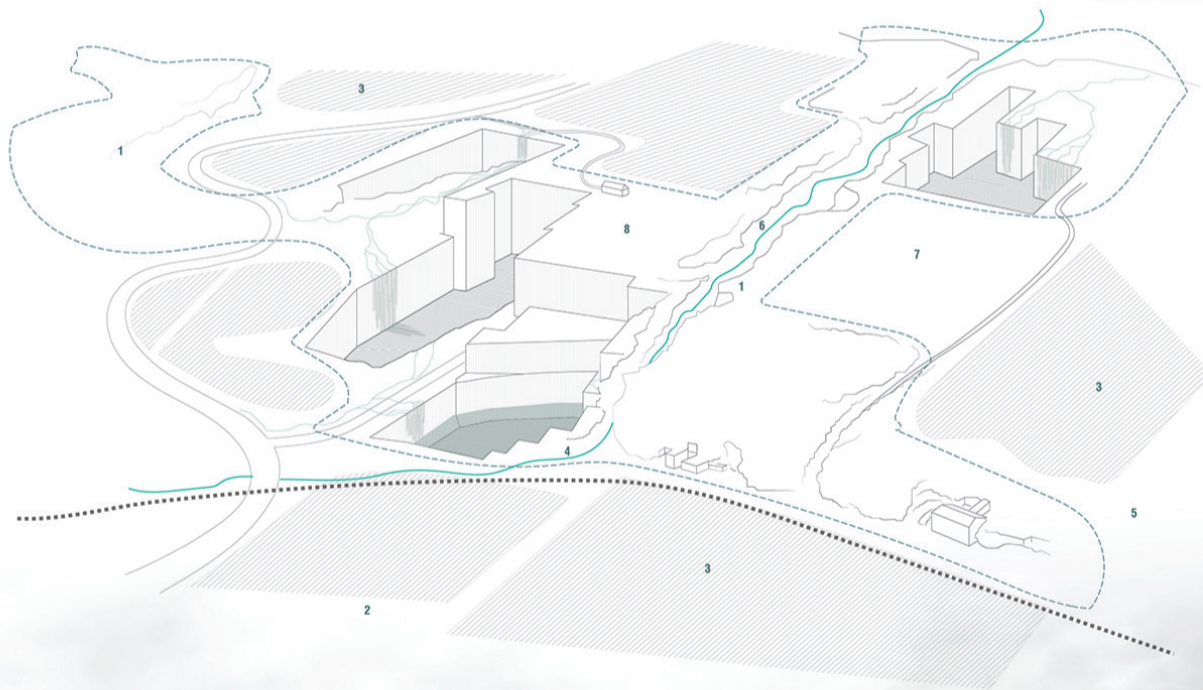


HISTORICAL TIME LINE



EVOLUTION OF THE ECOSYSTEM DURING THE TIME

PRESENCE OF NATURE



- 1 LIMESTONE SYSTEM
 - 2 ORCHARDS (*prunus dulcis*, olive, almond)
 - 3 SIMPLE SOWING
 - 4 SHRUBBERY (*locust-tree*, *thero brachypodietea*)
 - 5 GRASSLAND
 - 6 SHRUBS REPAIRS
 - 7 UNCULTIVATED SOIL USED FOR ARCHEOLOGICAL ACTIVITY
 - 8 GRASSLAND
- CRACK IN THE SOIL ○ ROCK SYSTEM — WATER FLUX — RAIN WATER FLUX — GRAVINE ● HUMIDITY

IDROGEOLOGICAL SYSTEM

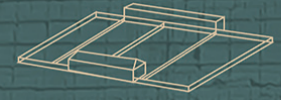


SITE ANALYSIS

MOSAIC OF THE SOIL

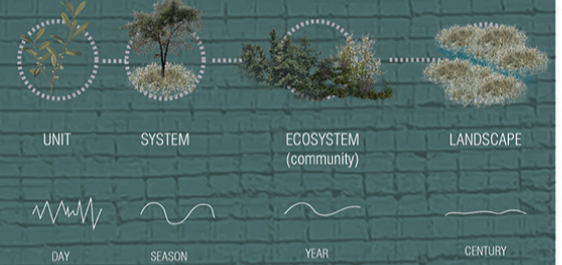
Originally this place was characterized by a high presence of WOODS, but with the growth of wood demand and the relative increase in the price of this raw material, the land owners intensively cut the woods and transforming the landscape.

After the area it changed again and became a place of farm animals TRANSHUMANCE, the herds also came from neighboring regions. Today in the area there are the characteristic signs of this land use:



The JAZZO is a particular enclosure for sheep commonly used in the territory of Murgia and Gargano, built along the *tratturi* and intended for the temporary shelter of the sheep during the long journey of transhumance so constituted stations suitable for all the activities connected to the pauses of the shepherds and the flocks during the transhumance. It is generally built on a slope, to favor the ventilation and the flow of water. It is always exposed to the south, to guarantee shelter from the cold northern winds, since the Apulian pastures were used in the cold season.

The structure consists of a main wall of fence, higher and sturdy, and smaller walls that divide the internal area into various compartments. The construction is in dry stone, obtained on site by the removal of the ground. Often there were also small buildings for the sheltering of shepherds, animals and for processing milk.



PRODUCTION OF PHOTOSYNTHESIS Hierarchical levels of ecological systems. Photosynthesis in different scale systems. Minor processing speeds correspond to the behavior of a high-level system.

Grassland is a mixed of different species: *stipa australitica*, *festuca circum-mediterranea*, *koeleria* and *phleum ambiguum*.

This is a typical eco- system of the Murgia Valley and his name is SUB MEDITERRANEAN XERIC GRASSES

The prairie system is a semi-natural habitat with a conservation value and a Community interest (NATURA 2000 code: 62A0-direttiva 92/43/CEE) often threatened by desertification (19%) by ridding technique and excessive grazing.

ECOSYSTEM COMMUNITY

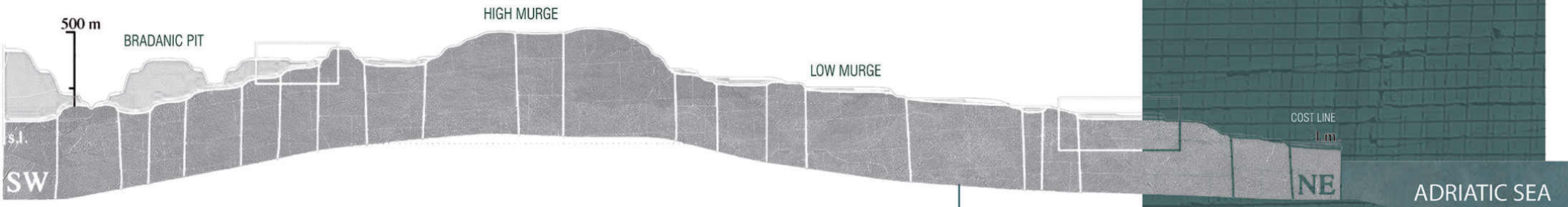


www.parcollamurgia.it
"I quaderni del parco" n° 1, n° 2, n° 3
PPTR Regione Puglia

Ministero dell' Ambiente e della Tutela del Territorio e del Mare
Direzione generale per le Valutazioni e le Autorizzazioni Ambientali
Osservazioni Grottelline

www.lateradipuglia.it
www.terredimediterraneo.com
Intervento di Legambiente alla conferenza "Da così a così"

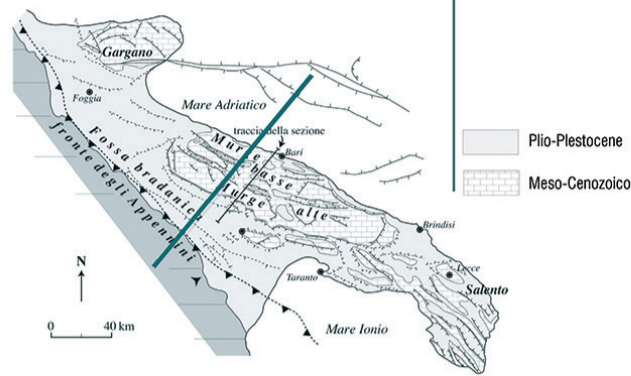
GEOLOGICAL ANALYSIS



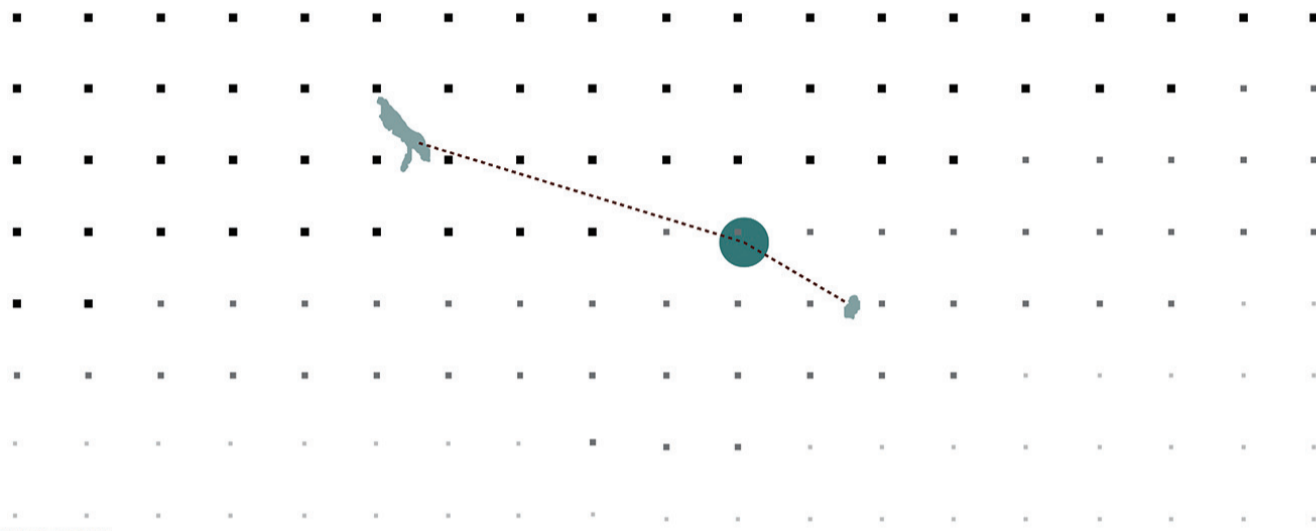
SEISMIC HAZARD MAP 0.02 DEGREE STEP

The territory of Spinazzola, indicated in the Order of the President of the Council of Ministers no. 3274/2003 is in a seismic zone 2. Area with average seismic hazard where strong earthquakes can occur.

SEISMIC ZONE	acceleration with a probability of exceeding 10% in 50 years [Ag]	maximum conventional horizontal acceleration (Technical Standards) [Ag]
2	ag > 0,25 g	0,35 g



■ 0,150 - 0,175 ■ 0,125 - 0,150 ■ 0,100 - 0,125



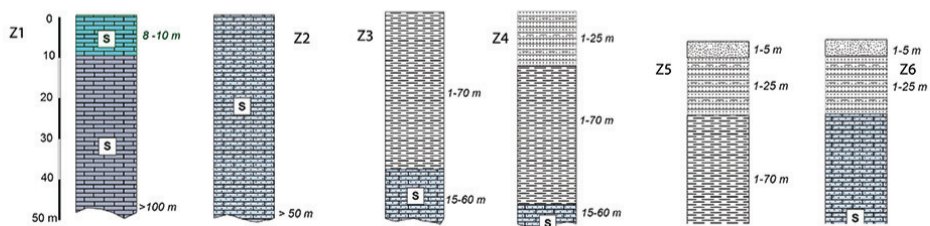
LIMESTONE

Limestone is a sedimentary rock composed primarily of calcium carbonate with the occasional presence of magnesium. Most limestone is biochemical in origin meaning the calcium carbonate in the stone originated from shelled oceanic creatures. Chemical limestone forms when calcium and carbonate ions suspended in water chemically bond and precipitate from their aquatic sources. Because of its high calcium content, limestone is usually light in color, although many variations exist. Two general phases of limestone production exist: quarrying and processing.

MATERIAL ACTION PALETTE



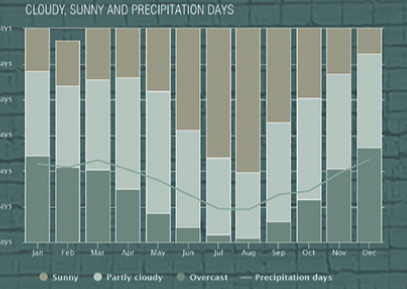
GEOLOGICAL LAYER



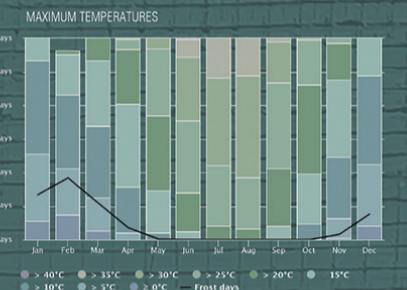
- INFORMATION ON THE RIGID GEOLOGICAL SUBSTRATE**
Litoid substrate consisting of locally fractured dolomite limestones and limestones with Vs > 800 m/sec
- INFORMATION ON THE GEOLOGICAL SUBSTRATE NOT RIDGE**
Litoid substrate consisting of fractured limestones with Vs < 800 m/sec
- Litoid substrate consisting of calcarenites with Vs < 800 m/sec
- S Stratified
- ROOFING LITHOLOGY**
- Sand
- Sandy lime clay
- Consistent clay

CLIMATE ANALYSIS

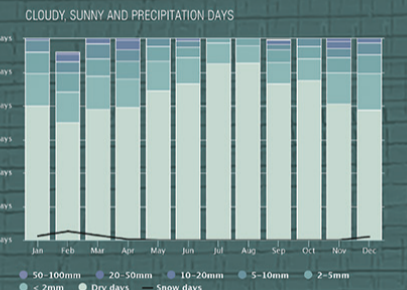
The precipitation chart is useful to plan for seasonal effects. Monthly precipitations above 150mm are mostly wet, below 50mm mostly dry.



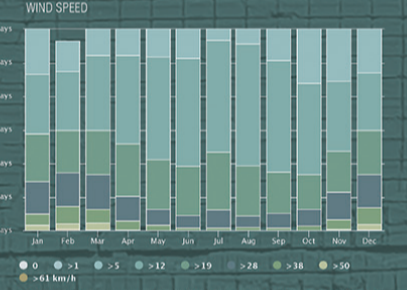
The graph shows the monthly number of sunny, partly cloudy, overcast and precipitation days. Days with less than 20% cloud cover are considered as sunny, with 20-80% cloud cover as partly cloudy and with more than 80% as overcast.



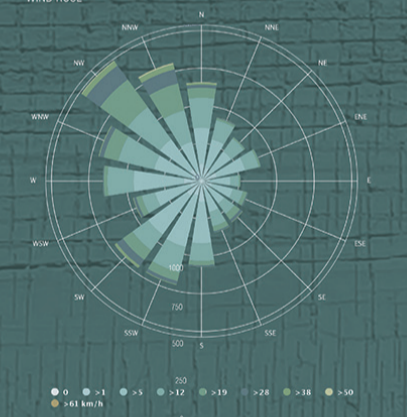
The maximum temperature diagram for Spinazzola displays how many days per month reach certain temperatures.



The precipitation diagram for Spinazzola shows on how many days per month, certain precipitation amounts are reached.



The diagram for Spinazzola shows how many days within each month can be expected to reach certain wind speeds.



The wind rose for Spinazzola shows how many hours per year the wind blows from the indicated direction.

www.melenblue.com
Istituto Nazionale di Geofisica e Vulcanologia
www.researchgate.net_da Tropeano & Sabatini's maps 2000

MARINE TERRACED SANDY CLAY

CONGLOMERATES TERRACE

CALCARENITE OF GRAVINA

CRETACEOUS LIMESTONE

REVITALIZATION OF GROTTELLINE QUARRIES

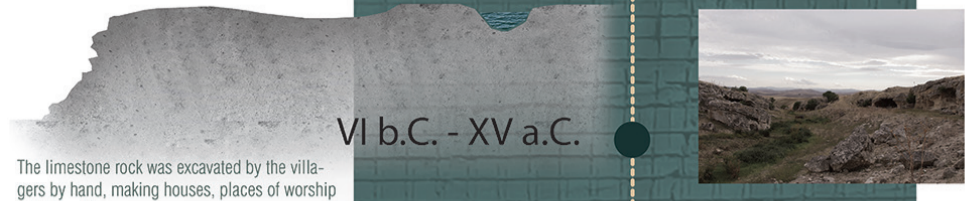
A



EXPERIMENTAL FOR THE RECOVERY OF THE QUARRY THROUGH BIO-LAKE



COMPONENT	FACTOR	IMPACT	
		BEFORE	AFTER
WATER ENVIRONMENT	rainwater collection	●●●●	●●●●
	groundwater pollution	●●●●	●●●●
	surface water pollution	●●●●	●●●●
SOIL & UNDERGROUND SOIL	geological security	●●●●	●●●●
	effects on wild animals	●●●●	●●●●
FLORA & FAUNA	effects on birds	●●●●	●●●●
	effects on habitat	●●●●	●●●●
SOUND	reverberation	●●●●	●●●●

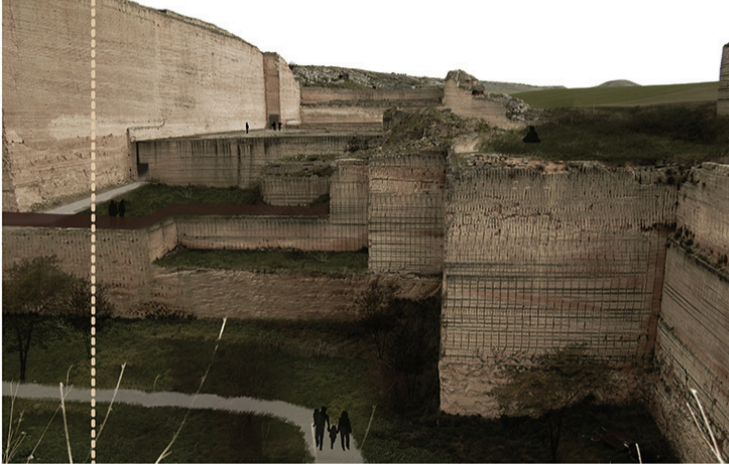


VI b.C. - XV a.C.

The limestone rock was excavated by the villagers by hand, making houses, places of worship and deposits



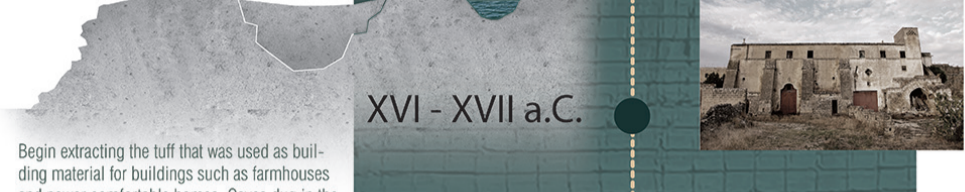
B



EXPERIMENTAL FOR THE RECOVERY OF THE QUARRY THROUGH BIODIVERSITY REHABILITATION



COMPONENT	FACTOR	IMPACT	
		BEFORE	AFTER
WATER ENVIRONMENT	rainwater collection	●●●●	●●●●
	groundwater pollution	●●●●	●●●●
	surface water pollution	●●●●	●●●●
SOIL & UNDERGROUND SOIL	geological security	●●●●	●●●●
	effects on wild animals	●●●●	●●●●
FLORA & FAUNA	effects on birds	●●●●	●●●●
	effects on habitat	●●●●	●●●●
SOUND	reverberation	●●●●	●●●●

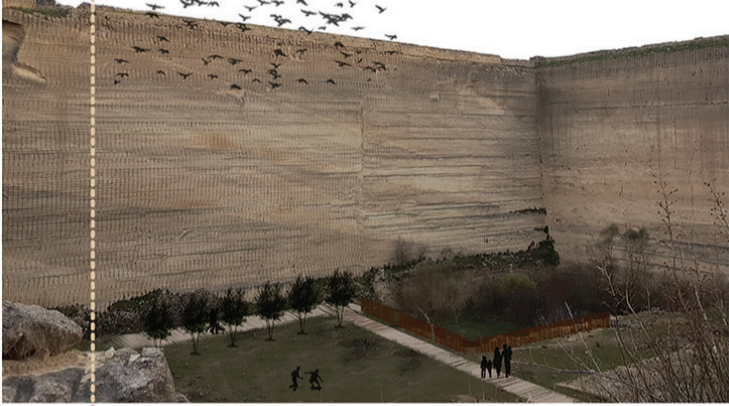


XVI - XVII a.C.

Begin extracting the tuff that was used as building material for buildings such as farmhouses and newer comfortable homes. Caves dug in the rock were used as deposits.



C



EXPERIMENTAL FOR THE RECOVERY OF THE QUARRY THROUGH RINATURALIZATION



COMPONENT	FACTOR	IMPACT	
		BEFORE	AFTER
WATER ENVIRONMENT	rainwater collection	●●●●	●●●●
	groundwater pollution	●●●●	●●●●
	surface water pollution	●●●●	●●●●
SOIL & UNDERGROUND SOIL	geological security	●●●●	●●●●
	effects on wild animals	●●●●	●●●●
FLORA & FAUNA	effects on birds	●●●●	●●●●
	effects on habitat	●●●●	●●●●
SOUND	reverberation	●●●●	●●●●



1960 - 1970

The quarries near the caves are opened, the extraction was done through the use of more modern machinery and the cuts became larger and regular. The tuff slabs are transported and sold for the construction of buildings.



1970 - 1999

Extraction stops due to an error in rock cutting. The wall adjacent to the stream was cut and for this reason with the flood canal, the water and the debris overflow and seep into the quarries.



2007 - 2014

The company starts work on the landfill, it coils the bottom of the quarry and an artificial lake is created due to the problems of the water flowing from the canal.



2014 - NOW

Through the water maintenance work the problem is solved. The channel is improved and the water does not overflow in the quarry. The landfill works are blocked by the police after the denunciation of the burglary of toxic materials near the quarries.



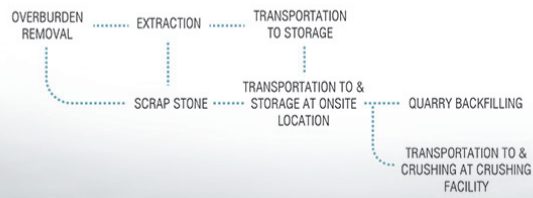
PROGRAM FOR THE RECOVERY OF THE QUARRY

LIMESTONE QUARRYING OPERATIONS

Extraction (more commonly referred to as quarrying) consists of removing blocks or pieces of stone from an identified and unearthed geologic deposit. Differences in the particular quarrying techniques used often stems from variations in the physical properties of the deposit itself—such as density, fracturing/bedding planes, and depth—financial considerations, and the site owner's preference. Nevertheless, the process is relatively simple: locate or create (minimal) breaks in the stone, remove the stone using heavy machinery, secure the stone on a vehicle for transport, and move the material to storage. The first step in quarrying is to gain access to the limestone deposit. This is achieved by removing the layer of earth, vegetation, and rock unsuitable for product. The overburden is then transferred to onsite storage for potential use in later reclamation of the site. After the face of the limestone is exposed, the stone is removed from the quarry in benches, usually 2.5 to 3.5 meters extending 6 meters or more using a variety of techniques suitable to the geology and characteristics of the limestone deposit. Quarrying operations typically include drilling holes along the perimeter of the bench followed by cutting the stone out of the deposit using saws equipped with diamond wire, or by splitting the stone using hydraulic splitters. If bedding planes are visible, forklifts can be used to pry up the blocks. Once the bench is cut or split loose from the deposit, heavy equipment is used to lift the limestone bench and transfer it to an inspection area for grading, temporary storage, occasional preprocessing into slabs, and eventual shipment from the site. Limestone of insufficient quality or size for current demand is stored on-site for future use, crushed for use in paving and construction applications, or stored for future site reclamation activities.

Processing commences with transportation of the (raw) stone from the quarry to the processing facility. It should be noted that this step may consist of multiple transportation steps; prior to reaching the doors of the facility, the stone may be transferred to a number of vendors or distribution locations worldwide. Additionally, some limestone (blocks) may have been cut into slabs before reaching the main fabrication plant.

Limestone is often produced with a natural surface, but finishes can be applied. In such cases, often a polished or honed finishing is given to limestone products, but a variety of other finishes are also common. Polishing and honing are manually and/or mechanically accomplished through the use of polishing pads or bricks.



NOW - 2023

EXTRACTION PROCESSES AND SITE HISTORY



2023 - 2028



cosimoforina.blogspot.com
www.geology.com
Cava: arte e cultura by Salvatore Sammartano 2004
www.architetturaecosostenibile.it
www.teatronaturale.it

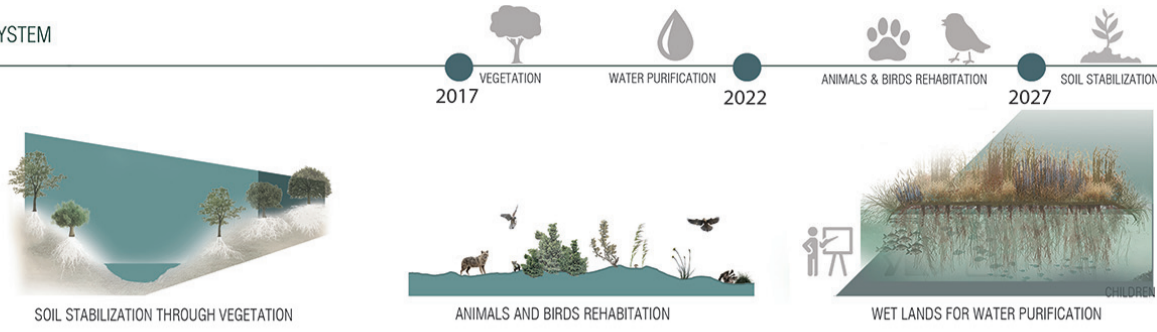
TOWER THAT SIGN THE 0 LEVEL OF THE SOIL BEFORE THE OPERATION OF EXTRACTION



PROGRAM OF PLANNING INTENTIONS

CASE STUDIES

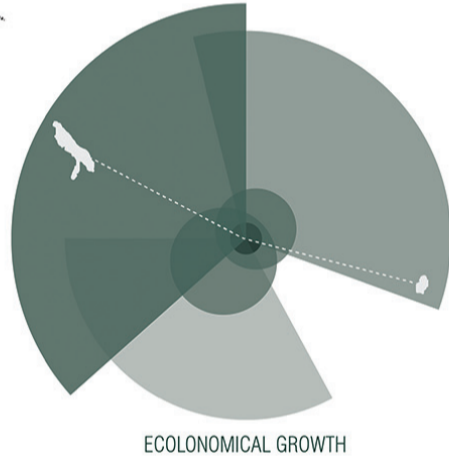
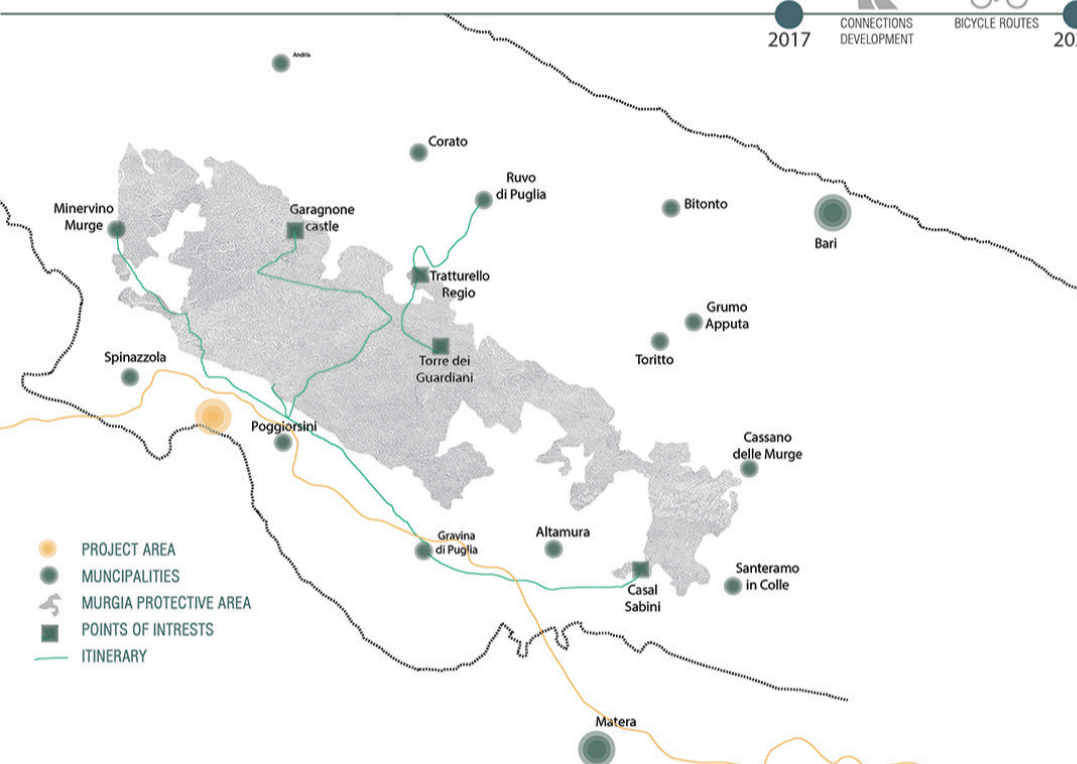
CONSOLIDATION OF THE ECOSYSTEM



REUSE OF THE EXCAVATED SPACES



INCREMENT OF CONNECTION



SCULPTURE PARK LA PALOMBA

• The Sculpture Park La Palomba is located in the periurban belt of Matera, and is part of a fascinating territory in which they merge remains of Neolithic villages and caves on the background of the incredible work of man in the quarries and of the natural landscape of the Park of the Rock Churches.

• The non-profit Foundation Park Sculpture La Palomba has made this place a scenario incredibly suggestive, where Antonio's great sculptures Paradiso and other artists speak the same language of nature that welcomes them.

• The structure of this open air museum consists exclusively from the walls of natural rock (the only exception is made for the volumes that host the bookshop, the bar and a small room exhibition) which accompany the visitor along the way exhibition, creating a highly evocative scene thanks to the different geometries of the rock and the signs inherited from the activity of cultivation, which enrich the surfaces with high textures chiaroscuro effect.

• Thanks to the excellent acoustics due to the presence of the tufts inside in the Park events are periodically organized unpublished concerts.



CAVA ISPICA

• Cava Ispica is a river valley that for 13 km cuts the Ibleo plateau, between the towns of Modica and Ispica. The valley, immersed in the typical Mediterranean vegetation, contains prehistoric necropolis, Christian catacombs, rock oratories, monastic hermitages and various types of housing. In the terminal area of the valley in the territory of Ispica, close to the city, there are numerous testimonies that attest the presence of man from prehistoric times until the earthquake of 1693.

• The particular morphology of the quarry, shaped like a throat, the type of rock, the position naturally suitable for defense, the proximity of the sea, have contributed to make this place one of the largest rock settlements in Sicily.

• The Cava d'Ispica Association is working on a large project that aims to enhance and make the "Cava d'Ispica" usable, with the aim of creating a Documental Cultural Center to support the Cava d'Ispica Rural Route.



ETHNOGRAPHIC MUSEUM OF TRENTO

• In a rich exhibition that crosses 43 rooms, the Museum stands out for its attention to the agrosilvopastorale system of the Trentino mountains and to the artisan work supporting the farming world - wood, iron, copper, ceramics, textiles - up to the testimonies of the religiosity, music and folklore.

• The Museum is the ideal place in which to approach the memory and the roots of the territory. In fact, at the permanent exhibition, the Museum offers an intense educational activity that, through educational services, offers about thirty thematic didactic itineraries and thematic creative workshops for the whole family at different times of the year, as well as courses for adults that teach activities, now little practiced.

• The Museum is also a publishing house and an important research center, in collaboration with several museums throughout Europe. Inside, it also houses a library and a specialized media library with more than 17,000 volumes and serves as a center of ethnographic studies for the entire Alpine arc.



2017

Commencement of the infrastructure development, Historical elements restoration and environmental purification interventions

2022

Completion of the construction phase (Archaeological research center and open museum) as well as the path that connects all the project

2027

Reaching the project goal through the increase of user interactions, Environmental improvement economical growth

GROTTELLINE ARCHAEOLOGICAL POLE

MASTERPLAN
1:2000

GAP AS INTERVALS
OF TIME THAT HAVE OCCURRED IN THIS PLACE.

GAP AS PASSAGE OF
THE DIFFERENT STORIES OF THE HUMAN WHO LIVED
IN THESE LANDS.

GAP AS VACUUM
BECAUSE ALL THIS LANDSCAPE IS CHARACTERIZED
BY THE EMPTY SPACES OF KARST, CAVES, AND
QUARRY BUT ALSO BY THE EMPTINESS OF THE ABAN-
DONMENT OF THESE PLACES.

THE MULTIFUNCTIONAL POLE INCLUDES:

**ETHNOGRAPHIC MUSEUM
& ARCHAEOLOGICAL PARC**

RESEARCH CENTER

THE PROJECT FOCUSES ON THE MUSEALISATION OF THE GROTTELLINE SITE AND THE RELATIVE TRANSFORMATION AND OCCUPATION OF THE MATERIAL ITSELF. THE CREATION OF A SYSTEM THAT CORRELATES THE ANCIENT AND MODERN TRACES PRESENT EVERYWHERE IN THE AREA WAS THE STARTING POINT FOR THE CREATION OF A MULTIFUNCTIONAL POLE.

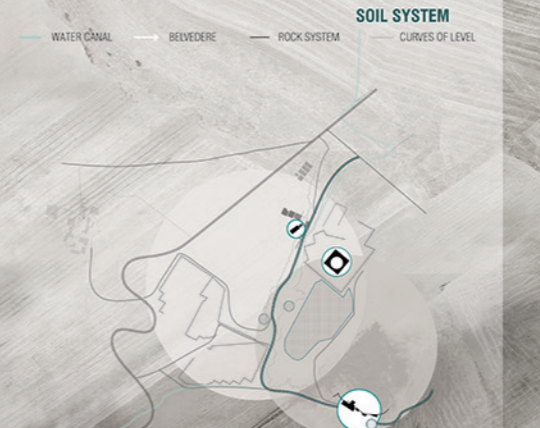
THE LANDSCAPE CULTURAL RICHES ARE ENHANCED BY A PATH THAT CAN ACCOMPANY THE VISITOR TO EXPLORE THE HISTORY OF THE PLACE AND THE ECOSYSTEM THAT CHARACTERIZES IT. DIFFERENT REFLECTIONS ARE STIMULATED ON THE CHANGES OF THE LANDSCAPE OVER TIME BUT ALSO ON THE PRACTICES AND CUSTOMS OF THE TERRITORY WITH THE ATTEMPT TO BRING TO LIGHT AS ELEMENTS OF CHANGE CAN BE REINTEGRATED INTO THE LANDSCAPE THROUGH ACTIONS OF RECOVERY AND RE-NATURALIZATION.

THE VISITOR WHO ARRIVES IN GROTTELLINE CAN ADMIRE THE CONSEQUENCES OF THE RELATIONSHIP THAT HAS OCCURRED FOR MILLENNIA BETWEEN HUMAN AND ROCK. FROM PREHISTORY TO INDUSTRIALIZED QUARRYING, THE TESTIMONY OF THE ANCIENT CAVES BECOMES A PLACE TO HOST LARGE EXHIBITION AREAS CAPABLE OF INVOLVING ALL THE PEOPLE AND GIVING LIFE BACK TO ABANDONED PLACES.

FLANKED BY THE MUSEUM THERE IS THE RESEARCH CENTER BUT ABOVE ALL OF THE EXPERIMENTATION WHERE RESEARCHERS WITH DIFFERENT MAJORS AND DIVERGENT BACKGROUNDS HAVE THE OPPORTUNITY TO CONTRIBUTE TO WORK ON NEW METHODS AND ADVANCED TECHNIQUES. DIRECTLY ON SITE THE POLE CLOSELY CONNECTED TO CULTURAL AND LANDSCAPE SITES OF PUGLIA AND BASILICATA WILL BECOME AN EXPERIMENTAL HUB FOR ARCHAEOLOGICAL AND GEOLOGICAL EXPERIMENTATION.

FUNCTIONAL PROGRAM

	POSITION	AREA	UNIT	USERS	UNIT
GROTTELLINE SITE GEO PARC	A	440	sqm		
	B	5500	sqm		
	C	1.4	m		space
	D	950	sqm	4	Cave
	E	240	sqm	2	Cave
	F	4730	sqm		
	G	660	sqm		
	H	1362	sqm		
	I	3000	sqm		
	L	270	sqm	3	space
	M	845	sqm	60	cars
	N	740	sqm	50	cars



ANCIENT ROCK CHURCH IN THE GRAVINE SYSTEM



SEATING AREA IN THE ANCIENT EXTRACTION SITE



BIO-LAKE & PANORAMIC TERRACE



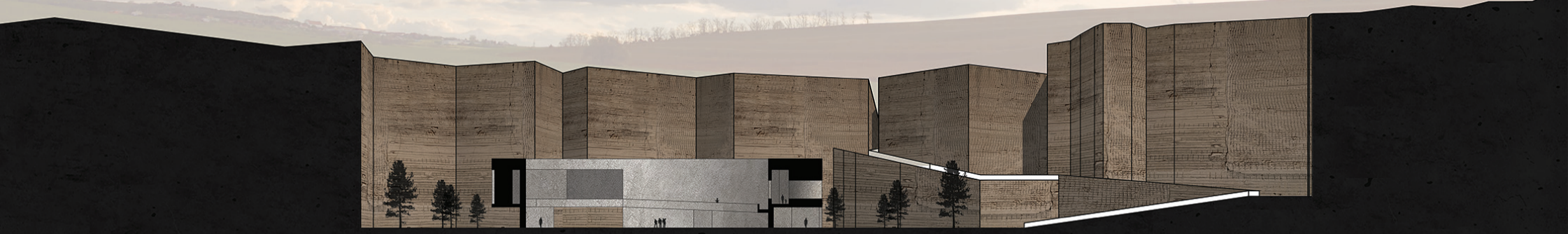
VIEW OF THE RESTORED GATE OF MASSERIA GROTTELLINI



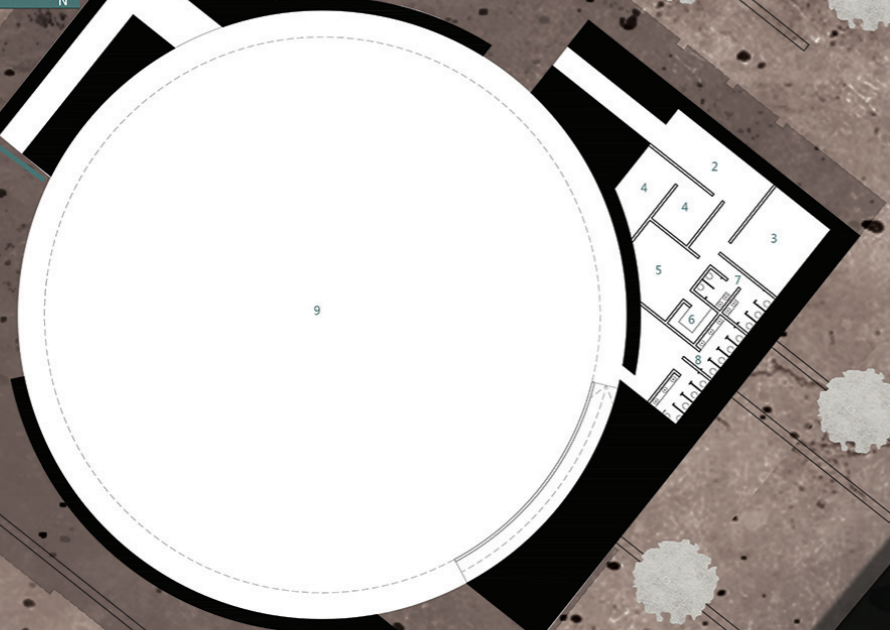
THE SOLID SHAPE WHICH REPRESENTS THE ORIGINAL STATE OF THE QUARRY

THE CIRCLE SHAPE WHICH REPRESENTS THE EXCAVATION OF THE QUARRY

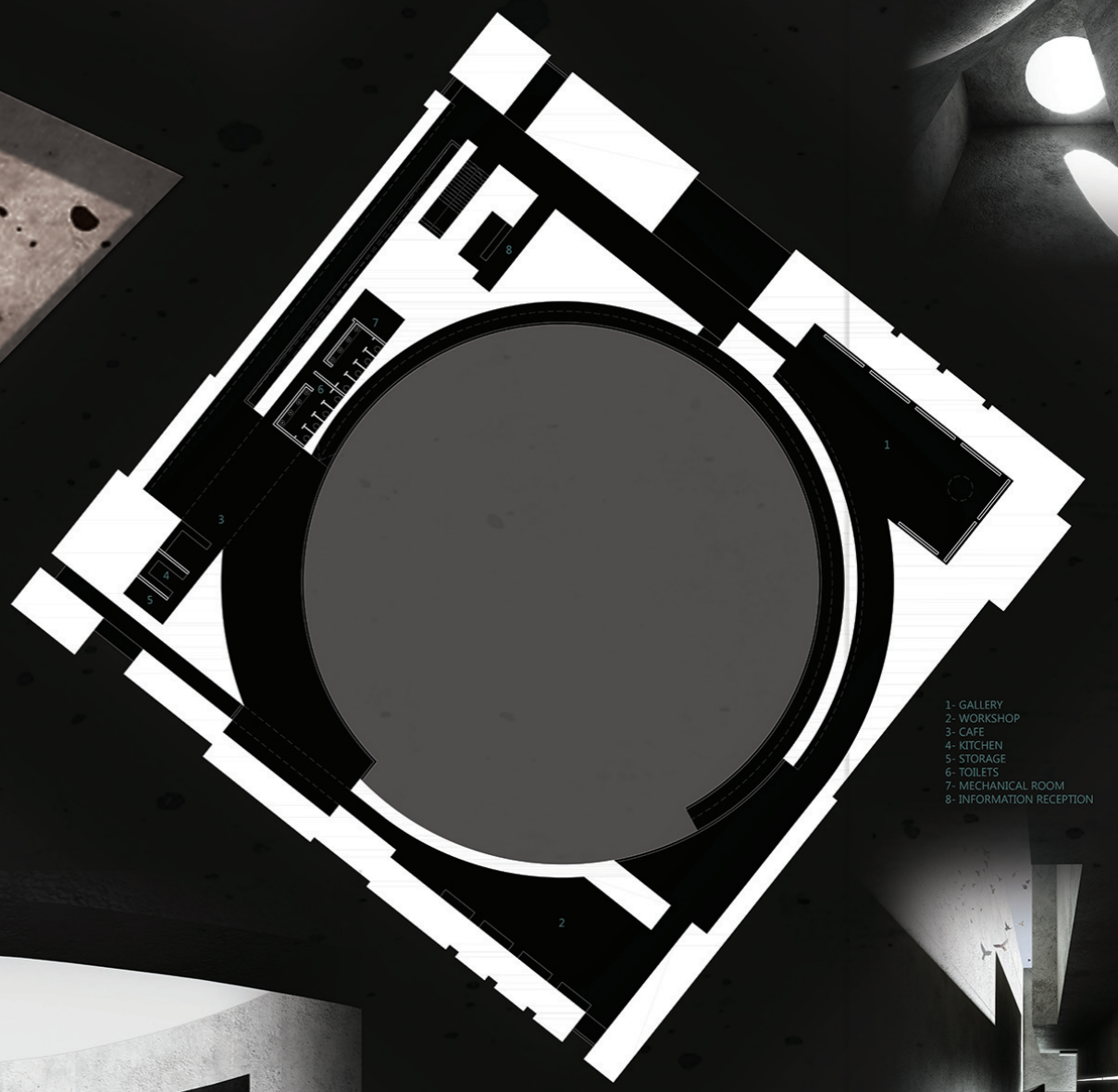
SUBTRACTION THE VOIDS FROM THE SOLID CREATING A NEW SPACE



GROUND & FIRST FLOOR PLAN scale 1:200



- 1- PARKING FOR ELECTRICAL BUGGIES
- 2- ADMIN LOBBY
- 3- MEETING ROOM
- 4- WORKING OFFICES
- 5- LIVING ROOM
- 6- KITCHEN
- 7- TOILETS
- 8- PUBLIC TOILETS
- 9- MAIN OUTDOOR PAVILION



- 1- GALLERY
- 2- WORKSHOP
- 3- CAFE
- 4- KITCHEN
- 5- STORAGE
- 6- TOILETS
- 7- MECHANICAL ROOM
- 8- INFORMATION RECEPTION

